Universidade do Minho
Escola de Psicologia

Marina Leonor Martins Pinheiro

Emotional Processing and Psychopathy in Female Offenders

April 2026

Emotional Processing and Psychopathy in Female Offenders
Marina Leonor Martins Pinheiro
UMinho | 2026

Universidade do Minho
Escola de Psicologia

Marina Leonor Martins Pinheiro

Emotional Processing and Psychopathy in Female Offenders

Doctoral Thesis
PhD in Applied Psychology

Work developed under the supervision of
Professor Dr. Olga Cunha
and
Professor Dr. Rui Abrunhosa Gonçalves

April 2026

DIREITOS DE AUTOR E CONDIÇÕES DE UTILIZAÇÃO DO TRABALHO POR TERCEIROS

Este é um trabalho académico que pode ser utilizado por terceiros desde que respeitadas as regras e boas práticas internacionalmente aceites, no que concerne aos direitos de autor e direitos conexos.

Assim, o presente trabalho pode ser utilizado nos termos previstos na licença abaixo indicada.

Caso o utilizador necessite de permissão para poder fazer um uso do trabalho em condições não previstas no licenciamento indicado, deverá contactar o autor, através do RepositóriUM da Universidade do Minho.

Licença concedida aos utilizadores deste trabalho



Atribuição-NãoComercial-SemDerivações

CC BY-NC-ND

https://creativecommons.org/licenses/by-nc-nd/4.0/

ACKNOWLEDGMENTS

This doctoral journey honors all those who have been a guiding light during difficult times, a shelter in moments of doubt, and a source of strength when it was most needed.

To Professor Olga Cunha, I sincerely thank you for your trust, humility, and firm, humane, and wise supervision throughout this process. Your guidance has profoundly shaped my growth as a person, psychologist, and researcher. I believe this is not an end, but the beginning of a lasting partnership.

To Professor Rui Abrunhosa Gonçalves, who always believed this day would come and encouraged me to gain field experience before embarking on this scientific journey with women who have committed crimes and present psychopathic traits, my sincere gratitude.

To Professor Sónia Caridade and Professor Andreia Castro-Rodrigues, I express my gratitude for your guidance, the academic opportunities you have provided, as well as your warmth, humility, and scientific rigor. I also thank the Research Group *Victims, Offenders, and the Justice System* for its generosity and collaborative spirit.

To all participants in this study, I extend my deepest gratitude for your trust and for sharing your life experiences. Each story contributed to a deeper understanding of strength, resilience, and survival.

To the friends this PhD brought into my life — Ana Cunha, Delfina Fernandes, Licínio Zitha, Maria Vale, and Virgínia Alves — thank you for your support, presence, and shared achievements.

To my family, my safe haven. To my mother, the woman who gave me life and the strength to reach this point, I promised that one day she would see me wear the highest symbol of academia, the doctoral cape. Today, I wear the cape she gave me, a symbol of all the layers of protection she has provided and will continue to provide throughout my life. To my father, who walked every step of this journey with me, thank you. To my brother, the most important person in my life, my companion in every journey, and the one from whom I learned the essential values of being, presence, humility, dedication, ambition, and the golden rule of never giving up, thank you for never allowing me to waver and for continually reigniting in me the strength to carry on. I also thank Alexandra, who has stood by me throughout these years.

To you, my partner in life, in dreams, and in the future we are building together, we promised to finish our doctorates “at the same time”, and we did. Thank you for being my home, a beacon, and a horizon.

Finally, I thank myself for the courage to rise every time it was necessary. There was exhaustion, silence, and tears, but never a lack of purpose, because “when we are weak, then we are strong”. This victory belongs to all of us.

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE (AI) TOOLS

I hereby declare having acted this academic work with integrity and confirm that I have not resorted to any form of undue use of AI tools, nor to the falsification or omission of information, sources, data, results or processes in any of the stages leading to its elaboration.

I further declare that any use of AI tools was done in a transparent and responsible manner, being duly noted in the work, and that I critically verified the accuracy of the content produced with their support, assuming full responsibility for what I submit.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho, as well as the applicable standards of academic integrity and data protection.

EMOTIONAL PROCESSING AND PSYCHOPATHY IN FEMALE OFFENDERS

Abstract

Emotional processing is a central aspect of psychopathy, although research focused on women, particularly in prison settings, remains fragmented and theoretically based on male samples, which limits the understanding of female emotional patterns. This thesis is organized into five studies, one systematic review and four empirical studies, conducted with a sample of 164 incarcerated Portuguese women (*M*age = 38.75 years; *SD* = 11.99), exploring emotional processing and developmental, emotional, and cognitive mechanisms linked to psychopathic traits. The empirical studies employed a multimethod approach, including the Self-Report Psychopathy Short-Form (SRP-SF), the Social Desirability Scale, the International Affective Picture System (IAPS) combined with the Self-Assessment Manikin (SAM), the Emotional Processing Scale (EPS-25), the Adverse Childhood Experiences scale (ACEs), the Benevolent Childhood Experiences scale (BCEs), the Basic Empathy Scale (BES), and the Frontal Assessment Battery (FAB). The systematic review (study 1) identified deficits in the understanding, regulation, and categorization of negative emotions, as well as elevated alexithymia in women with higher psychopathic traits. The characterization of emotional processing (study 2) revealed that women with higher psychopathic propensity showed increased arousal to threatening cues and reduced perceived control. Empirical studies 3 and 4 examined how developmental experiences and empathy influence the expression of psychopathic traits, with findings showing associations between ACEs and psychopathic traits, particularly in the lifestyle and antisocial facets, as well as impairments in affective empathy. Positive childhood experiences (PCEs) buffered the effect of some ACEs on psychopathic traits and affective empathy. Finally, study 5 tested a theoretical model examining relationships among ACEs, executive functioning (EF), emotional processing (and its dimensions), psychopathic traits, and empathy. It found that ACEs were associated with higher EF, that emotional processing difficulties emerged as a central mechanism underlying psychopathy, and that psychopathic traits were linked to deficits in affective, but not cognitive, empathy. This thesis advances understanding of emotional processing in female psychopathy, highlighting context-dependent emotional patterns and underscoring the need to integrate developmental, emotional, and cognitive mechanisms into theoretical models, informing psychological assessment and the development of gender-responsive, trauma-informed forensic interventions.

Keywords: Childhood Experiences; Emotional Processing; Empathy; Psychopathy; Women who Committed Crimes.

PROCESSAMENTO EMOCIONAL E PSICOPATIA EM MULHERES OFENSORAS

Resumo

O processamento emocional constitui um aspeto central da psicopatia, embora a investigação focada em mulheres, particularmente em contextos prisionais, permaneça fragmentada e baseada em amostras masculinas, o que limita a compreensão dos padrões emocionais femininos. Esta tese está organizada em cinco estudos, uma revisão sistemática e quatro estudos empíricos, realizados com uma amostra de 164 mulheres portuguesas reclusas (*M*idade = 38.75 anos; *DP* = 11.99), explorando o processamento emocional e os mecanismos desenvolvimentais, emocionais e cognitivos associados a traços psicopáticos. Os estudos empíricos recorreram a uma abordagem multimétodo, incluindo o Questionário de Autorrelato da Psicopatia (SRP-SF), a Escala de Desejabilidade Social, o Sistema Internacional de Imagens Afetivas (IAPS) combinado com o Manequim de Autoavaliação (SAM), a Escala de Processamento Emocional (EPS-25), a escala de Experiências Adversas na infância (ACEs), a escala de Experiências Benevolentes na Infância (BCEs), a Escala de Empatia Básica (BES) e a Bateria de Avaliação Frontal (FAB). A revisão sistemática (estudo 1) identificou défices na compreensão, regulação e categorização de emoções negativas, bem como alexitimia elevada em mulheres com maiores níveis de traços psicopáticos. A caracterização do processamento emocional (estudo 2) revelou que mulheres com maior propensão psicopática apresentavam maior ativação perante estímulos ameaçadores e menor perceção de controlo. Os estudos empíricos 3 e 4, que analisaram a influência das experiências desenvolvimentais e da empatia na expressão dos traços psicopáticos, evidenciaram associações entre ACEs e traços psicopáticos, particularmente nas facetas de estilo de vida e antissocial, bem como défices na empatia afetiva. As experiências positivas na infância (PCEs) atenuaram o efeito de algumas ACEs nos traços psicopáticos e na empatia afetiva. Por fim, o estudo 5 testou um modelo teórico para examinar as relações entre ACEs, funcionamento executivo (FE), processamento emocional, traços psicopáticos e empatia, demonstrando que as ACEs se associam a níveis mais elevados de FE, que as dificuldades no processamento emocional emergem como um mecanismo subjacente à psicopatia e que os traços psicopáticos se associam a défices na empatia afetiva, mas não na empatia cognitiva. Esta tese contribui para compreender o processamento emocional na psicopatia feminina, destacando padrões emocionais dependentes do contexto e sublinhando a necessidade de integrar mecanismos desenvolvimentais, emocionais e cognitivos em modelos teóricos, com implicações para a avaliação psicológica e desenvolvimento de intervenções forenses sensíveis ao género e informadas pelo trauma.

Palavras-chave: Empatia; Experiências na Infância; Mulheres que Cometeram Crimes; Processamento Emocional; Psicopatia

TABLE OF CONTENTS

ACKNOWLEDGMENTS ..... **III**

STATEMENT OF INTEGRITY ..... **IV**

DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE (AI) TOOLS ..... **IV**

ABSTRACT ..... **V**

RESUMO ..... **VI**

TABLE OF CONTENTS ..... **VII**

LIST OF ABBREVIATIONS ..... **XII**

LIST OF TABLES ..... **XVI**

LIST OF FIGURES ..... **XIX**

THESIS OVERVIEW ..... **XXI**

——— PART I | GENERAL INTRODUCTION ——— **1**

INTRODUCTION 2

1. Historical Roots of the Concept of Psychopathy 2

1.1 Classical Origins 2

1.2 From Categorical to Dimensional Models 4

2. Contemporary Dimensional Conceptualizations of Psychopathy 5

2.1. The Triarchic Model of Psychopathy 6

2.2 Two-Process and Development Model of Psychopathy 7

2.3 The PCL-R and the Multidimensional Structure of Psychopathy 7

3. Psychopathic Traits in Women: Phenotypic and Clinical Specificities 8

3.1 Historical Underrepresentation and Social Limitations in Research on Women with Psychopathic Traits 9

3.2 Gender-specific Manifestations of Psychopathic Traits 10

3.3 Clinical and Forensic Implications 12

4. Emotional Processing in Psychopathy: Concepts and Models 14

4.1 Definition and Components of Emotional Processing 14

4.2 Emotional Processing in Psychopathy 15

5. Empathy 17

5.1. Conceptualization of Empathy: Affective and Cognitive Components 18

5.2 Empathy and Psychopathy: Empathic Dysfunction in Women with Psychopathic Traits 18

6. Executive Functions 20

6.1 EF and Psychopathy: Implications for Emotional Regulation and Antisocial Behavior.... 21
6.2 EF in Women with Psychopathic Traits 23
7. Developmental Trajectories: Impact on the Expression and Attenuation of Psychopathic Traits 23
7.1. Adverse Childhood Experiences and Developmentally Related Pathways to the Presence of Psychopathic Traits 24
7.2 Positive Childhood Experiences (PCEs) as Protective Factors in Psychopathic Traits 26
7.3 Early Risk and Protective Factors Related to Psychopathic Traits in Incarcerated Women 27
8. Prison: A Critical Forensic Context for Women..... 30
8.1 Psychological Comorbidity, Cumulative Vulnerability, and Adaptation to the Prison Context among Incarcerated Women..... 30
9. Gaps in Knowledge and Rationale for the Thesis 33
———— PART II | EMPIRICAL STUDIES ————..... 53
CHAPTER I | CHARACTERIZATION OF EMOTIONAL PROCESSING IN WOMEN WITH PSYCHOPATHIC TRAITS..... 54
STUDY 1 | EMOTIONAL PROCESSING AND PSYCHOPATHY AMONG WOMEN: A SYSTEMATIC REVIEW..... 55
Abstract 56
Introduction 57
Methods 61
Eligibility Criteria 61
Search Strategies..... 62
Data Extraction 62
Coding Procedures..... 63
Methodological Quality Analysis..... 65
Results..... 65
Discussion 77
References..... 84
CHAPTER II | ASSESSMENT OF EMOTIONAL PROCESSING IN INCARCERATED WOMEN WITH PSYCHOPATHIC TRAITS 95

STUDY 2 | EMOTIONAL PROCESSING OF PICTURES AND PSYCHOPATHIC TRAITS IN WOMEN WHO COMMITTED CRIMES 96
Abstract 97
Introduction 98
Current study 103
Method 104
Participants 104
Procedure 106
Measures 107
Data analysis 109
Results 109
Discussion 119
References 129
CHAPTER III| DEVELOPMENTAL TRAJECTORIES OF PSYCHOPATHY IN INCARCERATED WOMEN: ADVERSITY, POSITIVE EXPERIENCES, AND EMPATHIC SKILLS 139
STUDY 3 | THE MODERATING ROLE OF POSITIVE CHILDHOOD EXPERIENCES IN THE RELATIONSHIP BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN 140
Abstract 141
Introduction 142
Current study 145
Method 146
Participants 146
Procedure 147
Measures 147
Data analysis 149
Results 149
Discussion 179
References 185
STUDY 4|ADVERSE CHILDHOOD EXPERIENCES, EMPATHY, AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN: THE BUFFERING ROLE OF POSITIVE CHILDHOOD EXPERIENCES .. 191
Abstract 192

Introduction 193
Current study 195
Method 196
Participants 196
Procedure 197
Measures 198
Data analysis 199
Results 199
Discussion 210
Conclusion 214
References 215
CHAPTER IV|AN INTEGRATIVE MODEL OF THE COGNITIVE, EMOTIONAL, AND DEVELOPMENTAL MECHANISMS OF PSYCHOPATHY AND EMPATHY IN INCARCERATED WOMEN 236
STUDY 5|LINKING CHILDHOOD ADVERSITY TO PSYCHOPATHIC TRAITS AND EMPATHY IN INCARCERATED WOMEN: THE ROLE OF EXECUTIVE FUNCTIONING AND EMOTIONAL PROCESSING 237
Abstract 238
Introduction 239
Current study 245
Method 246
Participants 246
Procedure 246
Measures 247
Results 249
Discussion 254
References 260
PART III |CONCLUSION 271
INTEGRATIVE CONCLUSION 272
1. Main Findings and Contributions to the Characterization and Understanding of Emotional Processing and Psychopathy in Incarcerated Women 273

2. Implications for the Assessment in Forensic Settings: The Importance of Psychopathic Traits and Emotional Processing in Women 279
3. Implications for Intervention in Women with Psychopathic Traits in a Prison Setting..... 285
4. Implications for the Management of the Prison System and Public Policies for Criminal Justice for Women in the Portuguese Context 294
5. General Limitations 301
6. Recommendations for Future Research 304
7. Conclusion: From Data to Lived Experience 308

LIST OF ABBREVIATIONS

ACC	Anterior cingulate cortex
ACEs	Adverse Childhood Experiences
AFF	Affective Factor of Psychopathy
aINS	Human anterior insula
ANT	Antisocial Factor of Psychopathy
APA	American Psychiatric Association
b	Unstandardized regression coefficient
BCEs	Benevolent Childhood Experiences
BES	Basic Empathy Scale
CBT	Cognitive Behavioral Therapy
CEICSH	Research Ethics Committee in Social and Human Sciences
CI	Confidence Interval
CU	Callous–unemotional
dACC	Dorsal anterior cingulate cortex
DBT	Dialectical Behavior Therapy
DEQ	Discrete Emotions Questionnaire
DGRSP-MJ	Directorate-General for Reintegration and Prison Services – Ministry of Justice
dlPFC	Right dorsolateral prefrontal cortex
DMAP	Dimensional Model of Adversity and Psychopathology
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th edition
DV	Domestic Violence
EDS-20	Social Desirability Scale – 20 Items
EEG	Electroencephalogram
EF	Executive Functions
EI	Emotional Intelligence
EMDB	Emotional Movie Database
EMDR	Eye Movement Desensitization and Reprocessing
EMG	Electromyogram
EPS-25	Emotional Processing Scale– 25 Items
ER	Emotion regulation

ERP	Event-related potential
f-CFT	Forensic Compassion-Focused Therapy
f^2	Effect size index for multiple regression
FAB	Frontal Assessment Battery
FEH	Fear Enjoyment Hypothesis
fMRI	Functional magnetic resonance imaging
G*Power	Power analysis software for statistical tests
HOPE	Healthy Outcomes from Positive Experiences
HPA Axis	Hypothalamic–Pituitary–Adrenal Axis
HTML	Heterotrait-Monotrait Ratio of Correlations
IAPS	International Affective Picture System
ICD-11	International Classification of Diseases, 11th Revision
IES	Integrated Emotion Systems Model
IFG	Inferior frontal gyrus
INT	Interpersonal Factor of Psychopathy
IQ	Intelligence Quotient
KDEF	Karolinska Directed Emotional Faces
LIF	Lifestyle Factor of Psychopathy
LPPs	Late positive potentials
LSRP	Levenson's Self-Report Psychopathy Scale
M	Mean
MAE	Mean Absolute Error
MANOVA	Multivariate Analysis of Covariance
MAX	Maximum
MBT	Mentalization-Based Treatment
MIN	Minimum
MMAT	Mixed Methods Appraisal Tool
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
n	Number of participants
N/A	Not applicable
N170	Event-related potential (ERP) component
N2	Event-related potential (ERP) component

OSF	Open Science Framework
PANAS	Positive and Negative Affect Schedule
PCEs	Positive Childhood Experiences
PCL-R	Psychopathy Checklist–Revised
PCL:SV	Psychopathy Checklist – Screening Version
PD	Prisoner's Dilemma
PICOS	Participants, Intervention/Exposure, Comparison, Outcome, and Study Design
PLS-SEM	Partial Least Squares Structural Equation Modeling
PMD	Paralimbic Dysfunction Model
PPI	Psychopathic Personality Inventory
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
PROCESS macro	Regression-based modeling tool (SPSS)
pSTS	Posterior superior temporal sulcus
PTSD	Post-traumatic stress disorder
QA	Quality Assessment
R^2	Coefficient of Determination
RGEP	General Regulation of Prison Establishments
RMET	Reading the Mind in the Eyes Test
RMH	Response Modulation Hypothesis
RMSE	Root Mean Square Error
RNR	Risk Need Responsivity
rTPJ	Right temporoparietal junction
SAM	Self-Assessment Manikin
SD	Standard Deviation
SE	Standard Error
SEM	Structural Equation Model
SMA	Supplementary motor area
SPSS	Statistical Package for the Social Sciences
SRP-SF	Self-Report Psychopathy Scale – Short Form
STS	Superior temporal sulcus
TAS	Toronto Alexithymia Scale
TF-CBT	Trauma-Focused Cognitive Behavioral Therapy

TIC	Trauma-Informed Care
ToM	Theory of Mind
TPJ	Temporoparietal junction
Tri-PM	Triarchic Psychopathy Measure
TSI	Trauma-Specific Interventions
UNODC	United Nations Office on Drugs and Crime
VA	Valence-Arousal
VAD	Valence-Arousal-Dominance
VR	Virtual Reality
WHO	World Health Organization
WRNA	Women's Risk/Need Assessment

LIST OF TABLES

STUDY 1 | EMOTIONAL PROCESSING AND PSYCHOPATHY AMONG WOMEN: A SYSTEMATIC REVIEW

TABLE 1 65

STUDY DESIGN AND CHARACTERISTICS OF THE SAMPLE 65

TABLE 2 ..... **67**

SUMMARY OF THE STUDIES' OBJECTIVES, MEASURES, AND RESULTS AND QUALITATIVE ASSESSMENT. 67

TABLE 3 ..... **82**

KEY FINDINGS OF THE SYSTEMATIC REVIEW 82

TABLE 4 ..... **83**

IMPLICATIONS FOR RESEARCH, PRACTICE, AND POLICY 83

STUDY 2 | EMOTIONAL PROCESSING OF PICTURES AND PSYCHOPATHIC TRAITS IN WOMEN WHO COMMITTED CRIMES

TABLE 1 ..... **105**

SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS 105

TABLE 2 ..... **106**

JURIDICAL-LEGAL CHARACTERISTICS OF PARTICIPANTS 106

TABLE 3 ..... **110**

PSYCHOMETRIC PROPERTIES AND SAMPLE DESCRIPTIVE STATISTICS FOR STUDY MEASURES, SCALES, AND SUBSCALES 110

TABLE 4 ..... **112**

DIFFERENCES BETWEEN WOMEN WITH LOWER AND HIGHER PSYCHOPATHY PROPENSITIES *IN THE DIMENSIONS OF VALENCE, AROUSAL, AND DOMINANCE USING INDEPENDENT SAMPLES T-TEST.* 112

TABLE A **113**

MANN-WHITNEY U TEST RESULTS: COMPARISON OF EVALUATIONS OF PLEASANT IMAGES IN THE DIMENSIONS OF VALENCE, AROUSAL, AND DOMINANCE BETWEEN WOMEN WITH LOWER AND HIGHER PROPENSITY FOR PSYCHOPATHIC TRAITS 113

TABLE B **115**

MANN-WHITNEY U TEST RESULTS: COMPARISON OF EVALUATIONS OF UNPLEASANT IMAGES IN THE DIMENSIONS OF VALENCE, AROUSAL, AND DOMINANCE BETWEEN WOMEN WITH LOWER AND HIGHER PROPENSITY FOR PSYCHOPATHIC TRAITS 115

TABLE C **116**

Mann-Whitney U test results: comparison of evaluations of neutral images in the dimensions of valence, arousal, and dominance between women with lower and higher propensity for psychopathic traits 116

Table 5 ..... **118**

Spearman Correlations Between Psychopathic Traits and Factors and the Evaluation of Pleasant, Unpleasant, and Neutral Emotional Stimuli in the Dimensions of Valence, Arousal, and Dominance (n=164) 118

STUDY 3 | THE MODERATING ROLE OF POSITIVE CHILDHOOD EXPERIENCES IN THE RELATIONSHIP BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN

Table 1 ..... **146**

Sociodemographic and Juridical-Legal Characteristics of Participants 146

Table 2 ..... **149**

Descriptive Statistics for Study Measures, Scales, and Subscales 149

Table 3 ..... **151**

Person Correlations Between Psychopathic Traits, Total ACEs, Types of ACEs, and Total PCEs in the Total Sample (n=164) 151

Table 4 ..... **160**

Moderation Role of PCEs in the Relationship Between ACEs and Psychopathic Traits, Controlling for EDS-20 160

Table 5 ..... **171**

Moderation Role of PCEs in the Relationship Between ACEs and Psychopathic Traits, Without Inclusion of EDS-20 as a Covariate 171

STUDY 4|ADVERSE CHILDHOOD EXPERIENCES, EMPATHY, AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN: THE BUFFERING ROLE OF POSITIVE CHILDHOOD EXPERIENCES

Table 1 ..... **197**

Participants' Sociodemographic and Juridical-Legal Characteristics 197

Table 2 ..... **200**

Descriptive Statistics for Study Measures, Scales, and Subscales 200

Table 3 ..... **202**

Person Correlations Between Psychopathic Traits, Total PCEs, Total ACEs, and Empathy (n=164) ... 202

TABLE 4 ..... **205**

HIERARCHICAL LINEAR REGRESSION ANALYSIS FOR EMPATHY: CONTRIBUTIONS OF ACES AND PCES AND PSYCHOPATHIC (TOTAL TRAITS AND FACTORS) (N = 164) 205

TABLE 5 ..... **207**

HIERARCHICAL LINEAR REGRESSION ANALYSIS FOR EMPATHY: CONTRIBUTIONS OF TYPES OF ACES, PCES, AND PSYCHOPATHIC TRAITS (N = 164) 207

TABLE 6 ..... **209**

MODERATION ROLE OF PCES IN THE RELATIONSHIP BETWEEN ACES AND EMPATHY, WITH SOCIAL DESIRABILITY AS A COVARIATE (N = 164) 209

TABLE 7 ..... **210**

MODERATION ROLE OF PCES IN THE RELATIONSHIP BETWEEN PSYCHOPATHY AND EMPATHY, WITH SOCIAL DESIRABILITY AS A COVARIATE (N = 164) 210

SUPPLEMENTARY MATERIALS 1 ..... **222**

MODERATION ROLE OF PCES IN THE RELATIONSHIP BETWEEN ACES AND EMPATHY, WITH EDS-20 AS A COVARIATE (N = 164) 222

SUPPLEMENTARY MATERIALS 2 ..... **233**

MODERATION ROLE OF PCES IN THE RELATIONSHIP BETWEEN PSYCHOPATHY AND EMPATHY, WITH EDS-20 AS A COVARIATE (N = 164) 233

STUDY 5 | LINKING CHILDHOOD ADVERSITY TO PSYCHOPATHIC TRAITS AND EMPATHY IN INCARCERATED WOMEN: THE ROLE OF EXECUTIVE FUNCTIONING AND EMOTIONAL PROCESSING

TABLE 1 ..... **250**

DESCRIPTIVE STATISTICS FOR STUDY MEASURES, SCALES, AND SUBSCALES 250

TABLE 2 ..... **253**

RELATIONS BETWEEN VARIABLES 253

LIST OF FIGURES

STUDY 1 | EMOTIONAL PROCESSING AND PSYCHOPATHY AMONG WOMEN: A SYSTEMATIC REVIEW

FIGURE 1 ..... **64**

PREFERRED REPORTING ITEMS FOR SYSTEMATIC REVIEWS AND META-ANALYSES – FLOW DIAGRAM OF THE STUDY SELECTION PROCESS *64*

STUDY 3 | THE MODERATING ROLE OF POSITIVE CHILDHOOD EXPERIENCES IN THE RELATIONSHIP BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN

FIGURE 1 ..... **152**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN PHYSICAL ABUSE EXPERIENCES (ACES) AND AFFECTIVE FACTOR OF PSYCHOPATHY 152

FIGURE 2 A **153**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN SEXUAL ABUSE EXPERIENCES (ACES) AND AFFECTIVE FACTOR OF PSYCHOPATHY 153

FIGURE 2 B **153**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN SEXUAL ABUSE EXPERIENCES (ACES) AND ANTISOCIAL FACTOR OF PSYCHOPATHY 153

FIGURE 2 C **154**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN SEXUAL ABUSE EXPERIENCES (ACES) AND ANTISOCIAL FACTOR OF PSYCHOPATHY 154

FIGURE 3 A **155**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPOSURE TO DOMESTIC VIOLENCE (ACES) AND AFFECTIVE FACTORS OF PSYCHOPATHY 155

FIGURE 3 B **155**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPOSURE TO DOMESTIC VIOLENCE (ACES) AND TOTAL SCORES OF PSYCHOPATHY 155

FIGURE 4 A **156**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPERIENCES OF IMPRISONMENT OF A FAMILY MEMBER (ACES) AND INTERPERSONAL FACTOR OF PSYCHOPATHY 156

FIGURE 4 B **157**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPERIENCES OF IMPRISONMENT OF A FAMILY MEMBER (ACES) AND AFFECTIVE FACTOR OF PSYCHOPATHY ... 157

FIGURE 4 C **157**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPERIENCES OF IMPRISONMENT OF A FAMILY MEMBER (ACES) AND LIFESTYLES FACTOR OF PSYCHOPATHY .. 157

FIGURE 4 D **158**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPERIENCES OF IMPRISONMENT OF A FAMILY MEMBER (ACES) AND ANTISOCIAL FACTOR OF PSYCHOPATHY .. 158

FIGURE 4 E **158**

MODERATING EFFECTS OF BENEVOLENT CHILDHOOD EXPERIENCES (PCES) ON THE RELATIONSHIP BETWEEN EXPERIENCES OF IMPRISONMENT OF A FAMILY MEMBER (ACES) AND TOTAL SCORES OF PSYCHOPATHY 158

STUDY 5 | LINKING CHILDHOOD ADVERSITY TO PSYCHOPATHIC TRAITS AND EMPATHY IN INCARCERATED WOMEN: THE ROLE OF EXECUTIVE FUNCTIONING AND EMOTIONAL PROCESSING

FIGURE 1 260

TESTED MODEL 270

THESIS OVERVIEW

The present thesis, entitled "Emotional Processing and Psychopathy in Female Offenders", has the central objective of understanding emotional processing in incarcerated women with psychopathic traits, integrating the analysis of the emotional, cognitive, and developmental mechanisms underlying these traits and their respective factors. This objective arises from the need to advance scientific knowledge on women with psychopathic traits, given that most of the existing research has been conducted with male samples, thereby neglecting critical specificities of women who commit crimes and present psychopathic features. The literature has documented consistent deficits in emotional perception and integration, atypical empathy patterns, and impairments in emotional processing, while also revealing that the expression of psychopathic traits in women may diverge substantially from classical formulations derived from male populations.

To address these objectives, this doctoral thesis is structured into three interrelated parts: a first part devoted to the theoretical and conceptual framework, presenting the scientific foundations that underpin the investigation (Part I); a second part comprising the empirical and theoretical studies developed, which operationalize and test the central research questions of the doctoral project (Part II); and a final part corresponding to the general discussion, where the main findings are synthesized, their implications examined, and a critical reflection offered on the overall contribution of the work (Part III).
The initial theoretical part (Introduction) establishes the rationale for the investigation and delineates the conceptual framework of the phenomenon, integrating major theoretical models, empirical evidence, and psychological, neuro-emotional, and developmental foundations that support the study of emotional processing and psychopathic traits in incarcerated women.

The empirical part of the thesis begins with Chapter I, which presents a systematic review of emotional processing in women with psychopathic traits, provides the conceptual foundation for the empirical studies that follow, and reinforces the need for a multidimensional framework for understanding emotional processing in incarcerated women with psychopathic traits. Chapter II builds on this foundation through an empirical study assessing emotional processing using an experimental task that evaluates core emotional response dimensions (valence, arousal, and dominance) based on affective visual. Chapter III then extends the investigation by incorporating two studies examining how childhood adversity, positive childhood experiences, and empathy contribute to the development and expression of psychopathic traits in incarcerated women. The empirical section concludes with Chapter IV, which introduces an integrative structural equation modelling study that articulates the relationships between

adversity, executive functioning, emotional processing, empathy, and psychopathic traits within a unified developmental and psychological framework.

The thesis concludes with a final part (Integrative Conclusion) that integrates and discusses the theoretical and empirical contributions achieved throughout the investigation. This concluding section reinforces the relevance of a multidimensional framework for understanding women with psychopathic traits and examines the clinical, forensic, and policy implications emerging from the findings. It also reflects on the limitations of the studies conducted and outlines avenues for future research aimed at deepening the understanding of the emotional, cognitive, and developmental mechanisms implicated in psychopathic traits among incarcerated women.

PART I | GENERAL INTRODUCTION

INTRODUCTION

Psychopathy has been a historically controversial construct marked by difficulties in definition and conceptualization, often being reduced to criminal or antisocial behavior (Gonçalves, 2017). However, contemporary conceptualizations, particularly those operationalized through the Psychopathy Checklist-Revised (PCL-R), emphasize that psychopathy constitutes a multidimensional construct encompassing interpersonal, affective, and behavioral components (Gonçalves & Cunha, 2017). Importantly, ongoing theoretical debates highlight that antisocial behavior should not be viewed as the sole or defining feature of psychopathy, but rather as one possible manifestation of underlying affective and interpersonal dysfunctions (Soeiro & Gonçalves, 2010). This distinction is particularly relevant, as it underscores the need to investigate core psychological processes, namely emotional processing, which remain insufficiently explored, especially in women who committed crimes.

In these recent efforts, in the Portuguese context, advances in the characterization, assessment, and intervention with individuals with psychopathic traits stand out, mostly in male populations (Gonçalves, 2017), although debates and questions persist regarding the validity, delimitation, and use of the construct, especially in female samples (Eisenbarth et al., 2012; Gonçalves & Lopes, 2007; Verona & Vitale, 2018). In Portugal, research on the construct of psychopathy has focused primarily on the conceptualization, evaluation, and validation of instruments, particularly in forensic contexts, without addressing gender issues. Thus, in these efforts to better understand psychopathy, women have been underrepresented, both in terms of scientific representation and in terms of female criminality, which seems to involve specific characteristics (Gonçalves & Lopes, 2007) that have been little explored.

That being said, this doctoral work, by systematically integrating psychopathic traits in women who have committed crimes, their developmental trajectories, and emotional and cognitive mechanisms, becomes innovative in its pursuit of knowledge, in supporting a deeper understanding for professionals and researchers, in contributing to the scientific community, and in expanding international knowledge on gender in psychopathy.

1. Historical Roots of the Concept of Psychopathy

1.1 Classical Origins

The construct of psychopathy has undergone substantial development in recent years, with significant progress in its diagnosis and theoretical conceptualization, particularly regarding interpersonal, affective, and behavioral processes (Horley, 2014).

The earliest meaningful clinical concept for psychopathy was labeled by the French psychologist Philippe Pinel in 1809. Pinel's "nomenclature of diseases" included extremely impulsive and socially disturbed individuals who lacked delusional and disordered thinking (Horley, 2014). Pinel's theory marked a significant departure from earlier psychiatric views that linked mental illness solely to intellectual impairment, showing that intact cognitive abilities can exist alongside severe emotional and behavioral disturbances (Saß & Felthous, 2020). As a result, emotional dysfunction came to be seen as a core aspect of psychopathology, not just a mere secondary consequence of cognitive deficits (Saß & Felthous, 2020). Pinel also suggested that these problems could come from factors like poor education or personal traits, anticipating later models that consider multiple causes of psychopathy (Horley, 2014).

Later in the nineteenth century, Cesare Lombroso proposed a biologically deterministic approach to criminality, invoking his notion of "born criminals" and arguing that criminality could be explained by biological atavism manifest as physical stigmata (Saß & Felthous, 2020). Although Lombroso's theory was later proven wrong, it continued to support biologically inspired interpretations of deviance that contributed to early definitions of psychopathy (Berrios, 1993).

Nevertheless, the nineteenth century was characterized, in psychiatry, particularly, by an essentially cognitive focus of mental illness, whereby affective disturbances tended to become secondary to the phenomenology of psychiatry (Saß & Felthous, 2020). Within this framework, Prichard, in 1835, characterized "moral insanity" as a disorder of emotions, moral feelings, and dispositions, without deterioration of reasoning faculties or the presence of delusions or hallucinations (Berrios, 1993). This definition reinforced the concept that affective or volitional disturbances could constitute the primary manifestation of mental illness, independent of cognitive impairment (Berrios, 1993).

Taken together, these early models, which emphasized preserved rational intelligence alongside marked affective-moral and behavioral disturbance, laid the groundwork for subsequent theoretical developments aimed at distinguishing heterogeneous etiological pathways within psychopathy (Saß & Felthous, 2020). In this regard, Karpman was the first to articulate a distinction between primary and secondary psychopathy, proposing that these variants shared surface behavioral similarities while differing substantially in underlying etiology and motivational processes (Karpman, 1941, 1948). Primary psychopathy was conceptualized as reflecting a core affective deficit, characterized by a lack of conscience, shallow emotional bonds, and diminished experiences of anxiety, remorse, and guilt (Karpman, 1941, 1948). By contrast, the concept of secondary psychopathy was more environmentally related, as it developed in the context of adversity, such as disturbed parenting, and was expressed

through emotional dysregulation, increased negative effects, anxiety, guilt, and more reactive, impulsive, and aggressive behavioral responses (Karpman, 1941, 1948).

These early accounts also formed a premise that has continued to feature largely in current conceptual frameworks for psychopathy: the presence of emotion and interpersonal deficits coupled with a lack of general cognitive impairment (Saß & Felthous, 2020). In 1941, Hervey Cleckley contributed to the conceptual frameworks of psychopathy in the 20th century with his work "The Mask of Sanity" (Cleckley, 1941), identifying the clinical picture of psychopathy based on superficial charm, superficial emotions, absence of guilt or remorse, egocentrism, and irresponsibility (Cleckley, 1976). Cleckley identified a clinical picture by formulating key components that entail superficial charm, lack of guilt or remorse, shallow emotions, egocentricity, and irresponsibility, conceptualizing psychopathy to embody a highly impairing feature by describing the construct of “semantic dementia” to reflect the poor ability to have authentic emotions, but for superb intellectual understanding (Cleckley, 1976).

Cleckley's approach had a crucial role in the development of subsequent theoretical constructs, which then formed the basis for the development of more recent assessment tools and the present-day conception of antisocial pathology (Hare, 2003; Saß & Felthous, 2020). Several points in Cleckley's theory correlate with the present-day concept of antisocial personality disorder, specifically about impulsiveness, irresponsibility, and lack of regard for social norms (American Psychiatric Association [APA], 2022).

1.2 From Categorical to Dimensional Models

Despite a long history of a rich clinical tradition in which affective and interpersonal dysfunction have been emphasized, the definition of psychopathy in the latter part of the twentieth century increasingly came to focus on categorical diagnostic classifications, with a prominent emphasis on manifest antisocial behavior (Saß & Felthous, 2020). This sort of preoccupation was manifest in major nosology, including both the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2022) and the International Classification of Diseases (ICD; World Health Organization [WHO], 2022), which have both been subject to criticism for being inadequately specific regarding the difficulties described above (Wright, 2008).

As a result of these limitations, the question of how to define the nature of psychopathy gained increasing prominence (Wright, 2008). Early categorical views have endeavored to isolate such a type of person, perhaps based on divergence along biological or neurodevelopmental lines (Harris et al., 2001). Nonetheless, the available evidence suggesting categorical views has largely been based on the presence of antisocial manifestations, in contrast to the affective-interpersonal traits that were core to Cleckley’s original formulation (Cleckley, 1941; Lilienfeld & Fowler, 2006).

Furthermore, growing evidence from taxometric or factorial studies supports the stability of the distribution of psychopathic traits across community and forensic samples (Walters et al., 2011). These traits are typically conceptualized as multidimensional, encompassing callousness, lack of emotion, manipulativeness, and impulsivity (Lilienfeld & Fowler, 2006; Lilienfeld et al., 2015).

Given its implications for assessment and intervention, this development is important to recognize, as it contributes considerably to a more integrated understanding of the multifactorial etiology of psychopathy (Lilienfeld et al., 2015). It is also worth noting that dimensional approaches have proven more suitable for identifying gender-based differences, particularly in detecting psychopathic traits in females, which tend to be characterized more by inhibitory features, such as emotional lability, than by the affective coldness associated with male-based prototypes (Forouzan & Cooke, 2005).

Robert Hare's work helped make psychopathy measurable by focusing scientific assessments on multiple areas within the Psychopathy Checklist (PCL-R) (Hare, 1991, 2003). Because psychopathy is multifaceted, the PCL-R was initially designed with two main dimensions/factors: Factor 1 - Interpersonal/Affective and Factor 2 - Lifestyle/Antisocial (Hare, 1991). This framework later expanded into four factors: Interpersonal, Affective, Lifestyle, and Antisocial (Hare, 2003; Hare & Neumann, 2008). The four-factor model of the PCL-R has better internal measurement than other models because it captures the interpersonal, affective, and behavioral traits of psychopathy (Patrick, 2018).

Although such extensive theoretical and empirical research efforts have been made, many research questions remain unanswered, including the validity of the construct of psychopathy in women and other cultures (Skeem et al., 2004), the validity of the factors of psychopathy itself (Brinkley et al., 2004), and the appropriate factor structure of the instruments, such as PCL-R (Brinkley et al., 2004; Cooke et al., 2005; Hare, 2003; Skeem et al., 2004).

2. Contemporary Dimensional Conceptualizations of Psychopathy

Current models of psychopathy have shifted away from single, behavior-based definitions toward dimensional models that highlight a complex mix of interpersonal, affective, and behavioral traits (Hare & Neumann, 2008; Patrick, 2018). This change follows mounting evidence indicating that psychopathic traits exist on a spectrum in the general population rather than as a distinct syndrome, reflecting important reevaluations of categorical diagnostic systems that tend to focus only on behavioral symptoms and overlook affective and interpersonal issues in defining the disorder (Lilienfeld & Fowler, 2006).

In this dimensional perspective, psychopathy is increasingly viewed as a heterogeneous pattern of partially independent and interrelated, trait dimensions, rather than the more unitary concept it has traditionally represented, and its manifestations, levels of severity, and trajectories can vary widely from

one individual or group to the next (Lilienfeld et al., 2015). Contemporary theories conceptualize psychopathy through phenotypic diversity, as opposed to a unitary prototypical definition, a point with marked implications for its conceptualization, etiology, and treatment procedures (Patrick, 2018; Skeem et al., 2011).

On the other hand, more general models of personality have also contributed to the dimensional reconceptualization of psychopathy, allowing researchers to describe its defining characteristics rather than relying on a criterion-listed approach to diagnosis (Ross et al., 2004). In this context, the Five-Factor Model has been particularly influential, situating psychopathic traits at the extreme ends of normative personality dimensions, including low agreeableness, low conscientiousness, and high antagonism (Costa & Widiger, 1994).

2.1. The Triarchic Model of Psychopathy

Among current dimensional models, the Triarchic Model of Psychopathy stands out for its significance within an integrative approach that can account for the heterogeneity of psychopathic traits and refine some past theoretical ideas that have appeared disparate and incompatible by developing a structural model that can reconcile several one-dimensional covariates and complex dynamics simultaneously (Patrick, 2010; Patrick et al., 2009).

Unlike other models, the Triarchic Model sees psychopathy as the result of a complex connection across three partially distinct dimensions: disinhibition, boldness, and meanness (Patrick et al., 2009). Each dimension focuses on separate psychological and biological principles that, according to the theory, are distinct and observable within psychopathy as a specific mental process (Patrick & Drislane, 2015). These dimensions can, ideally, be used to understand the overall principles, concepts, and applications of psychopathy, regardless of how they are framed within specific models and theories, as well as current thoughts and paradigms related to each one (Patrick et al., 2009). The disinhibition dimension relates to impulse control, emotional regulation, and behavior, closely aligning with externalizing psychopathology and impulsive antisocial tendencies linked to disruptions in executive functioning and reward processing (Patrick et al., 2009). Boldness includes traits like social dominance, resilience, low fear, and high stress tolerance, traits emphasized in Cleckley's (1976) clinical descriptions, and is associated with reduced reactivity of defensive motivational systems. These traits may provide situational advantages but also increase risk-taking (Fowles & Dindo, 2009). Meanness involves callousness, low empathy, diminished emotional sensitivity, and exploitative interpersonal styles, capturing the core affective and interpersonal deficits traditionally viewed as central to psychopathy (Patrick et al., 2009).

The Triarchic Model has accumulated empirical support in forensic and clinical research and has demonstrated its usefulness in studying phenotypic diversity in females. This often manifests as a psychopathic profile with high scores in disinhibition and emotional expressivity but low scores in affective coldness (Blair, 2005; Patrick, 2018). Additionally, the model has a strong metatheoretical foundation, enabling the integration and comparison of results from various psychopathy tests (Patrick, 2010).

2.2 Two-Process and Development Model of Psychopathy

The dual-processing model suggests that psychopathy results from two partially independent, interacting developmental processes that each contribute differently to its manifestation (Fowles & Dindo, 2009; Patrick & Bernat, 2009). Therefore, it is argued that psychopathy should not be seen as a single dimension, but rather as a complex profile shaped by the interactions between predispositions and environment (Skeem et al., 2007).

This approach is conceptually consistent with the classic views of primary and secondary psychopathy as outlined by Karpman (1941, 1948), but more recent formulations view it as having a dimensional rather than categorical structure (Skeem et al., 2007). Primary psychopathy entails affective dysfunctions in the presence of low fear response, reduced empathetic concern, low trait anxiety, and reduced response to aversive stimuli, and it is known to have disturbances in processing linked to neural systems mediating learning of affect and decision making in the amygdala and ventromedial prefrontal circuits (Blair, 2005; Patrick & Bernat, 2009). Secondary psychopathy, on the other hand, is understood as having more robust links to adverse environmental and developmental processes such as trauma or neglect. This type of psychopathy is characterized by a stronger connection to increased emotional reactivity or sensitivity, negative effects or moods, impulsivity, and difficulties with emotion regulation (Skeem et al., 2007). Empirical data also enable reliable neurocognitive and affective differentiations among these pathways, including variations in affect recognition, attentional priority, inhibitory control tasks, and measures of overall executive functioning (Newman et al., 2005). Notably, manifestations of emotional regulation deficits and trauma exposure as markers of secondary or superficial traits are much more prevalent among women than men (Verona & Vitale 2006).

2.3 The PCL-R and the Multidimensional Structure of Psychopathy

From a modern dimensional perspective, the PCL-R has been widely used as a rating tool to operationalize the definition of psychopathy (Hare, 2003; Hare & Neumann, 2008). The PCL-R was largely conceptualized based on the clinical perspectives outlined by the originator of the construct, Cleckley (1976), spanning from the prototypical to the empirical views. This approach allowed researchers to

evaluate the multidimensional aspects outlined in the construct, including interpersonal, affective, lifestyle, and behavioral factors (Hare, 2003). An early, primarily multidimensional version of the measure was developed on the basis of the model's two-dimensional framework for assessing psychopathy, differentiating interpersonal and affective traits from socially deviant and antisocial lifestyles (Hare, 2003).

However, subsequent studies using psychometric analyses suggested that this two-factor solution may be too simplistic for assessing psychopathy construct, leading to efforts to propose more detailed structural models (Hare & Neumann, 2008). In response to these concerns, Hare et al.'s proposal of a four-factor solution has gained significant support based on empirical evidence, distinguishing between interpersonal, affective, lifestyle, and antisocial aspects, ultimately enabling more precise analyses of which specific traits of psychopathy relate to certain criteria (Edens et al., 2008; Hare, 2003; Hare & Neumann, 2008). Specifically, support for this structural model has been found in various confirmatory factor analyses, which showed acceptable to good fit levels across forensic and psychiatric groups (Hare & Neumann, 2008). Additionally, this structural approach has demonstrated incremental validity for behavioral outcomes such as behavioral deviance across multiple clinical settings (Edens et al., 2008). Furthermore, support has also emerged for refining this two- and four-factor solution into hierarchical models, which aim to suggest that one model describes constructs in broader terms, as opposed to their more specific facet-level determinants (Hare & Neumann, 2008).

Despite the significance of PCL-R in forensic assessments, it is important to recognize certain conceptual and procedural issues linked to its use. These issues include its dependence on observable behavioral indicators, sensitivity to developmental and contextual factors, and questions about whether its factor structure applies across different populations (Cooke et al., 2005; Hare & Neumann, 2008). This underscores the complexity of interpreting PCL-R results and highlights the need to explore how psychopathy may be expressed differently among diverse groups, especially considering that some groups, historically under-represented in psychopathy research, are evaluated for psychopathy classification (Pinheiro et al., 2022).

3. Psychopathic Traits in Women: Phenotypic and Clinical Specificities

Although the literature on psychopathic traits in women has grown significantly in recent decades, it still faces historical, methodological, and sociocultural limitations that have shaped the understanding of psychopathy mainly based on the male model (Eisenbarth et al., 2012). Empirical studies involving women have been relatively few and insufficient to identify patterns of psychopathy in this group, making a precise analysis of gender-specific patterns impossible (Javdani et al., 2011). Therefore, there is an

increasing need to redefine the concept of psychopathy in women in current research on the topic (Lane, 2020).

At the international level, research has shown that the female prison population is among the fastest-growing groups within crime and justice systems, highlighting a broader trend in patterns of offending, crime management, and social control of women (Lane, 2020). Although they still comprise a minority in correctional data, there are signs of increased system interactions and recidivism rates among certain subgroups, such as those with psychopathic traits (Eisenbarth et al., 2012). These findings raise questions about how current systems are designed, as they are primarily male-oriented in perspective (Lane, 2020).

Portugal serves as an exemplary country in this international trend. According to data from the World Prison Brief, the number of women prisoners declined consistently from 2000 to 2010. However, since 2015, the trend has reversed, and the number has steadily risen, reaching 926 women in 2025, accounting for 7.1% of the country's total prison population (World Prison Brief, n.d.). This introduces a new reality: the criminal records and backgrounds of Portuguese prisoners deserve a more in-depth examination (Cunha et al., 2025a; Pinheiro et al., 2023). Complementing these epidemiological indicators, Portuguese forensic evidence indicates that psychopathic traits are linked to recidivism among women, with recidivism being more strongly associated with persistent antisocial behavior than with interpersonal or affective traits, highlighting the importance of facet-level assessments that explicitly account for gender (Pinheiro et al., 2022, 2023).

3.1 Historical Underrepresentation and Social Limitations in Research on Women with Psychopathic Traits

Historically, the literature on psychopathy has mainly focused on males, largely because of the high rate of violent crime among them (Coid & Ullrich, 2010). According to global studies, many violent crimes are committed by men with antisocial personality disorder, with nearly a third of these individuals having psychopathy (Coid & Ullrich, 2010).

Hence, empirically grounded models, evaluation methods, and intervention programs in forensics have mainly been tested on samples with a majority of males, indirectly shaping the male-centered concept of psychopathy (Eisenbarth et al., 2012). This focus has also affected criminal justice policies and rehabilitation strategies, which tend to align more with male patterns of offending, risk, and responsiveness, while overlooking women's pathways to crime and institutional adaptation (Breuer et al., 2021). In this context, gender-responsive strategies based on the Risk Need Responsivity model highlight

the importance of tailoring assessment and intervention by explicitly considering sex and gender-related factors (Bonta & Andrews, 2023).

Sociocultural, gendered expectations regarding women's roles, specifically caregiving, relational focus, and prosocial behavior, influence how psychopathy is understood and interpreted in women (Eisenbarth et al., 2012). This perspective has reinforced beliefs that traits like callousness, dominance, and aggression are less noticeable in women, which may lead to underrecognition or misinterpretation of psychopathic features (Verona & Vitale 2018). In both forensic and clinical settings, women's aggressive or antisocial actions are often viewed through the lens of trauma, emotional dysregulation, and context-specific behaviors rather than as signs of psychopathic traits (Verona & Vitale, 2018). Conversely, the existence of gender differences can also coincide with interpretation biases, especially when those differences are less obvious or less physically violent, affecting perceptions of psychopathy in women (Eisenbarth et al., 2012, Verona & Vitale, 2018).

Methodologically, psychopathy research has been limited by the systematic underrepresentation of women, leading to small samples with low statistical power for meaningful gender-based analyses (Kreis & Cooke, 2011). Consequently, findings from male samples have often been generalized to women, a practice increasingly challenged by evidence of gender-specific differences in both the expression and causes of psychopathic traits (Eisenbarth et al., 2018).

3.2 Gender-specific Manifestations of Psychopathic Traits

An increasing amount of evidence indicates that gender-sensitive conceptualizations of psychopathy are essential, especially concerning the interpersonal and affective domains and the ways through which antisocial behavior appears (Verona & Vitale, 2018). Although callousness, low empathy, and disinhibition are observed in both genders, their expression might differ depending on developmental paths, socialization, and contextual factors that influence women's behavioral patterns and the visibility of antisocial conduct (Forouzan & Cooke, 2005; Nicholls et al., 2005; Verona & Vitale, 2018). Therefore, assessing women requires a clear understanding that acknowledges the continuity of the core construct while considering the diversity and the specific settings in which women's antisocial behavior takes place (Verona & Vitale, 2006; 2018).

At the interpersonal level, women with high psychopathic traits are described as engaging in more relational, strategic, and context-dependent manipulation. This includes coercive use of emotional dynamics, impression management, relationship building, and the instrumentalization of intimacy, rather than primarily relying on intimidation or direct force (De Vogel & Lancel, 2016; Forouzan & Cooke, 2005; Kreis & Cooke, 2011). Some researchers highlight tactics like seduction, flirtation, and presenting a

superficially prosocial persona, often called a "mask of maternalism," while noting that these strategies do not necessarily indicate genuine prosocial motivation (De Vogel & Lancel, 2016; Kreis & Cooke, 2011).

Regarding affective expression and self-regulation, the literature suggests that some women with psychopathic traits exhibit greater emotional lability and heightened reactivity to interpersonal threats, including sensitivity to rejection, humiliation, or relational threats (Verona & Vitale, 2006). These features are conceptualized as compatible with more reactive forms of disinhibition, in which failures of inhibitory control and behavioral outbursts occur mainly under emotional activation. This contrasts with the colder, more instrumental profiles often emphasized in male samples (Hicks et al., 2010; Verona & Vitale, 2006). Importantly, this pattern does not exclude core affective deficits but indicates that, in some women, reduced guilt and empathic concern may coexist with elevated negative affect and stress reactivity, resulting in presentations less aligned with the exclusively "cold" prototype (Forouzan & Cooke, 2005; Verona & Vitale, 2006; 2018). In certain subgroups, self-directed behaviors such as self-harm and risk-taking are also discussed as potential expressions of dysregulation related to adversity and perceived threats, especially within trajectories consistent with secondary psychopathy (Sevecke et al., 2016).

At the behavioral level, evidence indicates differences in the form and visibility of aggression and antisocial behavior. Women are more likely to engage in indirect and relational aggression, such as verbal coercion, humiliation, defamation, emotional blackmail, and social exclusion, compared to the more overt physical aggression often seen in males (Thomson et al., 2019; Verona & Vitale, 2018). This pattern is typically viewed as relational aggression that may serve specific purposes, such as maintaining dominance, social punishment, or gaining interpersonal advantages, without relying heavily on physical violence. It is especially prominent in close and family relationships (Thomson et al., 2019; Verona & Vitale, 2018). Simultaneously, women's exploitative and offending behaviors tend to target familiar individuals more often, enabling ongoing manipulation and control within close proximity, although there is considerable variation among individuals (Verona & Vitale, 2018). Clinically, this variation matters because a smaller group of women may exhibit patterns similar to the male prototype, including greater criminal versatility and more instrumental aggression when they perceive potential rewards as outweighing the risks (Verona & Vitale, 2018).

Developmental trajectories linked to these phenotypes are often discussed in relation to early adversity, relational trauma, victimization, and family instability, which align with emotional dysregulation and more reactive antisocial patterns (Hicks et al., 2010; Sevecke et al., 2016). This alignment supports dual-process models and the idea that, in some women, psychopathic traits may develop under conditions of ongoing threat and stress, resembling secondary styles that feature negative affectivity, hostility,

impulsivity, and risk-taking behavior (Hicks et al., 2010; Sevecke et al., 2016; Verona & Vitale, 2006). From a criminological perspective, female criminality is also viewed as shaped by styles of tension, victimization, and socioeconomic hardship that can influence the expression and perception of innate traits related to psychopathy (Kennedy et al., 2020).

In the Portuguese context, recent empirical data from comparable prison samples show gender-linked phenotypic differences, with women more often characterized by profiles where disinhibition and lifestyle instability are prominent, whereas men more frequently exhibit interpersonal and affective features in a visible form (Cunha et al., 2025a). This pattern supports the idea that, in many women, psychopathy may present through configurations marked by impulsivity, emotional instability, and disorganized life paths, where interpersonal manipulation and affective deficits occur in relational and emotionally reactive contexts, making classic prototypical presentations less common or harder to detect (Cunha et al., 2025a; Forouzan & Cooke, 2005; Verona & Vitale, 2006).

3.3 Clinical and Forensic Implications

These gender-linked phenotypic patterns have direct clinical and forensic implications for diagnosis, formulation, and treatment planning in female forensic samples (Cunha et al., 2025a; De Vogel & Lancel, 2016; Pinheiro et al., 2022; Verona & Vitale, 2018). In many women who have committed crimes, the lower centrality of physical aggression and the higher centrality of relational factors may make their manifestations of psychopathic traits less likely to be diagnosed, especially if assessment tests are generally based on externalizing behaviors linked to male prototypes (Eisenbarth et al., 2012; Pinheiro et al., 2019; Verona & Vitale, 2018). At the same time, the likely comorbidity associated with being victims of trauma, difficulties in emotion regulation, and exposure to unfavorable psychosocial circumstances may contribute to developing an intervention focus centered around their reactions to situations (e.g., Post-Traumatic Stress Disorder [PTSD], substance abuse, self-harm, and poor coping behaviors), potentially leading to an underestimated predisposition to crime and antisocial behavior (Hicks et al., 2010).

Regarding evaluation, it has been noted in the literature that a tool designed and standardized primarily on a male sample might have certain limitations when assessing female participants, especially concerning item weight, profile evaluation, and factorial structure (Forouzan & Cooke, 2005; Pinheiro et al., 2022, 2023; Verona & Vitale, 2018). Specifically, regarding the PCL-R, studies have shown that women tend to score lower on average, raising questions about potential differences in prevalence, presentation, and sensitivity of the instrument (Pinheiro et al., 2019; Verona & Vitale, 2018). Additionally, many authors recommend caution when applying cut-off scores and classification thresholds, considering

the purpose of the assessment, cultural context, and the distinction between categorical classification and the dimensional approach, particularly in risk assessment scenarios (Pinheiro et al., 2022; Verona & Vitale, 2018).

Evidence on predictive validity further supports a facet-level approach in women. Across studies, behavioral dimensions, especially lifestyle instability and antisocial behavior, tend to explain more variance in criminal recidivism than interpersonal or affective traits (Hawes et al., 2013). In female samples, this pattern aligns with the hypothesis that criminal persistence is more strongly driven by past patterns of disinhibition and antisocial conduct, even when classic affective features are less evident or harder to observe (Eisenbarth et al., 2012; Thomson et al., 2019; Verona & Vitale, 2018). In Portugal, recent findings show that the antisocial facet of the PCL-R is a particularly strong predictor of overall recidivism among women, sometimes providing additional validity beyond other facets and established risk factors (e.g., criminal history, age) (Pinheiro et al., 2022). Additional national evidence indicates that the lifestyle factor predicts dimensions of criminal lifestyle and that criminal lifestyle is linked to recidivism regardless of overall psychopathy levels, highlighting the importance of a facet-specific interpretation (Pinheiro et al., 2023).

At the clinical level, these findings stress the importance of using dimensional assessment methods and gathering information from multiple sources, such as structured clinical interviews, file reviews, developmental history, and observed behavioral patterns (De Vogel & Lancel, 2016; Hare, 2003; Lilienfeld & Fowler, 2006). Moreover, treatment approaches for women in forensic settings should reflect the complexity of their profiles by addressing criminogenic risk and need factors while remaining responsive to gender-specific pathways to offending, in line with the Risk-Need-Responsivity (RNR) model (Bonta & Andrews, 2023; Kennedy et al., 2020). Although the RNR model remains a central framework in correctional intervention, recent evidence suggests that its gender-neutral application may be insufficient to capture women's trauma histories, relational vulnerabilities, caregiving roles, and broader structural adversities (de Castro Rodrigues et al., 2026). This underscores the need for a more explicitly gender-responsive and trauma-informed implementation of RNR principles. Notably, the same systematic review found that only a small proportion of interventions designed for incarcerated women were explicitly grounded in the RNR model, pointing to an important gap between theory and practice (de Castro Rodrigues et al., 2026) Furthermore, criminological perspectives such as Labeling Theory (Lee et al., 2017) and the Double Deviance framework (Heidensohn, 2012) help illustrate how gender shapes women's experiences within the justice system, including patterns of sentencing, social stigma, and opportunities for reintegration. Taken together, these findings reinforce the importance of developing

evidence-based practices that not only correctionally sound but also gender-informed and trauma-sensitive (de Castro Rodrigues et al., 2025).

4. Emotional Processing in Psychopathy: Concepts and Models

4.1 Definition and Components of Emotional Processing

Emotional processing is defined as an active, multicomponent, and often primarily unconscious set of processes through which emotionally significant information is detected, evaluated, differentiated, integrated, and translated into mental, somatic, and behavioral responses (Brockbank & Feldon, 2024; Scherer & Moors, 2019). Modern theories of emotions are generally characterized by a process-oriented perspective, viewing emotions as dynamic, functional sequences rather than as static, separate categories (Brockbank & Feldon, 2024; Scherer & Moors, 2019). According to this view, emotions can be understood as adaptive mechanisms that regulate perception, motivation, and behavior in response to situational demands and contextual factors (Scherer & Moors, 2019).

Emotional responses are not random but are systematically triggered when stimuli are evaluated as relevant to goals, needs, or values, enabling quick prioritization and regulation of behavior (Olteanu et al., 2019). Emotional processing develops through stages of elicitation, appraisal, differentiation into coordinated action tendencies, physical activation, expressive behavior, and subjective experience. These components are integrated into a largely nonverbal core feeling state that supports the monitoring and regulation of responses and can later be verbally categorized and labeled (e.g., fear, sadness, anger) (Scherer & Moors, 2019).

Within emotional theories, emotional experience is usually described along three key dimensions: valence, arousal, and dominance (Shuman et al., 2013). Valence refers to whether an event is viewed as pleasant or unpleasant, including information about the intention behind the event, its relevance to goals, and, in some models, its moral appropriateness. It plays an important role as an emotional indicator of whether the event supports or opposes one's objectives (Shuman et al., 2013). Arousal reflects the level of activation or alertness linked with the emotional experience, ranging from low levels to higher arousal, which is strongly connected to readiness for action (Bradley & Lang, 1994). Lastly, the dominance dimension relates to feelings of control, power, or submission elicited by the stimulus, broadly indicating whether the emotional response feels manageable or overwhelming (Shuman et al., 2013). Collectively, these dimensions offer a simplified way to describe emotional experience in terms of pleasure, intensity, and perceived control, which are essential for regulation, decision-making, and behavioral reactions (Shuman et al., 2013).

At the neurobiological level, the engagement of emotional processes involves fronto-limbic networks that include the thalamus, amygdala, and prefrontal cortical areas responsible for detecting salience, evaluating stimuli, and regulating responses (Phan et al., 2002). On more complex and organized levels, emotional processes also interact with networks responsible for attention, meaning construction, and executive functions, supporting the integration of emotions with decision-making and social behaviors (Scherer & Moors, 2019). Regardless of consciousness, and through both directed and undirected channels, emotional processes transmit information about needs, threats, and social value, supporting their essential role in adaptation and psychological integration throughout life (Scherer & Moors, 2019).

4.2 Emotional Processing in Psychopathy

Psychopathy has consistently been linked to dysfunctional emotional processes, particularly in areas related to empathy, fear conditioning, moral learning, and punishment, which have long been viewed as central to its clinical and forensic profile (Blair, 2003). Early theories suggested that deficits in emotional processing are the core issue of psychopathy, affecting normal socialization (Blair et al., 2007). In this context, difficulties in monitoring pain signals and expressing sadness, thereby impacting empathy and morality, increase the risk of aggressive behaviors (Kimonis et al., 2006).

The Integrated Emotional Systems (IES) model explains these mechanisms by suggesting that amygdala dysfunction impairs the recognition and experience of sadness and fear in response to others' pain, which are essential for moral learning and inhibiting aggression (Blair, 2005). The model states that decreased sensitivity to others' distress disrupts aversive conditioning and punishment-based learning, leading behavior to favor instrumental, goal-oriented strategies (Reidy et al., 2009). There is empirical evidence supporting this view, showing links between psychopathic traits and impaired processing of distressing stimuli, weakened fear conditioning, and reduced autonomic and startle responses to threat or danger signals (Reidy et al., 2009).

Nonetheless, accumulating evidence challenges the idea that emotional dysfunction in psychopathy is universal, instead indicating that emotional impairment depends on context and is significantly influenced by attentional processes (Baskin-Sommers et al., 2011). A conceptual framework of this condition includes the Response Modulation Hypothesis, which suggests that the key feature of psychopathy is a deficient ability to flexibly shift attention towards signals that are emotionally or motivationally relevant when they compete with the dominant goal-directed response set (Newman & Wallace, 1993). Due to reduced attention engagement, emotional signals do not interfere with ongoing cognitive tasks, and emotional processing appears diminished without a decrease in perceptual

recognition of those signals (Lilienfeld et al., 2015). This also explains classic findings of passive avoidance deficits, primarily seen in reward conflict tasks, where individuals with psychopathic traits continue to process tasks as planned despite signals of deviancy that would normally prompt behavioral adjustments (Lilienfeld et al., 2015). This hypothesis is strongly supported by empirical evidence, both in the specific direction of alertness toward affective goals, where individuals with high psychopathic traits do not show impairments in the fear-potentiated startle response nor in amygdala activation (Larson et al., 2013), and in the division of alertness, where psychopathic traits lessen the suppressive effect of emotional stimuli on both amygdala activity and related behaviors (Baskin-Sommers et al., 2011). This supports the idea that the core emotional dysfunction in psychopathy reflects an impairment in the emotion–attention integration specific to certain states, rather than a widespread deficit in the experience of emotions (Lilienfeld et al., 2015).

From a neurobiological perspective, these findings align with models emphasizing the interaction between regions responsible for salience detection and those involved in cognitive control (Anderson et al., 2017). Typically, emotional stimuli receive processing priority through interactions with the salience network, which includes areas such as the amygdala, anterior insula, and anterior cingulate cortex, to shift attentional focus to biologically relevant stimuli (Seeley et al., 2007). However, in psychopathy, bottom-up signaling for salience detection seems to be either disrupted or overridden by top-down regulation from cognitive and attentional networks during high levels of goal-directed focus (Larson et al., 2013). Consequently, emotional stimuli appear less capable of driving or directing ongoing behavior as they normally would toward signaling threat or punishment (Anderson et al., 2017).

One possible explanation for these abnormalities, from the perspective of the neurodevelopmental hypothesis, is the Paralimbic Dysfunction Model (Kiehl et al., 2006). This model views psychopathy as a systemic issue involving the function of the paralimbic system rather than a specific brain region (Kiehl et al., 2006). The paralimbic or mesocortical areas include the orbitofrontal cortex, the anterior and posterior cingulate cortex, the insular regions, the amygdala, the parahippocampal gyrus, and the anterior superior temporal sulcus. These areas, situated between the allocortex and the neocortex, are highly interconnected and play a key role in evaluating the emotional content of stimuli. They support affective learning, moral reasoning, and motivation - crucial processes involved in integrating feelings with thoughts and actions (Kiehl et al., 2006). Evidence from functional, electrophysiological, and structural imaging studies supports understanding psychopathy as a dysfunction of the paralimbic system (Kiehl, 2006). These studies show that isolated lesions in the amygdala, orbitofrontal cortex, and other areas do not fully account for the development of psychopathic traits (Pieperhoff et al., 2025; Seeley et al., 2007). Recent

morphometric research confirms this model by revealing widespread deviations in gray matter volume, especially in the fronto-subcortical and paralimbic regions (Pieperhoff et al., 2025). It is important to note that this study identified volumetric differences associated with different aspects of psychopathy. Specifically, structures linked to antisocial-impulsive symptoms (PCL-R Factor 2) showed reduced volume, while areas associated with interpersonal and affective traits (PCL-R Factor 1) displayed variability, including increased volume, consistent with their adaptive functions (Pieperhoff et al., 2025).

Despite the explanatory power of these models, it is important to acknowledge that most empirical research has been conducted with male participants, with considerably less research focusing on emotional processing in female individuals with psychopathic traits that directly addresses emotional dysfunction (Sutton et al., 2002). Psychophysiological studies have shown a deficiency in the defensive response to negative stimuli during the initial stages of processing, indicated by lower magnitudes of the fear-potentiated startle response, while functional emotional arousal persists in later stages, suggesting inefficient initial emotional processing (Sutton et al., 2002). Emotional deficits in women also seem to influence specific dimensions of psychopathy, with antisocial-impulsive traits (PCL-R Factor 2) more strongly associated with impairments in processing negative emotional valence and emotional regulation, whereas affective-interpersonal traits (PCL-R Factor 1) tend to be more closely linked to deficits in empathy and morality processing, which can occur without general emotional blunting (Edwards et al., 2019; Pinheiro et al., 2024). Functional neuroimaging studies further confirm that abnormal involvement of the paralimbic and prefrontal lobes is related to higher top-down processing demands in tasks related to emotional and moral processing (Yoder et al., 2021).

5. Empathy

Empathy is a fundamental concept in social functioning, attachment, morality, and the regulation of interpersonal behavior; however, its construct validity is recognized for its heterogeneity in terms of conceptual and terminological aspects (Cuff et al., 2016). This variability directly affects the comparability of empirical findings across studies and the ability to generalize results from one research area to different contexts (Cuff et al., 2016). In the case of psychopathy, which is characterized by consistent demonstration of distinct levels of socio-cognitive functioning and affective responsiveness, the need for rigorous construct validity is essential for studying the phenomenon (Flor & Foell, 2020; Gao et al., 2020). Therefore, empathy is best understood as a multidimensional and dynamic construct that includes understanding the internal state, emotional response, maintaining the distinction between self and other, and sensitivity to dispositional and contextual factors, with the capacity for change through automatic and top-down regulation processes (Cuff et al., 2016; Decety & Jackson, 2004; Shamay-Tsoory, 2011).

5.1. Conceptualization of Empathy: Affective and Cognitive Components

Although there are different ideas about empathy, there seems to be an agreement on its definition involving three connected underlying processes: (1) an emotional response to another person, which often, but not always, involves empathy with their emotions, (2) a mental ability to see things from another person's perspective, and (3) regulatory processes that control how one's own feelings and the feelings of others develop (Decety & Jackson, 2004).

This framework is often operationalized by differentiating between affective and cognitive empathy, which together offer a comprehensive explanation of the clinical presentation of asymmetric empathic functioning (Decety & Jackson, 2004; Shamay-Tsoory, 2011). Affective empathy can be defined as the capacity for empathy through emotional contagion or the subjective experience of another person's emotion, particularly in response to signals of distress. It has been closely linked to empathy for suffering and the suppression of aggressive behavior in social interactions (Cuff et al., 2016; Decety & Jackson, 2004). Conversely, cognitive empathy may be described as the ability to understand and infer another person's thoughts and intentions (Shamay-Tsoory, 2011). It is strongly associated with theory of mind or the process of mentalization, which is mediated by brain regions such as the medial prefrontal cortex, temporoparietal junction, and the superior temporal sulcus (Cuff et al., 2016; Shamay-Tsoory, 2011).

Empathic responses reflect the interaction between individual differences and situational factors, including similar feelings, the motivational relevance of the target, mood, attributions of responsibility, perceived need, and cognitive load (Cuff et al., 2016). Although empathic responses are often automatically triggered by social cues, they are also regulated by top-down controlled processes, such as attentional regulation, cognitive reappraisal, or emotion regulation (Decety & Jackson, 2004). Despite its connection to pro-social behaviors, experiences of empathy do not always lead to tangible expressions of empathy and can be suppressed by conflicts in motivations or situations (Cuff et al., 2016). The ability to accurately understand others' emotions can also serve instrumental purposes, as demonstrated in cases where individuals with psychopathic traits exploit these perceptions to manipulate others (Cuff et al., 2016).

5.2 Empathy and Psychopathy: Empathic Dysfunction in Women with Psychopathic Traits

Empathic dysfunction in psychopathy has been consistently described as selective rather than widespread, with impairments mainly affecting the emotional aspects of empathy, while cognitive aspects remain relatively intact (Blair, 2007; 2018; Flor & Foell, 2020). This pattern is well established in mostly male populations and is increasingly supported by findings from female samples (Blair, 2007; 2018; Flor & Foell, 2020). People with psychopathic traits typically show intact ability to understand others' mental

states but have severe deficits in emotional resonance, emotional contagion, and responsiveness to others' distress (Blair, 2007; Seara-Cardoso & Viding, 2015). It has been suggested that this dissociation reflects not generalized deficits in emotion recognition or mental state attribution, but reduced emotional responses to distress cues, mainly fear and sadness (Blair, 2007; Gao et al., 2020). As a result, recognizing others' emotions can occur without emotional involvement, weakening aversive learning and moral restraint against antisocial actions (Blair, 2007). Broadly, this separation between preserved cognitive empathy and decreased emotional engagement may enable manipulative and strategic interpersonal tactics seen in both forensic and community settings (Cuff et al., 2016).

Psychophysiological studies conducted in community samples of women further support that reduced affective responsiveness is linked to psychopathic traits (Anderson et al., 2011). In women undergraduate samples, higher levels of fearless dominance are associated with decreased aversive startle reflex potentiation, indicating diminished defensive reactions to aversive stimuli (Anderson et al., 2011), a pattern previously observed in male psychopathic samples (Patrick et al., 1993). Additional evidence from mixed-gender samples shows that affective-interpersonal traits are connected to reduced electrodermal fear conditioning, implying impaired learning from threat and punishment cues (Blair, 2007).

Although cognitive empathy is often viewed as intact in psychopathy, this conclusion is mostly based on simplified or static experimental paradigms (Brook & Kosson, 2013). However, when tasks involve dynamic and context-sensitive emotional inference, performance deficits may appear. In a male sample, Brook and Kosson (2013) showed that higher psychopathic traits were linked to lower empathic accuracy during simulated interpersonal interactions, especially in response to negatively valenced emotions like fear and sadness. This suggests that cognitive empathy might be vulnerable when needing to integrate multiple contextual and temporal cues.

Empirical studies focusing specifically on women generally replicate this pattern. In community samples of women, higher affective-interpersonal psychopathic traits have been linked to decreased affective responses to others' distress and sadness, diminished empathic concern, and a lower tendency to experience other-oriented moral emotions like guilt and compassion (Seara-Cardoso et al., 2013). Evidence from women in forensic samples further supports reduced affective responsiveness, with higher psychopathy scores associated with less personal distress in response to others' emotions, and interpersonal-affective traits showing stronger links to emotional empathy deficits than behavioral traits (Banasik et al., 2014).

From a neurocognitive perspective, expressions of fear and sadness are key social signals that typically inhibit ongoing behavior and promote moral learning by linking harmful actions to negative outcomes observed in others' suffering (Blair, 2007). Neurofunctional models, mostly based on male samples but increasingly backed by mixed-gender evidence, suggest that abnormal amygdala responses lead to lower sensitivity to distress signals and difficulties in aversive learning (Blair, 2008). They also involve changes in the activity of orbitofrontal and ventrolateral prefrontal areas, which are responsible for response reversal and behavioral adjustments following negative social experiences (Blair, 2003).

Taken together, the available evidence indicates that, in both women and men with psychopathic traits, empathic dysfunction involves impaired affective responses within a framework of relatively intact yet vulnerable cognitive empathy (Gao et al., 2020). In women, these impairments might appear more subtle or dependent on the context, highlighting the need for gender-sensitive and component-specific methods when evaluating empathy in psychopathy (Seara-Cardoso et al., 2013).

6. Executive Functions

Executive functions (EF) are a set of high-level cognitive control processes that support goal-oriented behavior and adaptive responses in complex and socially meaningful situations (Cruz et al., 2020). These processes include maintaining task objectives, inhibiting responses, shifting between mental contexts, updating and manipulating information in working memory, and planning sequences of actions under conditions of uncertainty, emotional arousal, or competing priorities (Diamond, 2013).

Within EF, executive control processes such as inhibition (the deliberate suppression of a dominant response), shifting (the ability to carry out a new operation despite proactive interference), working memory (central to executive control, along with attentional control, because of its role in inhibition and set-shifting), and updating information, which involves actively maintaining information in the mind during the process of replacing outdated, irrelevant data with newer, more relevant information, are considered core elements (Burghart et al., 2024). In contrast, planning is viewed more broadly as a higher-level EF that combines these processes to accomplish real-world goals (Burghart et al., 2024; Cruz et al., 2020).

There is substantial support for differentiating EF based on their connectivity to emotion (hot EFs) and cognitive aspects (cold EFs) (Salehinejad et al., 2021). Hot EFs are engaged in tasks involving emotional meaning, reward and punishment prediction, and affectively guided decision-making, and are primarily mediated by ventromedial prefrontal circuits that connect to mesolimbic and limbic structures, including the amygdala and striatum (De Brito et al., 2013). These functions play a critical role in emotional valuation, reinforcement learning, risk-sensitive decision-making, and the dynamic updating of

stimulus value following changes in environmental contingencies (De Brito et al., 2013; Salehinejad et al., 2021).

According to research, cold EF suggests a connection with the dorsolateral and ventrolateral prefrontal cortex, involved in abstract and decontextualized tasks that require executive control functions such as inhibitory control and working memory (De Brito et al., 2013; Salehinejad et al., 2021). It also includes EF that use executive control in tasks demanding flexible behavior and planned action execution (De Brito et al., 2013; Salehinejad et al., 2021). From this viewpoint, cold EF can be seen as a top-down representation of processes driven by higher-order cognitive functions to manage behavior in a goal-oriented manner (Salehinejad et al., 2021).

6.1 EF and Psychopathy: Implications for Emotional Regulation and Antisocial Behavior

EF has long been recognized for its involvement in theoretical and empirical models of psychopathy due to its importance in behavior regulation, directed action, impulse control, and adaptive decision-making (Patrick et al., 2009). These factors, in turn, influence the development and functioning of the brain, particularly the prefrontal cortex, which is responsible for controlling EF (Patrick, 2010). EF is believed to encompass a set of higher-order cognitive processes that are vital for adaptive behavior, although the complexity of the difficulties faced by individuals with psychopathic traits remains controversial (Cruz et al., 2020). However, results are inconsistent regarding which dimensions are actually impaired in people with psychopathic traits, and this seems to be due to differences in research methodologies on how psychopathy and EF are measured, task impurity, variations in comparison groups, and insufficient control for confounding factors common in forensic populations, such as substance use, neurological injury, intelligence quotient (IQ), educational level, and psychiatric comorbidity (Cruz et al., 2020).

In response to these inconsistencies, several researchers have suggested that isolating executive control mechanisms in psychopathy may require focusing on cold EF tasks, which are less influenced by motivational and emotional factors (Maes & Brazil, 2013). Planning has been identified as a potentially important area in psychopathy for organizing behavior over time, predicting outcomes, and linking actions to achieve specific goals (Burghart et al., 2024; Maes & Brazil, 2013). Empirical studies have found negative links between working memory performance and antisocial lifestyle in psychopathy (Delfin et al., 2018), as well as positive links between preserved executive planning and interpersonal and affective traits, suggesting that some individuals with psychopathic traits may selectively retain, or even show enhancement in, certain EF (Hansen et al., 2007).

Research further indicates that planning and problem-solving remain relatively understudied (Delfin et al., 2018). Nevertheless, evidence indicates negative associations between initial reasoning time on a planning and problem-solving task and the interpersonal, affective traits, impulsive, and antisocial traits of psychopathy (Bagshaw et al., 2014). Another study also found that performance in planning and problem-solving negatively correlates with impulsive and antisocial characteristics of psychopathy (Baskin-Sommers et al., 2015).

Although there is empirical evidence that individuals with psychopathic traits often exhibit executive dysfunction linked to impulse control issues, poor behavioral regulation, and maladaptive problem-solving skills (Cruz et al., 2020), researchers have also shown that these deficits may not be a defining feature of the psychopathic phenotype (De Brito et al., 2013). A study involving both individuals who had committed crimes and those who had not found that executive dysfunction is more strongly associated with criminal and aggressive behavior than with psychopathic traits themselves (De Brito et al., 2013). In fact, both violent individuals with and without psychopathic traits, as well as well-adjusted non-offenders, display deficits in cold and hot EF tasks, such as verbal memory, reversal learning, punishment-based learning, and affective decision-making under risk, after accounting for overall cognitive ability, age, IQ, and ethnicity (De Brito et al., 2013). Therefore, performance on these executive tasks does not differentiate between psychopathic and non-psychopathic individuals who had committed crimes, indicating that such cognitive vulnerabilities are likely more closely linked to ongoing conflict and aggression rather than psychopathy itself (De Brito et al., 2013). Additionally, research shows that executive dysfunction is a stronger predictor of crime and incarceration risks than psychopathy (Gao & Raine, 2010).

At the factor level of psychopathy, EF impairments are most often connected to disinhibition and externalizing traits, usually measured by PCL-R Factor 2, which includes impulsivity, irresponsibility, and ongoing antisocial behaviors (Baskin-Sommers et al., 2015; Gao & Raine, 2010; Patrick et al., 2009). These traits are conceptually linked to difficulties with inhibitory control, behavioral regulation, and adjusting to the demands of various situations, and are frequently associated with impulsive and aggressive actions (Cruz et al., 2020; Gao & Raine, 2010; Maes & Brazil, 2013). These EF challenges are believed to be rooted in broader neurobiological and psychophysiological dysfunctions, such as decreased information processing efficiency and lowered anticipatory autonomic responses, which can hinder learning from punishment and threat cues (Gao & Raine, 2010).

On the other hand, interpersonal and affective traits assessed by PCL-R Factor 1 show a more varied and sometimes opposite pattern of association with EF, characterized by relative preservation and

even successful enhancement of EF that support selective attention and goal persistence (Cruz et al., 2020; Gao & Raine, 2010). Notably, this pattern of functional separation seems to differ between successful and unsuccessful individuals with psychopathic traits, with successful individuals not showing the prefrontal, amygdala, or hippocampal deficits seen in unsuccessful individuals with psychopathic traits (Gao & Raine, 2010). Successful individuals demonstrate intact autonomic responses and preserved prefrontal-limbic function, along with improved executive skills that aid strategic goal pursuit, behavioral regulation, and deception (De Brito et al., 2013; Gao & Raine, 2010).

6.2 EF in Women with Psychopathic Traits

Research on EF in women with psychopathic traits remains limited, hindering a comprehensive understanding of the cognitive mechanisms underlying psychopathy in women (Kalinian & Wisniewski, 2007). However, existing research suggests that psychopathy in women is associated with deficits in EF, especially when evaluated through comprehensive tests that measure overall higher-level cognitive functions (Kalinian & Wisniewski, 2007). Studies involving female individuals who had committed crimes show difficulties with concept formation, abstract thinking, cognitive flexibility, initiating problem-solving, and translating knowledge into action, particularly in tasks that require verbal mediation and complex cognitive control (Kalinian & Wisniewski, 2007).

Similarly, studies on forensic samples of women reveal a link between higher levels of psychopathy and poorer performance in EF, such as planning, decision-making, sustained attention, and impulse control, assessed with traditional neuropsychological tests (e.g., Porteus Maze Test, Tower of London) (Ducro et al., 2014). The analysis of psychopathy by factors and facets also indicates variability in these associations, showing stronger links between the impulsive and antisocial dimensions and deficits in planning and execution, whereas the interpersonal factor primarily correlates with changes in decision-making (Ducro et al., 2014).

Recent meta-analytic evidence suggests that gender may act as a moderator in the relationship between psychopathy and EF (Burghart et al., 2024). Deficits in overall EF functioning, as well as in specific areas like inhibition, planning, and cognitive flexibility, are more pronounced in women with psychopathic traits than in men (Burghart et al., 2024). These findings should be interpreted carefully, considering the underrepresentation of women in the literature and the limited number of studies, although they highlight the importance of gender-sensitive approaches in psychopathy research (Burghart et al., 2024).

7. Developmental Trajectories: Impact on the Expression and Attenuation of Psychopathic

Traits

Longitudinal evidence indicates that psychopathic traits can be understood as forming through various developmental paths that evolve over time via ongoing interactions between innate tendencies and environmental factors, rather than being seen as fixed and unchanging from early development (Hawes et al., 2018). Literature distinguishes between characteristics and functioning patterns throughout childhood and adolescence, including emotional and behavioral indicators with phenotypic significance for the development of psychopathic traits, which persist into adulthood (Bégin et al., 2023; Klingzell et al., 2016).

Studies on the trajectory of callous-unemotional behaviors during childhood and adolescence identify these traits as early indicators of psychopathy in adulthood (Klingzell et al., 2016). These findings align with a complex form of psychopathy that involves developmental pathways based on combinations of early risk factors, such as temperamental risks, early adversity, parenting, socio-economic influences, and environmental exposures like educational attainment and associations with deviant peers (Klingzell et al., 2016). In fact, developmental systems theory offers a comprehensive conceptual framework suggesting that phenotypes result from ongoing interactions among biological, psychological, and environmental resources (Maung, 2021). Regarding females exhibiting psychopathic traits, this perspective is especially relevant due to evidence indicating that convicted women often experience a pattern of compounded adversity, instability, and victimization, reflecting a risk pattern unique to women (Forouzan & Nicholls, 2015). Additionally, recent research highlights perinatal and early-life features that shape risk pathways, leading to specific and context-dependent etiologies (Bégin et al., 2023).

7.1. Adverse Childhood Experiences and Developmentally Related Pathways to the Presence of Psychopathic Traits

Adverse childhood experiences (ACEs) occur before age 18 and include a range of negative events such as physical, emotional, and sexual abuse, as well as emotional and physical neglect (Felliti et al., 1998). They also encompass family dysfunctions like witnessing domestic violence, experiencing separation, substance abuse, mental illness, and parental incarceration (Felliti et al., 1998). The Dimensional Model of Adversity and Psychopathology (DMAP) categorize early adversity along two axes: deprivation, involving a lack of environmental stimulation and complexity; and threat, which relates to exposure to events involving actual or threatened violations of physical integrity (McLaughlin et al., 2014). These dimensions are believed to differently affect development and adaptation (McLaughlin et al., 2014). Evidence indicates that ACEs are strongly associated with negative developmental outcomes, including higher risks of externalized and antisocial behaviors throughout life (Cunha et al., 2025b).

Some studies identify characteristic traits or developmental patterns associated with psychopathy, highlighting its definitional complexity (Hare & Neumann, 2008). Within this framework, the distinction between primary and secondary psychopathy has been used to connect patterns of emotional variation and covariance to ACEs (Karpman, 1941). Primary psychopathy is linked to low anxiety levels, reduced affective sensitivity, and fundamental affective dysfunction, appearing relatively less susceptible to adverse environmental influences (Karpman, 1941; Moreira et al., 2020, 2022; Skeem et al., 2007). In contrast, secondary psychopathy is associated with higher levels of anxiety, negative affect, impulsivity, and psychopathological covariance, often reflecting cumulative ACEs and trauma (Hicks et al., 2004; Ireland et al., 2020; Moreira et al., 2020). This distinction aligns with models of adversity conceptualized as continua, whereby threat-related experiences (e.g., interpersonal violence and abuse) may affect vigilance and fear responses, whereas deprivation-related experiences (e.g., neglect and under-stimulation) may impair higher-order social and cognitive skills, such as self-control and socio-cognitive learning (McLaughlin et al., 2014).

Empirical evidence indicates that emotional abuse, emotional neglect, and physical abuse during childhood are linked to high levels of traits associated with psychopathy in adolescence and adulthood, especially in behavioral and lifestyle dimensions (Dargis et al., 2016). This connection has been more consistent for externalizing traits, typically measured by PCL-R Factor 2 or secondary traits, and is related to greater trauma exposure and internalizing symptoms, such as depression, post-traumatic symptoms, irritability, and others (Hare & Neumann, 2008; Ireland et al., 2020; Verona & Vitale, 2018). Recent findings have confirmed these results in a community sample, showing that cumulative exposure to ACEs, including dysfunctional and stressful family and external conditions before the age of 18, significantly predicts psychopathic traits in adulthood, even after accounting for the effects of age and gender as covariates (Van Doorn et al., 2025).

From a developmental perspective, early adversity is linked to issues in emotion regulation, social, and interpersonal development (Blair, 2005), including impaired empathy and attachment-related processes. These may manifest as emotional detachment, blunted affective expression (e.g., alexithymia, lack of emotional traits), and decreased responsiveness to others (Dargis et al., 2016). The timing, chronicity, and accumulation of ACEs also seem to matter, with exposure during sensitive developmental periods associated with more severe psychopathic traits in adulthood (Hawes et al., 2018).

The results from the Triarchic Model of Psychopathy further clarify this distinction, showing that disinhibition is more consistently linked to experiences of abuse, emotional regulation problems, and reactive aggression, while neglect is more closely tied to malevolence, affective restriction, and empathic

deficits (Moreira et al., 2024). Overall, these findings indicate that early adversity is more reliably connected to externalizing aspects of psychopathy-related traits than to the core interpersonal and affective traits (Moreira et al., 2024).

Regarding childhood and adolescence, there are no references to the development of psychopathic traits, but rather emotional, behavioral, and interpersonal factors that suggest phenotypic traits associated with psychopathic styles assessed in adulthood (Hawes et al., 2018; Klingzell et al., 2016). Evidence linking ACEs and psychopathy remains mostly cross-sectional (Van Doorn et al., 2025). However, the temporal sequence where childhood adversity occurs before the assessment of adult personality traits supports a cautious developmental interpretation, without implying deterministic or unidirectional pathways (Van Doorn et al., 2025).

7.2 Positive Childhood Experiences (PCEs) as Protective Factors in Psychopathic Traits

Although most of the literature on psychopathy emphasizes risk factors, recent research has explored the potential role of positive childhood experiences (PCEs) or benevolent childhood experiences (BCEs), also called counter-ACEs, in socio-emotional adaptation (Bethell et al., 2019; Cunha et al., 2025b; Narayan, 2018). PCEs include experiences of safety, stability, and support before age 18, such as caring and responsive caregivers, secure attachment relationships, predictable routines, a positive school or peer environment, and community (Almeida et al., 2021). Contrary to ACEs, PCEs consist of psychosocial experiences that foster skills relevant to psychological growth and functioning, including affect regulation, empathy, self-control, and the development of secure interpersonal relationships (Narayan et al., 2018). It is important to differentiate the absence of psychosocial resources from the presence of specific promotive experiences (Bethell et al., 2019).

Empirical evidence shows that higher levels of PCEs are linked to better mental health and psychosocial adjustment outcomes, including lower depression, anxiety, behavioral dysregulation, impulsivity, and risk-taking behaviors, as well as greater subjective well-being, resilience, and adaptive social functioning (Cunha et al., 2025b). These relationships are consistent across community samples and groups facing adversity, emphasizing the importance of PCEs even in challenging conditions (Toth & Cicchetti, 2013).

When discussing PCEs, it is important to consider the Healthy Outcomes from Positive Experiences (HOPE) framework, which views PCEs as relational and contextual assets that promote healthy outcomes (Burstein et al., 2021). More specifically, the HOPE framework organizes PCEs around four core building blocks: supportive relationships with adults and peers, safe, stable, and equitable environments, opportunities for social and civic engagement, and experiences that foster social and

emotional growth (Burstein et al., 2021). These assets interact in complex ways with biological, relational, and environmental processes, including caregiving relationships, safe and stable environments, social interactions, and the development of socio-emotional skills (Bethell et al., 2019; Sousa et al., 2025). Resilience models further differentiate between compensatory actions, which lead to beneficial outcomes regardless of adversity levels, and protective actions, which reduce the impact of risk factors on maladaptive results (Sousa et al., 2025).

Regarding psychopathic traits, incorporating PCEs marks a conceptual advance (Cunha et al., 2025b; Van Doorn et al., 2025). Recent findings indicate that PCEs are negatively linked to the expression of psychopathic traits in adulthood, supporting the idea that early experiences of relational support, emotional security, and social belonging may reduce affective coldness, disinhibition, and instrumental interpersonal styles (Van Doorn et al., 2025). These findings emphasize childhood not only as a period of vulnerability to risks but also as a window of opportunity for accumulating protective experiences with long-term effects (Cicchetti & Toth, 2009). PCEs help build more adaptive developmental paths, fostering socio-emotional skills that can decrease the chance of ongoing disinhibition, emotional detachment, and antisocial tendencies linked to psychopathic traits (Cicchetti & Toth, 2009; Cunha et al., 2025b).

In conclusion, incorporating PCEs to understand psychopathic traits allows for a more nuanced and less deterministic view of the development pathways associated with psychopathy (Cicchetti & Toth, 2009; Cunha et al., 2025b). Considering the findings that high levels of PCEs are linked to low levels of psychopathic traits, and that such experiences may even help mitigate adverse circumstances, this model enhances current ideas about psychopathy by providing a rational basis for interventions based on developmental trajectories (Cunha et al., 2025b; Van Doorn et al., 2025).

7.3 Early Risk and Protective Factors Related to Psychopathic Traits in Incarcerated Women

Evidence underscores that the women's developmental trajectories are characterized by early adversity, relationship disruption, and psychosocial vulnerability (Verona & Vitale, 2018). However, there remains a gap in empirical knowledge regarding early relationship experiences and lifelong protective mechanisms in incarcerated adult women (Pinheiro et al., 2025a) and attachment behaviors (Pinheiro et al., 2025b), contributing to the under-specification of women's development pathways toward psychopathy (Krischer & Sevecke, 2008; Pinheiro et al., 2025a).

There is increasing evidence suggesting that incarcerated women tend to have a greater burden and more complex experiences of ACEs, especially emotional neglect, emotional abuse, physical neglect, and sexual victimization (Krischer & Sevecke, 2008; Pinheiro et al., 2025a). In forensic environments,

although women show lower rates of psychopathic traits than men, women with high psychopathy scores often face more severe and chronic levels of cumulative childhood victimization (Almeida et al., 2023; Krischer & Sevecke, 2008). This pattern has been seen as aligning with a higher adversity threshold needed for women to develop criminal behavior and psychopathic traits, supporting early ideas about gender-sensitive pathways to criminality (McCuish, 2014).

Across development, relationship dysfunctions, attachment patterns of insecurity, caregiving patterns of instability, parental criminality, ineffective supervision, family conflict, school disengagement, and repeated exposure to victimization tend to co-occur and accumulate across development in women, contributing to antisocial outcomes (de Castro Rodrigues et al., 2026; Pinheiro et al., 2025a; 2025b). Trauma and victimization in women are mainly associated with emotional dysregulation, impulsivity, mood instability, and behavior volatility, consistent with secondary psychopathy (Hicks et al., 2010; Verona et al., 2005; Verona & Vitale, 2018). Gender-specific analyses suggest emotional neglect and relationship instability may be more salient predictors of antisocial and lifestyle characteristics among women than isolated physical abuse (Krischer & Sevecke, 2008). Furthermore, the relationship between overall scores on psychopathic traits among women who had committed crimes appears to be related to experiences of physical as well as sexual abuse, with effects explained by the affective component of psychopathy (Verona et al., 2005).

These findings are best understood within the framework of developmental psychopathology, which conceptualizes psychopathology as the result of cumulative, hierarchically organized, multilevel, and contextualized developmental trajectories, shaped by dynamic interactions between biological factors, environmental conditions, and prior developmental history (Masten, 2006; Sroufe, 2009). Thus, early adversity should not be interpreted as an isolated causal variable in determining developmental outcomes, but as part of broader developmental processes that progressively shape adaptation and maladaptation trajectories over time (Sroufe, 2009). Consequently, outcomes such as emotional dysregulation, impulsivity, and affective instability should be understood as developmental markers whose origins, organization, and transformation require a longitudinal and process-oriented analysis (Pollak, 2024; Sroufe, 2009). This framework further emphasizes that maladaptation should be understood in relation to normative development and developmental tasks relevant to each age group, such that disruptions in early care, attachment, emotional regulation, and interpersonal functioning can compromise adaptive processes throughout life (Masten, 2006). At the same time, the principles of equifinality and multifinality are fundamental to explaining the heterogeneity of outcomes, since different constellations of risk and protective factors can converge on similar outcomes, while similar early experiences can lead to divergent

developmental trajectories, depending on individual, relational, and contextual conditions (Masten, 2006; Sroufe, 2009). Expanding on these fundamental premises, more recent work has highlighted the need for greater specificity in explaining developmental change, arguing that associations between early adversity and later maladaptation are insufficient, by themselves, to explain how and why certain outcomes emerge (Pollak, 2024). From this perspective, equifinality and multifinality should not be invoked merely as post hoc explanations for heterogeneous findings, but rather incorporated from the outset into the conceptualization of developmental trajectories, with greater attention to the mechanisms by which individuals interpret, respond to, and adapt to their life experiences (Pollak, 2024).

Within this integrative developmental framework, increasing attention has been directed toward protective processes that may attenuate the impact of early adversity and shape more adaptive trajectories, particularly in high-risk populations such as incarcerated women (Cunha et al., 2023; Pinheiro et al., 2025a). Research on protective factors in women's criminality remains limited, but PCEs-oriented studies indicate that supportive relationships and socioemotional resources are linked to better emotional functioning and less affective instability, even among highly victimized women (Almeida et al., 2023). These findings align with the transactional model of development, emphasizing a bidirectional person-development context that integrates biological and psychological individual traits with multiple environmental influences, highlighting the importance of regulation and co-regulation processes in early relationships (Sameroff, 2009). From this perspective, longstanding adversity, relational disruptions, or chaotic caregiving environments may hinder the development of emotion self-regulation, while stable, responsive, and supportive relationships can serve as protective factors, even in the presence of individual vulnerabilities (Sameroff, 2009). Notably, although women tend to report higher levels of childhood adversity and greater affective dysregulation than men, they do not necessarily report fewer PCEs, suggesting that gender differences are more strongly linked to varying exposure to adversity and its emotional effects rather than the availability of positive experiences alone (Almeida et al., 2023).

Emerging evidence from male samples suggests links between psychopathic traits and resilience-related processes and coping, including psychological resistance and lower reactivity to stress (Međedović et al., 2018). However, these adaptive outcomes seem to be less robust in women's phenotypic profiles, with protective associations being more consistent in primary psychopathy than in secondary psychopathy (Saltoğlu & Irak, 2022). Similarly, Helfgott and Gunnison (2023) found that psychopathic traits did not influence the relationship between ACEs and criminal recidivism.

However, evidence regarding the buffering role of PCEs remains inconsistent (Almeida et al., 2023). In samples of women in prison, PCEs seem to function mainly as promotive and protective factors,

showing direct links to lower levels of affective lability rather than moderating the relationship between childhood abuse and affective lability (Almeida et al., 2023). In women, the lack of moderation effects of PCEs may be due to the severity, chronicity, and relational nature of traumatic exposure, along with the cumulative impact of mental health comorbidities, revictimization processes, and institutional stressors related to incarceration, which may diminish or limit the potential buffering effects of early PCEs (Pinheiro et al., 2025a; Van Doorn et al., 2025).

8. Prison: A Critical Forensic Context for Women

The correctional facility is described as a challenging forensic and developmental environment where successful adjustment requires ongoing emotion regulation, effective interpersonal skills, and the ability to handle chronic stressors in a setting characterized by deprivation and limited autonomy (Wright & Cain, 2018). Among women, institutional adjustment is consistently viewed as the result of a dynamic between prison stressors and pre-incarceration hardships, such as ACEs, psychiatric vulnerabilities, and substance use (Van Voorhis et al., 2010; Wright & Cain, 2018). Research with Portuguese populations further indicates that women often see imprisonment as having limited rehabilitative value and as possibly worsening criminal behaviors, affecting views on penal legitimacy and social reintegration (Matos et al., 2017).

8.1 Psychological Comorbidity, Cumulative Vulnerability, and Adaptation to the Prison Context among Incarcerated Women

The incarcerated women population consistently exhibits high rates of lifetime victimization, including physical and/or sexual abuse, which surpass rates seen in the general female population and incarcerated men (Wright & Cain, 2018). These victimization experiences rarely happen in isolation (Salisbury & Van Voorhis, 2009). Instead, they are embedded in socioeconomic marginalization, unstable or coercive relationships, and increased mental and physical health needs. These factors create cumulative risks that are central to women's pathways into crime (Salisbury & Van Voorhis, 2009).

In Portugal, incarcerated women are disproportionately affected by low educational attainment, unstable employment, economic dependence, and caregiving responsibilities, often alongside long-term exposure to abuse and neglect (Matos et al., 2017). Drug-related offenses among incarcerated women are usually viewed within this context of relational dependence and economic survival rather than as isolated decision-making (Matos et al., 2017). Substance use is frequently linked to offending and seen as an ineffective coping mechanism for psychological trauma (Wright & Cain, 2018). High levels of psychological comorbidity are also documented, including increased use of psychotropic medications

compared to male prisoners (Magaletta et al., 2008). The overlap of victimization, mental health issues, and substance use complicates assessment and treatment planning, Additionally, increasing risks for institutional maladjustment (Wright & Cain, 2018).

In research conducted with incarcerated women, Pinheiro et al. (2021) found a high rate of health service use during incarceration, including for mental health problems, indicating significant clinical needs within this group. These vulnerabilities are linked to specific emotional regulation difficulties, as Edwards et al. (2019) found that, among incarcerated women, difficulties in understanding and managing emotions were strongly associated with affective traits of psychopathy.

Motherhood emerges as a salient and complex dimension of women's prison experiences in Portugal. Caregiving responsibilities do not appear to protect women from custodial sentencing; instead, incarceration may intensify emotional burden through feelings of guilt, shame, and perceived moral failure associated with deviation from socially prescribed gender norms (Matos et al., 2017). Such experiences have direct implications for self-concept, well-being, and engagement with rehabilitation processes, and have been thought to represent "double punishment," whereby the woman is punished for her transgression of the law as well as for failing to live up to ideals of motherhood (Matos et al., 2017).

Severe emotional dysregulation outcomes, such as self-harm and suicidal behavior, are emphasized in the literature as serious manifestations of emotion dysregulation among women in prison (Wright & Cain, 2018). Trauma exposure, childhood neglect, and lack of social support are repeatedly reported correlates of suicidal behavior in this group, with childhood victimization remaining a significant predictor even after controlling for substance use and incarceration-related factors (Wright & Cain, 2018). In Portugal, relational deprivation, particularly separation from children and family networks, is described as intensified by the geographic concentration of women's prisons and visitation restrictions (Matos et al., 2017). This situation acts as a chronic stressor with documented effects on emotion regulation and psychological well-being (Matos et al., 2017).

Throughout incarceration, women experience disproportionate psychological disadvantages, reflecting accumulated adversity prior to imprisonment and the effects of institutional stressors during their time in prison (Kelman et al., 2024). These prison-related stressors include deprivation of liberty, interpersonal violence, and separation from family and social networks (Edison & Haynie, 2025). Women exhibit poorer mental health profiles before, during, and after incarceration (Edison & Haynie, 2025; Wooldredge & Steiner, 2016), along with poor sleep habits, higher depression levels, and increased self-harm compared to incarcerated men (Wooldredge & Steiner, 2016).

Within this ecology of accumulated stress, the fear of victimization in prison is a significant factor, as violent victimization diminishes perceived control and personal safety, and can lead to the ongoing activation of the body's stress response systems (McEwen, 2005). Although levels of violent violence are generally lower in women's prisons compared to men's, incarcerated women remain at substantial victimization risk of victimization with effects on their well-being and ability to adapt to prison adaptation (Kelman et al., 2024).

Prison adaptation among incarcerated women has been operationalized in terms of behavioral and clinical measures, such as disciplinary infractions, disruptive behaviors, utilization of health services, and self-harm, which reflect observable manifestations of the difficulty in meeting prison demands (Kruttschnitt & Gartner, 2005; Pinheiro et al., 2021). In gender-sensitive frameworks, ACEs and victimization during adulthood consistently emerge as strong predictors of more severe institutional misconduct, especially during the early stages of incarceration when adaptation needs are most intense (Van Voorhis et al., 2010). These links are even more pronounced among women with mental health problems, including a history of psychiatric illness and the use of psychotropic medications during incarceration (Steiner & Wooldredge, 2009). Comorbid mental illness and substance abuse further increase risk, leading to higher rates of both minor and multiple disciplinary infractions (Wright & Cain, 2018).

Antisocial psychopathic traits and impulsivity predict prison misconduct in women, especially nonviolent misconduct, since violent misconduct has been linked to a history of violent crime combined with high affective and antisocial psychopathic traits (Thomson et al., 2016). Global empathy was negatively related to psychopathic traits but did not predict violent or nonviolent misconduct (Thomson et al., 2016). Longitudinal research indicates that maternal incarceration during childhood is more strongly associated with affective psychopathic traits, violence, and future violence in prison among women than paternal incarceration (Thomson et al., 2020).

In addition to overt behavioral signs, the role of emotional functioning has emerged as a significant factor in how incarcerated women adapt to their environment (Edwards et al., 2019). Emotional skills seem inconsistent, with a relative ability to perceive emotions preserved, but difficulties in understanding and regulating those emotions, which are important for social interactions and managing emotional demands in prison (Edwards et al., 2019). Supporting this evidence, Liu et al. (2024) found that childhood discrimination was positively linked to emotional aggression, anger, and hostility. Additionally, cognitive empathy was negatively related to emotional aggression, while affective empathy was positively associated

with these traits (Liu et al., 2024). Perceived social support, on the other hand, was inversely related to emotional aggression, anger, and hostility (Liu et al., 2024).

Contemporary research conceptualizes prison adaptation as a dynamic process involving emotion regulation, meaning making, and identity reconstruction over time (Crewe et al., 2017). Although the initial phase of incarceration is particularly disruptive, emotional outcomes do not necessarily deteriorate linearly and are moderated by individual and institutional factors (van Ginneken et al., 2019). In this context, emotion regulation frameworks enhance coping models by viewing emotions as dynamic states that can be intensified, maintained, or decreased rather than simply suppressed (Sukmasari & Soetikno, 2024).

9. Gaps in Knowledge and Rationale for the Thesis

Although it is increasingly recognized that emotion dysregulation is a key component of psychopathy, a significant gap remains in empirical knowledge regarding emotional processing in women with psychopathic traits, especially in prison settings (Pinheiro et al., 2019). In Portugal, this gap is particularly notable since few empirical studies have examined emotion processing in women who have committed crimes (Pinheiro et al., 2019). Current theories of emotion processing and psychopathy are primarily based on male samples, which limits understanding of how women experience, regulate, express, and process emotions in forensic environments (Blair, 2007; Verona & Vitale, 2018).

This bias is not only methodological but also conceptual. Evidence suggests that, in women, emotion deficits may be selective rather than generalized, affecting emotions such as guilt, fear, or empathic concerns, while other emotional responses may remain relatively intact (Blair, 2007; Pinheiro et al., 2019). These differences seem to be influenced by individual differences and by interpersonal, moral, and situational contexts, contrasting with more general emotion deficit accounts often based on male samples (Sutton et al., 2002).

Research has linked psychopathy with difficulties in emotional functioning and experience, including attenuated subjective experience of emotions and decreased recognition of negative emotions such as fear, guilt, and anxiety (Blair, 2007, 2018). A lack of emotional awareness and integration has also been reported among individuals with high psychopathic traits (Blair, 2007; Blair, 2018). Alongside these findings, a widespread absence of empathy and moral function has been observed. This primarily involves a reduced resonance with expressions of sadness and fear in others, as well as difficulty in adopting another person's perspective, especially among those who score high on psychopathic traits (Seara-Cardoso et al., 2013). However, these results were derived mainly from male individuals, making their applicability to women remains empirically limited.

Emotional processing in women who had committed crimes often occurs within developmental trajectories marked by early adversity, including abuse, neglect, and relationship instability, which are consistently linked to persistently impaired emotion regulation (Salisbury & Van Voorhis, 2009). Although early adversity is not a causal factor for psychopathy, its effects are related to the development of these traits and to emotional reactivity and affective instability (Hicks et al., 2010; Verona & Vitale, 2006). Conversely, PCEs are conceptualized as protective factors for emotional development, with the potential to weaken adversity-related risks for negative emotion regulation outcomes (Narayan et al., 2018; Bethell et al., 2019). Additionally, EF have been implicated in regulating and modulating the links between emotion and behavior in psychopathy (Blair, 2018). Deficits in inhibitory control, cognitive flexibility, or emotionally charged decision-making may contribute to difficulties in emotion regulation and poorer task adaptation among women with psychopathic traits (Blair, 2018). Recent evidence highlights the importance of the relationship between EF and the connection between emotions and behaviors, yet the link between EF and emotional processing in incarcerated women with psychopathic traits remains underexamined (Burghart et al., 2024).

Each of these gaps represents a limited empirical model capable of explaining emotional processing in women with psychopathic traits, which has direct implications for assessment and intervention strategies. The primary aim of this research was to explore emotional processing in incarcerated women with psychopathic traits. Four interconnected objectives were outlined: (1) to characterize emotional processing in women with psychopathic traits; (2) to assess emotional processing in incarcerated women with these traits; (3) to examine the influence of developmental trajectories and empathic factors on individual differences in psychopathic traits; and (4) to develop an integrated model encompassing emotional, cognitive, and developmental aspects of incarcerated women with psychopathic traits.

To achieve the first specific objective, a systematic review of the literature was carried out. This review focused on collecting previous research findings related to emotional processing in women exhibiting psychopathic traits. Its goal was to identify patterns and discrepancies in past studies, providing a foundation for the empirical studies (Chapter I).

To accomplish the second specific objective of the research, an empirical study was conducted. The study included 164 incarcerated women in different Portuguese prisons. The empirical study focused on assessing emotional processing using static visual stimuli across the dimensions of Valence, Activation, and Dominance. This approach allowed for the identification of distinct emotional profiles and the examination of their relationships to psychopathic traits in incarcerated women (Study 2; Chapter II).

To fulfill the third specific research objective, two empirical studies were conducted focusing on developmental experiences and empathy as explanatory mechanisms for psychopathic traits (Studies 3 and 4; Chapter III). First, the moderating role of PCEs in the relationship between ACEs and the presence of psychopathic traits was examined. Then, we analyzed whether ACEs and psychopathic traits predicted empathy in incarcerated women, and whether PCEs moderated these relationships.

Finally, to address the fourth specific research objective, an integrative study using structural equation modeling explored the connections among early adversity, EF, empathy, emotional processing, and psychopathic traits. This study aimed to combine emotional, developmental, and cognitive mechanisms into a clear explanatory model, proposing an empirically supported framework of emotional processing in female psychopathy specifically adapted to women in a prison setting (Study 5; Chapter IV).

All studies included in this thesis were approved by the Ethics Committee for Research in Social Sciences and Humanities at the University of Minho (CEICSH 153/2022). For studies involving incarcerated women, approval was also obtained from the General Directorate of Reintegration and Prison Services – Ministry of Justice (DGRSP-MJ; Official Letter No. 146/CCCRE, July 27, 2023). Informed, free, and voluntary written consent was secured from all participants, covering the nature of the study, confidentiality and anonymity guarantees, and the voluntary nature of participation. All procedures adhered to the ethical standards established by the relevant research committees of the involved institutions and followed the lessons of the Declaration of Helsinki and its amendments (World Medical Associations, 2024).

References

Almeida, T. C., Fernandes, R. M., & Cunha, O. (2023). The role of positive childhood experiences in the link between childhood maltreatment and affective lability in a sample of incarcerated men and women. *Child abuse & neglect*, *135*, 105969. https://doi.org/10.1016/j.chiabu.2022.105969

Almeida, T. C., Guarda, R., & Cunha, O. (2021). Positive childhood experiences and adverse experiences: Psychometric properties of the Benevolent Childhood Experiences Scale (BCEs) among the Portuguese population. *Child abuse & neglect*, *120*, 105179. https://doi.org/10.1016/j.chiabu.2021.105179

American Psychiatric Association (2022). *Diagnostic and statistical manual of mental disorders: DSM-5™* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425787

Anderson, N. E., Stanford, M. S., Wan, L., & Young, K. A. (2011). High psychopathic trait females exhibit reduced startle potentiation and increased P3 amplitude. *Behavioral sciences & the law*, *29*(5), 649–666. https://doi.org/10.1002/bsl.998

Anderson, N. E., Steele, V. R., Maurer, J. M., Rao, V., Koenigs, M. R., Decety, J., Kosson, D. S., Calhoun, V. D., & Kiehl, K. A. (2017). Differentiating emotional processing and attention in psychopathy with functional neuroimaging. *Cognitive, affective & behavioral neuroscience*, *17*(3), 491–515. https://doi.org/10.3758/s13415-016-0493-5

Bagshaw, R., Gray, N. S., & Snowden, R. J. (2014). Executive function in psychopathy: the Tower of London, Brixton Spatial Anticipation and the Hayling Sentence Completion Tests. *Psychiatry research*, *220*(1-2), 483–489. https://doi.org/10.1016/j.psychres.2014.07.031

Banasik, M., Gierowski, J. K., & Stachura, M. (2014). Affective functioning in female offenders: An analysis of the relationship between the level of psychopathy and affective and cognitive empathy. *Problems of Forensic Sciences, 97*, 23–33.

Baskin-Sommers, A. R., Brazil, I. A., Ryan, J., Kohlenberg, N. J., Neumann, C. S., & Newman, J. P. (2015). Mapping the association of global executive functioning onto diverse measures of psychopathic traits. *Personality Disorders: Theory, Research, and Treatment*,*6*(4), 336–346. https://doi.org/10.1037/per0000125

Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2011). Specifying the attentional selection that moderates the fearlessness of psychopathic offenders. *Psychological Science*, *22*(2), 226–234. https://doi.org/10.1177/0956797610396227

Bégin, V., Fontaine, N. M. G., Vitaro, F., Boivin, M., Tremblay, R. E., & Côté, S. M. (2023). Perinatal and early-life factors associated with stable and unstable trajectories of psychopathic traits across childhood. *Psychological Medicine*, *53*(2), 379–387. https://doi.org/10.1017/S0033291721001586

Berrios, G. E. (1993). European views on personality disorders: A conceptual history. *Comprehensive Psychiatry, 34*(1), 14–30. https://doi.org/10.1016/0010-440x(93)90031-x

Bethell, C., Jones, J., Gombojav, N., Linkenbach, J., & Sege, R. (2019). Positive Childhood Experiences and Adult Mental and Relational Health in a Statewide Sample: Associations Across Adverse Childhood Experiences Levels. *JAMA Pediatrics*, *173*(11), e193007. https://doi.org/10.1001/jamapediatrics.2019.3007

Blair R. J. (2003). Neurobiological basis of psychopathy. *The British journal of Psychiatry: the journal of mental science*, *182*, 5–7. https://doi.org/10.1192/bjp.182.1.5

Blair R. J. (2005). Responding to the emotions of others: dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and Cognition*, *14*(4), 698–718. https://doi.org/10.1016/j.concog.2005.06.004

Blair R. J. (2008). The amygdala and ventromedial prefrontal cortex: functional contributions and dysfunction in psychopathy. *Philosophical Transactions of the Royal Society of London. Series B, Biological sciences*, *363*(1503), 2557–2565. https://doi.org/10.1098/rstb.2008.0027

Blair R. J. R. (2018). Traits of empathy and anger: implications for psychopathy and other disorders associated with aggression. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, *373*(1744), 20170155. https://doi.org/10.1098/rstb.2017.0155

Blair, K. S., Smith, B. W., Mitchell, D. G., Morton, J., Vythilingam, M., Pessoa, L., Fridberg, D., Zametkin, A., Sturman, D., Nelson, E. E., Drevets, W. C., Pine, D. S., Martin, A., & Blair, R. J. (2007). Modulation of emotion by cognition and cognition by emotion. *NeuroImage*, *35*(1), 430–440. https://doi.org/10.1016/j.neuroimage.2006.11.048

Blair, R. J. R. (2007). Empathic dysfunction in psychopathic individuals. In T. Farrow & P. Woodruff (Eds.), *Empathy in mental illness* (pp. 3–16). Cambridge University Press. https://doi.org/10.1017/CBO9780511543753.002

Blair, R. J., & Mitchell, D. G. (2009). Psychopathy, attention and emotion. *Psychological Medicine*, *39*(4), 543–555. https://doi.org/10.1017/S0033291708003991

Bonta, J., & Andrews, D.A. (2023). *The Psychology of Criminal Conduct* (7th ed.). Routledge. https://doi.org/10.4324/9781003292128

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: the Self-Assessment Manikin and the Semantic Differential. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*(1), 49–59. https://doi.org/10.1016/0005-7916(94)90063-9

Breuer, E., Remond, M., Lighton, S., Passalaqua, J., Galouzis, J., Stewart, K. A., & Sullivan, E. (2021). The needs and experiences of mothers while in prison and post-release: a rapid review and thematic synthesis. *Health & Justice*, *9*(1), 31. https://doi.org/10.1186/s40352-021-00153-7

Brinkley, C. A., Newman, J. P., Widiger, T. A., & Lynam, D. R. (2004). Two Approaches to Parsing the Heterogeneity of Psychopathy. *Clinical Psychology: Science and Practice, 11*(1), 69–94. https://doi.org/10.1093/clipsy.bph054

Brockbank, R. B., & Feldon, D. F. (2024). Cognitive reappraisal: The bridge between cognitive load and emotion. *Education Sciences, 14*(8), Article 870. https://doi.org/10.3390/educsci14080870

Burghart, M., Schmidt, S., & Mier, D. (2024). Executive functions in psychopathy: a meta-analysis of inhibition, planning, shifting, and working memory performance. *Psychological Medicine*, *54*(11), 2823–2837. https://doi.org/10.1017/S0033291724001259

Burstein, D., Yang, C., Johnson, K., Linkenbach, J., & Sege, R. (2021). Transforming Practice with HOPE (Healthy Outcomes from Positive Experiences). *Maternal and Child Health Journal*, *25*(7), 1019–1024. https://doi.org/10.1007/s10995-021-03173-9

Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: the coming of age of a discipline. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *50*(1-2), 16–25. https://doi.org/10.1111/j.1469-7610.2008.01979.x3

Cleckley, H. (1941). *The mask of sanity; an attempt to reinterpret the so-called psychopathic personality*. Mosby.

Cleckley, H. (1976). *The mask of sanity: An attempt to clarify Some Issues About the so called psychopathic personality* (5th ed.). St Louis: Mosby.

Coid, J., & Ullrich, S. (2010). Antisocial personality disorder is on a continuum with psychopathy. *Comprehensive Psychiatry*, *51*(4), 426–433. https://doi.org/10.1016/j.comppsych.2009.09.006

Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. (2005). Searching for the pan-cultural core of psychopathic personality disorder. *Personality and Individual Differences, 39*(2), 283–295. https://doi.org/10.1016/j.paid.2005.01.004

Costa, P. T., Jr., & Widiger, T. A. (Eds.). (1994). *Personality disorders and the five-factor model of personality.* American Psychological Association. https://doi.org/10.1037/10140-000

Crewe, B., Hulley, S., & Wright, S. (2017). The Gendered Pains of Life Imprisonment. *British Journal of Criminology, 57*(6), 1359-1378. https://doi.org/10.1093/bjc/azw088

Cruz, A. R., de Castro-Rodrigues, A., & Barbosa, F. (2020). Executive dysfunction, violence and aggression. *Aggression and Violent Behavior, 51,* Article 101380. https://doi.org/10.1016/j.avb.2020.101380

Cuff, B. M. P., Brown, S. J., Taylor, L., & Howat, D. J. (2014). Empathy: A Review of the Concept. *Emotion Review*, *8*(2), 144-153. https://doi.org/10.1177/1754073914558466

Cunha, O., Pinheiro, M., & Conde, A. R. (2025a). Psychopathy and Violent Offenses: A Comparison Between Incarcerated Men and Women in Portugal. *Deviant Behavior*, 1–19. https://doi.org/10.1080/01639625.2025.2543048

Cunha, O., Sousa, M., Almeida, T. C., Guarda, R., & Cruz, A. R. (2025b). When Good Experiences Matter: Positive Childhood Experiences as a Moderator Between Adverse Childhood Experiences and Psychopathic Traits in Community and Justice-Involved Samples. *Journal of Aggression, Maltreatment & Trauma*, *34*(9), 1447–1467. https://doi.org/10.1080/10926771.2025.2555564

Dargis, M., Newman, J., & Koenigs, M. (2016). Clarifying the link between childhood abuse history and psychopathic traits in adult criminal offenders. *Personality Disorders: Theory, research, and Treatment, 7*(3), 221–228. https://doi.org/10.1037/per0000147

De Brito, S. A., Viding, E., Kumari, V., Blackwood, N., & Hodgins, S. (2013). Cool and hot executive function impairments in violent offenders with antisocial personality disorder with and without psychopathy. *PloS one*, *8*(6), e65566. https://doi.org/10.1371/journal.pone.0065566

de Castro Rodrigues, A., Andrade, J., Gonçalves, R. A., Cruz, A. R., & Cunha, O. (2025). In or Out: Justice-Involved Women Characterization and Their Perceptions about Penal Sanctions. *Women & Criminal Justice*, *35*(4), 248–265. https://doi.org/10.1080/08974454.2022.2126743

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026, September 11–12). *Layers of vulnerability in incarcerated women* [Poster presentation]. Women Behind Bars – Female Portuguese Inmates Symposium, ISPA, Lisbon, Portugal.

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026). The gap between best practices and reality: A systematic review on the interventions with incarcerated women. *Trauma, Violence, & Abuse*. Advance online publication. https://doi.org/10.1177/15248380261439135

de Vogel, V., & Lancel, M. (2016). Gender differences in the assessment and manifestation of psychopathy: Results from a multicenter study in forensic psychiatric patients. *The International Journal of Forensic Mental Health, 15*(1), 97–110. https://doi.org/10.1080/14999013.2016.1138173

Decety, J., & Jackson, P. L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews*, *3*(2), 71–100. https://doi.org/10.1177/1534582304267187

Delfin, C., Andiné, P., Hofvander, B., Billstedt, E., & Wallinius, M. (2018). Examining Associations Between Psychopathic Traits and Executive Functions in Incarcerated Violent Offenders. *Frontiers in Psychiatry*, *9*, 310. https://doi.org/10.3389/fpsyt.2018.00310

di Giacomo, E., Santorelli, M., Pessina, R., Rucco, D., Placenti, V., Aliberti, F., Colmegna, F., & Clerici, M. (2021). Child abuse and psychopathy: Interplay, gender differences and biological correlates. *World Journal of Psychiatry*, *11*(12), 1167–1176. https://doi.org/10.5498/wjp.v11.i12.1167

Diamond A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135–168. https://doi.org/10.1146/annurev-psych-113011-143750

Ducro, C., Vicenzutto, A., Suinen, P., & Pham, T. (2014). Relationship between neuropsychological characteristics of attention, planning, impulsivity and decision making in female psychopathic forensic patients. *Acta Psychiatrica Belgica, 114*(4), 33–40.

Edens, J. F., Poythress, N. G., Jr, Lilienfeld, S. O., & Patrick, C. J. (2008). A prospective comparison of two measures of psychopathy in the prediction of institutional misconduct. *Behavioral Sciences & the Law*, *26*(5), 529–541. https://doi.org/10.1002/bsl.823

Edison, S., & Haynie, D. L. (2025). Social Support, Victimization, and Stress in a Women's Prison: The Role of in-Prison Friendship for Reducing Perceptions of Stress. *Women & Criminal Justice*, *35*(4), 266–283. https://doi.org/10.1080/08974454.2023.2246955

Edwards, B. G., Ermer, E., Salovey, P., & Kiehl, K. A. (2019). Emotional Intelligence in Incarcerated Female Offenders with Psychopathic Traits. *Journal of Personality Disorders*, *33*(3), 370–393. https://doi.org/10.1521/pedi_2018_32_349

Edwards, B. G., Maurer, J. M., Harenski, C. L., & Kiehl, K. A. (2021). Psychopathy, borderline personality disorder, and substance use in incarcerated females. *Criminal Justice and Behavior*, *48*(12), 1732–1748. https://doi.org/10.1177/00938548211033336

Eisenbarth, H., Krammer, S., Edwards, B. G., Kiehl, K. A., & Neumann, C. S. (2018). Structural analysis of the PCL-R and relationship to BIG FIVE personality traits and parenting characteristics in an

Hispanic female offender sample. *Personality and Individual Differences, 129,* 59–65. https://doi.org/10.1016/j.paid.2018.03.015

Eisenbarth, H., Osterheider, M., Nedopil, N., & Stadtland, C. (2012). Recidivism in female offenders: PCL-R lifestyle factor and VRAG show predictive validity in a German sample. *Behavioral Sciences & the Law*, *30*(5), 575–584. https://doi.org/10.1002/bsl.2013

Flor, H., & Foell, J. (2020). Cognitive Correlates. In A. R. Felthous & H. Saß (Eds.), *The Wiley international handbook on psychopathic disorders and the law*. John Wiley & Sons. https://doi.org/10.1002/9781119159322.ch16

Forouzan, E., & Cooke, D. J. (2005). Figuring out la femme fatale: conceptual and assessment issues concerning psychopathy in females. *Behavioral Sciences & the Law*, *23*(6), 765–778. https://doi.org/10.1002/bsl.669

Fowles, D. C., & Dindo, L. (2009). Temperament and psychopathy: A dual-pathway model. *Current Directions in Psychological Science, 18*(3), 179–183. https://doi.org/10.1111/j.1467-8721.2009.01632.x

Gao, Y., & Raine, A. (2010). Successful and unsuccessful psychopaths: a neurobiological model. *Behavioral Sciences & the Law*, *28*(2), 194–210. https://doi.org/10.1002/bsl.924

Gao, Y., Schug, R. A., Huang, Y., & Raine, A. (2020). Successful and Unsuccessful Psychopathy: An Updated Neurobiological Model. In A. R. Felthous & H. Saß (Eds.), *The Wiley international handbook on psychopathic disorders and the law*. John Wiley & Sons. https://doi.org/10.1002/9781119159322.ch26

Gonçalves, R. A. (2017). Psicopatia [Psychopathy]. In F. Vieira, A. S. Cabral, & C. B. Saraiva (Eds.), *Manual de Psiquiatria Forense* [Manual of Forensic Psychiatry] (pp. 449–461). Pactor.

Gonçalves, R. A., & Cunha, O. (2017). Escala de Psicopatia de Hare – Versão Revista (PCL-R) [Hare Psychopathy Checklist – Revised (PCL-R)]. In M. R. Simões, L. S. Almeida, & M. M. Gonçalves (Eds.), *Psicologia Forense: Instrumentos de avaliação* [Forensic psychology: Assessment instruments] (pp. 25–41). Pactor.

Gonçalves, R. A., & Lopes, M. (2007). Mulheres na prisão e reprodução da criminalidade [Women in prison and the reproduction of criminality]. In *Actas do Seminário "Educar o Outro – As questões de género, dos direitos humanos da educação nas prisões portuguesas"* [*Proceedings of the Seminar "Educar o Outro – Gender issues, human rights and education in Portuguese prisons"*] (pp. 55–77). Humana Global. Retrieved April 27 2026, from

https://www.dhnet.org.br/educar/mundo/portugal/a_pdf/humana_global_educar_outro_prisoes.pdf

Hansen, A. L., Johnsen, B. H., Thornton, D., Waage, L., & Thayer, J. F. (2007). Facets of psychopathy, heart rate variability and cognitive function. *Journal of Personality Disorders*, *21*(5), 568–582. https://doi.org/10.1521/pedi.2007.21.5.568

Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology*, *4*, 217–246. https://doi.org/10.1146/annurev.clinpsy.3.022806.091452

Hare, R.D. (1991) *The Hare PCL-R: Rating booklet.* Multi-Health Systems, Toronto.

Hare, R.D. (2003) *Manual for the revised psychopathy checklist.* 2nd Edition, Multi-Health Systems, Toronto.

Harris, G.T., Skilling, T.A., & Rice, M.E. (2001). The Construct of Psychopathy. *Crime and Justice, 28*, 197 - 264. https://doi.org/10.1086/652211

Hawes, S. W., Boccaccini, M. T., & Murrie, D. C. (2013). Psychopathy and the combination of psychopathy and sexual deviance as predictors of sexual recidivism: meta-analytic findings using the Psychopathy Checklist–Revised. *Psychological Assessment*, *25*(1), 233–243. https://doi.org/10.1037/a0030391

Hawes, S. W., Byrd, A. L., Gonzalez, R., Cavanaugh, C., Bechtold, J., Lynam, D. R., & Pardini, D. A. (2018). The Developmental Course of Psychopathic Features: Investigating stability, change, and long-term outcomes. *Journal of Research in Personality*, *77*, 83–89. https://doi.org/10.1016/j.jrp.2018.09.009

Heidensohn, F. (2012). The future of feminist criminology. *Crime, Media, Culture: An International Journal*, *8*(2), 123-134. https://doi.org/10.1177/1741659012444431

Helfgott, J. B., & Gunnison, E. (2023). Trauma, Psychopathic Traits, and Resilience in Female Post-Prison Reentry Outcomes. *Criminology, Criminal Justice, Law and Society*, *24*(1), 52–70. https://doi.org/10.54555/ccjls.7115.74096

Horley, J. (2014). The emergence and development of psychopathy. *History of the Human Sciences*, *27*(5), 91-110. https://doi.org/10.1177/0952695114541864

Ireland, J. L., Mann, S., Lewis, M., Ozanne, R., McNeill, K., & Ireland, C. A. (2020). Psychopathy and trauma: Exploring a potential association. *International Journal of Law and Psychiatry*, *69*, 101543. https://doi.org/10.1016/j.ijlp.2020.101543

Javdani, S., Sadeh, N., & Verona, E. (2011). Gendered social forces: A review of the impact of institutionalized factors on women and girls' criminal justice trajectories. *Psychology, Public Policy, and Law, 17*(2), 161–211. https://doi.org/10.1037/a0021957

Kalinian, H., & Wisniewski, A. W. (2007). Abnormal findings revealed in female criminal psychopaths using the sorting test. *Journal of Forensic Neuropsychology, 4*(4), 33–48. https://doi.org/10.1300/J151v04n04_03

Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: the symptomatic and the idiopathic. *Journal of Criminal Psychopathology, 3,* 112–137.

Karpman, B. (1948). The myth of the psychopathic personality. *The American Journal of Psychiatry, 104,* 523–534. https://doi.org/10.1176/ajp.104.9.523

Karpman, B. (1955). Criminal psychodynamics: a platform. *Archives of Criminal Psychodynamics, 1,* 3–100.

Kelman, J., Gribble, R., Harvey, J., Palmer, L., & MacManus, D. (2024). How Does a History of Trauma Affect the Experience of Imprisonment for Individuals in Women's Prisons: A Qualitative Exploration. *Women & Criminal Justice*, *34*(3), 171–191. https://doi.org/10.1080/08974454.2022.2071376

Kennedy, S. C., Mennicke, A. M., & Allen, C. (2020). 'I took care of my kids': Mothering while incarcerated. *Health & Justice*, *8*(1), 12–14. https://doi.org/10.1186/s40352-020-00109-3

Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathy, aggression, and the processing of emotional stimuli in non-referred girls and boys. *Behavioral Sciences & the Law*, *24*(1), 21–37. https://doi.org/10.1002/bsl.668

Klingzell, I., Fanti, K. A., Colins, O. F., Frogner, L., Andershed, A. K., & Andershed, H. (2016). Early Childhood Trajectories of Conduct Problems and Callous-Unemotional Traits: The Role of Fearlessness and Psychopathic Personality Dimensions. *Child Psychiatry and Human Development*, *47*(2), 236–247. https://doi.org/10.1007/s10578-015-0560-0

Kreis, M. K., & Cooke, D. J. (2011). Capturing the psychopathic female: a prototypicality analysis of the comprehensive assessment of psychopathic personality (CAPP) across gender. *Behavioral Sciences & the Law*, *29*(5), 634–648. https://doi.org/10.1002/bsl.1003

Krischer, M. K., & Sevecke, K. (2008). Early traumatization and psychopathy in female and male juvenile offenders. *International Journal of Law and Psychiatry*, *31*(3), 253–262. https://doi.org/10.1016/j.ijlp.2008.04.008

Kruttschnitt, C., & Gartner, R. (2005). *Marking time in the Golden State: Women's imprisonment in California*. Cambridge University Press.

Lane, J. (2020). An Overview: What We Know About Incarcerated Women and Girls. In: Hector, J. (eds) *Women and Prison* (pp. 1-13). Springer International Publishing. https://doi.org/10.1007/978-3-030-46172-0_1

Larson, C. L., Baskin-Sommers, A. R., Stout, D. M., Balderston, N. L., Curtin, J. J., Schultz, D. H., Kiehl, K. A., & Newman, J. P. (2013). The interplay of attention and emotion: top-down attention modulates amygdala activation in psychopathy. *Cognitive, Affective & Behavioral Neuroscience*, *13*(4), 757–770. https://doi.org/10.3758/s13415-013-0172-8

Lee, J. S., Tajima, E. A., Herrenkohl, T. I., & Hong, S. (2017). Effects of formal and informal deviant labels in adolescence on crime in adulthood. *Social Work Research*, *41*(2), 97–110. https://doi.org/10.1093/swr/svx003

Lilienfeld, S. O., & Fowler, K. A. (2006). The Self-Report Assessment of Psychopathy: Problems, Pitfalls, and Promises. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 107–132). The Guilford Press.

Lilienfeld, S. O., Watts, A. L., & Smith, S. F. (2015). Successful Psychopathy: A Scientific Status Report: A Scientific Status Report. *Current Directions in Psychological Science*, *24*(4), 298-303. https://doi.org/10.1177/0963721415580297

Liu, L., Ding, X., Li, S., & Chen, X. (2024). Exploring aggressive emotions in women in prison: the role of empathy and perceived social support in moderating the effects of childhood discrimination experiences. *BMC Public Health*, *24*(1), 3333. https://doi.org/10.1186/s12889-024-20844-8

Lombroso, C. (1876). *L'uomo delinquente*. Bocca.

Maes, J. H., & Brazil, I. A. (2013). No clear evidence for a positive association between the interpersonal-affective aspects of psychopathy and executive functioning. *Psychiatry Research*, *210*(3), 1265–1274. https://doi.org/10.1016/j.psychres.2013.09.028executive

Magaletta, P. R., Diamond, P. M., Faust, E., Daggett, D. M., & Camp, S. D. (2008). Estimating the Mental Illness Component of Service Need in Corrections: Results From the Mental Health Prevalence Project. *Criminal Justice and Behavior*, *36*(3), 229-244. https://doi.org/10.1177/0093854808330390

Masten, A. S. (2006). Developmental psychopathology: Pathways to the future. *International Journal of Behavioral Development*, *30*(1), 47-54.

Matos, R., Cunha, M. I., De Carvalho, P. M., Tavares, R., & Pereira, L. D. M. (2017). Women in prison in Portugal. In P. H. van Kempen & M. Krabbe (Eds.), *Women in prison: The Bangkok Rules and beyond* (pp. 613–644). Intersentia.

Maung, H. H. (2021). Psychopathic personalities and developmental systems. *Philosophical Psychology, 34*(4), 502 528. https://doi.org/10.1080/09515089.2021.1916453

McCuish, E. C., Corrado, R., Lussier, P., & Hart, S. D. (2014). Psychopathic traits and offending trajectories from early adolescence to adulthood. *Journal of Criminal Justice, 42*(1), 66–76. https://doi.org/10.1016/j.jcrimjus.2013.12.004

McEwen, B. S. (2005). Stressed or stressed out: What is the difference? *Journal of Psychiatry & Neuroscience, 30*(5), 315–318.

McLaughlin, K. A., Sheridan, M. A., & Lambert, H. K. (2014). Childhood adversity and neural development: deprivation and threat as distinct dimensions of early experience. *Neuroscience and Biobehavioral Reviews*, *47*, 578–591. https://doi.org/10.1016/j.neubiorev.2014.10.012

Međedović, J., Wertag, A., & Sokić, K. (2018). Can psychopathic traits be adaptive? Sex differences in relations between psychopathy and emotional distress. *Psihologijske Teme, 27*(3), 481–497. https://doi.org/10.31820/pt.27.3.7

Moreira, D., Moreira, D. S., Barbosa, F., Sousa-Gomes, V., & Fávero, M. (2022). Childhood traumatic experiences and psychopathy: A comprehensive review. *Psychological Trauma: Theory, Research, Practice, and Policy, 14*(8), 1281–1287. https://doi.org/10.1037/tra0001191

Moreira, D., Moreira, D. S., Oliveira, S., Ribeiro, F. N., Barbosa, F., Fávero, M., & Gomes, V. (2020). Relationship between adverse childhood experiences and psychopathy: A systematic review. *Aggression and Violent Behavior, 53*, Article 101452. https://doi.org/10.1016/j.avb.2020.101452

Moreira, D., Silva, C., Moreira, P., Pinto, T. M., Costa, R., Lamela, D., Jongenelen, I., & Pasion, R. (2024). Addressing the Complex Links between Psychopathy and Childhood Maltreatment, Emotion Regulation, and Aggression: A Network Analysis in Adults. *Behavioral Sciences*, *14*(2), 115. https://doi.org/10.3390/bs14020115

Narayan, A. J., Rivera, L. M., Bernstein, R. E., Harris, W. W., & Lieberman, A. F. (2018). Positive childhood experiences predict less psychopathology and stress in pregnant women with childhood adversity: A pilot study of the benevolent childhood experiences (BCEs) scale. *Child Abuse & Neglect*, *78*, 19–30. https://doi.org/10.1016/j.chiabu.2017.09.022

Newman, J. P., & Wallace, J. F. (1993). Psychopathy and cognition. In K. S. Dobson & P. C. Kendall (Eds.), *Psychopathology and cognition* (pp. 293–349). Academic Press.

Newman, J. P., MacCoon, D. G., Vaughn, L. J., & Sadeh, N. (2005). Validating a distinction between primary and secondary psychopathy with measures of Gray's BIS and BAS constructs. *Journal of Abnormal Psychology*, *114*(2), 319–323. https://doi.org/10.1037/0021-843X.114.2.319

Nicholls, T. L., Ogloff, J. R., Brink, J., & Spidel, A. (2005). Psychopathy in women: a review of its clinical usefulness for assessing risk for aggression and criminality. *Behavioral Sciences & the Law*, *23*(6), 779–802. https://doi.org/10.1002/bsl.678

Olteanu, L., Golani, S., Eitam, B., & Kron, A. (2019). The effect of relevance appraisal on the emotional response. *Emotion, 19*(4), 715–725. https://doi.org/10.1037/emo0000473

Patrick, C. J. (2010). Conceptualizing the psychopathic personality: Disinhibited, bold,...Or just plain mean? In R. T. Salekin & D. R. Lynam (Eds.), *Handbook of Child and Adolescent Psychopathy* (pp. 15–48). The Guilford Press.

Patrick, C. J. (Ed.). (2018). *Handbook of psychopathy* (2nd ed.). The Guilford Press.

Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience for the behavioral sciences,* (Vol. 2, pp. 1110–1131). John Wiley & Sons, Inc.. https://doi.org/10.1002/9780470478509.neubb002057

Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: startle reflex modulation. *Journal of Abnormal Psychology*, *102*(1), 82–92. https://doi.org/10.1037//0021-843x.102.1.82

Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, *21*(3), 913–938. https://doi.org/10.1017/S0954579409000492

Patrick, C.J., & Drislane, L.E. (2015), Triarchic Model of Psychopathy: Origins, Operationalizations, and Observed Linkages with Personality and General Psychopathology. *Journal of Personality, 83*, 627-643. https://doi.org/10.1111/jopy.12119

Phan, K. L., Wager, T., Taylor, S. F., & Liberzon, I. (2002). Functional neuroanatomy of emotion: a meta-analysis of emotion activation studies in PET and fMRI. *NeuroImage*, *16*(2), 331–348. https://doi.org/10.1006/nimg.2002.1087

Pieperhoff, P., Hofhansel, L., Schneider, F., Müller, J., Amunts, K., Weber-Papen, S., Weidler, C., Clemens, B., Raine, A., & Habel, U. (2025). Associations of brain structure with

psychopathy. *European Archives of Psychiatry and Clinical Neuroscience, 276*(1), 63-75. https://doi.org/10.1007/s00406-025-02028-6

Pinel, P. (1809). *Traité médico-philosophique sur l'aliénation mentale*. Richard, Caille & Ravier.

Pinheiro, M. L., Machado, A. B., Gonçalves, R. A., Caridade, S., & Cunha, O. (2025b). Exploring Attachment-Related Factors and Psychopathic Traits: A Systematic Review Focused on Women. *Behavioral Sciences, 15*(9), 1293. https://doi.org/10.3390/bs15091293

Pinheiro, M., Cunha, O., & Gonçalves, R. A. (2019). Emotions, Affections, and Psychopathy Among Female Prisoners. *International Journal of Offender Therapy and Comparative Criminology*, *64*(6-7), 708-729. https://doi.org/10.1177/0306624X19895976

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2021). Criminal lifestyle, psychopathy, and prison adjustment among female inmates. *Journal of Criminal Justice, 76,* 1–10. https://doi.org/10.1016/j.jcrimjus.2021.101849

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2022). Psychopathy and Reoffending Among Incarcerated Women. *Women & Criminal Justice*, *32*(6), 556–570. https://doi.org/10.1080/08974454.2022.2094525

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2024). Emotional processing and psychopathy among women: A systematic review. *Deviant Behavior, 45*(10), 1366–1390. https://doi.org/10.1080/01639625.2023.2295527

Pinheiro, M., Gonçalves, R. A., Caridade, S., & Cunha, O. (2023). Criminal Lifestyle Among Women Who Committed Crimes: The Role of Psychopathy. *Deviant Behavior*, *45*(8), 1202–1217. https://doi.org/10.1080/01639625.2023.2280102

Pinheiro, M., Machado, A. B., Gonçalves, R. A., & Cunha, O. (2025a). The Moderating Role of Positive Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Psychopathic Traits in Incarcerated Women. *Journal of Aggression, Maltreatment & Trauma*, *34*(9), 1468–1488. https://doi.org/10.1080/10926771.2025.2562542

Pollak, S. D. (2024). Continuing the momentum of developmental psychopathology: Lessons learned from the seminal contributions of Dante Cicchetti. *Development and Psychopathology*, *36*(5), 2051–2055. doi:10.1017/S0954579424001755

Reidy, D. E., Zeichner, A., & Foster, J. D. (2009). Psychopathy, aggression, and emotion processing of violent imagery in women. *Journal of Research in Personality, 43*(5), 928–932. https://doi.org/10.1016/j.jrp.2009.06.004

Ross, S.R., Lutz, C.J. & Bailley, S.E. (2004). Psychopathy and the Five Factor Model in a Noninstitutionalized Sample: A Domain and Facet Level Analysis. *Journal of Psychopathology and Behavioral Assessment*, *26*, 213–223. https://doi.org/10.1023/B:JOBA.0000045337.48535.a5

Salehinejad, M. A., Ghanavati, E., Rashid, M. H. A., & Nitsche, M. A. (2021). Hot and cold executive functions in the brain: A prefrontal-cingular network. *Brain and Neuroscience Advances*, *5*, Article 23982128211007769. https://doi.org/10.1177/23982128211007769

Salisbury, E. J., & Van Voorhis, P. (2009). Gendered Pathways: A Quantitative Investigation of Women Probationers' Paths to Incarceration: *Criminal Justice and Behavior*, *36*(6), 541-566. https://doi.org/10.1177/0093854809334076

Saltoğlu, S., & Uysal Irak, D. (2022). Primary versus secondary psychopathy: Coping styles as a mediator between psychopathy and well-being. *Current Psychology, 41*(9), 6534–6542. https://doi.org/10.1007/s12144-020-01155-8

Sameroff, A. (Ed.). (2009). *The transactional model of development: How children and contexts shape each other.* American Psychological Association. https://doi.org/10.1037/11877-000

Saß, H., & Felthous, A. R. (2020). History and conceptual development of psychopathic disorders. In A. R. Felthous & H. Saß (Eds.), *The Wiley international handbook on psychopathic disorders and the law*. John Wiley & Sons. https://doi.org/10.1002/9781119159322.ch1

Scherer, K. R., & Moors, A. (2019). The Emotion Process: Event Appraisal and Component Differentiation. *Annual Review of Psychology*, *70*, 719–745. https://doi.org/10.1146/annurev-psych-122216-011854

Seara-Cardoso, A., & Viding, E. (2015). Functional Neuroscience of Psychopathic Personality in Adults. *Journal of Personality*, *83*(6), 723–737. https://doi.org/10.1111/jopy.12113

Seara-Cardoso, A., Dolberg, H., Neumann, C., Roiser, J. P., & Viding, E. (2013). Empathy, morality and psychopathic traits in women. *Personality and Individual Differences, 55*(3), 328–333. https://doi.org/10.1016/j.paid.2013.03.011

Seeley, W. W., Menon, V., Schatzberg, A. F., Keller, J., Glover, G. H., Kenna, H., Reiss, A. L., & Greicius, M. D. (2007). Dissociable intrinsic connectivity networks for salience processing and executive control. *The Journal of Neuroscience, 27*(9), 2349–2356. https://doi.org/10.1523/JNEUROSCI.5587-06.2007

Sevecke, K., Franke, S., Kosson, D., & Krischer, M. (2016). Emotional dysregulation and trauma predicting psychopathy dimensions in female and male juvenile offenders. *Child and Adolescent Psychiatry and Mental Health, 10*, 43. https://doi.org/10.1186/s13034-016-0130-7

Shamay-Tsoory S. G. (2011). The neural bases for empathy. *The Neuroscientist, 17*(1), 18–24. https://doi.org/10.1177/1073858410379268

Shuman, V., Sander, D., & Scherer, K. R. (2013). Levels of valence. *Frontiers in Psychology*, *4*, Article 261. https://doi.org/10.3389/fpsyg.2013.00261

Skeem, J. L., Mulvey, E. P., Appelbaum, P., Banks, S., Grisso, T., Silver, E., & Robbins, P. C. (2004). Identifying subtypes of civil psychiatry patients at high risk for violence. *Criminal Justice and Behavior, 31*(4), 392–437. https://doi.org/10.1177/0093854803262585

Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: bridging the gap between scientific evidence and public policy. *Psychological Science in the Public Interest*, *12*(3), 95-162. https://doi.org/10.1177/1529100611426706

Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, *116*(2), 395–409. https://doi.org/10.1037/0021-843X.116.2.395

Soeiro, C., & Gonçalves, R. A. (2010). The state of the art of the concept of psychopathy [O estado de arte do conceito de psicopatia]. *Análise Psicológica*, 28(1), 227–240.

Sousa, M., Machado, A. B., Pinheiro, M., Pereira, B., Caridade, S., Almeida, T. C., Cruz, A. R., & Cunha, O. (2025). The Impact of Positive Childhood Experiences: A Systematic Review Focused on Children and Adolescents. *Trauma, Violence & Abuse*, *0*(0) 1-15. https://doi.org/10.1177/15248380251320978

Sroufe L. A. (2009). The Concept of Development in Developmental Psychopathology. *Child Development Perspectives*, *3*(3), 178–183. https://doi.org/10.1111/j.1750-8606.2009.00103.x

Steiner, B., & Wooldredge, J. (2009). Individual and Environmental Effects on Assaults and Nonviolent Rule Breaking by Women in Prison. *Journal of Research in Crime and Delinquency*, *46*(4), 437-467. https://doi.org/10.1177/0022427809341936

Steiner, B., Ellison, J. M., Butler, H. D., & Cain, C. M. (2017). The Impact of Inmate and Prison Characteristics on Prisoner Victimization. *Trauma, Violence & Abuse*, *18*(1), 17–36. https://doi.org/10.1177/1524838015588503

Sukmasari, D. S., & Soetikno, N. (2024). Emotion regulation and forgiveness among female inmates. *Philanthropy: Journal of Psychology, 8*(2), 211–229. https://doi.org/10.26623/philanthropy.v8i2.10899

Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among women with psychopathy during picture perception. *Journal of Abnormal Psychology*, *111*(4), 610–619. https://doi.org/10.1037//0021-843x.111.4.610

Thomson, N. D. (2019). *Understanding psychopathy: The biopsychosocial perspective*. Routledge. https://doi.org/10.4324/9780203703304

Thomson, N. D., Moeller, F. G., Amstadter, A. B., Svikis, D., Perera, R. A., & Bjork, J. M. (2020). The impact of parental incarceration on psychopathy, crime, and prison violence in women. *International Journal of Offender Therapy and Comparative Criminology*, *64*(10-11), 1178–1194. https://doi.org/10.1177/0306624X20904695

Thomson, N. D., Towl, G. J., & Centifanti, L. C. M. (2016). The habitual female offender inside: How psychopathic traits predict chronic prison violence. *Law and Human Behavior, 40*(3), 257–269. https://doi.org/10.1037/lhb0000178

Trammell, R. (2009). Relational Violence in Women's Prison: How Women Describe Interpersonal Violence and Gender. *Women & Criminal Justice*, *19*(4), 267–285. https://doi.org/10.1080/08974450903224246

Van Doorn, G., Dye, J., & Teese, R. (2025). Adverse and positive childhood experiences and their associations with dark personality traits. *Journal of Research in Personality, 115*. https://doi.org/10.1016/j.jrp.2025.104583

van Ginneken, E. F. J. C., Palmen, H., Bosma, A. Q., & Sentse, M. (2019). Bearing the Weight of Imprisonment: The Relationship Between Prison Climate and Well-Being. *Criminal Justice and Behavior*, *46*(10), 1385-1404. https://doi.org/10.1177/0093854819867373

Van Voorhis, P., Wright, E. M., Salisbury, E., & Bauman, A. (2010). Women's Risk Factors and Their Contributions to Existing Risk/Needs Assessment: The Current Status of a Gender-Responsive Supplement. *Criminal Justice and Behavior*, *37*(3), 261-288. https://doi.org/10.1177/0093854809357442

Verona, E., & Vitale, J. (2006). Psychopathy in Women: Assessment, Manifestations, and Etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 415–436). The Guilford Press.

Verona, E., & Vitale, J. (2018). Psychopathy in women: Assessment, manifestations, and etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 509–528). The Guilford Press.

Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidality in female offenders: mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology*, *73*(6), 1065–1073. https://doi.org/10.1037/0022-006X.73.6.1065

Wakai, S., Sampl, S., Hilton, L., & Ligon, B. (2014). Women in Prison: Self-Injurious Behavior, Risk Factors, Psychological Function, and Gender-Specific Interventions. *The Prison Journal*, *94*(3), 347-364. https://doi.org/10.1177/0032885514537602

Walters, G. D., Wilson, N. J., & Glover, A. J. J. (2011). Predicting recidivism with the Psychopathy Checklist: Are factor score composites really necessary? *Psychological Assessment, 23*(2), 552–557. https://doi.org/10.1037/a0022483

Wooldredge, J., & Steiner, B. (2016). Further inspection into the effects of correctional officers' sex, race, and perceptions of safety on job-related attitudes. *The Prison Journal, 96*(4), 576–599. https://doi.org/10.1177/0032885516650882

World Health Organization. (2022). *ICD-11: International Statistical Classification of Diseases for Mortality and Morbidity Statistics* (11th revision). https://icd.who.int/browse/2025-01/mms/en#941859884%2Funspecified

World Medical Association (2025). World Medical Association Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Participants. *JAMA*, *333*(1), 71–74. https://doi.org/10.1001/jama.2024.21972

World Prison Brief. (n.d.). World Prison Brief Portugal. Retrieved 20 December 2025, from https://www.prisonstudies.org/country/portugal

Wright, E. M. (2008). The Measurement of Psychopathy: Dimensional and Taxometric Approaches. *International Journal of Offender Therapy and Comparative Criminology*, *53*(4), 464-481. https://doi.org/10.1177/0306624X08319416

Wright, E. M., & Cain, C. M. (2018). Women in prison. In J. Wooldredge & P. Smith (Eds.), *The Oxford handbook of prisons and imprisonment* (pp. 163–188). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199948154.013.9

Wright, E. M., Salisbury, E. J., & Van Voorhis, P. (2007). Predicting the Prison Misconducts of Women Offenders: The Importance of Gender-Responsive Needs. *Journal of Contemporary Criminal Justice*, *23*(4), 310-340. https://doi.org/10.1177/1043986207309595

Wright, E. M., Van Voorhis, P., Salisbury, E. J., & Bauman, A. (2012). Gender-responsive lessons learned and policy implications for women in prison: A review. *Criminal Justice and Behavior, 39*(12), 1612–1632. https://doi.org/10.1177/0093854812451088

Yoder, K. J., Harenski, C., Kiehl, K. A., & Decety, J. (2021). Neural responses to morally laden interactions in female inmates with psychopathy. *NeuroImage. Clinical*, *30*, 102645. https://doi.org/10.1016/j.nicl.2021.102645

PART II | EMPIRICAL STUDIES

CHAPTER I | CHARACTERIZATION OF EMOTIONAL PROCESSING IN WOMEN WITH PSYCHOPATHIC TRAITS

STUDY 1 | EMOTIONAL PROCESSING AND PSYCHOPATHY AMONG WOMEN: A SYSTEMATIC REVIEW

This article was published in *Deviant Behavior*. Additionally, the findings of this empirical study were presented as an oral communication at the 23rd Annual Conference of the European Society of Criminology – "The Renaissance of European Criminology" (Florence, Italy) and at the IV International CINEICC Congress (Coimbra, Portugal), as well as in poster format at the XI Ibero-American Congress of Psychological Assessment – "Psychological Assessment: Models, Methodologies, and Applications" (Faro, Portugal).

References:

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2023). Emotional Processing and Psychopathy Among Women: A Systematic Review. *Deviant Behavior, 45*(10), 1366–1390. https://doi.org/10.1080/01639625.2023.2295527

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2023, September 6 – 9). *Emotion processing and psychopathy among women: A systematic review*. 23rd Annual Conference of the European Society of Criminology – The Renaissance of European Criminology [Paper presentation]. Florence, Italy.

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2023, March 23 –April 1). *Emotion processing and psychopathy among female offenders: A systematic review*. IV International CINEICC Congress – Innovations in Basic and Applied Psychology [Paper presentation]. Coimbra, Portugal.

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2023, May 4 – 5). *Emotional processing in women with psychopathic traits: A systematic review* [Poster presentation]. XI Ibero-American Congress of Psychological Assessment – Psychological Assessment: Models, Methodologies and Applications. Faro, Portugal.

Abstract

Psychopathy in women has gained the attention of the scientific community, but research on the emotional processing in individuals with psychopathic traits and its role in criminal behavior is still scarce. The present systematic review aims to aggregate existing literature that analyzes emotional processing in women with psychopathy traits. The search terms, conducted in six databases, identified 13 relevant studies, meeting the following criteria: women, 18 years or older, prison or community contexts, and written in English, Spanish, or Portuguese. Studies pointed to a compromise in the understanding, management, and categorization of emotions, especially those with negative valence, and the presence of alexithymia in women with higher scores of psychopathic traits. Some studies revealed that women with psychopathy had reduced limbic activation, cortical deficits in emotional processing, and an absence of aversive startle response when exposed to aversive stimuli. Significant relationships between psychopathic traits, heart rate, and skin conductance response were documented. Additionally, the interpersonal-affective facet of psychopathy was linked to emotion management difficulties, while the antisocial-impulsive dimension seems linked to alexithymia and deficits in the processing of negatively valenced emotions. These findings carry practical implications for interventions with psychopathic women.

Keywords: Emotional Processing; Prison and Community; Psychopathy; Women

Emotional Processing and Psychopathy Among Women: A Systematic Review

Introduction

A more profound understanding of emotional deficits in psychopathy and the underlying psychological and neural mechanisms constitutes a gap in the empirical literature, particularly in the case of women (Hare, 2003; Verona et al., 2013). Empirical findings indicated that individuals with psychopathic traits exhibit significant anomalies in the processing of emotions; however, doubts persist regarding whether affective deficits are comprehensive across the emotional spectrum and in all situations or whether they are specific to certain situations (Brook et al., 2013). Psychopathy is recognized for encompassing a set of clinical characteristics, including poor emotional response, superficial interpersonal relationships, and impulsive/aggressive behavior (Hare, 2003). It is posited that at the core of psychopathy lies an inability to feel or experience emotions in the same way as individuals without the condition (e.g., Van Dongen, 2020).

From a broader emotional deficit perspective, psychopaths are characterized by a diminished ability to experience emotions in general, impeding the understanding of meaning, along with a reduced manifestation of fear responsiveness to aversive events (Patrick, 2007). Some authors argue that the main affective and interpersonal characteristics of psychopathy are linked to specific emotional deficits (Brook et al., 2013). Furthermore, lifestyle and antisocial dimension scores correlate with other indices of externalizing psychopathology (Patrick et al., 2005).

Psychopathic Traits Among Women

Most research on psychopathy has predominantly focused on men, yielding limited results regarding its manifestations in women (Pinheiro et al., 2019; Pinheiro et al., 2021). Nevertheless, the literature has documented a low prevalence of psychopathy in women compared to men (De Brito et al., 2021). This disparity may be attributed to gender differences influenced by physical, cultural, socioeconomic, political, and legal factors (Guay et al., 2018), methodological and assessment constraints (Haneveld et al., 2022), and inconsistencies in the conceptualization of psychopathy (e.g., Sellbom & Drislane, 2021).

Indeed, the conceptualization and nature of psychopathy have sparked debate among several researchers, involving discussions regarding its dimensional or taxonomic nature (Sellbom & Drislane, 2021) and the materialization of the study of psychopathy (Edens et al., 2006). The uncertainty surrounding the quantification of psychopathy has captured the attention of scholars, with some advocating for the establishment of a cut-off point of 30 points (Hare, 2003). This cut-off points suggest

abnormalities at the extremes of a scale, with this cut-off point. Notably, this dimensional perspective has been extensively studied in more specific situations, particularly in women, where a lower cutoff point is advocated (Cooke, 1995). Based on this dimensional nature, numerous researchers classify individuals as "psychopaths" or "non-psychopaths" depending on higher scores on the PCL-R (Hare, 2003). These cut-off scores are frequently employed in assessing dangerousness and informing jurisprudential decision-making (Sellbom & Drislane, 2021). On the other hand, in contrast to the dimensional approach that focuses on the characteristics of psychopathy, the taxometric perspective assumes an assessment of psychopathy centered on past and observable antisocial behavior. It understands the limitations generated by psychopathy as separate and distinct classes, essentially categorizing psychopathy is a taxon (Wright, 2009). There is a growing body of evidence indicating that taxometric analysis is valuable in measuring personality disorders and psychopathy (Edens et al., 2006; Marcus et al., 2004), providing support for a taxon underlying psychopathy. Despite this ongoing debate, it is important to emphasize that health professionals utilize the concept of psychopathy both as a dimension and as a taxon (Gacono, 2000).

Psychopathy has been largely defined as a multifaceted construct, consisting of four main facets (Interpersonal, Affective, Lifestyle, and Antisocial; Neumann et al., 2007), derived from a psychopathy assessment measure (PCL-R). Within this conceptualization, psychopathy appears to be associated with future crime and violence for women and men (Patrick, 2018). Recent studies reported that the antisocial and affective facets appear to predict future violence in prison and previous violent crimes in female offenders (Thomson, 2020) and are associated with object-directed aggression in young women, while the lifestyle facet is associated with reactive aggression (Thomson et al., 2019). However, the results regarding the predictive validity of the PCL-R for recidivism in women are divergent. Studies suggested that Factor 1 (interpersonal-affective) was more predictive of violence in hospitalized female offenders during a pre-treatment phase, but Factor 2 (lifestyle-antisocial) was most predictive during an “on-program” phase (Richards et al., 2003). Other studies found that Facet 4 (antisocial facet) was predictive of subsequent violent and nonviolent recidivism, but much more so for men than for women (Hemphälä & Hodgins, 2014). Furthermore, some authors argue that women with psychopathic traits tend to display less criminal and physically violent behavior compared to men but are more likely to engage in manipulative behavior and verbal violence (Pinheiro et al., 2019), representing highly destructive behavioral manifestations for others (Pinheiro et al., 2019). Other studies found that, in comparison to their male counterparts, women exhibit similar degrees of instrumental and manipulative behavior, insensitivity, antisocial behavior, and criminal activity (Cunliffe et al., 2016).

Psychopathy has also been categorized into two distinct groups: primary and secondary psychopathy (Karpman, 1941). Primary psychopathy has been conceptualized as resulting from an affective deficit related to a lack of consciousness and an impaired ability to develop normative attachment, as well as an absence of neurotic feelings of guilt or anxiety. That said, primary psychopaths are motivated by pathological narcissism that fuels the parasitic exploitation of others. On the other hand, secondary psychopathy was understood as an affective disorder due to neurotic conflicts, normally attributed to difficulties in childhood relationships, or, in extreme cases, child abuse. Studies suggested that primary psychopathy is more prevalent in men than in women (Falkenbach et al., 2017). However, women are more prone to secondary psychopathy (Moffett et al., 2020), exhibiting violent and deviant behavior (e.g., in prison against staff and other inmates) and non-compliance with rules (Hicks et al., 2010). They also experience more mental health problems (e.g., PTSD), substance abuse, a history of suicide attempts, forming a subgroup that, in a prison context, requires greater health care (Hicks et al., 2010).

Psychopathy and Emotional Processing Among Women

Emotional processing encompasses a complex interplay of affective, behavioral, and cognitive mechanisms that underlie our emotions (Kret & Ploegera, 2015). The ability to recognize and regulate emotions is a crucial aspect of mental health, as a lack thereof can negatively impact subjective, physiological, and behavioral components (Kret & Ploegera, 2015). Achieving emotional regulation necessitates the utilization of various strategies to ensure interpersonal functioning and overall well-being (Gross & John, 2003). However, emotions also play a central role in mental disorders, with connections to factors such as emotional intensity, duration, frequency, type, awareness, regulation goals, and strategies (Gross & Jazaieri, 2014).

For this study, it is pertinent to focus on two main gaps in emotional processing: emotional perception - referring to attention to emotional signals from the environment, precise recognition of emotion, and appropriate responses - and emotional regulation - involving the management and control of one's emotions (Kret & Ploegera, 2015).

In the absence of direct observation of a person experiencing an emotion, humans rely on cues such as facial expressions and body posture (De Gelder et al., 2010; Ekman & Cordaro, 2011). The underlying mechanism of emotional perception involves specific neural network areas, including the superior temporal sulcus and the amygdala (Haxby et al., 2000), coordinating emotional responses synchronized with environmental stimuli (i.e., anterior cingulate cortex, medial prefrontal cortex region; Patterson et al., 2002). The amygdala plays a fundamental role in recognizing emotional expressions and

interacts with higher brain areas involved in inhibition and social decision-making (Pessoa & Adolphs, 2010). In terms of emotional regulation, the execution of positive and negative emotional regulation may engage distinct subsets of fronto-cortical structures (Kohn et al., 2014). The dorsolateral prefrontal cortex is associated with the regulation of cognitive processes (i.e., attention), the ventrolateral prefrontal cortex may signal the need for regulation, and the anterior middle cingulate cortex is in an ideal position, anatomically and functionally, to influence behavior and subcortical structures related to the display of affect (Kohn et al., 2014).

These brain regions are typically activated in healthy individuals. However, in cases of deficits in emotional processing, we encounter impairment in these brain areas and dysregulated emotional processes (Leweke et al., 2012). Individuals experiencing these difficulties may struggle with identifying and describing their own emotions and those of others, a condition known as alexithymia. Alexithymia is commonly observed in psychiatric disorders, such as autism, depression, anxiety disorders (Leweke et al., 2012).

In personality disorder, dysfunction in emotional awareness, social attachment, empathy, and interpersonal relationships (Bird & Viding, 2014) are linked to variations in anterior cingulate and mediofrontal activity during the processing of emotional stimuli (Berthoz et al., 2002). This leads to interpersonal problems as emotionally close relationships are avoided. Individuals with psychopathy disorder are recognized for their inability to anticipate negative consequences of their actions, resulting in an insufficient capacity to develop anticipatory fear (Hare, 1978) and a defective modulation of associative links between external stimuli and internal reactions (Patrick et al., 1994). Moreover, studies conducted with male samples have indicated that individuals with psychopathy disorder exhibit increased cortical (i.e., dorsolateral prefrontal cortex) and subcortical activation (i.e., amygdala) during differential classical conditioning compared to non-psychopaths in response to conditioned emotions (Schneider et al., 2000).

Thus, emotional processing deficits can be explained by the response modulation hypothesis, where individuals with psychopathic traits are particularly inattentive to other environmental cues, including the shadow, as they are focused on a goal, such as obtaining a reward. The expanded model, which encompasses the motivational component, suggests that the drive for reward becomes so dominant that individuals with psychopathy ignore other signals, including protective signals, which may suggest that a change in behavior is justified (Newman et al., 1997). The model postulates that psychopathic individuals show deficits in disadvantage learning only when faced with competing reward contingencies or other dominant response sets (Newman et al., 1997).

However, studies posit the hypothesis that women with psychopathic traits may not exhibit the same emotional processing deficits as men (Sutton et al., 2002). Nonetheless, there is still limited empirical evidence supporting these conclusions (e.g., Pinheiro et al., 2019), leading to questions about whether different manifestations or dimensions of psychopathy are (or not) associated with deficits in processing emotions (Snowden et al., 2022). The literature reveals that emotional deficits in psychopathic women appear more pronounced in traits of primary psychopathy and are limited to specific emotions (e.g., sadness, disgust, and shame; Prado et al., 2015). On the other hand, the categorization of neutral expressions has been negatively associated with secondary psychopathy (Ali et al., 2009), with these emotional recognition deficits emerging in connection with the antisocial-impulsive factor (Brook et al., 2013). However, a valid indicator of affective dysfunction in women with psychopathy seems to be the decreased startle modulation, evidenced by failures in the blinking response during unpleasant images (Sutton et al., 2002); decreased potentiation of startle to unpleasant images compared to neutral images (Anderson et al., 2011); and deficits in defensive reactivity, particularly associated with PCL-R Factor 1 (affective-interpersonal), when viewing images of victims compared to direct threat imagery among women (Verona et al., 2013). These results lead authors to hypothesize a specific deficit in response to others' distress rather than a general deficit in fear reactivity (Verona et al., 2013). Furthermore, women with psychopathic traits appear to be more capable of attending to emotional information than men (Anton et al., 2012) by focusing on goal-relevant stimuli (Vitale et al., 2007).

Research on psychopathy, particularly regarding emotional processing in individuals with psychopathic traits, has predominantly concentrated on men. Only in recent years has there been a growing interest in studying women with psychopathic traits (Verona et al., 2013; Pinheiro et al., 2019). Notably, no systematic review has explored emotional processing in female psychopaths, underscoring the novelty and value of this study in consolidating existing knowledge on the subject.

Methods

The present systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009).

Eligibility Criteria

Only studies employing empirical methodology and adhering to the PICOS strategy (Participants, Intervention/Exposure, Comparison, Outcome, and Study Design) were considered for inclusion in this systematic review. The PICOS structure facilitates the systematic development of article research, ensuring a broader scope of investigation, well-defined components of search terms, and the quality of

the bias-free systematic review (Pollock & Berge, 2018). It aids in determining the transparency of results and conclusions, contributing to the synthesis of research evidence.

Thus, studies that directly investigated an aspect (behavioral, neuroimaging) of emotional processing, utilizing either a forensic or a community sample of women aged 18 and above, and where psychopathy scores were assessed using a standardized tool, were included. Studies with mixed samples (men and women) were also considered, provided that data analysis was conducted separately for men and women.

The following criteria were employed to assess the eligibility of studies for inclusion: (i) female participants; (ii) adult participants aged 18 or older; (iii) samples from the community or prison; (iv) examination of the influence of psychopathy on emotional processing; and (v) published articles in English, Spanish, or Portuguese.

Search Strategies

Initially, different keywords and their combinations were defined to create the following search equation: (psychopathy OR "psychopath* traits") AND (women OR female) AND (offend* OR prison* OR incarcerat* OR criminal OR inmate) AND ("emotion* processing" OR "emotion* expression" OR "emotion* deficit" OR affection* OR emotion*). This set of keywords was employed to conduct the search across various electronic databases, including B-on, ESBCO, PubMed, SAGE Publishing, SCOPUS, and Web of Science Collection. We limited our search to titles and abstracts, encompassing English, Portuguese, and Spanish manuscripts.

The search was carried out until May 2022, including all studies published up to that date. Studies with cross-sectional or longitudinal assessments of emotional processing and psychopathic traits in women, as well as experimental and quantitative studies, were considered for inclusion. This systematic review excluded studies from gray literature sources, such as reviews, conference papers, academic papers, or thesis and/or dissertations. The review protocol was registered at OSF (https://doi.org/10.17605/OSF.IO/PH3UM).

Data Extraction

The references obtained from databases were uploaded to Rayyan, and duplicate articles were removed. Titles and abstracts were reviewed to determine if the articles met the inclusion criteria. Articles meeting the inclusion criteria were retrieved and thoroughly read to make a final decision. Two independent researchers conducted the evaluation of the articles based on the established eligibility criteria. Disagreements were resolved through discussion, and any remaining discrepancies were

addressed by a third researcher, as outlined in the protocol of this systematic review. Figure 1 presents the PRISMA flow diagram, illustrating the number of studies included in each phase of the selection process and the reasons for inclusion/exclusion.

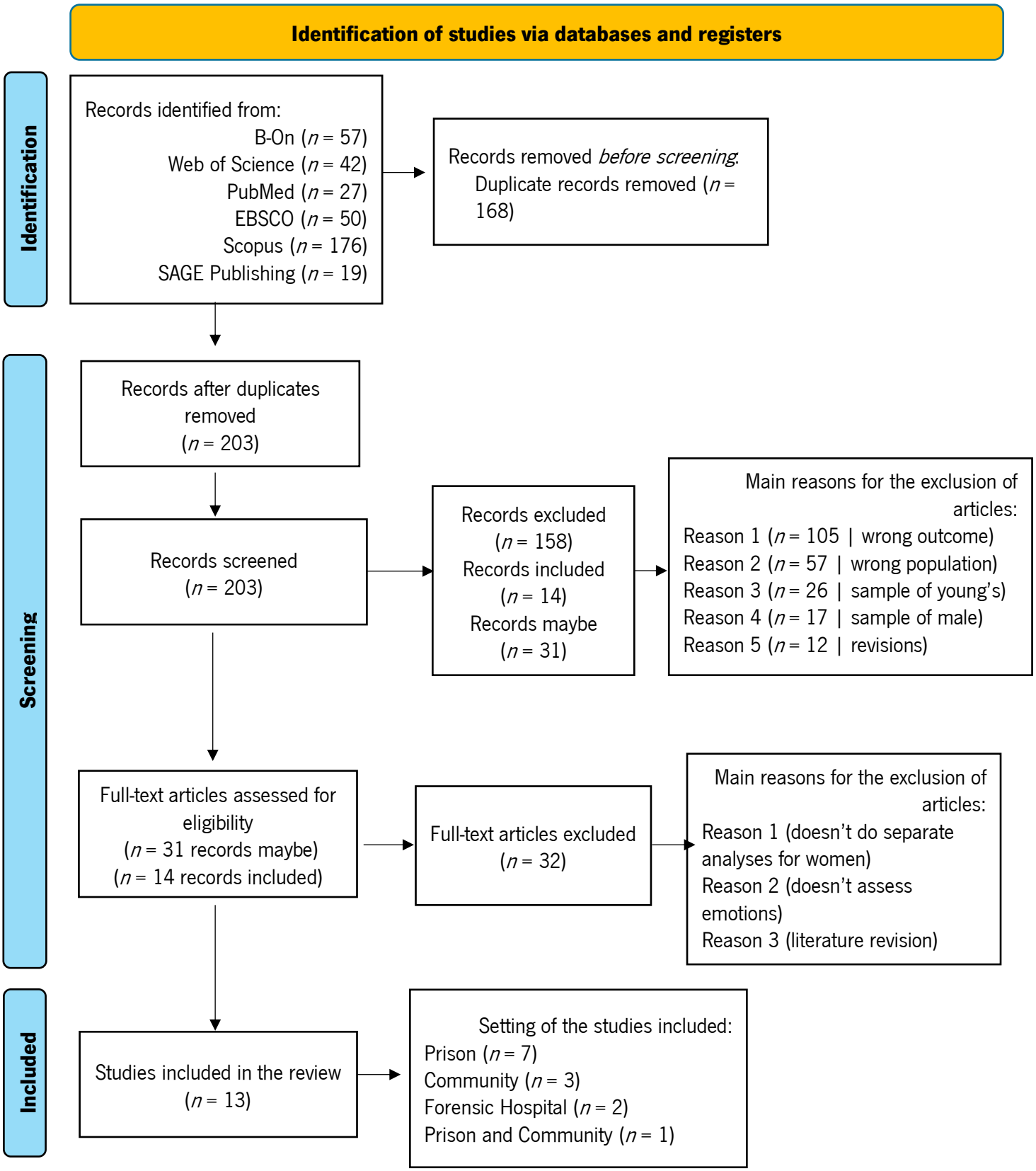
Coding Procedures

A codebook was developed to extract data from all the included manuscripts, focusing on key characteristics such as reference information (e.g., authors, year, country); studies characteristics (e.g., setting, type of crime); samples characteristics (e.g., sex, size, ethnicity/race); design (e.g., study design type); measurement characteristics (e.g., assessment measures of emotional processing and psychopathy); and main outcomes.

All articles were independently coded by the first and the last authors. Any disagreements between the raters were resolved through consensus.

Figure 1

Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Flow diagram of the study selection process



Methodological Quality Analysis

In conducting this study and to mitigate threats to the validity of the included studies, we employed the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018) to assess methodological quality. The MMAT serves as a checklist for concurrently appraising and/or describing studies included in systematic mixed studies reviews (reviews including original qualitative, quantitative and mixed methods studies. This tool proved essential in minimizing bias in evidence synthesis. The MMAT initiates with two screening questions, followed by five evaluation criteria for various types of study designs. Each criterion is categorized as “Yes”, “No” or “can't tell”, allowing for a quality score ranging from 1 to 5. Two investigators independently assessed the methodological quality of the studies.

Results

The results are presented in two separate tables. Table 1 provides a description of the characteristics of the studies included in this review, while Table 2 contains the main results of the studies.

Table 1

Study Design and Characteristics of the Sample

Study	Design type	Location and setting	Crime	Sample characteristics		
				Sex	Size	Ethnicity/Race
Burley et al. (2017)	Non-randomized study	England; Community	N/A	Men and women	Total = 102 (52 women)	N/A
Edwards et al. (2019)	Descriptive	USA; Prison	N/A	Men and women	Total= 573 (228 women)	53.8% Hispanic, 30.9% Caucasian, 8.9% African American, 5.8% Native American
Eisenbarth et al. (2008)	Non-randomized study	Italy; Forensic Hospital	Physical assault or homicide	Women	Total = 44 (18 forensic inpatients; 16 healthy participants)	N/A
Eisenbarth et al. (2013)	Non-randomized study	Italy; Forensic Hospital	Murder, attempted murder, robbery, physical injury	Women	23	N/A
Harenski et al. (2014)	Non-randomized study	USA; Prison and Community	N/A	Women	Prison = 157; community = 46	N/A

Justus & Finn, 2007	Non-randomized study	USA; Community	N/A	Men and women	Total = 99 (51 women)	N/A
Lamoureux & Glenn (2021)	Descriptive	USA; Prison	N/A	Men and women	Total= 64 (30 women)	50% African American, 40.6% Caucasian, 4.7% Hispanic or Latino, 1.6% Native American
Louth et al. (1998)	Descriptive	Canada; Prison	N/A	Women	37	76.5% Caucasian, and 13.5% Canadian Aboriginals
Pinheiro et al. (2019)	Descriptive	Portugal; Prison	Crimes against people, property, life in society, against the governme nt, related to drug dealing	Women	63	Caucasian
Rilling et al., 2007	Non-randomized study	USA; Community	N/A	Men and women	Total = 30 (15 women)	N/A
Verona et al. (2013)	Non-randomized study	USA; Prison	N/A	Women	48	50.0% African American, 39.6% Caucasian, and 10.4% Hispanic.
Vitale et al. (2011)	Non-randomized study	USA; Prison	N/A	Women	Study 1 = 111	White
Yoder et al. (2021)	Non-randomized study	USA; Prison	N/A	Women	107	N/A

Table 2

Summary of the Studies' Objectives, Measures, and Results and Qualitative Assessment.

Study	Variable(s) | Objective(s) Study	Measures		Main Outcomes	QA
		Emotional Processing	Psychopathy		
Burley et al. (2017)	To explore whether psychopathic traits were associated with autonomic hyporesponsivity to emotionally arousing cues using pupillometry	Affective images from International Affective Picture System (IAPS); Static facial expressions from the Radboud Faces Database; Dynamic facial expressions from the Amsterdam Dynamic Facial Expression Set; Affective sound-clips from the International Affective Digitalised Sounds - eye tracker recorded pupil (pupil diameter).	Triarchic Psychopathy Measure (Tri-PM)	Interpersonal/affective psychopathic traits were unrelated to emotional responses to images, static facial expressions, dynamic facial expressions, and sound clips as measured by changes in pupil diameter	4
Edwards et al. (2019)	To examine Emotional Intelligence (EI) and the extent to which men and women differ in EI; test relations between psychopathic traits and EI; test differential relationships between EI and psychopathic traits across gender	Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)	Hare's Psychopathy Checklist-Revised (PCL-R)	Women scored higher than men in EI. Affective psychopathic traits (e.g., callousness) yielded a small relationship with difficulties in managing emotion in women. Few gender differences in relationships between psychopathy and EI were found.	3
Eisenbarth et al. (2008)	To examine the differences in categorization and evaluation of emotional facial expressions between psychopathic and non-psychopathic women and the control group.	Pictures of six women and six men from the Karolinska Directed Emotional Faces set (KDEF) depicting anxious, angry, disgusted, happy, neutral, sad, and surprising expressions	Hare's Psychopathy Checklist-Revised (PCL-R)	Psychopathic patients performed worst with briefly presented sad expressions. Their dimensional evaluation resulted in less positive ratings for happy expressions and less arousal for angry expressions compared with the responses of non-psychopathic and normal subjects	4

Eisenbarth et al. (2013)	To investigate psychophysiological correlates of face processing using both time domain and time-frequency domain analytic approaches in order to assess these processes and their relationship with psychopathic traits	Two tasks were presented: 1) a picture-viewing paradigm involving positive, negative, and neutral pictures from the International Affective Pictures System; 2) mood induction followed by the presentation of IAPS pictures, different from the pictures of the first task; EEG activity	Hare's Psychopathy Checklist-Revised (PCL-R)	No differences exist between groups in N170, P3, and late positive potential components. However, there is a significant difference in N2 for angry and fear facial expressions, with high psychopathic participants showing lower reactivity. The N2 effect was related to PCL-R Factor 2 but not Factor 1. In time-frequency analysis, theta activity underlying N2 best reflected these differences.	4
Harenski et al. (2014)	To investigate whether psychopathy in women is associated with reduced limbic and paralimbic activation when processing emotional stimuli and making moral judgments	Three picture sets (25 moral, 25 non-moral, 25 neutral) from the International Affective Picture System and media sources; fMRI scanning (to collect brain images).	Hare's Psychopathy Checklist-Revised (PCL-R)	Negative correlations between PCL-R scores and activation in the right amygdala and rostral anterior cingulate. Negative correlations between PCL-R scores and activation in the right temporoparietal junction. Psychopathy in women, as in men, is characterized by reduced limbic activation during emotion processing. Reduced temporoparietal activation to moral transgressions is less observed in psychopathic men	4
Justus & Finn, 2007	To investigate the relationship between gender, self-reported levels of psychopathy, and individual personality characteristics in modulating the affective startle response	36 color photographs (12 pleasant, 12 neutral, and 12 unpleasant) from the International Affective Picture System (IAPS); Eye blink electromyogram (EMG) activity.	Psychopathic Personality Inventory (PPI)	Women showed normal responses across probe times and levels of psychopathy. Women reporting elevated levels of psychopathy did not differ from men in a number of psychopathic or related characteristics, yet they failed to show the same	4

				deficits in modulation of the startle response	
Lamoureux & Glenn (2021)	To clarify the relationship between fear and psychopathy in men and women	Discrete Emotions Questionnaire (DEQ); Images (while measuring heart rate and skin conductance); Frequency and Intensity of Emotions Questionnaire; Interceptive ability; Multidimensional Assessment of Interceptive Awareness; Toronto Alexithymia Scale (TAS)	PCL:SV (screening Version)	No significant relationships were found between total psychopathy and measures for the conscious experience of fear and automatic threat response. Gender was not a significant moderator in any of the relationships.	3
Louth et al. (1998)	To investigate the prevalence and comorbidity of psychopathy and alexithymia, and the association of these constructs with the use of affective language and with a history of violence	Toronto Alexithymia Scale (TAS); Participants are asked to describe their feelings about an emotionally charged event	Hare's Psychopathy Checklist-Revised (PCL-R)	The correlation between PCL-R and TAS total scores was not significant, but the socially deviant, impulsive factor of the PCL-R was significantly correlated with the TAS items that reflect an inability to discriminate feelings and bodily sensations. Alexithymia, but not psychopathy, was negatively related to measures of affective speech content.	3
Pinheiro et al. (2019)	To analyze the correlation between emotions and affections and psychopathy; analyze the correlation between emotions, affections, and primary and secondary psychopathy	Positive and Negative Affect Schedule (PANAS)	Levenson's Self-Report Psychopathy Scale (LSRP); Hare's Psychopathy Checklist-Revised (PCL-R)	Nine women presented moderate psychopathy. Women with higher psychopathy scores revealed deficits in positive emotional abilities, and secondary psychopathy was related to negative affect	2

Rilling et al. (2007)	To examine neural correlates of emotions experienced during social interactions by scanning subjects as they were engaged in an interaction with nonscanned social partners outside the scanner in the context of an iterated Prisoner's Dilemma (PD) game	Participants play 20 rounds of an iterated PD game with each of the two partners; subjects rated their emotional reaction (e.g., afraid, envious, angry, sad, happy, ashamed, irritated, contemptuous, jealous, guilty, camaraderie, trust, betrayed, indignant, disappointed, and relieved) to the four PD game outcomes on a seven-point Likert scale; fMRI scanning	Psychopathic Personality Inventory (PPI) Short Form; Levenson's Self-Report Psychopathy Scale (LSRP)	Subjects scoring higher on psychopathy, particularly men, defected more often and were less likely to continue cooperating after establishing cooperation with a partner. Subjects scoring high in psychopathy showed less amygdala activation, suggesting weaker aversive conditioning to those outcomes. Compared with low psychopathy subjects, subjects higher in psychopathy showed weaker activation within the orbitofrontal cortex when choosing to cooperate and weaker activation within the dorsolateral prefrontal and rostral anterior cingulate cortex when choosing to defect. Significant negative associations between Levenson total psychopathy scores and ratings of trust in response to cooperative outcomes (CC) for women	3
Verona et al. (2013)	To advance understanding of affective deficits in female psychopathy, as assessed by the Psychopathy Checklist-Revised (PCL-R)	66 pleasant, neutral, and unpleasant IAPS picture stimuli; Acoustic startle probes - blink-eliciting noise probes	Hare's Psychopathy Checklist-Revised (PCL-R)	Women scoring high on PCL-R exhibited deficits in startle reactivity to unpleasant pictures, especially regarding victim-distress scenes, highlighting a specific insensitivity to the vicarious distress of others. The deficient affective modulation was specific to interpersonal-affective features	4

Vitale et al. (2011)	To increase the understanding of psychopathy in women by testing for specific deficits in affective and behavioral processes	Study 1: lexical decision task (12 positive words, 12 negative words, 24 neutral words, and 48 non-words)	Hare's Psychopathy Checklist-Revised (PCL-R)	Psychopathic women did not exhibit deficits in performance typically exhibited by psychopathic men	4
Yoder et al. (2021)	To examine socioemotional processing in response to third-party morally laden interactions	Dyadic interactions depicting intentional interpersonal harm or intentional assistance; Video clip showing a person making one of six expressions (happy, sad, frightened, angry, disgust, or in pain); fMRI scanning (to collect brain images)	Hare's Psychopathy Checklist-Revised (PCL-R)	PCL-R scores were not associated with differences in confidence or accuracy ratings. However, psychopathy was significantly related to increased hemodynamic response in the right dorsolateral prefrontal cortex when viewing harmful interactions and decreased functional connectivity from the right amygdala to the inferior parietal cortex and insula and from the temporal, parietal junction to the dorsomedial prefrontal cortex. Psychopathy is associated with normal behavioral accuracy and confidence, but alterations in neural network activity during moral decision-making	4

Note. QA = Quality Assessment; (fMRI) Functional magnetic resonance imaging; (IAPS) International Affective Picture System; (dlPFC) Right dorsolateral prefrontal cortex; (STS)Superior temporal sulcus; (pSTS) Posterior superior temporal sulcus; (ACC) Anterior cingulate cortex; (TPJ) Temporoparietal junction; (rTPJ) Right temporoparietal junction; (dACC) Dorsal anterior cingulate cortex; (SMA) Supplementary motor area; (aINS) human anterior insula (IFG) Inferior frontal gyrus; (LPPs) Late positive potentials; N170|N2 = Event-related potential (ERP) component; P3 = event-related potential (ERP) component elicited in the process of decision making.

Included Studies

A total of 371 articles were initially identified within the selected databases. After removing 168 duplicate articles, the abstracts and titles of the remaining 203 articles were screened. Of these, 158 articles were excluded as they did not meet the defined eligibility criteria. The main reasons for exclusion included: (i) incorrect outcome, (ii) inappropriate population, (iii) samples comprising individuals below 18 years of age, (iv) samples consisting solely of men, and (v) literature reviews. Subsequently, 45 articles underwent a thorough review, and 32 were further excluded for not meeting the eligibility criteria. Reasons for exclusion at this stage included: (i) failure to report separate analyses for women (e.g., Ireland et al., 2020), (ii) absence of emotion assessment (e.g., Colins et al., 2017), and (iii) being a literature review (e.g., Rogstad & Rogers, 2008) (see Figure 1). As a result, 13 articles were deemed eligible for inclusion in the systematic review, and data were extracted from each of these studies.

Quality Assessment

Within the selected articles, the identified research designs comprised: quantitative non-randomized studies (*n*= 9) and descriptive (*n*= 4) (see Table 1). As illustrated in Table 2, none of the studies met the criteria of excellent, while eight studies demonstrated good criteria, that is, met four of the five criteria (Burley et al., 2017; Eisenbarth et al., 2008; Eisenbarth et al., 2013; Harenski et al., 2014; Justus & Finn, 2007; Verona et al., 2013; Vitale et al., 2011; Yoder et al., 2021). Three studies fulfilled three out of the five criteria (Edwards et al., 2019; Lamoureux & Glenn, 2021; Louth et al., 1998), and one study met only two of the quality criteria (Pinheiro et al., 2019).

Characteristics of Studies Included

Sample characteristics

The studies encompassed in this review were conducted in diverse settings, with a predominant focus on the prison context (*n*= 7), mostly utilizing exclusive female samples, with two of these studies using a mixed sample of both men and women (Edwards et al., 2019; Lamoureux & Glenn, 2021). The studies carried out in the community (*n*= 3) used mixed samples (men and women) (e.g., Rilling et al., 2007). Two studies were conducted in psychiatric hospitals (*n*= 2) with exclusive female samples. A single study included in this review was conducted in both community and prison contexts, including only women (Harenski et al., 2014; see Table 1).

All the studies adopted a quantitative approach, and a majority were conducted in the United States of America (*n*= 8), two in Italy and one in Portugal. The sample sizes varied, ranging from 30 participants (Rilling et al., 2007) to 573 participants (Edwards et al., 2019), with all participants being 18

years of age or older. Seven studies did not report the ethnicity of the participants, two studies had a higher representation of African Americans (Lamoureux & Glenn, 2021; Verona et al., 2013), one had a greater sample of Hispanics (Edwards et al., 2019), and three featured predominantly Caucasian participants (Louth et al., 1998; Pinheiro et al., 2019; Vitale et al., 2011).

Assessment measures

In the included studies, the assessment of psychopathy involved the utilization of several instruments, including Hare's Psychopathy Checklist–Revised (PCL-R; *n*= 9; Edwards et al., 2019; Eisenbarth et al., 2008; Eisenbarth et al., 2013; Harenski et al., 2014; Louth et al., 1998; Pinheiro et al., 2019; Verona et al., 2013; Vitale et al., 2011; Yoder et al., 2021), the Psychopathy Checklist - Screening Version (PCL:SV; *n*= 1; Lamoureux & Glenn, 2021), the Psychopathic Personality Inventory (PPI; *n*= 1; Justus & Finn, 2007) and its short form (Rilling et al., 2007), as well as the Levenson Self-Report Psychopathy Scale (LSRPS; *n*= 2; Pinheiro et al., 2019; Rilling et al., 2007). Studies employing PCL measures were primarily conducted in prison and forensic hospital settings. On the other hand, studies utilizing measures other than PCL carried out within community samples, with the exception of the study by Pinheiro et al. (2019).

The assessment of emotional processing in the studies included primarily employed self-report instruments, and physiological measures and functional magnetic resonance imaging (fMRI) associated with the presentation of visual and/or auditory stimuli or the execution of specific tasks. Specifically, one study employed the Positive and Negative Affect Program (PANAS; Pinheiro et al., 2019), one study used the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Edwards et al., 2019), and one study used the Discrete Emotions Questionnaire (DEQ), the Frequency and Intensity of Emotions Questionnaire and the Multidimensional Assessment of Interceptive Consciousness (Lamoureux & Glenn, 2021). The Toronto Alexithymia Scale (TAS) was utilized in two studies (Lamoureux & Glenn, 2021; Louth et al., 1998). Seven studies employed visual stimuli to assess emotional processing, including dyadic interactions depicting intentional interpersonal harm or assistance (Yoder et al., 2021), a video clip featuring various facial expressions (happy, sad, scared, angry, disgusted, or in pain; Yoder et al., 2021), images from the International Affective Picture System (IAPS; Burley et al., 2017; Eisenbarth et al., 2013; Harenski et al., 2014; Justus & Finn, 2007; Verona et al., 2013), static facial expressions from the Radboud Faces Database and dynamic facial expressions from the Amsterdam Dynamic Facial Expression Set (Burley et al., 2017), Prisoner's Dilemma Game (Rilling et al., 2007), and photos from the Karolinska Directed Emotional Faces (KDEF; Eisenbarth et al., 2008), measuring heart rate and skin conductance in response to visual stimuli (Lamoureux & Glenn, 2021). Additionally, auditory stimuli were

employed in two studies: Acoustic startle probes (Verona et al., 2013) and affective sound clips from the International Affective Digitalized Sounds (Burley et al., 2017). Another study utilized lexical decision tasks involving positive, negative, and neutral words and non-words (Vitale et al., 2011). Eight studies incorporated physiological recordings to enhance the understanding of emotional processing in the study population, including blink responses collected for noise probes (Verona et al., 2013), EEG activity (ElectroCap; Eisenbarth et al., 2013; Justus & Finn, 2007), eye tracker recorded pupil diameter (Burley et al., 2017), and heart rate and skin conductance (Lamoureux & Glenn, 2021). Three studies used fMRI scanning techniques (Harenski et al., 2014; Rilling et al., 2007; Yoder et al., 2021).

Main Outcomes

The outcomes of the studies incorporated in this review are organized and presented based according to shared results centered around specific themes, facilitating a more coherent presentation of the findings. Upon a comprehensive examination of the articles included in this review, common themes were identified. The integration of results was then carried out based on these themes and the constructs under analysis across the various articles. Thus, in this section, we first present the results concerning psychopathy scores in women. Subsequently, we delve into findings related to the association between psychopathy and emotional processing, placing emphasis on the distinct roles played by different psychopathy facets/dimensions, and across different outcomes, including neuronal activity and physiological indicators.

Prevalence of psychopathy traits

In this systematic review, studies utilizing PCL measures (i.e., PCL-R and PCL:SV) and conducted in prison or forensic hospitals consistently observed that women exhibited low scores on psychopathic traits (e.g., Burley et al., 2017; Edwards et al., 2019; Pinheiro et al., 2019). In these studies, a limited number of women scored above 30, underscoring the overall lower prevalence of psychopathy traits in women (e.g., Edwards et al., 2019; Vitale et al., 2011). Similarly, studies employing other psychopathy measures (and conducted in the community) reported lower psychopathy scores for women when compared to men (e.g., Justus & Finn, 2007). The study conducted in a prison context, assessing primary and secondary psychopathy, revealed that women scored above average in primary and both dimensions of psychopathy (Pinheiro et al., 2019).

Emotional functioning

Studies indicated that women who engage in criminal behavior exhibit heightened challenges in comprehending and regulating emotions (Edwards et al., 2019), with positive associations between total

psychopathy scores and alexithymia (Lamoureux & Glenn, 2021). Findings also pointed to emotional deficits in lexical decision tasks (Vitale et al., 2011), diminished limbic activation during emotion processing (Harenski et al., 2014), and cortical deficits in processing negative emotions (Eisenbarth et al., 2013).

Concerning emotional categorization, individuals with elevated psychopathy scores displayed poorer performance in tasks involving the categorization of facial expressions, particularly in recognizing facial expressions of sadness, mistaking facial expressions of fear for anger, and perceiving facial expressions of fear and sadness as surprise (Eisenbarth et al., 2008). They also tend to view all facial expressions as less stimulating, and exhibit reduced positive expectations for expressions of happiness compared to comparison groups (employees, non-psychopathic patients; Eisenbarth et al., 2008).

Furthermore, research findings indicated that women with elevated psychopathy scores exhibited an absence of aversive startle response when viewing scenes depicting a victim suffering, in contrast to neutral scenes (Verona et al., 2013). Nevertheless, findings from a study involving a mixed sample underscored that women did not show equivalent deficits in startle response modulation as observed in men with high psychopathy scores (Justus & Finn, 2007).

Dimensions of psychopathy and emotional processing

The findings indicated a modest association between affective psychopathic traits (i.e., insensitivity) and difficulties in managing emotions among women who committed crimes (Edwards et al., 2019). The deficits in empathic capacity and observed unresponsiveness to aversive startle stimuli in women with high psychopathy scores appear to be specific to interpersonal-affective traits rather than antisocial traits (Verona et al., 2013). Furthermore, a connection was also identified between PCL-R factor 1 (interpersonal-affective) and the defensive response, suggesting that the defensive startle response serves as an indicator of physiological aspects related to the interpersonal-affective characteristics of psychopathy, as opposed to antisocial-impulsive traits (PCL-R factor 2; Verona et al., 2013), with no significant effects on factor 2 scores (Justus & Finn, 2007). However, a study by Burley et al. (2017), utilizing changes in pupil diameter as a metric, concluded that psychopathic interpersonal-affective traits (factor 1) were unrelated to emotional responses across various stimulus types, including images, static facial expressions, dynamic facial expressions, and sound clips.

Conversely, the socially deviant and impulsive factor of the PCL-R (factor 2) demonstrated positive associations with the ability to identify and describe feelings, as well as distinguish between feelings and bodily sensations (i.e., Toronto Alexithymia Scale factor 1) in women, suggesting a manifest inability to differentiate and describe feelings and bodily sensations (Louth et al., 1998). Another study found that

PCL-R factor 2 exclusively predicted event-related potential (ERP) responses for negative affect (i.e., fear and anger), emphasizing its greater relevance in explaining variance compared to factor 1, as neither factor 1 nor factor 2 predicted responses to positive affect stimuli (Eisenbarth et al., 2013). In exploring emotional processing and primary and secondary psychopathy, a study revealed that women with above-average scores in primary and secondary psychopathy, who engage in criminal behavior, demonstrated a predominance of negative affect in secondary psychopathy (Pinheiro et al., 2019).

A singular study assessed the relationship between psychopathic traits and emotional intelligence (EI) within a mixed prison sample (Edwards et al., 2019). It uncovered modest negative relationships between affective and antisocial traits and strategic EI scores. Moreover, affective and antisocial traits exhibited negative associations with emotion management ability within strategic EI, while affective traits were negatively linked to both global and strategic EI. The authors examined gender as a moderator of the relationships between psychopathic traits and EI, revealing a significant main effect of gender in all areas of EI, suggesting that women tend to score higher than men on EI.

Neural activity

Some studies have explored potential changes in the neural activity during moral decision-making processes, revealing associations between psychopathy scores and heightened responses in the right dorsolateral prefrontal cortex (dlPFC) when exposed to harmful interactions versus helpful interactions. Conversely, there was a diminished response in the right superior temporal sulcus (STS) when discerning the emotions of individuals engaged in harmful versus helpful interactions (Yoder et al., 2021). Specifically, PCL-R factor 1 demonstrated a correlation with the reduction of the signal in the right STS.

Concerning the identification of emotions of protagonists initiating harmful and helpful interactions, PCL-R scores were linked to a reduced signal in the bilateral posterior superior temporal sulcus (pSTS) when discerning the emotional states of harm recipients compared to those of help recipients (Yoder et al., 2021). Notably, PCL-R factor 2 exhibited a significant association with decreased responses in the right pSTS, caudate, and anterior cingulate cortex (ACC) (Yoder et al., 2021). Assessing responses between harmful and helpful interactions, PCL-R scores demonstrated reduced functional connectivity from the amygdala to the left parietal and right temporal cortex, along with diminished connectivity from the temporoparietal junction (TPJ) to the left parietal and parahippocampal gyrus. These findings suggest potential associations between psychopathy in women and changes in neural network activity during moral decision-making (Yoder et al., 2021).

In another study exploring the relationship between PCL-R scores and brain activation in response to moral and non-moral versus neutral images, a negative correlation emerged between PCL-R scores

and activation in the right amygdala and rostral ACC, particularly associated with PCL-R factor 2 (Harenski et al., 2014). When comparing PCL-R scores and brain activity for moral versus non-moral images, a negative correlation was identified between total PCL-R scores and activation of the parahippocampal gyrus, specifically linked to PCL-R factor 1 scores (Harenski et al., 2014). Additionally, individuals with elevated psychopathy scores showed less amygdala activation, indicating weaker aversive conditioning to cooperate-defect outcomes, and diminished activation in the dorsolateral prefrontal cortex and rostral anterior cingulate when opting to defect in a game task (Rilling et al. al., 2007).

Physiological outcomes

Significant associations were identified among total psychopathy scores, heart rate, and skin conductance response specifically during fear prompts while viewing neutral, threatening, or images depicting individuals in danger (Lamoureux & Glenn, 2021; Verona et al., 2013). This aligns with findings from men exhibiting elevated psychopathy levels, wherein an absence of an increased startle response to aversive stimuli compared to neutral stimuli was observed (total score and factor 1; Justus & Finn, 2007). In addition, women demonstrated more pronounced modulation in pupil size during the late time window in response to unpleasant sound clips (Burley et al., 2017). In a study utilizing EEG, a significant overall prediction of the N2 amplitude (an event-related potential component) was noted, particularly in response to facial expressions of anger and fear, indicating reduced reactivity among women with high psychopathy scores. Notably, factor 2 contributed additional predictive value to this outcome (Eisenbarth et al., 2013).

Discussion

This systematic review aimed to provide an overview of the emotional functioning of women exhibiting psychopathic traits. The 13 manuscripts included in this review were predominantly conducted in the United States of America (e.g., Rilling et al., 2007; Verona et al., 2013; Vitale et al., 2011), with one conducted in Portugal (Pinheiro et al., 2019). The concentration of studies in the United States underscores a deficiency in comprehensive investigations into psychopathy among women globally, despite a significant increase in the incarceration of women (Walmsley, 2017). The studies reveal a low prevalence of psychopathy in women, with few scorings above 30 points on the PCL-R (Edwards et al., 2019; Vitale et al., 2011). This prompts speculation about the appropriateness of the PCL-R cutoff point for characterizing psychopathy in women (Vitale & Newman, 2001), suggesting potential gender bias in PCL-R items, particularly in behavioral characteristics (Haneveld et al., 2022). Authors have proposed lower cutoff points for psychopathy in women, ranging from 18 (Ullrich et al., 2008), 25 (e.g., Lehmann

& Ittel, 2012), 27 (e.g., Kennealy et al., 2007), to 29 (e.g., Verona et al., 2005), aiming to enhance the comparability of sensitivity and specificity statistics to those of male prisoners (Kennealy et al., 2007).

Studies included in this systematic review suggested that women with psychopathic traits experience impairments in understanding and managing emotions (Edwards et al., 2019), encounter difficulties in recognizing facial emotional expressions - particularly those of sadness and fear -, perceived most emotions as less positive and exciting (Eisenbarth et al., 2008) and exhibited a prevalent presence of alexithymic traits, indicating marked difficulty in describing emotional content (Lamoureux & Glenn, 2021). It appears that individuals with psychopathic traits may lack proficiency in empathic experience, revealing deficits in this domain (Kyranides et al., 2022), particularly in affective empathy but not cognitive empathy (i.e., mentalizing; Robinson & Rogers, 2015). These deficits could account for the observed absence of startle response to aversive stimuli (Verona et al., 2013), indicating empathic dysfunction (i.e., including moral cognitions), affecting both affect and behavior toward others (van Dongen, 2020). This may contribute to difficulties in forming associations related to punishment (Lykken, 1995). Thus, the results supporting the hypothesis of specific deficits in empathy among psychopathic individuals suggest a physiological non-responsiveness when witnessing others in suffering - a lack of sensitivity to the suffering of others (Patrick, 2018). It has been proposed that these empathic deficits may elucidate the ease with which these individuals engage in antisocial and cruel acts, thereby facilitating criminal offending (van Langen et al., 2014). This finding aligns with similar results in male psychopaths, who exhibit reduced startle potentiation using an image visualization paradigm (Anderson et al., 2011; Sutton et al., 2002). However, it is important to note that there is not unanimous agreement on this aspect, as one study in this review suggests that women may not manifest the same deficits in modulating the startle response as men (Justus & Finn, 2007).

The present review provides additional support for the difficulties associated with categorizing emotions, especially expressions of sadness and fear, in women exhibiting psychopathic traits (Eisenbarth et al., 2008). This lends credence to the hypothesis of a cortical deficit in the negative valence of emotional processing (Eisenbarth et al., 2013). Furthermore, the study aligns with previous research indicating emotional deficits in lexical decision tasks (Vitale et al., 2011) and diminished limbic activation during emotional processing (Harenski et al., 2014). These findings appear to be consistent with findings in male psychopaths, who also exhibit difficulties in categorizing emotional expressions with negative valences, such as sadness (Eisenbarth et al., 2008) and/or fear (Prado et al., 2015).

Studies suggest a connection between dimensions of psychopathy and specific emotional deficits and expressions (Snowden et al., 2022). The identified association in women who committed crimes

between the affective-interpersonal factor of psychopathy (F1 PCL-R) and difficulties in emotional management and empathic capacity (Edwards et al., 2019) supports existing literature characterizing the interpersonal-affective factor (F1) of psychopathy by traits such as superficial affection, lack of remorse, and insensitivity (Hare & Neumann, 2008). Moreover, the observed link between the affective-interpersonal factor in women with psychopathic traits and deficits in the potentiation of startle responses to unpleasant stimuli (Verona et al., 2013) suggests a potential association with low fear (Lykken, 1995) or with an underactivation of a complex moral brain circuit in individuals scoring high on the interpersonal-affective factor (Glenn et al., 2009). Notably, women in the community with low scores on this dimension exhibit the typical potentiation of standard startle (Justus & Finn, 2007). Despite some studies considering decreased potentiation of the startle response as a valid indicator of affective dysfunction in psychopathy (Sutton et al., 2002; Anderson et al., 2011; Verona et al., 2013), there remain conflicting results between prison and community samples, preventing the formulation of definitive conclusions.

On the contrary, the antisocial-impulsive factor (F2 PCL-R) exhibited robust associations with alexithymia, displaying similar manifestations (Louth et al., 1998). This outcome was anticipated, given that the link between psychopathy and aggressiveness/impulsivity may be mediated by emotional dysregulation (Garofalo et al., 2021), deficits in self- and other-understanding (Louth et al., 1998), and a lack of insight (Haviland et al., 2004).

Interestingly, deficits in the negative valence of emotional processing (i.e., fear, anger) identified in psychopathic women appear to be linked to factor 2 (antisocial-impulsive) rather than factor 1 (affective-interpersonal; Eisenbarth et al., 2013). While not immediately intuitive, as factor 1 comprises more emotional dimensions (e.g., empathy, lack of remorse, reduced emotionality, superficial affect), these deficits associated with factor 2 may be more closely tied to emotional dysregulation (i.e., externalization), resulting in behavioral dysregulation (e.g., impulsivity, criminal behavior, deficits in inhibitory processes; Patrick et al., 2005), moral socialization deficits (Goulter et al., 2019), impaired attentional control (Sadeh et al., 2013), compromised frontal control, and behavioral dysregulation (Sprague & Verona, 2010). These findings align well with the prevalence of negative affect in secondary psychopathy among women (i.e., impulsivity, anxiety, and propensity to guilt; Pinheiro et al., 2019), as they are less adept at enduring difficulties in regulating negative emotions (Kyranides et al., 2023).

The higher emotional intelligence (EI) scores observed in women with psychopathic traits, in comparison to men (Edwards et al., 2019), may be linked to the negatively correlated affective tendencies (Salekin et al., 2004). Additionally, antisocial tendencies have been found to exhibit a negative association with EI (Grieve & Panebianco, 2013). It is well-established that low EI is connected to antisocial and

criminal behaviors (Gillespie et al., 2019), high rates of criminal recidivism (Fix & Fix, 2015), significantly impacting interpersonal functioning (Gillespie et al., 2019), empathy capacity, and the effective management of stress and mood levels (Fix & Fix, 2015). Despite this, further research is needed to thoroughly document this reduction in EI, given that the majority of studies have predominantly focused on men (Ermer et al., 2012). Nevertheless, consistent findings with female psychopaths suggest a decline in EI alongside psychopathic traits (Jauk et al., 2016).

Based on the findings from the studies incorporated into this systematic review, the hyperactivity observed in the right dorsolateral prefrontal cortex (dlPFC) during processing and moral judgment in women with psychopathic traits (Yoder et al., 2021) suggests an increased propensity for impulsive, antisocial, and aggressive behaviors (Claes et al., 2009). This hyperactivity occurs specifically in a region associated with the exertion of cognitive control over impulses (Sanfey et al., 2003). It is noteworthy that the prefrontal cortex plays a pivotal role in moral judgment, cognitive control over emotions in dilemmas, abstract reasoning, and the management of aversive emotions (Tassy et al., 2009). Furthermore, temporal cortex regions appear to be affected by the presence of psychopathy traits, particularly the right superior temporal sulcus (STS) and limbic regions, including the amygdala (Ermer et al., 2012). This involvement gives rise to emotional and behavioral alterations (Kiehl, 2006), as evidenced in the identification of emotions in individuals engaged in harmful interactions. The interpersonal-affective factor appears to actively contribute to this outcome (Yoder et al., 2021).

The difficulty faced by women with psychopathic in identifying emotional states within moral decision-making scenarios, such as discerning the emotional state of the recipient of harm, appears to garner support from existing literature, with the antisocial-impulsive factor playing a proactive role in this outcome (Yoder et al., 2021). It is crucial to underscore that the ACC is a region with robust connections both limbic (emotional) system and prefrontal (cognitive) cortex. The ACC becomes activated in tasks inducing high levels of cognitive conflict (e.g., responding to moral dilemmas; Greene et al., 2004) and demonstrates extensive functional connections with the amygdala (Marsh et al., 2013). Illustrative instances of such tasks include processing and responding to emotional facial expressions (Deeley et al., 2006), aversive conditioning (Büchel & Dolan, 2000), and the emotional evaluation of fear stimuli (LeDoux, 2003). This outcome underscores the evident impact on certain regions of the paralimbic system in women with psychopathic traits, as indicated by reduced functional connectivity involving the amygdala, the left parietal, the right temporal cortex, the TPJ, and the hippocampal gyrus (Harenski et al., 2014). Furthermore, there are observed changes in neural network activity during moral decision-making processes when exposed to moral/non-moral images (Harenski et al., 2014). Additionally,

reduced amygdala activity is accompanied by milder moral judgments during exposure to fear-relevant stimuli (Harenski et al., 2014).

Women exhibiting high scores on antisocial-impulsive traits displayed a diminished N2 amplitude (an event-related potential component associated with cognitive processes related to behavioral control and affective processes) during mood induction task (i.e., observation of facial expressions of anger and fear, but not happiness) (Eisenbarth et al., 2013). The existing literature highlights that psychopathic women tend to exhibit a significant reduction in cortical activity during emotional processing, a diminished inhibitory control response to stimuli, heightened emotional reactivity to negative stimuli, both within clinical samples (Hicks & Patrick, 2006) and the general population (Seara-Cardoso et al., 2012). Additionally, they often demonstrate a hypervigilant attentional orientation towards negative emotions (e.g., anger and fear; Richards et al., 2014). Contrarily, in a sample of psychopathic men, there is no empirical consensus regarding this data, as some studies suggest reduced amplitudes of N2 (Kiehl et al., 2000) while others argue for an increased amplitude of N2 (Kiehl et al., 2006).

The literature indicates that pupillary modulation serves as a reflection of cognitive-affective brain activity elicited by a stimulus through the sympathetic nervous system (Siegle et al., 2004). This modulation of the pupil size may serve as a valuable tool for assessing emotional processing in psychopathy. However, research is this area is limited, with studies demonstrating reduced pupillary affective modulation in psychiatric patients (Burley et al., 2019) and in prisoners with elevated psychopathy scores (Gillespie et al., 2019). Notably, this review revealed that female psychopaths in the community exhibited greater pupil size modulation when exposed to unpleasant sound clips (Burley et al., 2017).

Conclusion: Limitations and Future Research

Despite the significant findings, this systematic review has some limitations. First, most studies included (Eisenbarth et al., 2008; Eisenbarth et al., 2013; Pinheiro et al., 2019; Verona et al., 2013; Vitale et al., 2011) suffer from the limitation of lack of representativeness, potentially explaining the absence of some significant results (Lamoureux & Glenn, 2021). This limitation could stem from the underestimation of women's criminal behavior and their invisibility within the justice system (Silvestri & Crowther-Dowey, 2008). There may also be efforts to conceal violent behavior in women, psychologizing and pathologizing their criminal acts (Cardi & Pruvost, 2011). In addition, concerns arise regarding the use of self-report measures to assess emotional processing, given the characteristics of manipulation, superficial affection, and attempts to display socially desirable behavior in psychopathic individuals (Lamoureux & Glenn, 2021; Pinheiro et al., 2019). While self-report measures are valuable for a quick

assessment of psychopathy (e.g., Sellbom, 2011), it is advisable to employ multiple measures to comprehensively explore and analyze the broader construct of psychopathy (Tsang et al., 2018) and to assess emotional processing. Some studies also noted difficulties in obtaining scores above 30 points on the PCL-R for women (Edwards et al., 2019; Pinheiro et al., 2019), a limitation acknowledged by most researchers in determining an appropriate cutoff point for assessing psychopathy in women due to the lower levels of psychopathy observed (Warren & South, 2006). This limitation may impede the detection of affective deficits in psychopathy at lower scores, necessitating exploration of more extreme psychopathy scores to discern these deficits (Burley et al., 2017). It is noteworthy to mention that studies conducted within a prison environment often overlook the potential moderating or mediating effects that the prison setting may exert on the emotional processing of women, thereby influencing study outcomes. Furthermore, as psychopathy levels were generally low, there is also a limitation in obtaining a comprehensive understanding of various aspects of psychopathy in women. Replication of research in samples with clinically elevated levels of psychopathy is imperative to realistically assess emotional processing deficits. Additionally, although the generalization of results was not the primary objective of this systematic review, it is crucial to acknowledge that, in certain domains analyzed in this study (e.g., physiological responses), the review is constrained by a scarcity of studies. This limitation stems from the emergent nature of assessment methodologies for emotional processing in psychopathy in women, preventing broad generalizations of results.

However, this work proves to be crucial in aggregating comprehensive empirical data that examines emotional processing in psychopathic women. It underscores that abnormal emotional processing is deemed a central dimension in psychopathic women, particularly in response to negative stimuli or threats, revealing deficits in cortical regions that are also observed in male psychopaths (Eisenbarth et al., 2008). Additionally, difficulties in emotional categorization were identified (Eisenbarth et al., 2013) (Table 3).

Table 3

Key Findings of the Systematic Review

- The present systematic review concluded that psychopathic women:
  Have difficulties in emotional categorization.
- Show deficits in cortical regions in processing negative emotions.
- Reveal reduced functional connectivity of the amygdala, left parietal and right temporal cortex, and the temporoparietal junction with the left parietal and parahippocampal gyrus.

- Show traits of alexithymia, revealing difficulties in distinguishing and describing emotions.
  Have an absence of a startle response to aversive stimuli, evidencing reaction deficits.
- The different dimensions of psychopathy (interpersonal-affective, antisocial-impulsive) reveal different contributions to the manifestations of emotional deficits.

Moreover, this review highlights the pivotal role of functional neuroimaging in comprehending the pathophysiology of psychopathy in women (Harenski et al., 2014; Rilling et al., 2007; Yoder et al., 2021). Nevertheless, further investigations are imperative to gain a deeper understanding of the emotional deficits (Table 4). In addition, future research endeavors should explore additional negative stimulus categories with sufficient potency to measure the impact of psychopathy on emotional processing. Disgust, danger, humiliation, and guilt warrant consideration for a more comprehensive understanding of the subject.

Table 4

Implications for Research, Practice, and Policy

Implications for research	Implications for practices and policy
● More research is needed to understand the emotional processing in psychopathic women. ● Additional research should include self-report and multiple measures for a more in-depth assessment of emotional processing in psychopathic women. ● More neuroimaging studies are needed to understand the brain areas affected by the psychopathic personality, leading to severe difficulty in processing emotional content.	● Empirical work on psychopathy has been dominated by the operationalization of the PCL instrument and its variants; however, this review led us to question its predictive validity for psychopathic women. ● Professionals need to understand psychopathy as a combination of multiple traits and not in a monolithic view, reinforcing the need to introduce multiple instruments in risk assessment. ● There is a need for interventions and government policies aimed at risk assessment for psychopathic women, adjusted to the heterogeneity of psychopathy and its specific characteristics and manifestations in women.

References

Ali, F., Amorim, I. S., & Chamorro-Premuzic, T. (2009). Empathy deficits and trait emotional intelligence in psychopathy and Machiavellianism. *Personality and Individual Differences, 47*(7), 758–762. https://doi.org/10.1016/j.paid.2009.06.016.

Anderson, N. E., Stanford, M. S., Wan, L., & Young, K. A. (2011). High psychopathic trait females exhibit reduced startle potentiation and increased p3 amplitude. *Behavioral Sciences & the Law, 29*(5), 649–666. https://doi.org/10.1002/bsl.998.

Anton, M. E., Baskin-Sommers, A. R., Vitale, J. E., Curtin, J. J., & Newman, J. P. (2012). Differential effects of psychopathy and antisocial personality disorder symptoms on cognitive and fear processing in female offenders. *Cognitive, Affective, & Behavioral Neuroscience, 12*(4), 761–776.

Berthoz, S., Artiges, E., Van De Moortele, P. F., Poline, J. B., Rouquette, S., Consoli, S. M., & Martinot, J. L. (2002). Effect of impaired recognition and expression of emotions on front cingulate cortices: an fMRI study of men with alexithymia. *The American Journal of Psychiatry*, *159*(6), 961–967. https://doi.org/10.1176/appi.ajp.159.6.961.

Bird, G., & Viding, E. (2014). The self to other model of empathy: providing a new framework for understanding empathy impairments in psychopathy, autism, and alexithymia. *Neuroscience and Biobehavioral Reviews*, *47*, 520–532. https://doi.org/10.1016/j.neubiorev.2014.09.021.

Brook, M., Brieman, C. L., & Kosson, D. S. (2013). Emotion processing in Psychopathy Checklist — assessed psychopathy: A review of the literature. *Clinical Psychology Review, 33*(8), 979–995. https://doi.org/10.1016/j.cpr.2013.07.008

Büchel, C., & Dolan, R. J. (2000). Classical fear conditioning in functional neuroimaging. *Current Opinion in Neurobiology, 10*(2), 219–223. https://doi.org/10.1016/s0959-4388(00)00078-7.

Burley, D. T., Gray, N. S., & Snowden, R. J. (2017). As far as the eye can see: Relationship between psychopathic traits and pupil response to affective stimuli. *PLoS ONE, 12*(1), e0167436. https://doi.org/10.1371/journal.pone.0167436.

Burley, D. T., Gray, N. S., & Snowden, R. J. (2019). Emotional modulation of the pupil response in psychopathy. *Personality Disorders, 10*(4), 365–375. https://doi.org/10.1037/per0000313.

Cardi, C., & Pruvost, G. (2011). The violence of women: suppressions and narratives. *Champ Pénal.* https://journals.openedition.org/champpenal/8367.

Claes, L., Vertommen, S., Soenens, B., Eyskens, A., Rens, E., & Vertommen, H. (2009). Validation of the Psychopathic Personality Inventory among psychiatric inpatients: sociodemographic, cognitive

and personality correlates. *Journal of Personality Disorders, 23*(5), 477–493. https://doi.org/10.1521/pedi.2009.23.5.477.

Colins, O. F., Fanti, K. A., Salekin, R. T., & Andershed, H. (2017). Psychopathic Personality in the General Population: Differences and Similarities Across Gender. *Journal of Personality Disorders, 31*(1), 49–74. https://doi.org/10.1521/pedi_2016_30_237.

Cooke, D. J. (1995). Psychopathic disturbance in the Scottish prison population: The cross-cultural generalisability of the Hare psychopathy checklist. *Psychology, Crime and Law, 2*, 101–108.

Cunliffe, T. B., Gacono, C. B., Smith, J. M., Kivisto, A. J., Meloy, J. R., & Taylor, E. E. (2016). *Assessing psychopathy in women*. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide* (2nd ed., pp. 167-190). New York, NY: Routledge/Taylor & Francis Group.

De Brito, S. A., Forth, A. E., Baskin-Sommers, A. R., Brazil, I. A., Kimonis, E. R., Pardini, D., Frick, P. J., Blair, R. J. R., & Viding, E. (2021). Psychopathy. *Nature Reviews Disease Primers, 7*(1), 49. https://doi.org/10.1038/s41572-021-00282-1.

De Gelder, B., Van den Stock, J., Meeren, H. K., Sinke, C. B., Kret, M. E., & Tamietto, M. (2010). Standing up for the body. Recent progress in uncovering the networks involved in the perception of bodies and bodily expressions. *Neuroscience and Biobehavioral Reviews*, *34*(4), 513–527. https://doi.org/10.1016/j.neubiorev.2009.10.008.

Deeley, Q., Daly, E., Surguladze, S., Tunstall, N., Mezey, G., Beer, D., Ambikapathy, A., Robertson, D., Giampietro, V., Brammer, M. J., Clarke, A., Dowsett, J., Fahy, T., Phillips, M. L., & Murphy, D. G. (2006). Facial emotion processing in criminal psychopathy. Preliminary functional magnetic resonance imaging study. *The British Journal of Psychiatry, 189*, 533–539. https://doi.org/10.1192/bjp.bp.106.021410.

Edens, J. F., Marcus, D. K., Lilienfeld, S. O., & Poythress, N. G., Jr. (2006). Psychopathic, not psychopath: Taxometric evidence for the dimensional structure of psychopathy. *Journal of Abnormal Psychology, 115*(1), 131–144. https://doi.org/10.1037/0021-843X.115.1.131.

Edwards, B. G., Ermer, E., Salovey, P., & Kiehl, K. A. (2019). Emotional intelligence in incarcerated female offenders with Psychopathic Traits. *Journal of Personality Disorders, 33*(3), 370–393. https://doi.org/10.1521/pedi_2018_32_349.

Eisenbarth, H., Alpers, G. W., Conzelmann, A., Jacob, C. P., Weyers, P., & Pauli, P. (2008). Psychopathic traits in adult ADHD patients. *Personality and Individual Differences, 45*(6), 468–472. https://doi.org/10.1016/j.paid.2008.05.022.

Eisenbarth, H., Angrilli, A., Calogero, A., Harper, J., Olson, L. A., & Bernat, E. (2013). Reduced negative affect response in female psychopaths. *Biological Psychology, 94*(2), 310–318. https://doi.org/10.1016/j.biopsycho.2013.07.007.

Ekman, P., & Cordaro, D. (2011). What is Meant by Calling Emotions Basic. *Emotion Review*, *3*(4), 364-370. https://doi.org/10.1177/1754073911410740.

Ermer, E., Cope, L. M., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2012). Aberrant paralimbic gray matter in criminal psychopathy. *Journal of Abnormal Psychology, 121*(3), 649–658. https://doi.org/10.1037/a0026371.

Falkenbach, D. M., Reinhard, E. E., & Larson, F. R. R. (2017). Theory based gender differences in psychopathy subtypes. *Personality and Individual Differences, 105*, 1–6. https://doi.org/10.1016/j.paid.2016.09.023.

Fix, R. L., & Fix, S. T. (2015). Trait psychopathy, emotional intelligence, and criminal thinking: Predicting illegal behavior among college students. *International Journal of Law and Psychiatry, 42-43*, 183–188. https://doi.org/10.1016/j.ijlp.2015.08.024.

Gacono, C. B. (Ed.). (2000). *The clinical and forensic assessment of psychopathy: A practitioner's guide.* Lawrence Erlbaum Associates Publishers. https://doi.org/10.4324/9781410604736.

Garofalo, C., Neumann, C. S., & Velotti, P. (2021). Psychopathy and Aggression: The Role of Emotion Dysregulation. *Journal of Interpersonal Violence, 36(*23–24), NP12640–NP12664. https://doi.org/10.1177/0886260519900946.

Gillespie, S. M., Rotshtein, P., Chapman, H., Brown, E., Beech, A. R., & Mitchell, I. J. (2019). Pupil reactivity to emotional faces among convicted violent offenders: The role of psychopathic traits. *Journal of Abnormal Psychology, 128*(6), 622–632. https://doi.org/10.1037/abn0000445.

Glenn, A. L., Raine, A., & Schug, R. A. (2009). The neural correlates of moral decision-making in psychopathy. *Molecular Psychiatry, 14*(1), 5–6. https://doi.org/10.1038/mp.2008.104.

Goulter, N., Kimonis, E. R., Denson, T. F., & Begg, D. P. (2019). Female primary and secondary psychopathic variants show distinct endocrine and psychophysiological profiles. *Psychoneuroendocrinology, 104,* 7–17. https://doi.org/10.1016/j.psyneuen.2019.02.011.

Greene, J. D., Nystrom, L. E., Engell, A. D., Darley, J. M., & Cohen, J. D. (2004). The neural bases of cognitive conflict and control in moral judgment. *Neuron, 44*(2), 389–400. https://doi.org/10.1016/j.neuron.2004.09.027.

Grieve, R., & Panebianco, L. (2013). Assessing the role of aggression, empathy, and self-serving cognitive distortions in trait emotional manipulation. *Australian Journal of Psychology, 65*(2), 79–88. https://doi.org/10.1111/j.1742-9536.2012.00059.x.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348.

Gross, J.J., Jazaieri, H., 2014. Emotion, emotion regulation, and psychopathology: an affective science perspective. *Clinical Psychological Science 2* (4), 387–401. https://doi.org/10.1177/2167702614536164

Guay, J.-P., Knight, R. A., Ruscio, J., & Hare, R. D. (2018). A taxometric investigation of psychopathy in women. *Psychiatry Research, 261*, 565–573. https://doi.org/10.1016/j.psychres.2018.01.015.

Haneveld, E. K., Molenaar, D., de Vogel, V., Smid, W., & Kamphuis, J. H. (2022). Do We Hold Males and Females to the Same Standard? A Measurement Invariance Study on the Psychopathy Checklist-Revised. *Journal of Personality Assessment, 104*(3), 368–379. https://doi.org/10.1080/00223891.2021.1947308.

Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–143). New York: Wiley.

Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology*, *4*, 217–246. https://doi.org/10.1146/annurev.clinpsy.3.022806.091452.

Hare, R.D. (2003) *Manual for the revised psychopathy checklist*. 2nd Edition, Multi-Health Systems, Toronto.

Harenski, C. L., Edwards, B. G., Harenski, K. A., & Kiehl, K. A. (2014). Neural correlates of moral and non-moral emotion in female psychopathy. *Frontiers in Human Neuroscience, 8*, 741. https://doi.org/10.3389/fnhum.2014.00741.

Haviland, M. G., Sonne, J. L., & Kowert, P. A. (2004). Alexithymia and psychopathy: comparison and application of California Q-set prototypes. *Journal of Personality Assessment, 82*, 306–316. https://doi.org/10.1207/s15327752jpa8203_06

Haxby, J. V., Hoffman, E. A., & Gobbini, M. I. (2000). The distributed human neural system for face perception. *Trends in Cognitive Sciences*, *4*(6), 223–233. https://doi.org/10.1016/s1364-6613(00)01482-0.

Hemphälä, M., & Hodgins, S. (2014). Do psychopathic traits assessed in mid-adolescence predict mental health, psychosocial, and antisocial, including criminal outcomes, over the subsequent 5 years? *Canadian Journal of Psychiatry, 59*(1), 40–49. https://doi.org/10.1177/070674371405900108.

Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger-hostility. *Journal of Abnormal Psychology, 115*(2), 276–287. https://doi.org/10.1037/0021-843X.115.2.276.

Hicks, B. M., Vaidyanathan, U., & Patrick, C. J. (2010). Validating female psychopathy subtypes: differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Personality Disorders*, *1*(1), 38–57. https://doi.org/10.1037/a0018135.

Hong Q. N., Pluye P., Fàbregues S., Bartlett G., Boardman F., Cargo M., Dagenais P., Gagnon M. P., Griffiths F., Nicolau B., O'Cathain A., Rousseau M. C., Vedel I. (2018). *Mixed methods appraisal tool (MMAT), version 2018. Registration of copyright (#1148552), Canadian intellectual property Office.*

Ireland, J. L., Mann, S., Lewis, M., Ozanne, R., McNeill, K., & Ireland, C. A. (2020). Psychopathy and trauma: Exploring a potential association. *International Journal of Law and Psychiatry, 69*, 101543. https://doi.org/10.1016/j.ijlp.2020.101543.

Jauk, E., Freudenthaler, H. H., & Neubauer, A. C. (2016). The Dark Triad and trait versus ability emotional intelligence: Emotional darkness differs between women and men. *Journal of Individual Differences, 37*(2), 112–118. https://doi.org/10.1027/1614-0001/a000195.

Justus, A. N., & Finn, P. R. (2007). Startle modulation in non-incarcerated men and women with psychopathic traits. *Personality and Individual Differences, 43*(8), 2057–2071. https://doi.org/10.1016/j.paid.2007.06.020.

Karpman, B. (1941). On the need for separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology, 3,* 112–137.

Kennealy, P. J., Hicks, B. M., & Patrick, C. J. (2007). Validity of factors of the Psychopathy Checklist–Revised in female prisoners: discriminant relations with antisocial behavior, substance abuse, and personality. *Assessment, 14*(4), 323–340. https://doi.org/10.1177/1073191107305882.

Kiehl K. A. (2006). A cognitive neuroscience perspective on psychopathy: evidence for paralimbic system dysfunction. *Psychiatry Research, 142(2-3)*, 107–128. https://doi.org/10.1016/j.psychres.2005.09.013.

Kiehl, K. A., Liddle, P. F., & Hopfinger, J. B. (2000). Error processing and the rostral anterior cingulate: an event-related fMRI study. *Psychophysiology, 37*(2), 216–223.

Kohn, N., Falkenberg, I., Kellermann, T., Eickhoff, S. B., Gur, R. C., & Habel, U. (2014). Neural correlates of effective and ineffective mood induction. *Social Cognitive and Affective Neuroscience*, *9*(6), 864–872. https://doi.org/10.1093/scan/nst055.

Kret, M. E., & Ploeger, A. (2015). Emotion processing deficits: a liability spectrum providing insight into comorbidity of mental disorders. *Neuroscience and Biobehavioral Reviews*, *52*, 153–171. https://doi.org/10.1016/j.neubiorev.2015.02.011.

Kyranides, M. N., Christofides, D., & Çetin, M. (2022). Difficulties in facial emotion recognition: taking psychopathic and alexithymic traits into account. *BMC Psychology, 10*(1), 239. https://doi.org/10.1186/s40359-022-00946-x.

Kyranides, M.N., Lu, K.M. & Ten Seldam, S. (2023). Differences in emotional contagion, interpersonal relationships and social rewards in males and females: examining the links with primary and secondary psychopathic traits. *Current Psychology, 43*(1), 300–315. https://doi.org/10.1007/s12144-023-04236-6.

Lamoureux, V. A., & Glenn, A. L. (2021). An analysis of conscious fear and automatic threat response in psychopathy. *Personality Disorders: Theory, Research, and Treatment, 12*(2), 171–181. https://doi.org/10.1037/per0000406.

LeDoux J. (2003). The emotional brain, fear, and the amygdala. *Cellular and Molecular Neurobiology, 23*(4-5), 727–738. https://doi.org/10.1023/a:1025048802629.

Lehmann, A., & Ittel, A. (2012). Aggressive behavior and measurement of psychopathy in female inmates of German prisons—A preliminary study. *International Journal of Law and Psychiatry, 35*(3), 190–197. https://doi.org/10.1016/j.ijlp.2012.02.007.

Leweke, F., Leichsenring, F., Kruse, J., & Hermes, S. (2012). Is alexithymia associated with specific mental disorders?. *Psychopathology*, *45*(1), 22–28. https://doi.org/10.1159/000325170

Louth, S. M., Williamson, S., Alpert, M., Pouget, E. R., & Hare, R. D. (1998). Acoustic distinctions in the speech of male psychopaths. *Journal of Psycholinguistic Research, 27*(3), 375–384. https://doi.org/10.1023/A:1023207821867.

Lykken, D. T. (1995). *The antisocial personalities*. Lawrence Erlbaum Associates, Inc.

Marcus, D. K., John, S. L., & Edens, J. F. (2004). A Taxometric Analysis of Psychopathic Personality. *Journal of Abnormal Psychology, 113*(4), 626–635. https://doi.org/10.1037/0021-843X.113.4.626.

Marsh, A. A., Finger, E. C., Fowler, K. A., Adalio, C. J., Jurkowitz, I. T., Schechter, J. C., Pine, D. S., Decety, J., & Blair, R. J. (2013). Empathic responsiveness in amygdala and anterior cingulate cortex in youths with psychopathic traits. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 54*(8), 900–910. https://doi.org/10.1111/jcpp.12063.

Moffett, S., Javdani, S., Miglin, R., & Sadeh, N. (2020). Examining latent profiles of psychopathy in a mixed-gender sample of juvenile detainees. *Personality Disorders, 11*(4), 290–299. https://doi.org/10.1037/per0000370.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G., PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7), Article e1000097. https://doi.org/10.1371/journal.pmed. 1000097.

Neumann, C. S., Hare, R. D., & Newman, J. P. (2007). The superordinate nature of the Psychopathy Checklist-Revised. *Journal of Personality Disorders, 21*(2), 102–117. https://doi.org/10.1521/pedi.2007.21.2.102.

Newman, J. P., Schmitt, W. A., & Voss, W. D. (1997). The impact of motivationally neutral cues on psychopathic individuals: Assessing the generality of the response modulation hypothesis. *Journal of Abnormal Psychology, 106*(4), 563–575. https://doi.org/10.1037/0021-843X.106.4.563.

Patrick C. J. (1994). Emotion and psychopathy: startling new insights. *Psychophysiology, 31*(4), 319–330. https://doi.org/10.1111/j.1469-8986.1994.tb02440.x.

Patrick, C. J. (2007). Affective Processes in Psychopathy. In J. Rottenberg & S. L. Johnson (Eds.), *Emotion and psychopathology: Bridging affective and clinical science* (pp. 215–239). American Psychological Association. https://doi.org/10.1037/11562-010.

Patrick, C. J. (Ed.). (2018). *Handbook of psychopathy* (2nd ed.). The Guilford Press.

Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between Psychopathy Facets and Externalizing in a Criminal Offender Sample. *Journal of Personality Disorders, 19*(4), 339–356. https://doi.org/10.1521/pedi.2005.19.4.339.

Patterson, J. C., 2nd, Ungerleider, L. G., & Bandettini, P. A. (2002). Task-independent functional brain activity correlation with skin conductance changes: an fMRI study. *NeuroImage*, *17*(4), 1797–1806. https://doi.org/10.1006/nimg.2002.1306.

Pessoa, L., & Adolphs, R. (2010). Emotion processing and the amygdala: from a 'low road' to 'many roads' of evaluating biological significance. *Nature reviews Neuroscience*, *11*(11), 773–783. https://doi.org/10.1038/nrn2920.

Pinheiro, M., Cunha, O., & Gonçalves, R. A. (2019). Emotions, affections, and psychopathy among female prisoners. *International Journal of Offender Therapy and Comparative Criminology*, *64*(6–7), 708–729. https://doi.org/10.1177/0306624X19895976.

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2021). Criminal lifestyle, psychopathy, and prison adjustment among female inmates. *Journal of Criminal Justice*, *76, 1*-10. https://doi.org/10.1016/j.jcrimjus.2021.101849.

Pollock, A., & Berge, E. (2018). How to do a systematic review. *International Journal of Stroke, 13*(2), 138–156. https://doi.org/10.1177/1747493017743796.

Prado, C. E., Treeby, M. S., & Crowe, S. F. (2015). Examining relationships between facial emotion recognition, self-control, and psychopathic traits in a non-clinical sample. *Personality and Individual Differences, 80*, 22–27. https://doi.org/10.1016/j.paid.2015.02.013.

Richards, H. J., Benson, V., Donnelly, N., & Hadwin, J. A. (2014). Exploring the function of selective attention and hypervigilance for threat in anxiety. *Clinical Psychology Review, 34*(1), 1–13. https://doi.org/10.1016/j.cpr.2013.10.006.

Richards, H. J., Casey, J. O., & Lucente, S. W. (2003). Psychopathy and treatment response in incarcerated female substance abusers. *Criminal Justice and Behavior, 30*(2), 251–276. https://doi.org/10.1177/0093854802251010.

Rilling, J. K., Glenn, A. L., Jairam, M. R., Pagnoni, G., Goldsmith, D. R., Elfenbein, H. A., & Lilienfeld, S. O. (2007). Neural correlates of social cooperation and non-cooperation as a function of psychopathy. *Biological Psychiatry, 61*(11), 1260–1271. https://doi.org/10.1016/j.biopsych.2006.07.021.

Robinson E. V., Rogers R. (2015). Empathy faking in psychopathic offenders: the vulnerability of empathy measures. *Journal of Psychopathology Behavioral Assessment, 37,* 545–552. https://doi.org/10.1007/s10862-015-9479-9

Rogstad, J. E., & Rogers, R. (2008). Gender differences in contributions of emotion to psychopathy and antisocial personality disorder. *Clinical Psychology Review, 28*(8), 1472–1484. https://doi.org/10.1016/j.cpr.2008.09.004.

Sadeh, N., Spielberg, J. M., Heller, W., Herrington, J. D., Engels, A. S., Warren, S. L., Crocker, L. D., Sutton, B. P., & Miller, G. A. (2013). Emotion disrupts neural activity during selective attention in psychopathy. *Social Cognitive and Affective Neuroscience, 8*(3), 235–246. https://doi.org/10.1093/scan/nsr092.

Salekin, R. T., Neumann, C. S., Leistico, A. M., & Zalot, A. A. (2004). Psychopathy in youth and intelligence: an investigation of Cleckley's hypothesis. *Journal of Clinical Child and Adolescent Psychology, 53, 33*(4), 731–742. https://doi.org/10.1207/s15374424jccp3304_8.

Sanfey, A. G., Rilling, J. K., Aronson, J. A., Nystrom, L. E., & Cohen, J. D. (2003). The neural basis of economic decision-making in the Ultimatum Game. *Science, 300*(5626), 1755–1758. https://doi.org/10.1126/science.1082976.

Schneider, F., Habel, U., Kessler, C., Posse, S., Grodd, W., & Müller-Gärtner, H. W. (2000). Functional imaging of conditioned aversive emotional responses in antisocial personality disorder. *Neuropsychobiology*, *42*(4), 192–201. https://doi.org/10.1159/000026693.

Seara-Cardoso, A., Neumann, C., Roiser, J., McCrory, E., & Viding, E. (2012). Investigating associations between empathy, morality and psychopathic personality traits in the general population. *Personality and Individual Differences*, *52*(1), 67–71. https://doi.org/10.1016/j.paid.2011.08.029.

Sellbom M. (2011). Elaborating on the construct validity of the Levenson self-report psychopathy scale in incarcerated and non-incarcerated samples. *Law and Human Behavior, 35*(6), 440–451. https://doi.org/10.1007/s10979-010-9249-x.

Sellbom, M., & Drislane, L. E. (2021). The classification of psychopathy. *Aggression and Violent Behavior, 59*, Article 101473. https://doi.org/10.1016/j.avb.2020.101473.

Siegle, G. J., Steinhauer, S. R., & Thase, M. E. (2004). Pupillary assessment and computational modeling of the Stroop task in depression. *International Journal of Psychophysiology, 52*(1), 63–76. https://doi.org/10.1016/j.ijpsycho.2003.12.010.

Silvestri, M., & Crowther-Dowey, C. (2008). *Gender & Crime*. Sage publications. https://doi.org/10.4135/9781446212721.

Snowden, R. J., Frongillo Juric, A., Leach, R., McKinnon, A., & Gray, N. S. (2022). Automatic processing of emotional images and psychopathic personality traits. *Cognition & Emotion, 36*(5), 821–835. https://doi.org/10.1080/02699931.2022.2054780.

Sprague, J., & Verona, E. (2010). Emotional conditions disrupt behavioral control among individuals with dysregulated personality traits. *Journal of Abnormal Psychology, 119*(2), 409–419. https://doi.org/10.1037/a0019194.

Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among women with psychopathy during picture perception. *Journal of Abnormal Psychology, 111*(4), 610–619. https://doi.org/10.1037/0021-843X.111.4.610.

Tassy, S., Oullier, O., Cermolacce, M., & Wicker, B. (2009). Do psychopathic patients use their DLPFC when making decisions in moral dilemmas?. *Molecular Psychiatry, 14*(10), 908–911. https://doi.org/10.1038/mp.2009.71.

Thomson, N. D. (2020). An Exploratory Study of Female Psychopathy and Drug-Related Violent Crime. *Journal of Interpersonal Violence, 35*(3–4), 794–808. https://doi.org/10.1177/0886260517690876.

Thomson, N. D., Kiehl, K. A., & Bjork, J. M. (2019). Violence and aggression in young women: The importance of psychopathy and neurobiological function. *Physiology & Behavior, 201*, 130–138. https://doi.org/10.1016/j.physbeh.2018.11.043.

Tsang, S., Salekin, R. T., Coffey, C. A., & Cox, J. (2018). A comparison of self-report measures of psychopathy among nonforensic samples using item response theory analyses. *Psychological Assessment, 30*(3), 311–327. https://doi.org/10.1037/pas0000481.

Ullrich S., Farrington D. P., Coid J. W. (2008). Psychopathic personality traits and life-success. *Personality and Individual Differences, 44*, 1162-1171. https://doi.org/10.1016/j.paid.2007.11.008.

van Dongen J. D. M. (2020). The Empathic Brain of Psychopaths: From Social Science to Neuroscience in Empathy. *Frontiers in Psychology, 11*, 695. https://doi.org/10.3389/fpsyg.2020.00695.

van Langen, M. A. M., Wissink, I. B., van Vugt, E. S., Van der Stouwe, T., & Stams, G. J. J. M. (2014). The relation between empathy and offending: A meta- analysis. *Aggression and Violent Behavior, 19*(2), 179–189. https://doi.org/10.1016/j.avb.2014.02.003

Verona, E., Bresin, K., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of Abnormal Psychology, 122*(4), 1088–1093. https://doi.org/10.1037/a0034062.

Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidality in female offenders: mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology, 73*(6), 1065–1073. https://doi.org/10.1037/0022-006X.73.6.1065.

Vitale, J. E., & Newman, J. P. (2001). Using the Psychopathy Checklist—Revised with female samples: Reliability, validity, and implications for clinical utility. *Clinical Psychology: Science and Practice, 8*(1), 117–132. https://doi.org/10.1093/clipsy.8.1.117.

Vitale, J. E., Brinkley, C. A., Hiatt, K. D., & Newman, J. P. (2007). Abnormal selective attention in psychopathic female offenders. *Neuropsychology, 21*(3), 301–312. https://doi.org/10.1037/0894-4105.21.3.301.

Vitale, J. E., MacCoon, D. G., & Newman, J. P. (2011). Emotion facilitation and passive avoidance learning in psychopathic female offenders. *Criminal Justice and Behavior, 38(7*), 641–658. https://doi.org/10.1177/0093854811403590.

Walmsley, Roy. 2017. *World Female Imprisonment List,* (4th ed.). London: Birkbeck College, University of London, Institute for Criminal Policy Research.

Warren, J. I., & South, S. C. (2006). Comparing the Constructs of Antisocial Personality Disorder and Psychopathy in a Sample of Incarcerated Women. *Behavioral Sciences & the Law, 24*(1), 1–20. https://doi.org/10.1002/bsl.663.

Wright, E. M. (2009). The Measurement of Psychopathy: Dimensional and Taxometric Approaches. *International Journal of Offender Therapy and Comparative Criminology, 53*(4), 464-481. https://doi.org/10.1177/0306624X08319416

Yoder, K. J., Harenski, C., Kiehl, K. A., & Decety, J. (2021). Neural responses to morally laden interactions in female inmates with psychopathy. *NeuroImage Clinical, 30*, 102645. https://doi.org/10.1016/j.nicl.2021.102645.

CHAPTER II | ASSESSMENT OF EMOTIONAL PROCESSING IN INCARCERATED WOMEN WITH PSYCHOPATHIC TRAITS

STUDY 2 | EMOTIONAL PROCESSING OF PICTURES AND PSYCHOPATHIC TRAITS IN WOMEN WHO COMMITTED CRIMES

This article was published in *Women & Criminal Justice*. Additionally, the findings of this empirical study were presented as an oral communication at the 25th Annual Conference of the European Society of Criminology – "Logos of crime and punishment" (Athens, Greece) and at the XII National Symposium on Psychological Research (Porto, Portugal).

References:

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2025). Emotional Processing of Pictures and Psychopathic Traits in Women Who Committed Crimes. *Women & Criminal Justice*, 1–24. https://doi.org/10.1080/08974454.2025.2576209

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2025, September 3–6). *Psychopathy and emotional processing in incarcerated women using visual stimuli: A study on valence, arousal, and dominance* [Poster presentation]. 25th Annual Conference of the European Society of Criminology - Logos of crime and punishment. Athens, Greece.

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2025, May 30). *Emotional processing and psychopathy in women who have committed crimes* [Poster presentation]. 4º Psychology Doctoral Symposium U. NORTE. Faculty of Psychology and Education Sciences, University of Porto, Porto, Portugal.

Abstract

Psychopathy involves emotional deficits and affective processing difficulties, yet its relationship with emotional processing in incarcerated women remains underexplored. This study examines associations between emotional processing and psychopathic traits in 164 incarcerated women (18 to 81 years), categorized into higher and lower psychopathic propensities using the Self-Report Psychopathy Scale – Short Form. Participants rated 30 images from the International Affective Picture System on valence, arousal, and dominance using the Self-Assessment Manikin. Women with higher psychopathic propensities showed lower arousal to neutral and pleasant images, greater arousal to threatening stimuli, and hypo-reactivity to suffering-related images. They perceived less control over unpleasant images, with interpersonal, affective, and lifestyle facets increasing arousal. This pattern of hypoarousal and heightened threat reactivity may reflect a dysregulated affective system marked by reduced empathy and increased threat sensitivity. Findings suggest emotional dysregulation may hinder prosocial development and reduce rehabilitation effectiveness in lowering recidivism and promoting reintegration.

Keywords: Emotional Processing; International Affective Picture System; Psychopathic Propensities; Psychopathic Traits; Women who Committed Crimes

Emotional Processing of Pictures and Psychopathic Traits in Women Who Committed Crimes

Introduction

Psychopathy is often described as a non-consensual personality disorder, not only because of ongoing theoretical and empirical debates surrounding its conceptual boundaries, but also due to its lack of formal recognition as a distinct diagnostic category in the major nosological systems (Skeem & Cooke, 2010), such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2022) and the International Classification of Diseases (ICD-11; World Health Organization [WHO], 2019). Instead, traits associated with psychopathy are often subsumed under broader diagnoses such as Antisocial Personality Disorder, raising concerns about the conceptual clarity and clinical utility of the construct (Lilienfeld et al., 2012; Patrick, et al., 2009).

Despite this diagnostic ambiguity, a substantial body of research supports the distinctiveness of psychopathy, emphasizing its core characteristics across three main domains: interpersonal (e.g., manipulative, grandiose, and arrogant behavior), affective (e.g., emotional detachment, lack of guilt, and absence of empathy and remorse), and behavioral features (e.g., impulsivity, irresponsibility, and disregard for social and moral norms) (Hare, 2003). Individuals with psychopathic traits often exhibit a combination of emotional detachment and a chronic need for stimulation, which manifests in impulsive, sensation-seeking behaviors and a persistent pursuit of excitement and novelty (Fowles & Dindo, 2006; Blair, 2005). This emotional aloofness, coupled with disinhibited and thrill-driven tendencies, contributes to a heightened risk for antisocial and criminal behaviors (Hare, 2003).

Gender seems to play a significant role in the manifestation of psychopathy, with women typically scoring lower on psychopathy scales than men, possibly due to less overt behavioral traits (Beryl et al., 2014; Wynn et al., 2012). The prevalence of psychopathy in forensic settings is estimated to be around 10.3% among women (Sanz-García et al., 2021), compared to rates ranging from 15% to 30% among men (Vitale et al., 2002). Women generally show lower rates of repeat offenses compared to men (Hicks et al., 2010; Lee & Salekin, 2010), which may reflect differences in the behavioral expression of psychopathic traits.

Women with psychopathic traits often tend to display self-centeredness, shallow emotions, impulsivity, lack of accountability, and manipulative behavior (Guay et al., 2018; Wynn et al., 2012). Research has shown that these women tend to be more likely to commit both violent and non-violent crimes, with a tendency to re-offend (Pinheiro et al., 2022). Some research suggests that women with

psychopathic traits may not display the same emotional processing deficits as men (Sutton et al., 2002). A recent systematic review by Pinheiro et al. (2023b) found that women with psychopathic traits exhibit impairments in emotion recognition, regulation, and categorization, particularly for emotions with negative valence. However, empirical evidence on the relationship between psychopathic traits and emotional processing in women remains limited. Given this gap, the present study seeks to further investigate this relationship.

Emotional Processing and Gender

Emotional experience plays a vital role in shaping perceptions, actions, and connections with others. Early classifications of emotions into categories like happiness, sorrow, and rage were limited in capturing the complexity of emotional experiences (Gaertner et al., 2021; Gonzalez et al., 2020). The Valence-Arousal (VA) model represents emotions on a two-dimensional plane, with valence indicating enjoyment or dissatisfaction, and arousal measuring intensity (Gonzalez et al., 2020). The Valence-Arousal-Dominance (VAD) model, introduced by Russell and Mehrabian (1977), adds dominance to account for control or submissiveness, providing a more nuanced view of emotions (Buechel & Hahn, 2016). This model is crucial for emotional analysis across research and clinical practice.

Research has shown that highly arousing stimuli activate brain regions like the amygdala and prefrontal cortex, regardless of the emotional nature of the stimulus (Sutton et al., 2019). Such activation has been observed in response to various stimulus modalities, including images from the International Affective Picture System (IAPS), emotional facial expressions, and affectively charged words (Bayer & Schacht, 2014; Lang et al., 1998; Pessoa et al., 2002). However, the intensity and specificity of neural responses appear to vary depending on the nature of the stimulus. Evidence indicates that visually salient emotional stimuli, such as facial expressions or interpersonal scenes, evoke more robust and widespread neural responses compared to verbal stimuli. Studies showed that affective images activate the amygdala more intensely than emotionally valenced words, suggesting that the sensory richness and immediacy of visual stimuli potentiate the engagement of subcortical emotional structures (Bayer & Schacht, 2014). Contrary to early theories positing automatic and unconditional emotional reactivity, more recent evidence highlights the modulatory role of attentional resource allocation on these responses. Pessoa et al. (2002) demonstrated that under high attentional load, amygdala responses to emotional faces are significantly attenuated, indicating that emotional salience alone does not guarantee full recruitment of relevant neural structures. These findings underscore the importance of top-down control mechanisms in emotional processing, even in the presence of highly affective stimuli.

Furthermore, emotional processing shows sex differences at both neural and behavioral levels. Neurofunctional studies indicated that women tend to show greater amygdala and prefrontal cortex activation in response to negative or socially relevant stimuli, such as expressions of fear or pain (Whittle et al., 2011; Williams et al., 2005). Moreover, women tend to be more likely to rate such stimuli as more intense and unpleasant (Schienle et al., 2005) and to recall negative emotional events with greater accuracy (van Wingen et al., 2011). In contrast, men exhibited heightened reactivity to positively valenced stimuli, particularly erotic content, with increased activation in the amygdala, hypothalamus, and frontal regions (Fine et al., 2009; Hamann et al., 2004). These differences in brain activation are accompanied by distinct emotional expression patterns: women tend to express emotions more frequently through verbal and facial channels, while men appear more likely to express emotions through actions, including aggressive behavior (Kret & De Gelder, 2012). It is also noteworthy that attributing emotional states to oneself versus others involves partially distinct neural networks. The medial prefrontal cortex is predominantly engaged during self-referential processing, while lateral prefrontal and occipital regions are more active during evaluation of others' emotional states (Ochsner et al., 2004). This pattern suggests potential sex differences in empathic processes and emotional regulation mechanisms.

Psychopathy, Emotional Processing in Women and Criminal Behavior

Psychopathy is characterized by significant emotional deficits, including a diminished capacity for guilt, empathy, and fear, which contribute to impaired interpersonal relationships and an increased risk for criminal behavior (Blair, 2013). Although psychopathy is more prevalent in men, research has emphasized the importance of understanding its manifestation in women, given the differences in how psychopathic traits are expressed and detected by men and women (Beryl et al., 2014; Eisenbarth et al., 2008).

Gender differences in psychopathy can be explained by an interplay of biological and sociocultural factors that shape the manifestation of psychopathic traits and emotional processing (Blair, 2007; Kogler et al., 2023; Verona & Vitale, 2006). Biologically, hormonal variations – particularly in testosterone and estrogen – contribute to distinct emotional reactivity and aggression patterns. Neuroimaging studies further suggested sex-specific differences in the amygdala and prefrontal cortex, regions central to emotional regulation (Blair, 2007; Kogler et al., 2023). The amygdala, in particular, is crucial for processing aversive emotional cues and supporting associative learning related to others' suffering. Hypoactivity in this structure has been consistently linked to core psychopathic traits such as emotional insensitivity, impaired empathy, and difficulty recognizing others' distress (Blair, 2005; Patrick et al., 2009). Dysfunctions in the prefrontal cortex, which governs emotional regulation and inhibitory control,

contribute to impulsivity and disinhibition in individuals with psychopathic traits, reflecting broader executive dysfunctions beyond simple inhibitory deficits (Blair, 2005; Fowles, 2000). These neurobiological features are mirrored in blunted electrodermal responses, particularly in the context of the lifestyle and antisocial dimensions of psychopathy (Fowles, 2000), indicating a reduced autonomic reactivity to environmental cues of threat or punishment. Recent work also suggested that individuals with high levels of psychopathic traits may not merely show reduced reactivity to fear but may actually derive enjoyment from threatening stimuli. According to the Fear Enjoyment Hypothesis (FEH), these individuals – particularly those high in affective-interpersonal traits – may report positive emotional states when exposed to fear-inducing contexts, such as emotionally arousing video clips (Book et al., 2020; Hofmann et al., 2024). Supporting this, psychopathic individuals have been shown to display similar physiological responses to both appetitive and aversive stimuli (Levenston et al., 2000) and may interpret fear-laden situations as exciting or pleasurable (Hosker-Field et al., 2016). This atypical emotional valence attribution may underlie their emotional detachment and interpersonal boldness (Hofmann et al., 2021).

Sociocultural factors, including gender norms and societal expectations, encourage women to adopt more covert and relationally oriented strategies, such as flirtation, emotional manipulation, and exaggeration of femininity, to achieve goals, contrasting with the more overt, physical aggression typically observed in men (Forouzan & Cooke, 2005; Verona & Vitale, 2006). While emotional manipulation is associated with psychopathic traits in both sexes, its underlying mechanisms seem to differ: in men, it is often facilitated by higher emotional intelligence, enabling strategic interpersonal influence, whereas in women, it is more strongly linked to secondary psychopathy, marked by impulsivity, emotional dysregulation, and antisocial tendencies (Grieve & Mahar, 2010). These patterns suggest different forms of emotional dysregulation, with women showing greater emotional instability and relational difficulties, which may foster manipulative behaviors over direct aggression (de Vogel & Lancel, 2016). Within this framework, the motivation for interpersonal dominance emerges as a core component of certain psychopathic profiles (Yildirim & Derksen, 2015), encapsulated in the construct of *Fearless Dominance* – a combination of boldness, assertiveness, and social efficacy (Lilienfeld & Widows, 2005). Although this dimension may be adaptive in some contexts, its interaction with more maladaptive traits such as meanness and disinhibition may contribute to a dysfunctional psychopathic phenotype (Lilienfeld et al., 2012). Additionally, individuals with elevated psychopathic traits, particularly in the antisocial domain, tend to exhibit biased perceptions of interpersonal power and dominance, often interpreting ambiguous emotional expressions as more dominant – a pattern linked to both a desire for control and underlying emotional regulation deficits (Hicks & Drislane, 2018).

These covert expressions may go unnoticed in clinical and forensic settings, raising concerns about underdiagnosis or misclassification of psychopathy in women (Efferson & Glenn, 2018). Hare's (2003) psychopathy four-factor model helps elucidate these manifestations. The interpersonal factor is characterized by manipulative behaviors, superficial charm, pathological lying, egocentrism, and grandiosity, using manipulation to influence, control, and exploit others without empathy or remorse (Kreis & Cooke, 2012). In women, these characteristics tend to manifest more relationally and subtly, with superficial and inconsistent displays of affection often driven by impression management, contrasting with the colder and more domineering presentation typically observed in men, possibly reflecting the influence of gender norms on the expression of psychopathic traits (Guay et al., 2018). Regarding the affective factor, women tend to show greater emotional dysregulation compared to men, which may contribute to interpersonal difficulties and increased manipulative behaviors (Verona & Vitale, 2006). The lifestyle factor is often expressed through less overt behaviors in women than men, such as impulsive sexual activity and unstable relationships, driven by poor emotional regulation (Hare, 2003). Lastly, the antisocial factor tends to manifest differently across genders: while men are more prone to overt physical aggression, women tend to be more likely to engage in relational aggression and emotional manipulation as means of control and goal attainment (Beryl et al., 2014; de Vogel & Lancel, 2016; Forouzan & Nicholls, 2015; Wynn et al., 2012).

Several theoretical frameworks contribute to our understanding of psychopathy's emotional and cognitive underpinnings. The Integrated Emotion System (IES) model posits that amygdala dysfunction impairs the formation of stimulus-reinforcement associations, disrupting the processing of emotional and moral consequences (Blair, 2007; Glenn et al., 2009). The Response Modulation Hypothesis (RMH), on the other hand, attributes impulsivity and goal-focused behavior to attentional deficits in shifting toward peripheral cues (Newman & Lorenz, 2003). The Dual-Process Model integrates affective impairments (e.g., lack of empathy, low emotional reactivity) with cognitive deficits (e.g., disinhibition), implicating both the amygdala and prefrontal cortex (Fowles & Dindo, 2006; Patrick et al., 2009). The Low-Fear Hypothesis further highlights reduced fear responses as a core mechanism of impaired avoidance learning and increased aggression (Lykken, 1995), while the Fear Enjoyment Hypothesis expands this by suggesting that fear itself may be experienced as pleasurable in some psychopathic individuals (Hosker-Field et al., 2016). Empirical studies supported these models, consistently revealing deficits in emotion recognition – especially fear and sadness – among individuals with elevated psychopathic traits (Eisenbarth et al., 2008; Pinheiro et al., 2023b). Interestingly, some studies report better recognition of anger, which may reflect strategic or instrumental uses of emotional cues (Igoumenou et al., 2017). Moral cognition in

psychopathy is often utilitarian, prioritizing outcomes over empathy, with reduced sensitivity to others' suffering (Glenn et al., 2009). In women, this moral style also emerges, particularly in situations involving personal harm, suggesting a gender-specific interaction between psychopathy and moral reasoning (Seara-Cardoso et al., 2013).

Taken together, these emotional, cognitive, and moral deficits contribute to the expression of antisocial and, in some cases, criminal behavior among women with psychopathic traits. Although violent offences are less prevalent in women, research shows that some women with elevated psychopathic traits engage in persistent criminal trajectories marked by emotional manipulation, relational aggression, neglectful parenting, and, in more severe cases, physical violence (DeLisi, 2009; Reidy et al., 2011). These behaviors are often sustained by low empathy, impulsivity, and an increased tolerance for instrumentalizing others (Pinheiro et al., 2023a). The reduced emotional responsivity to signs of distress, combined with utilitarian moral reasoning, appears to lower natural inhibitions against harming others, thus facilitating aggressive and antisocial acts when perceived as instrumental (Glenn et al., 2009; Seara-Cardoso et al., 2013). Furthermore, the covert and relational nature of aggression in women may hinder early detection and intervention in clinical and forensic contexts (de Vogel & Lancel, 2016; Forouzan & Nicholls, 2015). Understanding the interplay between emotional deficits, moral deviation, and criminal behavior is thus essential for developing gender-sensitive assessment and intervention strategies. Despite these advancements, research on emotional processing deficits in women with psychopathic traits remains limited compared to studies on men, highlighting the need for further investigation into gender-specific mechanisms, including neural, physiological, and behavioral factors (Pinheiro et al., 2023b).

Current study

The current study explores the relationship between psychopathic traits and emotional processing in women who committed crimes, specifically examining how they evaluate emotional stimuli in terms of valence, arousal, and dominance. By analyzing responses to standardized visual stimuli categorized as pleasant, unpleasant, and neutral, this research aims to identify distinct patterns or deficits in emotional processing associated with psychopathic traits.

This study is important due to the distinct emotional and behavioral profiles of women with psychopathic traits, highlighting the need for gender-specific research to improve intervention strategies. While much of the existing psychopathy literature focuses on male samples, there is a pressing need to address the psychological and behavioral characteristics of female offenders, especially considering the influence of psychopathic traits on emotional processing and criminal behavior. Studies highlight that women with psychopathic tendencies often display distinct deficits in emotional regulation, interpersonal

functioning, and physiological responses to emotional stimuli, reinforcing the importance of tailored research in this area (Pinheiro et al., 2023b).

To fill these gaps, three hypotheses were formulated. First, (H1) women with higher psychopathy propensities, particularly those high in the interpersonal and affective factors, are predicted to rate unpleasant images as more positive in terms of valence, consistent with evidence suggesting that individuals with elevated psychopathic traits tend to interpret threatening or aversive stimuli in a more positive or appetitive manner (Book et al., 2020; Levenston et al., 2000). This may reflect atypical affective processing and a reduced capacity to assign appropriate emotional value to negative stimuli (Blair, 2005; Hosker-Field et al., 2016; Patrick et al., 2009; Seara-Cardoso et al., 2013). Second, (H2) women with higher psychopathy propensities, especially those exhibiting higher scores in the lifestyle factor, are expected to show lower arousal in response to pleasant, unpleasant, and neutral images, compared to women with lower psychopathy propensities, in line with previous findings indicating reduced autonomic reactivity and emotional under-responsiveness among individuals with elevated psychopathic features (Blair, 2005; Fowles, 2000), reflecting reduced emotional reactivity associated with impulsive behavior and sensation seeking (Levenston et al., 2000). Third, (H3) women with higher psychopathic traits, particularly those with a more pronounced antisocial factor, are expected to rate all images (pleasant, unpleasant, and neutral) as more dominant, reflecting a biased perception of interpersonal power and a heightened motivation for control consistent with emotional dysregulation, impulsivity, and antisocial tendencies characteristic of secondary psychopathy in women (de Vogel & Lancel, 2016; Grieve & Mahar, 2010; Hare, 2003).

Method

Participants

This study was designed as a cross-sectional exploratory investigation. Participants were selected through non-random convenience sampling and met the following inclusion criteria: a) woman; b) age 18 or older; c) currently incarcerated; d) conviction for one or more criminal offenses; e) proficiency in Portuguese with adequate reading skills to complete self-report questionnaires; f) abstinence from substance use for a minimum of six months (to minimize the confounding effects of recent use on cognitive and emotional measures); and g) absence of cognitive impairments (to ensure participants can comprehend and accurately respond to self-report measures).

The sample consisted of 164 incarcerated women, aged between 18 and 81 years (M= 38.75, SD = 11.99). Most participants were Portuguese (76.8%), single (50.6%), and had children (82.3%).

Regarding the education level, 10th, 11th and 12th grades were the most prevalent (35.4%), followed by 7th, 8th, and 9th grades (20.1%). Most participants were convicted (*n*= 127), with sentences ranging from 9 to 300 months (*M*=93.55, *SD*= 64.88). Regarding the types of crimes committed, a significant proportion were involved in non-violent crimes (64.4%), with drug trafficking being the most frequent (47.7%). Among those who committed violent crimes (36.6%), homicide was the most prevalent (14.0%).

Table 1

Sociodemographic Characteristics of Participants

Variables	*n*	%
Marital Status		
Single	83	50.6
Married / Civil Union	51	31.1
Divorced/Separated	22	13.4
Widowed	8	4.9
Nationality		
Portuguese	126	76.8
Brazilian	26	15.9
Others	12	7.3
Education		
Uneducated	4	2.4
1st, 2nd, 3rd, and 4th grade	29	17.7
5th and 6th grade	29	17.7
7th, 8th, 9th grade	33	20.1
10th, 11th, and 12th grade	58	35.4
Bachelor's or Master's Degree	11	6.7
Children [a]	135	82.3

Note. N= 164 participants.

[a] Reflects the number and percentage of participants answering "yes" to this question.

Table 2

Juridical-Legal Characteristics of Participants

Variables	*n*	%	Range
Legal Situation			
Conviction	127	77.4	-
Length of sentence [a]	127		9 to 300 months
Preventive	37	22.6	-
Conviction			
Violent crimes	60	36.6	-
Murder	23	14.0	-
Non-violent crimes	104	64.4	-
Drug trafficking	77	47.7	-
Prison confinement			
Age of first arrest	154[b]	-	16 to 81 years old
Criminal Status			
Recidivism	35	21.3	-
Recidivism of the same crime	23	14.0	-
Recidivism of different crime	12	7.3	-
First-time	129	78.7	-

Note. M= Means. *SD* = Standard Deviation.

[a] Reflects the number and percentage of participants (*n*= 127) convicted with defined sentence duration.

[b] Reflects the number of participants (*n*=154) that answer the question.

Procedure

The present study was approved by the University's Research Ethics Committee in Social and Human Sciences (CEICSH 153/2022).

Following ethical approval, authorization was obtained from the General Directorate of Reintegration and Prison Services – Ministry of Justice (DGRSP-MJ) to collect data within prisons. The study was conducted across four national women's prisons in Portugal, encompassing a total prison population of 906 women at the time of data collection (2023), and was carried out in full compliance with Portuguese legislation and the ethical principles outlined in the Declaration of Helsinki.

Data collection was organized into four distinct phases, typically completed within a single day. Phases one and two were conducted in the morning, followed by phases three and four in the afternoon. In the first phase, participants were invited to prison schoolrooms, which had been identified as the most appropriate settings for conducting the study. They were provided with a comprehensive explanation of the study's objectives, procedures, and phases, with particular emphasis on the voluntary, anonymous, and non-mandatory nature of participation. No incentives or compensation were offered. Individuals who

chose not to participate were invited to leave, while those who agreed to take part were given written informed consent forms to formally indicate their willingness to participate.

In the second phase, visual stimuli were presented in the prison schoolrooms using a tablet and a projector. Prior to viewing the 30 images, participants were informed that the content would include pleasant, unpleasant, and neutral images, some of which might evoke discomfort. They were also reminded of their right to withdraw from the study at any point. A researcher was present throughout the session to provide assistance and ensure participants' well-being. Participants were trained to use the Self-Assessment Manikin (SAM; Bradley & Lang, 1994) to evaluate emotional responses to the images. Each image was displayed for six seconds, preceded by five-second preparatory slide instructing participants to "Get ready to begin. Identify line 4200 on your answer sheet". Following each image, a 15-second assessment slide prompted participants to rate their emotional responses using the SAM and to select three illustrations that best represented the emotions elicited. The 30 experimental images were then presented in the same sequence for evaluation. In the third phase, participants completed a battery of self-report instruments, including the Self-Report Psychopathy Scale-Short Form (SRP-SF) and the Social Desirability Scale (EDS-20). These assessments were administered either in prison schoolrooms or in private offices located within the prison wings, depending on availability. The fourth and final phase involved individual interviews designed to collect detailed sociodemographic data, legal and criminal history, and other relevant background information. These interviews were typically conducted in private offices or designated visiting areas within the prison. Throughout all group sessions, a minimum of two researchers were present to address questions and provide support as needed.

Measures

Sociodemographic and Juridical-Legal Questionnaire

A comprehensive questionnaire was used to collect sociodemographic (age, marital status, nationality, educational qualifications) and legal information (criminal history, length of sentence, recidivism). This information was collected through individual interviews with each participant, ensuring consistent and accurate data collection.

Self-Report Psychopathy Scale – Short Form (SRP-SF)

The Self-Report Psychopathy Short-Form (SRP-SF) (Seara-Cardoso et al., 2020) is a 29-item self-report instrument based on the four-factor structure of the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 2003). It assesses four distinct dimensions of psychopathy: the interpersonal factor (INT), which captures traits such as superficial charm, manipulativeness, and grandiosity (e.g., *"I would get a kick out*

of 'scamming' someone"); the affective factor (AFF), reflecting emotional deficits including lack of remorse, shallow affect, and reduced empathy (e.g., *"I never feel guilty over hurting others"*); the lifestyle factor (LIF), which relates to impulsivity, sensation seeking, and a parasitic lifestyle (e.g., *"I keep getting in trouble for the same things over and over"*); and the antisocial factor (ANT), characterized by poor behavioral control, early conduct problems, and overt antisocial behaviors (e.g., *"I have threatened people into giving me money, clothes, or makeup"*). The items are assessed on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with total scores ≥70 indicating higher psychopathy propensities. The Portuguese version showed acceptable psychometric properties, with Cronbach's alpha ranging from .71 to .76 for the subscales and .87 for the total scale (Seara-Cardoso et al., 2020). In this study, the total scale showed high internal consistency (α = .87), while the INT (α = .76) and the LIF (α = .74) subscales showed acceptable values, and the AFF (α = .54) and the ANT (α = .57) subscales showed lower consistency.

Social Desirability Scale (EDS-20)

The EDS-20 (Almiro et al., 2017) is a self-report instrument designed to assess individuals' tendency to respond in a socially desirable manner, capturing both the denial of negative traits and the attribution of positive qualities. The scale consists of 20 dichotomous response items (''Yes''/''No''). Example items include questions such as, *"Have you ever cheated in a game?"* and *"Have you ever taken advantage of someone?"*. The scale demonstrated good psychometric properties (Almiro et al., 2017). In the current sample, a Cronbach's alpha of .88 was found.

International Affective Picture System (IAPS)

The IAPS database (Lang et al., 1997) comprises 1,196 high-resolution color photographs encompassing a wide range of content across the affective spectrum. Developed from a dimensional perspective of emotion, the IAPS primarily focuses on the dimensions of valence (from happy to sad), arousal (from excited to calm), and dominance (from dominated to dominant), providing a comprehensive tool for assessing affective reactions across various emotional stimuli (Bradley & Lang, 2007). In this study, 30 images were selected from the IAPS, based on prior research included in a systematic review (Pinheiro et al., 2024) on emotional processing and psychopathy in women using IAPS stimuli. This approach ensured the relevance and validation of the images in similar experimental contexts. The final selection comprised 10 pleasant (e.g., ice cream, polar bears), 10 unpleasant (e.g., dead body, corpse), and 10 neutral images (e.g., zipper, scarves). To control for presentation effects, the images were presented in a fixed order across all participants. Care was taken to avoid presenting more than two

images of the same valence consecutively, and the sequence was arranged to end with a pleasant image to minimize potential negative emotional impact at the end of the task.

Self-Assessment Manikin (SAM)

The SAM (Bradley & Lang, 1994) assesses three dimensions – valence, arousal, and dominance – using a nine-point scale. Valence ranges from 1 (sad) to 9 (happy), arousal ranges from 1 (low arousal) to 9 (high arousal), and dominance follows a reversed scale, with 1 indicating a feeling of being dominated and 9 representing high control. Participants selected the SAM figures that best represented their emotional experience. In the present study, the SAM revealed good psychometric properties in the three dimensions under analysis: Valence (α= .76), Arousal (α= .91), and Dominance (α= .93).

Data analysis

Data analysis was performed using SPSS version 29. For this study, the sample was split into two groups based on a cut-off score of 70 points on the SRP-SF (Seara-Cardoso et al., 2020). Participants who scored 70 or higher were classified as having greater psychopathic propensities, while those scoring below 70 were classified as having lower psychopathic propensities. This classification enables a comparative analysis of emotional processing and psychopathic traits between the two groups.

Descriptive statistics, including means, standard deviations, and frequencies, were calculated to summarize participants' demographic and criminal justice characteristics, psychopathy scores, and emotional responses across the dimensions of valence, arousal, and dominance. To examine differences in emotional processing between women with lower and higher psychopathic propensities, independent samples t-tests and Mann-Whitney U tests were performed for each emotional dimension (valence, arousal, and dominance) on pleasant, unpleasant, and neutral images. A Multivariate Analysis of Covariance (MANOVA) was conducted to assess the impact of social desirability on emotional processing, controlling any potential influence of socially desirable responses, a common tendency in this study population. Finally, Spearman correlation coefficients were calculated to explore associations between psychopathy traits (total and factor scores) and evaluation of pleasant, unpleasant, and neutral images, based on the dimensions of valence, arousal, and dominance.

Results

Descriptive Data

Of the sample, 18.9% (n= 31) of the women had higher psychopathic propensities and 81.1% (n= 133) of the women had lower psychopathic propensities.

As seen in Table 3, participants scored an average of 57.25 (*SD* = 15.93) on the SRP-SF, with the lifestyle factor showing the highest mean score. On the EDS-20, the mean total score was 10.93 (*SD* = 5.25), suggesting a moderate tendency toward socially desirable responses. Regarding emotional responses measured by the SAM, the valence dimension had a mean score of 7.85 (*SD* = 1.17) for pleasant images and 2.03 (*SD* = 1.18) for unpleasant images. In the arousal dimension, unpleasant images elicited a higher mean score (*M* = 7.42; *SD* = 1.70) compared to pleasant images (*M* = 6.75; *SD* = 1.87). For the dominance dimension, pleasant images had a mean score of 6.09 (*SD* = 2.36), slightly lower than neutral images (*M* = 6.30; *SD* = 2.30) but higher than unpleasant images (*M* = 4.71; *SD* = 2.25).

Table 3

Psychometric Properties and Sample Descriptive Statistics for Study Measures, Scales, and Subscales

Measures	Cronbach's α (original study)	Cronbach's α (present study)	*M*	*SD*	Min	Max
SRP-SF						
INT	.76	.76	13.10	5.04	5	32
AFF	.70	.54	12.95	3.95	7	27
LIF	.76	.74	15.60	5.22	7	31
ANT	.71	.57	13.01	4.51	7	27
Total	.87	.87	57.25	15.93	31	122
EDS-20						
Total	.85	.88	10.93	5.25	0	20
SAM						
Valence	-	.76			-	-
Pleasant	-	.81	7.85	1.17	2	9
Unpleasant	-	.84	2.03	1.18	1	9
Neutral	-	.73	5.79	1.18	2	9
Arousal	-	.91			-	-
Pleasant	-	.87	6.75	1.87	1	9
Unpleasant	-	.88	7.42	1.70	1	9
Neutral	-	.88	4.51	1.96	1	9
Dominance	-	.93			-	-
Pleasant	-	.88	6.09	2.36	1	9
Unpleasant	-	.89	4.71	2.25	1	9
Neutral	-	.89	6.30	2.30	1	9

Note. Min= Minimum; Max= Maximum; SRP-SF= Self-Report Psychopathy Scale – Short Form; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; EDS-20= Social Desirability Scale - 20 Items; SAM= Self-Assessment Manikin.

Differences in the emotional processing of women with higher and lower psychopathic propensities by type of image

As seen in Table 4, the t-tests results revealed no significant differences between the groups in the valence dimension across all image types (pleasant, unpleasant, and neutral). However, in the arousal dimension, a significant difference was found for neutral images, t (162) = 2.274, p = .024, d = 1.933, 95% CI [. 116, 1. 638], indicating that women with higher psychopathic propensities exhibited lower arousal levels when viewing neutral images. Furthermore, a significant difference in the dominance dimension was observed for unpleasant images, t (56, 367) = 3,162, p = 0.003, d = 2.208, 95% CI [. 434, 1933], suggesting that women with higher psychopathic propensities reported lower dominance scores in response to unpleasant images.

Table 4

Differences Between Women with Lower and Higher Psychopathy Propensities *in the Dimensions of Valence, Arousal, and Dominance Using Independent Samples t-Test.*

SAM	Group Women (lower psychopathy propensities) (*n*= 133)	Group Women (higher psychopathy propensities) (*n*=31)	*t* (*df*)	*p*	Cohen's *d*	95% CI
	Mean (*SD*)	Mean (*SD*)				
Valence [a]						
Pleasure	7.86 (1.21)	7.82 (1.02)	.182 (162)	.856	1.175	[-.420, .505]
Unpleasure	2.03 (1.26)	2.04 (.82)	-.012 (162)	.991	1.188	[-.471, .465]
Neutral	5.82 (1.23)	5.68 (.96)	.576 (162)	.566	1.184	[-.330, .602]
Arousal [a]						
Pleasure	6.78 (1.89)	6.64 (1.77)	.381 (162)	.704	1.871	[-.595, .879]
Unpleasure	7.48 (1.67)	7.16 (1.83)	.941 (162)	.348	1.699	[-.350, .988]
Neutral	4.68 (1.94)	3.80 (1.90)	2.274 (162)	.024	1.933	[.116, 1.638]
Dominance [a]						
Pleasure	6.20 (2.41)	5.62 (2.13)	1.227 (162)	.221	2.359	[-.352, 1.507]
Unpleasure	4.94 (2.23)	3.75 (1.76)	3.162 (56.367)	.003	2.208	[.434, 1.933]
Neutral	6.28 (2.34)	6.38 (2.14)	-.207 (162)	.836	2.307	[-.1.004, .813]

Note. [a] Reflects the average of the responses given by the participants to the 10 pleasant, unpleasant, and neutral images depending on the dimension of valence, arousal, and dominance. The t-test statistics include the *t*-value, *p*-value, effect size (Cohen's *d*), and 95% confidence interval (95% CI) for the mean difference.

The MANOVA results indicated that social desirability had a minor but significant effect on the dimensions of valence, arousal, and dominance, suggesting a limited influence on these variables, Λ= 0.117, $F(9,153) = 2.253$, $p = 0.021$, $\eta^2 = 0.117$.

Differences in emotional processing of women with higher and lower psychopathic propensities traits by specific image

Mann-Whitney U tests revealed statistically significant differences between the groups in the responses to specific pleasant images: 2080 (babies), 7200 (brownie), and 5760 (nature). Women with lower psychopathic propensities scored higher on the dominance dimension for the image of babies, U = 1537.000, $p = 0.021$, as well as for the image of a brownie compared to those with higher psychopathic propensities, U = 1554.000, $p = 0.024$. Regarding the nature image, differences between the two groups were marginally significant in the arousal dimension, with women with lower psychopathic propensities, U = 1642.500, $p = 0.058$, revealing greater emotional activation in response to the image, whereas the group with higher psychopathic propensities exhibited a more blunted emotional response, possibly reflecting reduced affective reactivity to pleasant stimuli (see Table A in Supplementary Files).

Table A

Mann-Whitney U test results: comparison of evaluations of pleasant images in the dimensions of valence, arousal, and dominance between women with lower and higher propensity for psychopathic traits

Pleasure images	Dimension	Group Women (with a lower propensity for psychopathy) (n= 133)	Group Women (with a higher propensity for psychopathy) (n=31)	*U*	*Z*	*p*
		Mean Rank	Mean Rank			
4250	Valence	82.14	84.03	2014.000	-.214	.830
	Arousal	84.78	69.67	1625.000	-1.622	.105
	Dominance	81.13	85.85	1879.500	-.524	.600
7330	Valence	84.00	76.05	1861.500	-1.046	.296
	Arousal	83.76	77.08	1893.500	-.774	.439
	Dominance	85.12	68.18	1580.500	-1.839	.066
1441	Valence	83.04	80.18	1989.500	-.414	.679
	Arousal	82.67	81.76	2038.500	-.104	.917
	Dominance	84.71	73.02	1767.500	-1.303	.193
1460	Valence	81.79	85.56	1966.500	-.487	.626
	Arousal	83.48	78.27	1930.500	-.585	.559

	Dominance	82.70	81.66	2035.500	-.113	.910
	Valence	82.57	82.19	2052.000	-.055	.956
2080	Arousal	82.02	84.56	1997.500	-.322	.747
	Dominance	86.44	65.58	1537.000	-2.308	.021
	Valence	81.67	83.42	2002.000	-.212	.832
5830	Arousal	81.60	81.10	2018.000	-.057	.955
	Dominance	84.77	70.19	1680.000	-1.619	.105
	Valence	85.29	70.55	1691.000	-1.865	.062
5760	Arousal	85.65	68.98	1642.500	-1.896	.058
	Dominance	83.08	80.00	1984.000	-.351	.726
	Valence	84.42	71.71	1727.000	-1.572	.116
1602	Arousal	84.82	72.56	1753.500	-1.341	.180
	Dominance	83.10	77.32	1901.000	-.646	.518
	Valence	83.82	76.85	1886.500	-.816	.415
7580	Arousal	82.22	83.69	2024.500	-.162	.871
	Dominance	84.37	74.58	1813.000	-1.102	.270
	Valence	83.37	78.77	1946.000	-.618	.537
7200	Arousal	80.09	92.84	1741.000	-1.562	.118
	Dominance	86.32	66.13	1554.000	-2.253	.024

Note. The following images were selected as pleasant images: 4250 – attractive female; 7330 – ice cream; 1441 – polar bears; 1460 – kitten; 2080 – babies; 5830 – sunset; 5760 – nature; 1602 – butterfly; 7580 – desert; 7200 – brownie.

Statistically significant differences were also observed in the evaluation of unpleasant images across valence, arousal, and dominance dimensions. For image 6010 (jail), women with higher psychopathic propensities reported higher arousal scores compared to those with lower psychopathic propensities, $U = 1634.00$, $p = .035$. In contrast, for the image depicting a corpse (9490), women with higher psychopathic propensities rated it lower on the arousal dimension than the lower psychopathic propensities group, $U = 1559.50$, $p = .032$. However, they assigned higher valence scores to this image compared to women with lower psychopathic propensities, $U = 1358.50$, $p = .002$, who in turn perceived the image as more arousing and emotionally unpleasant.

For the dominance dimension, women with higher psychopathic propensities assigned significantly lower ratings to several unpleasant images, including 3180 (battered female), $U = 1502.50$, $p = .018$; 3350 (infant), $U = 1474.50$, $p = .013$; 9410 (soldier), $U = 1535.50$, $p = .022$; 6020 (electric chair), $U = 1482.00$, $p = .012$); and 3150 (mutilation), $U = 1514.50$, $p = .018$ (see Table B in Supplementary Files).

Table B

Mann-Whitney U test results: comparison of evaluations of unpleasant images in the dimensions of valence, arousal, and dominance between women with lower and higher propensity for psychopathic traits

Unpleasure images	Dimension	Group Women (with a lower propensity for psychopathy) (*n*= 133)	Group Women (with a higher propensity for psychopathy) (*n*=31)	*U*	*Z*	*p*
		Mean Rank	Mean Rank			
6010	Valence	84.02	75.97	1859.000	-1.059	.289
	Arousal	85.71	68.71	1634.000	-2.105	.035
	Dominance	85.00	69.21	1649.500	-1.732	.083
3180	Valence	81.59	86.42	1940.000	-.691	.489
	Arousal	80.27	89.35	1818.000	-1.112	.266
	Dominance	86.12	64.47	1502.500	-2.356	.018
3140	Valence	83.95	76.26	1868.000	-1.259	.208
	Arousal	84.12	75.55	1846.000	-1.084	.278
	Dominance	85.15	71.11	1708.500	-1.526	.127
3350	Valence	83.41	78.58	1940.000	-.660	.509
	Arousal	82.39	80.34	1994.500	-.269	.788
	Dominance	86.33	63.56	1474.500	-2.487	.013
3120	Valence	82.86	78.32	1932.000	-.658	.511
	Arousal	82.75	81.42	2028.000	-.172	.864
	Dominance	85.10	68.81	1637.000	-1.777	.076
9410	Valence	83.15	79.73	1975.500	-.529	.597
	Arousal	83.40	78.65	1942.000	-.667	.505
	Dominance	86.45	65.53	1535.500	-2.290	.022
9490	Valence	77.21	105.18	1358.500	-3.156	.002
	Arousal	85.69	66.31	1559.500	-2.144	.032
	Dominance	82.61	82.03	2047.000	-.063	.950
6020	Valence	81.94	84.92	1986.500	-.364	.716
	Arousal	80.63	85.18	1916.500	-.531	.596
	Dominance	86.86	63.81	1482.000	-2.514	.012
3530	Valence	79.82	94.00	1705.000	-1.700	.089
	Arousal	85.29	70.53	1690.500	-1.653	.098
	Dominance	84.39	74.39	1810.000	-1.082	.279
3150	Valence	82.35	83.15	2041.500	-.109	.913
	Arousal	83.60	77.79	1915.500	-.693	.488
	Dominance	86.61	64.85	1514.500	-2.368	.018

Note. Unpleasant images comprised images 6010 – jail; 3180 – battered female; 3140 – dead body; 3350 – infant; 3120 – dead body; 9410 – soldier; 9490 – corpse; 6020 – electric chair; 3530 – attack; 3150 – mutilation.

When evaluating neutral images, significant differences in the arousal dimension were observed. Specifically, women with higher psychopathic propensities rated image 2190 (man) lower on arousal, U = 1465.50, p = 0.010. A similar pattern was found for image 7179 (rug), which also received lower arousal ratings from this group, U = 1,605.50, p = 0.049 (see Table C in Supplementary Files).

Table C

Mann-Whitney U test results: comparison of evaluations of neutral images in the dimensions of valence, arousal, and dominance between women with lower and higher propensity for psychopathic traits

Neutral images	Dimension	Group Women (with a lower propensity for psychopathy) (n= 133)	Group Women (with a higher propensity for psychopathy) (n=31)	U	Z	p
		Mean Rank	Mean Rank			
7020	Valence	82.59	82.13	2050.000	-.051	.959
	Arousal	84.15	69.34	1576.000	-1.571	.116
	Dominance	80.95	86.65	1855.500	-.631	.528
7045	Valence	84.94	72.03	17.37.000	-1.633	.102
	Arousal	84.86	72.39	1748.000	-1.407	.159
	Dominance	82.30	83.37	2034.500	-.119	.905
7205	Valence	82.06	84.40	1002.500	-.261	.794
	Arousal	85.78	68.42	1625.000	-1.876	.061
	Dominance	82.41	82.87	2050.000	-.051	.959
7179	Valence	85.33	70.35	1685.000	-1.707	.088
	Arousal	85.93	67.79	1605.500	-1.972	.049
	Dominance	82.71	81.61	2034.000	-.120	.904
7052	Valence	84.47	74.05	1799.500	-1.189	.235
	Arousal	84.39	74.39	1810.000	-1.084	.278
	Dominance	81.93	84.94	1986.000	-.331	.741
2190	Valence	82.09	84.24	2007.500	-.243	.808
	Arousal	86.98	63.27	1465.500	-2.565	.010
	Dominance	81.27	87.79	1897.500	-.714	.475
2200	Valence	81.82	85.42	1971.000	-.399	.690
	Arousal	85.28	70.56	1691.500	-1.599	.110
	Dominance	83.06	80.11	1987.500	-.329	.742
7130	Valence	82.88	80.87	2011.000	-.241	.810
	Arousal	84.47	74.06	1800.000	-1.136	.256
	Dominance	83.73	77.21	1897.500	-.718	.473
7170	Valence	83.71	77.29	1900.000	-.708	.479
	Arousal	84.59	73.58	1783.500	-1.196	.232
	Dominance	82.09	84.26	2007.000	-.241	.809
7710	Valence	83.81	76.87	1887.000	-.778	.436
	Arousal	83.59	77.84	1917.000	-.636	.524

Dominance	84.63	73.35	1778.000	-1.253	.210

Note. Neural images comprised images 7020 – fan; 7045 – zipper; 7205 – scarves; 7179 – rug; 7052 – clothespins; 2190 – man; 2200 – neutral face; 7130 – truck; 7170 – light blue; 7710 – bed.

Associations Between Psychopathic Traits and their Factors and the Evaluation of Pleasant, Unpleasant, and Neutral Emotional Stimuli across the Dimensions of Valence, Arousal, and Dominance

As seen in Table 5, the results showed that scores on the valence dimension for pleasant images were negatively correlated with the lifestyle factor of psychopathy, $r = -170$, $p < 0.05$. This indicates that women with higher scores on the lifestyle factor tended to assign lower valence scores to pleasant images. For unpleasant images in the valence dimension, statistically significant positive correlations were observed with the interpersonal, $r = .182$, $p < 0.05$, affective, $r = .164$, $p < 0.05$, and lifestyle factors, $r = 0.170$, $p < 0.05$, and total psychopathy scores, $r = .188$, $p < 0.05$. These findings suggest that women with higher psychopathic traits tended to perceive unpleasant images as less negative, potentially reflecting affective blunting, emotional detachment, or atypical processing of aversive emotional stimuli.

In the arousal dimension, only unpleasant images showed statistically significant negative correlations with the interpersonal, $r = -.181$, $p < 0.05$, and affective factors, $r = -.154$, $p < 0.05$. This suggests that women with higher scores on these factors tend to evaluate unpleasant images as less arousing.

For the dominance dimension, pleasant images displayed statistically significant negative correlations with the interpersonal factor, $r = -.202$, $p < 0.05$. Women with higher scores on the interpersonal factor rated pleasant images with lower dominance, indicating a diminished sense of control over the images. Furthermore, significant negative correlations were observed with the lifestyle factor, $r = -.270$, $p < 0.01$, and total psychopathy scores, $r = -.218$, $p < 0.01$, suggesting that women with higher scores on these measures also evaluated pleasant images as having lower dominance. Unpleasant images revealed statistically significant negative correlations with the antisocial factor, $r = -.161$, $p < 0.05$, and total psychopathy scores, $r = -.157$, $p < 0.05$, indicating that women with higher scores on the antisocial factor and overall psychopathy traits tend to perceive unpleasant images with lower dominance. For neutral images, a significant negative correlation was found with the lifestyle factor, $r = -.207$, $p < 0.01$, suggesting that women with higher lifestyle factor scores tend to rate neutral images with lower dominance.

Table 5

Spearman Correlations Between Psychopathic Traits and Factors and the Evaluation of Pleasant, Unpleasant, and Neutral Emotional Stimuli in the Dimensions of Valence, Arousal, and Dominance (n=164)

		Valence			Arousal			Dominance		
		Pleasure	*Unpleasure*	Neutral	*Pleasure*	*Unpleasure*	Neutral	*Pleasure*	*Unpleasure*	Neutral
SRP-SF	INT	-.068	.182*	.069	-.054	-.181*	-.029	-.202*	-.130	-.110
	AFF	-.081	.164*	.028	-.110	-.154*	-.062	-.077	-.065	-.047
	LIF	-.170*	.170*	-.040	-.054	-.123	.010	-.270**	-.093	-.207**
	ANT	-.001	.080	-.041	.091	.031	.052	-.082	-.161*	-.091
	Total	-.118	.188*	-.020	-.048	-.137	-.020	-.218**	-.157*	-.151

Note. [a] Reflects the average of the participant's responses to the 10 pleasant, unpleasant, and neutral images depending on the dimension of valence, arousal, and dominance.

*p <.05, **p <.01

Discussion

The present study aimed to explore the relationship between emotional processing and psychopathic traits in women who committed crimes, focusing specifically on how these women evaluate emotional stimuli in terms of valence, arousal, and dominance. By analyzing emotional responses to standardized visual stimuli categorized as pleasant, unpleasant, and neutral, the study sought to identify distinct patterns or deficits in emotional processing that may be associated with psychopathic traits. In addition, this study aimed to provide information on the unique emotional and behavioral profiles of women with psychopathic traits, thus filling gaps in the existing literature, which focuses predominantly on male samples.

In this study, most participants exhibited lower psychopathic propensities, with only a small percentage of women displaying higher psychopathic propensities. This finding align with patterns typically observed in female samples, where psychopathic traits are less prevalent compared to male populations (Beryl et al., 2014; Guay et al., 2018). Among the psychopathy factors, the lifestyle factor exhibited the highest scores. Women with elevated psychopathy levels, particularly those scoring high on the lifestyle factor, often display impulsive behaviors and a disregard for social norms. These tendencies are linked to risk-taking behaviors such as substance abuse, unstable relationships, and impulsive sexual activity, all of which contribute to a pattern of criminality (Pinheiro et al., 2023a). This behavioral profile reflects a broader tendency toward immediate gratification and an aversion to long-term consequences, which are core characteristics of the lifestyle factor of psychopathy.

Our first hypothesis - that women with higher psychopathic propensities would rate unpleasant images as more positive in valence - was not supported, as no significant group differences were found in valence ratings of unpleasant images. This hypothesis was grounded in the Fear Enjoyment Hypothesis (Hosker-Field et al., 2016) and prior research suggesting that individuals with pronounced psychopathic traits may interpret threatening stimuli more positively, reflecting an atypical affective processing style (Book et al., 2020; Hosker-Field et al., 2016). One possible explanation for the null findings lies in attentional processes: individuals high in psychopathy are known to allocate limited attentional resources to emotionally salient stimuli unless their attention is explicitly guided (Baskin-Sommers et al., 2011; Newman et al., 2010), potentially dampening the expected effect. This attentional insensitivity may result in a more superficial and less differentiated evaluation of valence, even when stimuli elicit heightened arousal or perceptions of dominance. Additionally, neurofunctional evidence suggests that individuals with psychopathic traits exhibit hyporesponsivity in the amygdala - a region critically involved in processing emotional salience and encoding valence, particularly in response to threatening or morally salient stimuli

(Blair et al., 2005; Kiehl, 2006). Such neural dysfunction may contribute to reduced emotional engagement with stimuli, irrespective of valence, lending support to theories that propose a generalized deficit in emotional reactivity among individuals with psychopathy (Herpertz et al., 2001; Verona et al., 2004).

On the other hand, significant differences were observed in the arousal dimension, particularly with neutral images. Women with higher psychopathic propensities exhibited significantly lower arousal levels compared to those with lower propensities. These results partially support the second hypothesis, which predicted reduced arousal levels in women with higher psychopathic propensities. This finding is consistent with previous research indicating diminished emotional reactivity to neutral stimuli in individuals with psychopathic traits (Fowles & Dindo, 2006). A possible explanation for the observed reduction in arousal may lie in the influence of past emotional experiences, often referred to as "ghost memories" - internalized, frequently unconscious representations of early adverse or traumatic experiences, particularly those involving attachment figures (Lieberman et al., 2005). Ghost memories can act as emotional “shadows” from the past that shape and modulate current emotional responses, potentially accounting for the blunted arousal to neutral images observed in our sample (Narayan et al., 2017). Furthermore, this diminished arousal is consistent with psychopathic traits such as sensation seeking, wherein individuals require more intense or novel stimuli to achieve optimal levels of emotional activation (Lykken, 1995).

In the dominance dimension, group differences also emerged, with women exhibiting higher psychopathic propensities tending to report lower dominance ratings, particularly in response to unpleasant images. This finding contradicts our third hypothesis, which anticipated higher dominance scores among women with elevated psychopathic traits, given that psychopathy is commonly associated with heightened interpersonal control, manipulativeness, and a fearless approach to social dominance (Hare, 2003; Lilienfeld et al., 2012). One plausible explanation draws on the Response Modulation Hypothesis, which posits that individuals with psychopathic traits have difficulty redirecting attention from goal-directed behavior toward peripheral emotional cues (Blair, 2013). Consequently, these women may fail to detect threat signals promptly, undermining their defensive readiness and creating a subjective sense of diminished control (Levenston et al., 2000). Furthermore, defensive emotional strategies such as disengagement or suppression are often employed by psychopathic individuals to reduce distress elicited by aversive stimuli (Blair et al., 2005; Verona et al., 2013). By emotionally distancing themselves, they effectively reduce conscious engagement with unpleasant content, which paradoxically may feel like losing control rather than exerting dominance. This interpretation aligns with the Low-Fear Hypothesis,

which highlights reduced subjective fear and amygdala hyporesponsivity to aversive stimuli among individuals with psychopathic traits, resulting in blunted defensive reactivity and impaired threat-induced action preparation (Blair et al., 2005; Moul et al., 2012). Additionally, the activation of "ghost memories" can amplify perceived threat and trigger emotional numbing or avoidance, further blunting engagement with unpleasant images (Lieberman et al., 2005; Narayan et al., 2017). Alternatively, attentional deficits in processing emotional stimuli may coexist with a tendency to seek heightened stimulation as compensation for diminished emotional engagement (Baskin-Sommers et al., 2011).

In addition, women with lower psychopathic propensities rated pleasant images, particularly those depicting babies and brownies, with higher dominance scores. This finding suggests that women with lower psychopathic propensities may experience a greater sense of control when viewing pleasant stimuli. These results align with research indicating that lower psychopathic traits are associated with better emotional regulation (Kiehl, 2006) and greater emotional engagement with positive stimuli (Blair et al., 2005). The enhanced emotional reactivity to pleasant images likely improves their perception of control (Patrick et al., 2009).

Regarding unpleasant images, significant differences emerged between women with lower and higher psychopathic propensities. Women with higher psychopathic propensities rated the unpleasant image depicting a jail with higher arousal scores. This is consistent with the observation that individuals with psychopathic traits often exhibit heightened emotional responses to stimuli involving threat or risk (Fowles & Dindo, 2006). This response may reflect a compensatory mechanism for reduced sensitivity and attentional deficits, as corroborated by emotion-modulated startle response paradigms (Newman et al., 2010). Conversely, the image of a corpse elicited lower arousal ratings and higher valence scores in women with higher psychopathic propensities. This finding suggests emotional hyporeactivity to distressing stimuli (Blair et al., 2005), such as death and violence, which typically evoke strong emotional reactions in others (Hare, 2003; Patrick, 2018). Additionally, the higher valence ratings indicate deficits in processing negative stimuli, consistent with previous research showing a tendency to evaluate such stimuli more neutrally or positively (Sutton et al., 2002). The results also show that women with higher psychopathic propensities tend to attribute lower dominance scores to unpleasant images of a battered female and an electric chair. Although individuals with psychopathic traits are often characterized by an elevated sense of control and manipulativeness (Hare, 2003; Lilienfeld et al., 2012), the findings suggest that they may adopt defensive emotional regulation strategies when confronted with unpleasant stimuli, especially those depicting the suffering of others (Kiehl, 2006; Pinheiro et al., 2023b). This defensive emotional regulation may involve atypical physiological reactivity to negative stimuli (Verona et al., 2013)

and the deactivation or suppression of distressing memories, including **"**ghost memories", to avoid experiencing emotional discomfort (Lieberman et al., 2005). However, it is important to consider that certain visual stimuli, such as the image of a battered woman, may have a particular impact on female offender populations, whose life histories are often marked by prior experiences of victimization, including domestic violence, physical abuse, or coercive interpersonal relationships (Caravaca-Sánchez et al., 2019; De Vogel & Lancel, 2016). Such experiences may modulate emotional processing, leading to atypical affective responses – either through progressive desensitization or through emotional avoidance strategies – which could contribute to less negative or less emotionally intense interpretations of these stimuli (Ford & Courtois, 2020). The literature has shown that prolonged exposure to interpersonal violence can affect neurobiological circuits involved in the perception and regulation of emotional pain, particularly in women (Teicher & Samson, 2016), underscoring the importance of considering these experiences in studies assessing emotional responses in this population.

For neutral images, women with higher psychopathic propensities evaluated the images of a man and a rug with lower arousal scores, suggesting these stimuli were perceived as less exciting or emotionally stimulating. This suggests that individuals with psychopathic traits show diminished emotional reactivity to neutral stimuli, reflecting deficits in processing emotionally relevant information (Kiehl, 2006; Patrick, 2018). The reduced arousal may result from the difficulty that individuals with psychopathic traits have in interpreting or responding to ambiguous stimuli, which lack clear emotional significance (Blair et al., 2006). This diminished arousal may also result from the influence of "ghost memories", where past emotional experiences may render neutral stimuli less engaging or emotionally relevant (Narayan et al., 2017). Neutral images, lacking clear emotional significance, are less likely to evoke an emotional response, reinforcing the association between psychopathic traits and emotional detachment and hypo-reactivity to less stimulating, contextually ambiguous stimuli (Kimonis et al., 2020).

The results of this study indicate relevant associations between total psychopathy scores, its factors, and the evaluation of emotional stimuli in the dimensions of valence, arousal, and dominance. Specifically, women with higher scores on the lifestyle factor tend to attribute lower scores on the valence dimension to pleasant images, which suggests a more attenuated emotional response to positive stimuli. This pattern is consistent with the literature, which points to emotional deficits and affective processing difficulties in individuals with high psychopathy (Blair et al., 2005; Patrick, 2018). Regarding the evaluation of unpleasant images in the valence dimension, the results partially support the original hypothesis, which predicted that women with higher traits of psychopathy, particularly those with higher scores in the interpersonal and affective factors, would evaluate unpleasant images more positively,

indicating deficits in responding appropriately to negative emotional stimuli. The results showed that, in addition to the interpersonal and affective factors, the lifestyle factor was also positively correlated with the evaluation of unpleasant images, with greater emotional intensity (higher valence) when confronted with unpleasant stimuli. However, this heightened emotional intensity appears to reflect a distorted emotional response, suggesting that women with high traits in these factors may experience a greater perception of distress, but also exhibit a tendency towards emotional distortion (Patrick, 2018; Verona et al., 2013).

The results of the arousal dimension correlate negatively with the interpersonal and affective factors of psychopathy, indicating that women with higher scores in these factors tend to evaluate unpleasant images with lower arousal. This result does not support our hypothesis that women with higher psychopathic traits, especially those with higher lifestyle factor scores, would show lower arousal levels across all emotional stimuli. This suggests that emotional detachment linked to the interpersonal and affective factors (Hare, 2003; Patrick et al., 2009) may be more closely related to decreased emotional reactivity than to impulsivity and stimulus-seeking behaviors associated with the lifestyle factor (Blair et al., 2005; Lykken, 1995).

Regarding dominance, the significant negative correlations with the lifestyle and antisocial factors indicate a reduced perception of control, especially in response to both pleasant and unpleasant images. These results do not support our hypothesis, as they suggest that women with psychopathy may have difficulty conventionally processing emotional information and presenting an emotional defense against affective reactivity, a characteristic commonly observed in psychopathic individuals (Kiehl, 2006; Patrick et al., 2009).

Conclusions and Future Implications

This study offers valuable insights into the emotional processing patterns of incarcerated women with higher psychopathic propensities an under-researched population, as the majority of psychopathy research has historically focused on male samples (Wynn et al., 2012). The findings reveal distinct emotional reactivity profiles across pleasant, unpleasant, and neutral stimuli. While no significant group differences were observed in valence ratings (happiness or sadness), women with higher psychopathic traits showed notable differences in the arousal and dominance dimensions, suggesting a more complex and nuanced emotional response profile. Specifically, women with higher psychopathic propensities show a reduced emotional response to neutral stimuli and a diminished sense of control in response to unpleasant stimuli, which could indicate a defensive emotional regulation strategy. Evidence from prior research supports the existence of gender differences in psychopathy. For instance, Blair (2007) and

Seara-Cardoso et al. (2013) report that women with psychopathic traits often present greater emotional dysregulation and different autonomic responses to emotional stimuli compared to men. Additionally, studies have found that female offenders with psychopathic characteristics tend to exhibit more affective instability and interpersonal difficulties, contrasting with the often more overt antisocial behavior seen in males (Vitale et al., 2002). These results contribute to a better understanding of how psychopathy manifests in women and underline the need for gender-specific considerations when examining emotional processing and psychopathic traits.

This study also provides further evidence supporting the notion that emotional reactivity in individuals with psychopathic traits is often blunted or distorted. These emotional processing deficits may be linked to broader deficits in emotional regulation and interpersonal functioning, which are critical features of psychopathy. Moreover, the results suggest that the psychopathy lifestyle factor, which is particularly relevant in the context of impulsivity and irresponsibility, may be more strongly associated with emotional detachment and hypo-reactivity to emotional stimuli, especially negative ones.

While our study contributes to the growing body of literature on psychopathy in women, it also underscores several limitations that should be addressed in future research. First, the restrictive nature of the prison context may influence emotional responses and processing, creating an environment that can exacerbate negative emotional responses and affect the interpretation of neutral stimuli, making it impossible to generalize our findings to women outside this specific context. Second, the static visual stimuli (IAPS) used to capture emotional processing may not capture the complexity of emotional processing in psychopathy. In this study, the images were presented in a fixed order across participants to control for presentation effects; however, this may have introduced order effects or individual biases related to specific images. Although care was taken to avoid presenting more than two images of the same valence consecutively and to conclude the task with a pleasant image to reduce potential emotional discomfort, the absence of randomization remains a methodological limitation. Future studies should consider randomizing image presentation for each participant to minimize such biases and improve the robustness of findings. Furthermore, in the current study, the IAPS task was administered in a group setting, where participants viewed the stimuli simultaneously on a shared screen. There is evidence supporting this procedure: a recent systematic review by Branco et al. (2023) reported that approximately 43% of IAPS studies adopted a group-based administration format, demonstrating its feasibility and effectiveness in eliciting emotional responses across diverse cultural contexts. While this approach is employed in different IAPS studies and shows feasibility across different cultural contexts (Branco et al., 2023), it may introduce potential biases such as peer influence or social cultural effects. Additionally, the

use of a large number of stimuli increases the likelihood of finding statistically significant results by chance, potentially inflating the Type I error rate, which represents a further methodological limitation. Although the IAPS is widely used in various studies to assess emotional responses, some research suggests that the use of dynamic stimuli (e.g., videos or virtual reality) could allow for a more comprehensive analysis of the emotional processing and integration in women with psychopathic traits (Decety et al., 2013). Third, the cross-sectional design of this investigation limits the identification of potential causal relationships or moderating and/or mediating factors in the relationship between emotional processing and psychopathic traits in women over time, indicating that these studies would benefit from longitudinal designs. The use of self-report measures to assess psychopathic traits represents an additional limitation of this study, given the potential response bias, particularly in this population where characteristics of manipulation and socially desirable responding may influence the provided answers (Foulkes et al., 2014). The internal consistency of the affective and antisocial subscales of the SRP-SF was below the commonly accepted threshold, which may reflect both measurement-related and population-specific factors. In female offender populations, the influence of complex psychosocial experiences – such as high levels of lifetime trauma, emotional dysregulation, and interpersonal adversity – may contribute to the heterogeneity observed in psychopathic traits among women (Caravaca-Sánchez et al., 2019; Ford & Courtois, 2020). In addition to these factors, incarcerated women report higher rates of mental health problems – such as anxiety, depression, impulsivity, and post-traumatic stress disorder (PTSD) – than both the general population and incarcerated men (Covington, 2007). The prison environment itself may further exacerbate psychological distress and hinder access to adequate mental health care (Binswanger et al., 2010). Such variability in individual histories may lead to more heterogeneous response patterns, potentially reducing the coherence of responses within these subscales. In addition to these factors, previous research indicates that women tend to exhibit lower and less variable levels of antisocial behaviors, potentially compromising the reliability of this dimension (Wynn et al., 2012). Additionally, the relatively small subgroup of women with higher psychopathy propensity limits the statistical power to detect effects in this group and may affect the generalizability of the findings. Another important aspect to consider concerns the use of self-report instruments in the assessment of psychopathic traits. In prison contexts, it is common for individuals to adopt strategies of positive impression management and symptom denial, associated with social desirability bias, which often leads to underreporting of behaviors and experiences (Van de Mortel, 2008). This bias is particularly problematic in individuals with higher levels of psychopathic traits, who tend to minimize or downplay the expression of affective and behavioral characteristics, providing less extreme responses than would be

expected (Lilienfeld et al., 2012). Although, in this study, social desirability showed only a statistically significant but small effect on emotional processing measures, its potential impact on the results should not be overlooked – especially considering that individuals with higher psychopathic traits often engage in strategic dissimulation to enhance their social image, and research suggests that standard validity indices may fail to detect such deceptive responding, especially among those most prone to it, thereby potentially compromising the reliability of self-report data in this population (Book et al., 2006). Reduced internal consistency and sample size constraints may increase measurement error, thus attenuating the observed associations with emotional processing variables. Another limitation concerns the fact that sociodemographic (e.g., age, education level) and juridical-legal variables (e.g., type of offense, sentence length) were not included as covariates in the analyses. Although these characteristics may not function as classical confounders, they could influence how psychopathic traits and emotional processing are expressed, potentially acting as moderators or contributing to unobserved heterogeneity in the sample. Therefore, future studies should examine their role in more depth.

Future research should include a sample of women from community settings, as the context may influence response patterns and emotional processing dynamics, allowing for a broader understanding of the contextual factors that affect emotional processing in women with psychopathic traits (Blair et al., 2006; Verona et al., 2013). Additionally, it is imperative to employ multimodal methods for assessing emotional processing that combine psychophysiological measures, such as galvanic skin response, with neuroimaging techniques, such as functional magnetic resonance imaging (fMRI). The integration of these methodologies would provide a comprehensive view of emotional experiences and the underlying neural reinforcement mechanisms, allowing for more nuanced insights into the emotional deficits associated with psychopathic traits (Decety et al., 2013; Harenski et al., 2014). On the other hand, future investigations should consider the role of emotional and contextual memories in the interpretation and evaluation of emotional stimuli. In this context, ghost memories - emotionally aversive memories linked to past trauma or neglect - and angel memories appear to influence emotional responses and may distort the perception of neutral stimuli in individuals with psychopathic traits (Lieberman et al., 2005; Narayan et al., 2017). Additionally, adverse childhood experiences (ACEs) are known to significantly affect the development of emotional processing systems and contribute to the manifestation of psychopathic traits, especially in women (Moreira et al., 2020). Neurobiological evidence indicates that ACEs can lead to structural and functional alterations in brain regions critical for emotion regulation, such as the amygdala and prefrontal cortex (Teicher et al., 2016). In addition to ACEs, this study acknowledges as a limitation the absence of a more comprehensive assessment of traumatic events experienced during adulthood and

other forms of victimization. Such experiences are associated with significant disturbances in emotional regulation, including the development of alexithymia - a difficulty in identifying and describing emotions - which is strongly related to the severity of post-traumatic stress disorder (PTSD) symptoms (Edwards et al., 2022). Evidence indicates that cumulative lifetime trauma exposure has been associated not only with PTSD symptoms but also with antisocial and psychopathic personality disorders in incarcerated women (Gobin et al., 2015). Therefore, future research should consider the impact of trauma experienced at different stages of life as factors that influence emotional processing and the manifestation of psychopathic traits in women. These changes may underlie patterns of emotional desensitisation, reduced affective responsiveness, and the misinterpretation of emotional cues, which are commonly observed in individuals with high psychopathic propensities (Blair, 2013; Verona et al., 2013). Future investigations should also explore executive functioning deficits, which are linked to impaired emotional regulation and impulsivity, as they contribute to psychopathic traits (Delfin et al., 2018).

The present findings, which highlight emotional-processing deficits in women with elevated psychopathic traits, underscore the need for gender-responsive policies and interventions. Female psychopathy often presents a distinctive profile - higher scores on the interpersonal and lifestyle facets and lower involvement in severe antisocial behavior (Forouzan & Cooke, 2005; Verona & Vitale, 2006). Accordingly, assessment tools must be adapted to this phenotypic expression in women, allowing for more accurate risk appraisal and the identification of clinical-emotional needs, while guiding interventions that incorporate affect-regulation techniques, empathy training, and the strengthening of secure relational bonds (Covington & Bloom, 2007). Therapeutic approaches such as Trauma-Focused Cognitive-Behavioral Therapy and Eye Movement Desensitization and Reprocessing (EMDR) have proven effective in reducing trauma-related symptoms and improving emotional functioning (Korn, 2009; Pérez et al., 2022) and may be particularly beneficial for this clinical subgroup. In parallel, training for correctional and re-entry professionals should cover explanatory models of psychopathy, including the Low-Fear Hypothesis (Lykken, 1957) and the Response Modulation Hypothesis (Newman et al., 1985), as well as neuro-emotional dysfunctions such as amygdala hyporeactivity and deficits in processing emotional cues (Blair et al., 2005). Finally, early-prevention policies targeting girls exposed to childhood adversity should incorporate programmes in emotional literacy, interpersonal-skills training, and structured family support to interrupt risk trajectories and promote adaptive developmental patterns (Ford et al., 2012; Baskin-Sommers et al., 2011). Such initiatives can also help reduce criminal recidivism by enhancing emotional awareness and facilitating the social reintegration of women with psychopathic traits, thereby decreasing

antisocial behavior and improving the long-term effectiveness of correctional interventions (Verona et al., 2013).

References

Almiro, P. A., Almeida, D., Ferraz, M., Ferreira, R., Silvestre, M. J., Perdiz, C., Dias, I. S., Gonçalves, S., Sousa, L. B., & Simões, M. R. (2017). *Social Desirability Scale (EDS-20)*. In M. R. Simões, L. S. Almeida, & M. M. Gonçalves (Eds.), *Forensic Psychology: Assessment Instruments* (pp. 335-352). Pactor.

American Psychiatric Association, DSM-5 Task Force. (2022). *Diagnostic and statistical manual of mental disorders: DSM-5™* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425787

Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2011). Specifying the attentional selection that moderates the fearlessness of psychopathic offenders. *Psychological Science*, *22*(2), 226–234. https://doi.org/10.1177/0956797610396227

Bayer, M., & Schacht, A. (2014). Event-related brain responses to emotional words, pictures, and faces – a cross-domain comparison. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.01106

Beryl, R., Chou, S., & Völlm, B. (2014). A systematic review of psychopathy in women within secure settings. *Personality and Individual Differences, 71*, 185–195. https://doi.org/10.1016/j.paid.2014.07.033

Binswanger, I. A., Merrill, J. O., Krueger, P. M., White, M. C., Booth, R. E., & Elmore, J. G. (2010). Gender differences in chronic medical, psychiatric, and substance-dependence disorders among jail inmates. *American Journal of Public Health, 100*(3), 476–482. https://doi.org/10.2105/AJPH.2008.149591

Blair R. J. (2005). Applying a cognitive neuroscience perspective to the disorder of psychopathy. *Development and Psychopathology, 17*(3), 865–891. https://doi.org/10.1017/S0954579405050418

Blair, R. J. R. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends in Cognitive Sciences*, *11*(9), 387–392. https://doi.org/10.1016/j.tics.2007.07.003

Blair, R. J. R. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience*, *14*(11), 786–799. https://doi.org/10.1038/nrn3577

Blair, R. J. R., Peschardt, K. S., Budhani, S., Mitchell, D. G. V., & Pine, D. S. (2006). The development of psychopathy. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 47*(3–4), 262–276. https://doi.org/10.1111/j.1469-7610.2006.01596.x

Blair, R. J., Mitchell, D., & Blair, K. (2005). *The psychopath: Emotion and the brain* (pp. ix, 201). Blackwell Publishing.

Book, A. S., Holden, R. R., Starzyk, K. B., Wasylkiw, L., & Edwards, M. J. (2006). Psychopathic traits and experimentally induced deception in self-report assessment. *Personality and Individual Differences, 41*(4), 601–608. https://doi.org/10.1016/j.paid.2006.02.011

Book, A., Stark, S., MacEachern, J., Forth, A., Visser, B., Wattam, T., Young, J., Power, J., & Roters, J. (2020). In the eye of the beholder: Psychopathy and fear enjoyment. *Journal of Personality*, *88*(6), 1286–1301. https://doi.org/10.1111/jopy.12571

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*(1), 49–59. https://doi.org/10.1016/0005-7916(94)90063-9

Bradley, M. M., & Lang, P. J. (2007). The International Affective Picture System (IAPS) in the Study of Emotion and Attention. Em J. A. Coan & J. J. B. Allen (Eds.), *Handbook of Emotion Elicitation and Assessment* (p.0). Oxford University Press. https://doi.org/10.1093/oso/9780195169157.003.0003

Branco, D., Gonçalves, Ó. F., & Badia, S. B. I. (2023). A Systematic Review of International Affective Picture System (IAPS) around the World. *Sensors*, *23*(8), 3866. https://doi.org/10.3390/s23083866

Buechel, S., & Hahn, U. (2016). Emotion analysis as a regression problem – Dimensional models and their implications on emotion representation and metrical evaluation. In *Proceedings of the Twenty-second European Conference on Artificial Intelligence (ECAI'16)* (pp. 1114–1122). IOS Press. https://doi.org/10.3233/978-1-61499-672-9-1114

Caravaca-Sánchez, F., Fearn, N. E., Vidovic, K. R., & Vaughn, M. G. (2019). Female Prisoners in Spain: Adverse Childhood Experiences, Negative Emotional States, and Social Support. *Health & Social Work, 44*(3), 157–166. https://doi.org/10.1093/hsw/hlz013

Covington, S. S. (2007). Women and the criminal justice system [Editorial]. *Women's Health Issues, 17*(4), 180–182. https://doi.org/10.1016/j.whi.2007.05.004

Covington, S. S., & Bloom, B. E. (2007). Gender Responsive Treatment and Services in Correctional Settings. *Women & Therapy*, *29*(3–4), 9–33. https://doi.org/10.1300/J015v29n03_02

de Vogel, V., & Lancel, M. (2016). Gender differences in the assessment and manifestation of psychopathy: Results from a multicenter study in forensic psychiatric patients. *The International Journal of Forensic Mental Health, 15*(1), 97–110.

https://doi.org/10.1080/14999013.2016.1138173

Decety, J., Skelly, L. R., & Kiehl, K. A. (2013). Brain response to empathy-eliciting scenarios involving pain in incarcerated individuals with psychopathy. *JAMA Psychiatry*, *70*(6), 638–645. https://doi.org/10.1001/jamapsychiatry.2013.27

Delfin, C., Andiné, P., Hofvander, B., Billstedt, E., & Wallinius, M. (2018). Examining Associations Between Psychopathic Traits and Executive Functions in Incarcerated Violent Offenders. *Frontiers in Psychiatry*, *9*, 310. https://doi.org/10.3389/fpsyt.2018.00310

DeLisi, M. (2009). Psychopathy is the Unified Theory of Crime. *Youth Violence and Juvenile Justice*, *7*(3), 256-273. https://doi.org/10.1177/1541204009333834

Edwards, E. R. (2022). Posttraumatic stress and alexithymia: A meta-analysis of presentation and severity. *Psychological Trauma: Theory, Research, Practice, and Policy, 14*(7), 1192–1200. https://doi.org/10.1037/tra0000539

Efferson, L. M., & Glenn, A. L. (2018). Examining gender differences in the correlates of psychopathy: A systematic review of emotional, cognitive, and morality-related constructs. *Aggression and Violent Behavior, 41,* 48–61. https://doi.org/10.1016/j.avb.2018.05.009

Eisenbarth, H., Alpers, G., Segrè, D., Calogero, A., & Angrilli, A. (2008). Categorization and evaluation of emotional faces in psychopathic women. *Psychiatry Research*, *159*, 189–195. https://doi.org/10.1016/j.psychres.2007.09.001

Fine, J. G., Semrud-Clikeman, M., & Zhu, D. C. (2009). Gender differences in BOLD activation to face photographs and video vignettes. *Behavioural Brain Research*, *201*(1), 137–146. https://doi.org/10.1016/j.bbr.2009.02.009

Ford, J. D., & Courtois, C. A. (Eds.). (2020). *Treating complex traumatic stress disorders in adults: Scientific foundations and therapeutic models* (2nd ed.). The Guilford Press.

Ford, J. D., Chapman, J., Connor, D. F., & Cruise, K. R. (2012). Complex Trauma and Aggression in Secure Juvenile Justice Settings. *Criminal Justice and Behavior*, *39*(6), 694-724. https://doi.org/10.1177/0093854812436957

Forouzan, E., & Cooke, D. J. (2005). Figuring out la femme fatale: Conceptual and assessment issues concerning psychopathy in females. *Behavioral Sciences & the Law*, *23*(6), 765–778. https://doi.org/10.1002/bsl.669

Forouzan, E., & Nicholls, T. L. (2015). Childhood and Adolescent Characteristics of Women with High versus Low Psychopathy Scores: Examining Developmental Precursors to the Malignant Personality Disorder. *Journal of Criminal Justice*, *43*(4), 307–320.

https://doi.org/10.1016/j.jcrimjus.2015.06.001

Foulkes, L., McCrory, E. J., Neumann, C. S., & Viding, E. (2014). Inverted social reward: Associations between psychopathic traits and self-report and experimental measures of social reward. *PloS One, 9*(8), e106000. https://doi.org/10.1371/journal.pone.0106000

Fowles D. C. (2000). Electrodermal hyporeactivity and antisocial behavior: does anxiety mediate the relationship?. *Journal of Affective Disorders, 61*(3), 177–189. https://doi.org/10.1016/s0165-0327(00)00336-0

Fowles, D. C., & Dindo, L. (2006). A Dual-Deficit Model of Psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 14–34). The Guilford Press.

Gaertner, M., Sauter, D., Baumgartl, H., Rieg, T., & Buettner, R. (2021). *Multi-class emotion recognition within the valence-arousal-dominance space using EEG*. In Proceedings of the 27th Americas Conference on Information Systems (AMCIS 2021), Virtual Conference, August 9–13. Association for Information Systems. Retrieved April 17 2024, from https://aisel.aisnet.org/amcis2021?utm_source=aisel.aisnet.org%2Famcis2021%2Fsig_hci%2Fsig_hci%2F15&utm_medium=PDF&utm_campaign=PDFCoverPages

Glenn, A. L., Raine, A., & Schug, R. A. (2009). The neural correlates of moral decision-making in psychopathy. *Molecular Psychiatry*, *14*(1), 5–6. https://doi.org/10.1038/mp.2008.104

Gobin, R. L., Reddy, M. K., Zlotnick, C., & Johnson, J. E. (2015). Lifetime trauma victimization and PTSD in relation to psychopathy and antisocial personality disorder in a sample of incarcerated women and men. *International Journal of Prisoner Health*, *11*(2), 64–74. https://doi.org/10.1108/IJPH-06-2014-0016

Gonzalez, H., Muzaffar, S., Yoo, J., & Elfadel, I. (Abe). (2020). BioCNN: A Hardware Inference Engine for EEG-based Emotion Detection. *IEEE Access*, *8*, 1–1. https://doi.org/10.1109/ACCESS.2020.3012900

Grieve, R., & Mahar, D. (2010). The emotional manipulation–psychopathy nexus: Relationships with emotional intelligence, alexithymia and ethical position. *Personality and Individual Differences*, *48*(8), 945–950. https://doi.org/10.1016/j.paid.2010.02.028

Guay, J.-P., Knight, R. A., Ruscio, J., & Hare, R. D. (2018). A taxometric investigation of psychopathy in women. *Psychiatry Research*, *261*, 565–573. https://doi.org/10.1016/j.psychres.2018.01.015

Hamann, S., Herman, R. A., Nolan, C. L., & Wallen, K. (2004). Men and women differ in amygdala response to visual sexual stimuli. *Nature Neuroscience*, *7*(4), 411–416.

https://doi.org/10.1038/nn1208

Hare, R. D. (2003). *The Hare Psychopathy Checklist Revised* (2nd Ed.). Multi-Health Systems.

Harenski, C. L., Edwards, B. G., Harenski, K. A., & Kiehl, K. A. (2014). Neural correlates of moral and non-moral emotion in female psychopathy. *Frontiers in Human Neuroscience*, *8*, 741. https://doi.org/10.3389/fnhum.2014.00741

Herpertz, S. C., Werth, U., Lukas, G., Qunaibi, M., Schuerkens, A., Kunert, H. J., Freese, R., Flesch, M., Mueller-Isberner, R., Osterheider, M., & Sass, H. (2001). Emotion in criminal offenders with psychopathy and borderline personality disorder. *Archives of General Psychiatry, 58*(8), 737–745. https://doi.org/10.1001/archpsyc.58.8.737

Hicks, B. M., & Drislane, L. E. (2018). Variants ("subtypes") of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 297–332). The Guilford Press.

Hicks, B. M., Vaidyanathan, U., & Patrick, C. J. (2010). Validating female psychopathy subtypes: Differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Personality Disorders, 1*(1), 38–57. https://doi.org/10.1037/a0018135

Hofmann, M. J., Mokros, A., & Schneider, S. (2024). The joy of being frightened: Fear experience in psychopathy. *Journal of Personality, 92*(2), 321–341. https://doi.org/10.1111/jopy.12890

Hofmann, M. J., Schneider, S., & Mokros, A. (2021). Fearless but anxious? A systematic review on the utility of fear and anxiety levels to classify subtypes of psychopathy. *Behavioral Sciences & the Law, 39*(5), 512–540. https://doi.org/10.1002/bsl.2544

Hosker-Field, A. M., Gauthier, N. Y., & Book, A. S. (2016). If not fear, then what? A preliminary examination of psychopathic traits and the Fear Enjoyment Hypothesis. *Personality and Individual Differences, 90,* 278–282. https://doi.org/10.1016/j.paid.2015.11.016

Igoumenou, A., Harmer, C. J., Yang, M., Coid, J. W., & Rogers, R. D. (2017). Faces and facets: The variability of emotion recognition in psychopathy reflects its affective and antisocial features. *Journal of Abnormal Psychology*, *126*(8), 1066–1076. https://doi.org/10.1037/abn0000293

Kiehl, K. A. (2006). A cognitive neuroscience perspective on psychopathy: Evidence for paralimbic system dysfunction. *Psychiatry Research*, *142*(2–3), 107–128. https://doi.org/10.1016/j.psychres.2005.09.013

Kimonis, E. R., Kidd, J., Most, S. B., Krynen, A., & Liu, C. (2020). An elusive deficit: Psychopathic personality traits and aberrant attention to emotional stimuli. *Emotion, 20*(6), 951–964. https://doi.org/10.1037/emo0000601

Kogler, L., Müller, V. I., Moser, E., Windischberger, C., Gur, R. C., Habel, U., Eickhoff, S. B., & Derntl, B.

(2023). Testosterone and the Amygdala's Functional Connectivity in Women and Men. *Journal of Clinical Medicine*, *12*(20), 6501. https://doi.org/10.3390/jcm12206501

Korn, D. L. (2009). EMDR and the treatment of complex PTSD: A review. *Journal of EMDR Practice and Research, 3*(4), 264–278. https://doi.org/10.1891/1933-3196.3.4.264

Kreis, M., & Cooke, D. (2012). The Manifestation of Psychopathic Traits in Women: An Exploration Using Case Examples. *International Journal of Forensic Mental Health*, *11*, 267–279. https://doi.org/10.1080/14999013.2012.746755

Kret, M. E., & De Gelder, B. (2012). A review on sex differences in processing emotional signals. *Neuropsychologia*, *50*(7), 1211–1221. https://doi.org/10.1016/j.neuropsychologia.2011.12.022

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1997). International affective picture system (IAPS): Technical manual and affective ratings. *NIMH Center for the Study of Emotion and Attention*, 39-58.

Lang, P. J., Bradley, M. M., Fitzsimmons, J. R., Cuthbert, B. N., Scott, J. D., Moulder, B., & Nangia, V. (1998). Emotional arousal and activation of the visual cortex: an fMRI analysis. *Psychophysiology*, *35*(2), 199–210.

Lee, Z., & Salekin, R. T. (2010). Psychopathy in a noninstitutional sample: Differences in primary and secondary subtypes. *Personality Disorders*, *1*(3), 153–169. https://doi.org/10.1037/a0019269

Levenston, G. K., Patrick, C. J., Bradley, M. M., & Lang, P. J. (2000). The psychopath as observer: emotion and attention in picture processing. *Journal of Abnormal Psychology*, *109*(3), 373–385. https://doi.org/10.1037/0021-843X.109.3.373

Lieberman, A. F., Padrón, E., Van Horn, P., & Harris, W. W. (2005). Angels in the nursery: The intergenerational transmission of benevolent parental influences. *Infant Mental Health Journal, 26*(6), 504–520. https://doi.org/10.1002/imhj.20071

Lilienfeld, S. O., & Widows, M. R. (2005). P*sychopathic Personality Inventory-Revised: Professional Manual*. Lutz, FL: Psychological Assessment Resources Inc.

Lilienfeld, S. O., Patrick, C. J., Benning, S. D., Berg, J., Sellbom, M., & Edens, J. F. (2012). The role of fearless dominance in psychopathy: confusions, controversies, and clarifications. *Personality Disorders, 3*(3), 327–340. https://doi.org/10.1037/a0026987

Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *The Journal of Abnormal and Social Psychology, 55*(1), 6–10. https://doi.org/10.1037/h0047232

Lykken, D. T. (1995). *The antisocial personalities* (pp. x, 259). Lawrence Erlbaum Associates, Inc.

Moreira, D., Sá Moreira, D., Oliveira, S., Ribeiro, F. N., Barbosa, F., Fávero, M., & Gomes, V. (2020). Relationship between adverse childhood experiences and psychopathy: A systematic review. *Aggression and Violent Behavior, 53*, Article 101452. https://doi.org/10.1016/j.avb.2020.101452

Moul, C., Killcross, S., & Dadds, M. R. (2012). A model of differential amygdala activation in psychopathy. *Psychological Review*, *119*(4), 789–806. https://doi.org/10.1037/a0029342

Narayan, A. J., Ippen, C. G., Harris, W. W., & Lieberman, A. F. (2017). Assessing Angels in the Nursery: A Pilot Study of Childhood Memories of Benevolent Caregiving as Protective Influences. *Infant Mental Health Journal*, *38*(4), 461–474. https://doi.org/10.1002/imhj.21653

Newman, J. P., Curtin, J. J., Bertsch, J. D., & Baskin-Sommers, A. R. (2010). Attention moderates the fearlessness of psychopathic offenders. *Biological Psychiatry*, *67*(1), 66. https://doi.org/10.1016/j.biopsych.2009.07.035

Newman, J. P., Widom, C. S., & Nathan, S. (1985). Passive avoidance in syndromes of disinhibition: psychopathy and extraversion. *Journal of Personality and Social Psychology*, *48*(5), 1316–1327. https://doi.org/10.1037//0022-3514.48.5.1316

Newman, J.P., & Lorenz, A.R. (2003). Response modulation and emotion processing: Implications for psychopathy and other dysregulatory psychopathology. In R. J. Davidson, K. Scherer, & H. H. Goldsmith (Eds.), *Handbook of Affective Sciences* (pp. 1043-1067). Oxford University Press.

Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D., & Gross, J. J. (2004). For better or for worse: neural systems supporting the cognitive down- and up-regulation of negative emotion. *NeuroImage*, *23*(2), 483–499. https://doi.org/10.1016/j.neuroimage.2004.06.030

Patrick, C. J. (2018). Psychopathy as masked pathology. In C. J. Patrick (Ed.), *Handbook of psychopathy, 2nd ed* (pp. 3–21). The Guilford Press.

Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, *21*(3), 913–938. https://doi.org/10.1017/S0954579409000492

Pérez, V., López, S. V., & Andrade, J. (2022). EMDR therapy and emotional dysregulation in women with complex trauma: A randomized clinical trial. *Journal of Traumatic Stress, 35*(1), 105–117. https://doi.org/10.1002/jts.22761

Pessoa, L., McKenna, M., Gutierrez, E., & Ungerleider, L. G. (2002). Neural processing of emotional faces

requires attention. *Proceedings of the National Academy of Sciences of the United States of America*, *99*(17), 11458–11463. https://doi.org/10.1073/pnas.172403899

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2022). Psychopathy and Reoffending Among Incarcerated Women. *Women & Criminal Justice*, *32*(6), 556–570. https://doi.org/10.1080/08974454.2022.2094525

Pinheiro, M., Gonçalves, R. A., Caridade, S., & Cunha, O. (2023a). Criminal Lifestyle Among Women Who Committed Crimes: The Role of Psychopathy. *Deviant Behavior*, *45*(8), 1202–1217. https://doi.org/10.1080/01639625.2023.2280102

Pinheiro, M., Gonçalves, R., & Cunha, O. (2023b). Emotional Processing and Psychopathy Among Women: A Systematic Review. *Deviant Behavior*, 1–25. https://doi.org/10.1080/01639625.2023.2295527

Reidy, D. E., Shelley-Tremblay, J. F., & Lilienfeld, S. O. (2011). Psychopathy, reactive aggression, and precarious proclamations: A review of behavioral, cognitive, and biological research. *Aggression and Violent Behavior, 16*(6), 512–524. https://doi.org/10.1016/j.avb.2011.06.002

Russell, J. A., & Mehrabian, A. (1977). Evidence for a three-factor theory of emotions. *Journal of Research in Personality*, *11*(3), 273–294. https://doi.org/10.1016/0092-6566(77)90037-X

Sanz-García, A., Gesteira, C., Sanz, J., & García-Vera, M. P. (2021). Prevalence of Psychopathy in the General Adult Population: A Systematic Review and Meta-Analysis. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.661044

Schienle, A., Schäfer, A., Stark, R., Walter, B., & Vaitl, D. (2005). Gender differences in the processing of disgust- and fear-inducing pictures: An fMRI study. *Neuroreport*, *16*(3), 277–280. https://doi.org/10.1097/00001756-200502280-00015

Seara-Cardoso, A., Dolberg, H., Neumann, C., Roiser, J. P., & Viding, E. (2013). Empathy, morality and psychopathic traits in women. *Personality and Individual Differences*, *55*(3), 328–333. https://doi.org/10.1016/j.paid.2013.03.011

Seara-Cardoso, A., Queirós, A., Fernandes, E., Coutinho, J., & Neumann, C. (2020). Psychometric Properties and Construct Validity of the Short Version of the Self-Report Psychopathy Scale in a Southern European Sample. *Journal of Personality Assessment*, *102*, 1–12. https://doi.org/10.1080/00223891.2019.1617297

Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy? Conceptual directions for resolving the debate. *Psychological Assessment, 22*(2), 433–445. https://doi.org/10.1037/a0008512

Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among women with psychopathy during picture perception. *Journal of Abnormal Psychology*, *111*(4), 610–619. https://doi.org/10.1037//0021-843x.111.4.610

Sutton, T. M., Herbert, A. M., & Clark, D. Q. (2019). Valence, arousal, and dominance ratings for facial stimuli. *Quarterly Journal of Experimental Psychology, 72*(8), 2046–2055. https://doi.org/10.1177/1747021819829012

Teicher, M. H., & Samson, J. A. (2016). Annual Research Review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 57*(3), 241–266. https://doi.org/10.1111/jcpp.12507

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews Neuroscience, 17*(10), 652–666. https://doi.org/10.1038/nrn.2016.111

van de Mortel, T.F. (2008) Faking it: Social desirability response bias in self-report research. *Australian Journal of Advanced Nursing, 25*, 40-48. https://doi.org/10.37464/2008.254.1817

van Wingen, G. A., Geuze, E., Vermetten, E., & Fernández, G. (2011). Perceived threat predicts the neural sequelae of combat stress. *Molecular Psychiatry*, *16*(6), 664–671. https://doi.org/10.1038/mp.2010.132

Verona, E., & Vitale, J. (2006). Psychopathy in Women: Assessment, Manifestations, and Etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 415–436). The Guilford Press.

Verona, E., Bresin, K., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of Abnormal Psychology*, *122*(4), 1088–1093. https://doi.org/10.1037/a0034062

Verona, E., Patrick, C. J., Curtin, J. J., Bradley, M. M., & Lang, P. J. (2004). Psychopathy and physiological response to emotionally evocative sounds. *Journal of Abnormal Psychology*, *113*(1), 99–108. https://doi.org/10.1037/0021-843X.113.1.99

Vitale, J. E., Smith, S. S., Brinkley, C. A., & Newman, J. P. (2002). The reliability and validity of the Psychopathy Checklist–Revised in a sample of female offenders. *Criminal Justice and Behavior, 29*(2), 202–231. https://doi.org/10.1177/0093854802029002005

Whittle, S., Yucel, M., Yap, M., & Allen, N. (2011). Sex differences in the neural correlates of emotion: Evidence from neuroimaging. *Biological Psychology*, *87*, 319–333. https://doi.org/10.1016/j.biopsycho.2011.05.003

Williams, L. M., Barton, M. J., Kemp, A. H., Liddell, B. J., Peduto, A., Gordon, E., & Bryant, R. A. (2005).

Distinct amygdala-autonomic arousal profiles in response to fear signals in healthy males and females. *NeuroImage*, *28*(3), 618–626. https://doi.org/10.1016/j.neuroimage.2005.06.035

World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). Retrieved May 27 2024, from https://icd.who.int/

Wynn, R., Høiseth, M. H., & Pettersen, G. (2012). Psychopathy in women: Theoretical and clinical perspectives. International *Journal of Women's Health, 4*, 257–263. https://doi.org/10.2147/IJWH.S25518

Yildirim, B. O., & Derksen, J. J. L. (2015). Clarifying the heterogeneity in psychopathic samples: Towards a new continuum of primary and secondary psychopathy. *Aggression and Violent Behavior, 24*, 9–41. https://doi.org/10.1016/j.avb.2015.05.001

CHAPTER III| DEVELOPMENTAL TRAJECTORIES OF PSYCHOPATHY IN INCARCERATED WOMEN: ADVERSITY, POSITIVE EXPERIENCES, AND EMPATHIC SKILLS

STUDY 3 | THE MODERATING ROLE OF POSITIVE CHILDHOOD EXPERIENCES IN THE RELATIONSHIP BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN

This article was published in the *Journal of Aggression, Maltreatment & Trauma*. Additionally, the findings of this empirical study were presented as an oral communication at the 24th Annual Conference of the European Society of Criminology – "Criminology goes East" (Bucharest, Romania).

References:

Pinheiro, M., Machado, A. B., Gonçalves, R. A., & Cunha, O. (2025). The Moderating Role of Positive Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Psychopathic Traits in Incarcerated Women. *Journal of Aggression, Maltreatment & Trauma*, *34*(9), 1468–1488. https://doi.org/10.1080/10926771.2025.2562542

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2024, September 11–14). *Adverse and positive experiences in childhood and psychopathy in a sample of women in prison* [Oral presentation]. 24th Annual Conference of the European Society of Criminology – "Criminology goes East". Bucharest, Romania.

Abstract

The relationship between adverse childhood experiences (ACEs) and psychopathic traits in incarcerated women remains underexplored, despite evidence linking early adversities to problematic behaviors and criminal pathways. This study examines the association between ACEs and psychopathic traits, focusing on the moderating role of positive childhood experiences (PCEs). The sample consisted of 164 women aged 18 to 81 years (M = 38.75, SD = 11.99) who completed the Adverse Childhood Experiences scale, the Benevolent Childhood Experiences scale, and the Self-Report Psychopathy Scale - Short Form (SRP-SF). The results revealed significant correlations between ACEs and total psychopathy, lifestyle, and antisocial factors. Physical abuse, physical neglect, and exposure to domestic violence (DV) were also significantly correlated with psychopathic traits. PCEs moderated the association between sexual abuse and the affective and antisocial factors of psychopathy, as well as overall psychopathy scores. They also moderated the relationship between exposure to DV and both the affective factor and total psychopathy. Furthermore, PCEs moderated the association between having an incarcerated family member and all psychopathy factors. These findings highlight the protective role of PCEs in mitigating the impact of some ACEs on psychopathy, reinforcing the need for trauma-informed interventions in forensic settings. Implementing attachment-based and resilience-building programs could help reduce the long-term consequences of childhood adversities in incarcerated women.

Keywords: Adverse Childhood Experiences; Incarcerated Women; Positive Childhood Experience; Psychopathic Traits.

The Moderating Role of Positive Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Psychopathic Traits in Incarcerated Women

Introduction

More than 733,000 women and girls are currently held in penal institutions worldwide, including both pre-trial detainees and convicted prisoners (Fair & Walmsley, 2024). In Portugal, the women's prison population has fluctuated over recent decades, peaking at 1,216 women in 2000 (9.4% of the total prison population) (*Portugal | World Prison Brief*, n.d.). Since then, this proportion decreased but has gradually increased again since 2015, reaching 904 women in 2025, representing approximately 7.2% of the total prison population in Portugal (*Portugal | World Prison Brief*, n.d.). The female incarceration rate in Portugal stands at 8.4 per 100,000 inhabitants, reflecting a moderate upward trend (*Portugal | World Prison Brief*, n.d.).

Women in prison often have histories of victimization and adversity, including high rates of sexual abuse experienced during their childhood (Salekin & Lynam, 2010). Adverse childhood experiences (ACEs) are associated with increased mental health problems during incarceration (Almeida et al., 2023) and contribute to the development of psychopathic traits, with emotional maltreatment potentially disrupting parent-child attachment bonds (Moreira et al., 2020). Conversely, positive childhood experiences (PCEs) can mitigate the negative effects of ACEs and promote resilience and healthy functioning (Almeida et al., 2023). However, PCEs have received less attention than ACEs, particularly their moderating role in the relationship between ACEs and psychopathic traits in women. Therefore, this study aims to provide valuable insights into the relationship between childhood experiences and psychopathic traits in incarcerated women by examining whether PCEs moderate the association between ACEs and psychopathic traits.

Adverse Childhood Experiences

ACEs refer to potentially adverse events that occur during childhood and may negatively affect an individual's development, health, and well-being across the lifespan (Boullier & Blair, 2018). These experiences, which often co-occur rather than exist in isolation (Felitti et al., 2019), include various forms of abuse (physical, emotional, and sexual), neglect (physical and emotional), and household dysfunctions such as witnessing domestic violence, growing up with family members who have substance disorders, and mental illnesses, who are incarcerated, and experiencing parental separation or divorce (Boullier & Blair, 2018; Felitti et al., 2019).

The accumulation of ACEs has been linked to severe and lasting consequences, including permanent damage to brain development and dysregulation of the immune, neurological, and endocrine

systems (Boullier & Blair, 2018). Individuals exposed to multiple ACEs in childhood are at an increased risk of developing physical health issues (e.g., heart disease, diabetes, obesity, stroke, chronic bronchitis, or emphysema), mental health conditions (e.g., depression, anxiety, adult psychopathology, and post-traumatic stress disorder), and behavioral issues (e.g., smoking, alcoholism, drug abuse, suicide attempts, and risky sexual behaviors) (Friestad et al., 2014).

Although population-based surveys indicate that approximately 10–20% of community-dwelling adults report one or more ACEs (Felitti, 2002), incarcerated women bear a disproportionately high burden. Research consistently demonstrates that justice-involved women report higher rates of childhood adversity than both non-incarcerated women and incarcerated men (Wolff et al., 2011). For example, Aizpurua et al. (2023) found that over 40% of incarcerated women endorse multiple ACEs, compared with approximately 30% of incarcerated men, while Levenson et al. (2015) reported a 41% prevalence of at least one ACE among justice-involved women versus 15% in non-justice samples. This pronounced disparity in early adversity underscores the unique developmental context of female offenders and highlights the importance of examining ACEs when investigating psychopathic trait expression in forensic populations (Friestad et al., 2014).

Positive Childhood Experiences

PCEs are critical factors in promoting mental and emotional health in adulthood (Almeida et al., 2023). Recent studies highlight that PCEs are vital in mitigating the negative effects of ACEs and fostering healthy and resilient development (Almeida et al., 2023).

Research suggests that PCEs, such as secure attachment bonds, effective parenting practices, and community support, significantly contribute to emotional regulation and the development of empathy (Narayan, 2023). PCEs help shape resilience, essential for coping with emotional and psychological challenges in adulthood (Narayan, 2023). For instance, PCEs have been associated with lower levels of depressive symptoms, affective lability, reduced perceived stress, and increased life satisfaction (Cunha et al., 2025). In a study involving incarcerated women (Almeida et al., 2023), PCEs were found to be negatively associated with affective lability and criminal behavior, even in the presence of ACEs. Stable family environments characterized by positive and consistent parental relationships are critical in buffering against the negative consequences of ACEs (Han et al., 2023).

Like ACEs, PCEs tend to accumulate, offering cumulative benefits for positive adaptation and adjustment and predicting better mental and relational health - even in adults with high ACEs exposure (Cunha et al., 2025). This finding aligns with literature showing that PCEs can act as promotive factors,

enhancing outcomes, and as protective factors, moderating the negative effects of ACEs (Cunha et al., 2025; Han et al., 2023).

Childhood Experiences and Psychopathy

Psychopathy is commonly viewed as a personality disorder characterized by a cluster of interpersonal, affective, lifestyle, and antisocial traits, including grandiosity, egocentricity, deceptiveness, shallow emotions, lack of empathy or remorse, irresponsibility, impulsivity, and a tendency to violate social norms (DeLisi et al., 2019; Patrick et al., 2009). The widely accepted four-factor model conceptualizes psychopathy through these distinct but related dimensions: the interpersonal factor (e.g., superficial charm, manipulation, grandiosity), the affective factor (e.g., lack of empathy, shallow affect, remorse deficits), the lifestyle factor (e.g., impulsivity, irresponsibility, need for stimulation), and the antisocial factor (e.g., poor behavioral control, early conduct problems, criminal versatility) (Hare, 2003).

While psychopathy is often viewed as a single construct, debates persist regarding its dimensional versus categorical nature, with dimensional models, such as the widely-used 30-point cutoff on the Revised Psychopathy Checklist (PCL-R), showing robust empirical support, though their applicability to women remains less clear (Sellbom & Drislane, 2021). Gender differences in the expression of psychopathic traits further complicate the construct's applicability to women. Women typically exhibit more internalized aggression compared to the overt violence seen in men, suggesting the need for gender-sensitive diagnostic tools (Lehmann & Ittel, 2012). Both genders, however, share difficulties in processing negative emotions, a core feature of psychopathic traits (Delk et al., 2017). Although psychopathic traits are generally less pronounced in women, their prevalence in forensic settings indicates a heightened expression among those engaged in criminal activities (Sanz-García et al., 2021).

Psychopathy, from a developmental psychopathology perspective, is viewed not just as a collection of traits or behaviors, but as a maladaptive developmental trajectory shaped by the interaction of genetic, environmental, and individual factors (Cicchetti & Toth, 2009). The developmental psychopathology model suggests that psychopathic traits form the interplay between risks, vulnerabilities, and protective factors across the lifespan. ACEs act as environmental risks, disrupting typical developmental processes and increasing the likelihood of maladaptive outcomes. Indeed, ACEs, such as neglect, abuse, and family dysfunction, are significant predictors of psychopathic traits (Moreira et al., 2020). Longitudinal studies have confirmed that accumulating ACEs strongly predict the development and severity of psychopathic traits over time (e.g., Glenn, 2019). This link is especially evident in forensic populations, where ACEs are associated with emotional instability, relational aggression, and maladaptive coping, factors closely tied to the development of psychopathic traits (Garofalo et al., 2025).

To date, to the best of our knowledge, no studies have thoroughly explored how different types of ACEs relate to distinct psychopathic traits (interpersonal, affective, lifestyle, and antisocial). Existing research, largely focused on male populations, has linked childhood maltreatment to the antisocial and lifestyle dimensions, but not to the interpersonal or affective traits (Poythress et al., 2006). This distinction may reflect different etiological pathways of psychopathic traits. One influential theory proposes two subtypes: primary psychopathy, characterized by emotional and interpersonal deficits such as lack of empathy and shallow affect, appears less influenced by adverse experiences; and secondary psychopathy, thought to arise from environmental adversity like abuse and neglect, is marked by emotional reactivity, instability, and impulsive, antisocial behavior - traits mainly reflected in the lifestyle and antisocial dimensions (Patrick et al., 2009; Poythress et al., 2006). These differences can also be partly explained by neurobiological alterations associated with ACEs, such as dysfunctions in the amygdala and prefrontal cortex, which affect emotional regulation and impulse control (Teicher et al., 2016). Moreover, temperamental vulnerabilities and protective factors like secure attachment modulate how individuals respond to adversity (Narayan, 2023).

The developmental psychopathology model also emphasizes the role of protective factors, such as PCEs, in mitigating the impact of ACEs on the development of psychopathic traits (Cicchetti & Toth, 2009). PCEs like responsive caregiving, secure attachments, and emotional regulation opportunities can buffer against the negative effects of adversity by fostering resilience and healthier adaptation. For women with ACEs, PCEs may be particularly important in moderating the severity of psychopathic traits, offering meaningful avenues for intervention (Cicchetti & Toth, 2009).

Current study

This study investigates the relationship between ACEs, PCEs, and psychopathic traits in a sample of incarcerated women. Although research has shown high levels of adversity in this population (Almeida et al., 2023), studies on protective factors like PCEs remain scarce - especially in forensic samples of women (Han et al., 2023; Cunha et al., 2025). Addressing this gap, the present study explores whether PCEs are linked to lower psychopathic traits and whether they moderate the ACEs-psychopathic traits relationship. Given the multidimensional structure of psychopathy, the analysis also explores the distinct expression of its interpersonal, affective, lifestyle, and antisocial components in women (Lehmann & Ittel, 2012).

Based on previous findings (e.g., Almeida et al., 2023; Narayan, 2023), the following hypotheses were formulated: H1) Exposure to different types of ACEs is positively associated with specific psychopathic traits, including their distinct factors (interpersonal, affective, lifestyle, and antisocial); H2)

PCEs are negatively associated with total psychopathy scores, suggesting a general protective role against the development of psychopathic traits; and H3) PCEs moderate the relationship between ACEs and psychopathic traits, attenuating the severity of these traits in individuals with higher levels of PCEs.

Method

Participants

This cross-sectional exploratory study used a non-random convenience sampling method. Inclusion criteria were: a) being a woman; b) being 18 years of age or older; c) being in prison; d) being a Portuguese speaker with sufficient reading ability to complete the self-report questionnaires; e) having abstained from substance use for at least six months; and f) not exhibiting cognitive deficits.

The sample consisted of 164 incarcerated women (age range: 18 and 81 years, *M*= 38.75, *SD* = 11.99). Most participants were Portuguese (*n* = 126; 76.8%), single (*n* = 83; 50.6%), and had children (*n* = 135; 82.3%). Regarding the education level, the most common levels were 10th - 12th grades (*n* = 135; 35.4%), followed by 7th - 9th grades (*n* = 33; 20.1%). Most participants were convicted (*n*= 127; 77.4 %), with sentences ranging from 9 to 300 months (*M*=93.55, *SD*= 64.88). Non-violent crimes were predominant (*n* = 104; 64.4%), particularly drug trafficking (*n* = 77; 47.7%). Among those who committed violent crimes (*n* = 60; 36.6%), homicide was the most prevalent (*n* = 23;14.0%).

Table 1

Sociodemographic and Juridical-Legal Characteristics of Participants

Variables	*n*	%
Marital Status		
Single	83	50.6
Married / Civil Union	51	31.1
Divorced/Separated	22	13.4
Widowed	8	4.9
Nationality		
Portuguese	126	76.8
Brazilian	26	15.9
Others	12	7.3
Education		
Uneducated	4	2.4
1st, 2nd, 3rd, and 4th grade	29	17.7
5th and 6th grade	29	17.7
7th, 8th, 9th grade	33	20.1
10th, 11th, and 12th grade	58	35.4
Bachelor's or Master's Degree	11	6.7
Children [a]	135	82.3

Legal Situation		
Conviction	127	77.4
Preventive	37	22.6
Conviction		
Violent crimes	60	36.6
Murder	23	14.0
Non-violent crimes	104	64.4
Drug trafficking	77	47.7

Note. *N*= 164 participants, Means. *SD* = Standard Deviation.

[a] Reflects the number and percentage of participants answering "yes" to this question.

Procedure

The current research received ethical approval from the Committee on Ethics in Social Sciences and Humanities (CEICSH 153/2022). Subsequently, authorization was sought and granted by the Directorate-General for Reintegration and Prison Services – Ministry of Justice (DGRSP-MJ) to conduct the research within four women's prisons. Data collection followed Portuguese legislation and adhered to the ethical principles outlined in the Declaration of Helsinki.

This quantitative study was conducted in three distinct phases. First, briefing sessions were held in classrooms within the prison facilities, where participants were informed about the study's objectives, procedures, and voluntary nature of participation. They were assured of the confidentiality and anonymity of their responses, and individuals who chose not to participate could withdraw without any consequences. Those who agreed to participate provided written informed consent. In the second phase, participants completed a set of self-report instruments. At least two researchers were present to provide support, clarify doubts, and ensure that all ethical guidelines were upheld throughout the data collection process. In the final phase, individual interviews were conducted to collect detailed information regarding participants' sociodemographic profiles, legal and criminal histories, and other relevant contextual data.

Measures

Sociodemographic and Juridical-Legal Questionnaire

A comprehensive questionnaire was used to assess sociodemographic variables (age, marital status, nationality, educational qualifications) and legal variables (criminal history, length of sentence, recidivism). This information was collected through individual interviews with each participant, ensuring consistent and accurate data collection.

Adverse Childhood Experiences Scale (ACEs)

The ACEs (Felitti et al., 1998; Portuguese version Silva & Maia, 2008) is a self-report questionnaire aimed to assess experiences of adversity before the age of 16 (Silva & Maia, 2008). The survey consists of 17 questions that are answered with dichotomous response items ("Yes"/"No"). It assesses 10 types of adversity: emotional abuse (items 1 and 2), physical abuse (items 3 and 4), sexual abuse (items 5 and 6), emotional neglect (items 7 and 8), physical neglect (items 9 and 10), parental divorce or separation (item 11), exposure to domestic violence (DV; items 12, 13, and 14), household substance abuse (item 15), family mental illness or suicide (item 16), and imprisonment of a family member (items 17). The total adversity score ranges between 0 and 10 different types of ACEs. For analyses focusing on specific types of ACEs, the sum of the items within each domain was used, resulting in a score that can range from zero to the maximum number of items per type (e.g., exposure to DV ranges from 0 to 3, corresponding to the three items included in this type of ACE). The instrument in the present study revealed good internal consistency, with a Cronbach's alpha of .90.

Benevolent Childhood Experiences Scale (BCEs)

The BCEs (Narayan et al., 2018; Portuguese version Almeida et al., 2021) assess the presence of favorable childhood experiences between 0 and 18 years, using dichotomous response items ("Yes"/"No"). It is divided into three categories: perceived relational and internal security, positive and predictable quality of life, and interpersonal support (Almeida et al., 2021). The total score ranges from 0 to 10, resulting from the sum of the 10 items. In the current study, the scale reveals an internal consistency of .77.

Social Desirability Scale - 20 (EDS-20)

The EDS-20 (Almiro et al., 2017) is a self-report instrument designed to assess individuals' tendency to respond in a socially desirable manner, capturing both the denial of negative traits and the attribution of positive qualities. The scale consists of 20 dichotomous response items (''Yes'' or ''No''). In the present study, the scale demonstrated high internal consistency (α= .88).

Self-Report Psychopathy Scale – Short Form (SRP-SF)

The SRP-SF (Paulhus et al., 2016; Portuguese version of Seara-Cardoso et al., 2019) is a 29-item self-report instrument based on the four-factor structure of the PCL-R, assessing the interpersonal (INT), affective (AFF), lifestyle (LIF), and antisocial (ANT) factors. The items are assessed on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with total scores ≥70 indicating a higher propensity for psychopathic traits. In this study, the total scale showed high internal consistency (α =

.87), while the INT (α = .76) and LIF (α = .74) subscales showed acceptable values, and the AFF (α = .54) and ANT (α = .57) subscales showed lower consistency.

Data analysis

All statistical analyses were performed in SPSS (version 29). A priori power analyses in G*Power 3.1 (Faul et al., 2009) determined the required sample size. For multiple linear regression, assuming a medium effect size ($f^2 = 0.15$), α = 0.05, power = 0.95, and two predictors, the required sample was 107 participants.

Descriptive statistics, including measures of central tendency and dispersion, were used to characterize the sample. Pearson correlation was performed to examine the associations between PCEs, ACEs, their subscales, psychopathy scores (total and factors), and social desirability (EDS-20). To examine the moderating effects of PCEs on the relationship between ACEs and psychopathic traits, including its specific factors, the PROCESS macro (version 4.2) (Hayes, 2022) was employed. This moderation model treated ACEs (and types of ACEs) as the independent variable or predicted variable (X). The psychopathy factors (Interpersonal, Affective, Lifestyle, and Antisocial) and the total psychopathy score were the dependent variables or outcome (Y), while PCEs served as the moderator variable (W), with social desirability (EDS-20) as a covariate.

Results

Descriptive Analyses

Total psychopathy had a mean score of 57.25 (*SD* = 15.93), with the lifestyle facet showing the highest scores. The EDS-20 had a mean score of 10.93 (*SD* = 5.25), reflecting moderate levels of social desirability. Participants reported an average of 4.02 (*SD* = 3.03) ACEs, with emotional abuse and exposure to DV being the most reported. PCEs had a mean score of 8.24 (*SD* = 2.15).

Table 2

Descriptive Statistics for Study Measures, Scales, and Subscales

Measures	*N (%)*	*M*	*SD*	Min	Max
SRP-SF Total	164 (100)	57.25	15.93	31	122
INT	164 (100)	13.10	5.04	5	32
AFF	164 (100)	12.95	3.95	7	27
LIF	164 (100)	15.60	5.22	7	31
ANT	164 (100)	13.01	4.51	7	27
EDS-20 Total	164 (100)	10.93	5.25	0	20
PCEs Total	164 (100)	8.24	2.15	1	10

ACEs Total	164 (100)	4.02	3.03	0	10
Prevalence of ACEs					
Emotional abuse	87 (53.0)	.94	.938	0	2
Physical abuse	85 (51.8)	.88	.912	0	2
Sexual abuse	55 (33.5)	.57	.851	0	2
Emotional neglect	76 (46.3)	.73	.859	0	2
Physical neglect	53 (32.3)	.43	.684	0	2
Divorce or parental separation	65 (39.6)	.40	.491	0	1
Exposure to DV	65 (39.6)	.90	1.358	0	6
Household substance abuse	88 (53.7)	.54	.500	0	1
Mental illness or suicide in family	41 (25.0)	.25	.434	0	1
Imprisonment of a family member	44 (26.8)	.27	.444	0	1

Note. Min= Minimum; Max= Maximum; SRP-SF= Self-Report Psychopathy Scale – Short Form; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; AI= Affective-Interpersonal Dimension; LA= Lifestyle-Antisocial Dimension; EDS-20= Social Desirability Scale - 20 Items; PCEs= Benevolent Childhood Experiences Scale; ACEs= Adverse Childhood Experiences Questionnaire

Results revealed that 81.7% (*n*=134) of participants reported at least one ACE. Household substance abuse (53.7%), emotional abuse (53.0%), and physical abuse (51.8%) were the most frequently reported types of ACEs.

Correlation analyses

Pearson correlations indicated that social desirability was significantly negatively correlated with the total psychopathy score as well as with all its factors, and PCEs were negatively correlated with the psychopathy lifestyle factor. Total ACEs were positively correlated with lifestyle and antisocial factors and total psychopathy.

Among specific ACEs types, emotional abuse was positively correlated with lifestyle and antisocial factors. Physical abuse showed positive correlations with lifestyle and antisocial factors, and total psychopathy. Sexual abuse was positively correlated with lifestyle and antisocial factors. Physical neglect was positively associated with lifestyle and antisocial factors and total psychopathy. Exposure to DV

exhibited positive correlations with interpersonal and lifestyle factors and total psychopathy. Finally, household substance abuse was positively associated with lifestyle and antisocial factors.

Table 3

Person Correlations Between Psychopathic Traits, Total ACEs, Types of ACEs, and Total PCEs in the Total Sample (n=164)

PCEs and ACEs Experiences	SRP-SF				
	INT	AFF	LIF	ANT	Total
EDS-20	-.570**	-.421**	-.591**	-.336**	-.586**
PCEs Total	-.102	-.040	-.164*	-.122	-.138
ACEs Total	.109	.013	.249**	.219**	.183*
Number and Types of ACEs experienced					
Emotional abuse	.038	-.026	.186*	.168*	.122
Physical abuse	.096	.071	.248**	.209**	.196*
Sexual abuse	.048	.008	.186*	.171*	.123
Emotional neglect	.008	-.015	.081	.107	.059
Physical neglect	.073	.043	.198*	.233**	.169*
Divorce or parental separation	.039	.030	.172*	.109	.099
Exposure to domestic violence	.168*	.092	.208**	.138	.188*
Household substance abuse	.106	-.035	.193*	.209**	.148
Mental illness or suicide in family	.087	-.006	.142	.083	.086
Imprisonment of a family member	.068	.089	.126	.130	.114

Note. *p <.05, **p<.01; EDS-20 = Social Desirability Scale; SRP-SF = Self-Report Psychopathy Scale; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; AI= Affective-Interpersonal Dimension; LA= Lifestyle-Antisocial Dimension; PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences.

Moderation Analyses

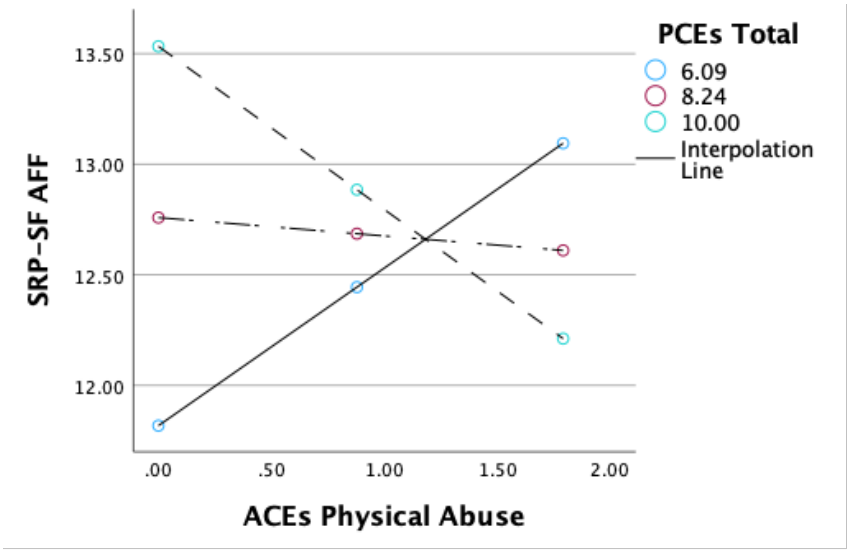
Moderation Effects Controlling for Social Desirability

Moderation analyses, with total ACEs as the predictor (X), psychopathic traits as the outcome variables (Y), PCEs as the moderator, and social desirability (EDS-20) as a covariate, revealed no

significant moderating effect of PCEs (cf. Table 4). However, when specific ACEs were examined, PCEs appeared to moderate the link between physical abuse and the affective dimension of psychopathy, b = –0.372, p = .026. Simple slope analyses revealed that, at high levels of PCEs (M = 10.00), the relationship between physical abuse and affective traits was weaker - and even negative - compared to lower levels of PCEs. This pattern suggests that PCEs may buffer the impact of physical abuse on the affective features of psychopathy (Figure 1).

Figure 1

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Physical Abuse Experiences (ACEs) and Affective Factor of Psychopathy



Note. Figure 1: Interactions between Physical Abuse Experiences (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Affective factors of Psychopathy (SRP-SF AFF).

Similarly, PCEs significantly moderated the relationships between childhood sexual abuse and the affective (b = –0.3392, p = 0.0291), antisocial (b = –0.4246, p = 0.020), and total psychopathy scores (b = –1.2969, p = 0.0215). Simple slopes analyses showed that at low levels of PCEs, childhood sexual abuse was positively and significantly associated with affective, antisocial, and total psychopathy scores. At moderate levels of PCEs, these associations weakened. At high levels of PCEs (M = 10.00), the associations became negative, indicating a disordinal interaction, a crossover effect, where PCEs not only buffered but reversed the direction of the relationship between sexual abuse and psychopathy (Figures 2A, B, C).

Figure 2 A

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Sexual Abuse Experiences (ACEs) and Affective Factor of Psychopathy

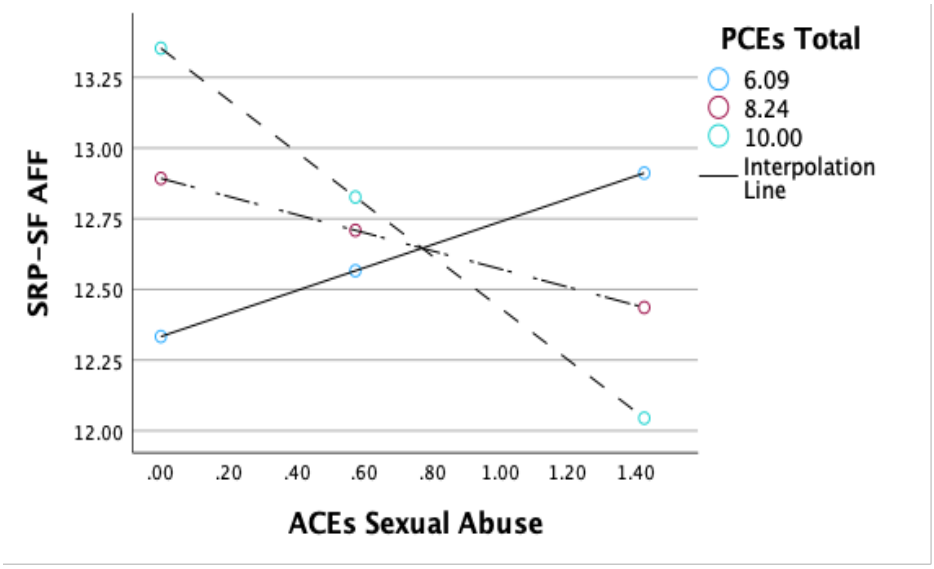


Figure 2 B

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Sexual Abuse Experiences (ACEs) and Antisocial Factor of Psychopathy

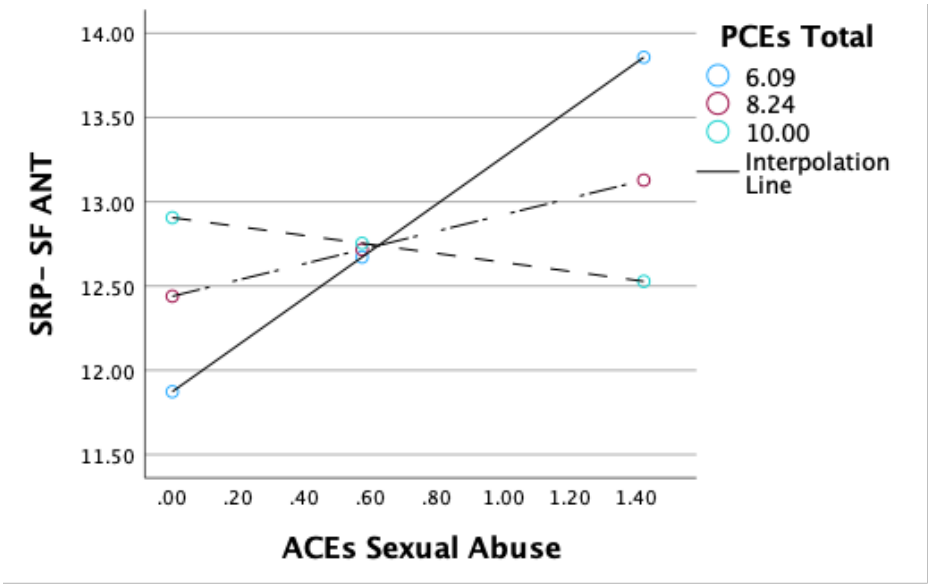
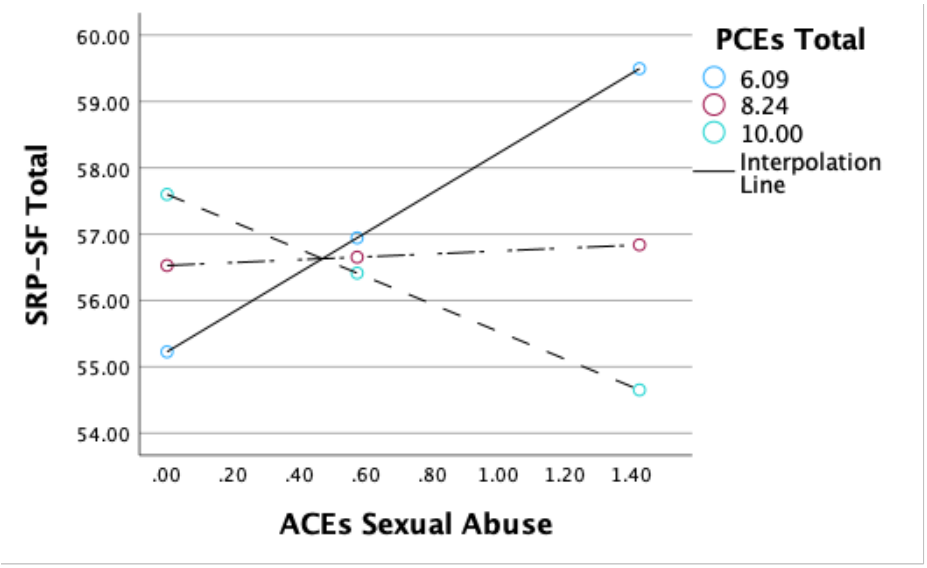


Figure 2 C

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Sexual Abuse Experiences (ACEs) and Antisocial Factor of Psychopathy



Note. Figure 2 A: Interactions between Sexual Abuse Experiences (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Affective factors of Psychopathy (SRP-SF ANT); Figure 2 B: Interactions between Sexual Abuse Experiences (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Antisocial factors of Psychopathy (SRP-SF ANT); Figure 2 C: Interactions between Sexual Abuse Experiences (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting total scores of Psychopathy (SRP-SF total).

Furthermore, PCEs significantly moderated the relationship between exposure to DV and both total psychopathy scores (b = −0.5890, p = 0.033) and the affective dimension (b = −0.2287, p = 0.0027). Simple slopes analyses indicated a significant and stronger positive association at low levels of PCEs levels (M = 6.09), whereas at high levels of PCEs (M = 10.00), this association was attenuated and no longer significant (Figures 3A, B).

Figure 3 A

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Exposure to Domestic Violence (ACEs) and Affective Factors of Psychopathy

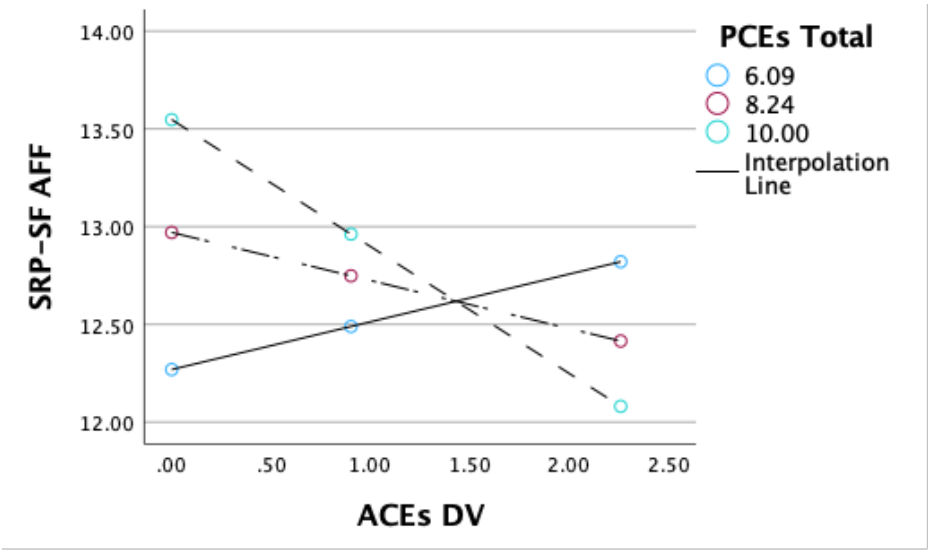
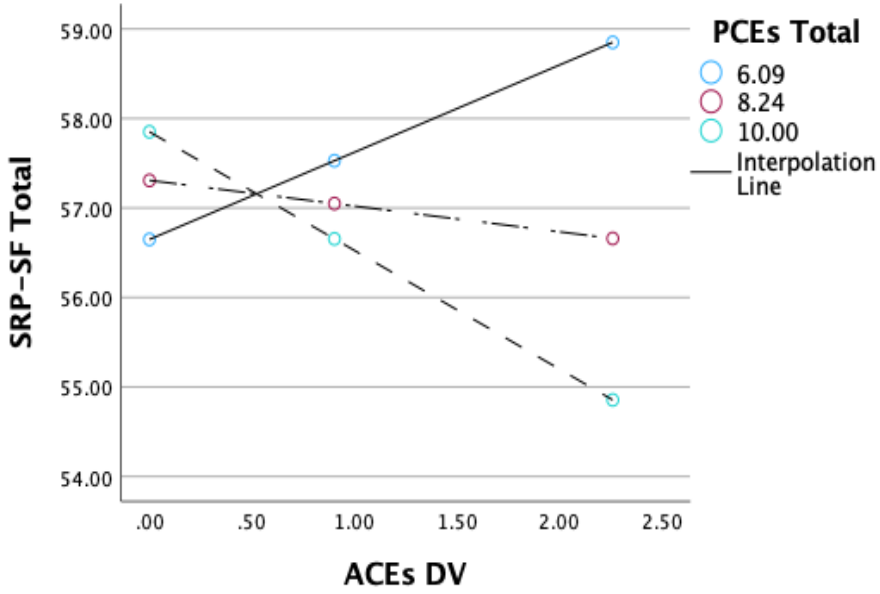


Figure 3 B

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Exposure to Domestic Violence (ACEs) and Total Scores of Psychopathy



Note. Figure 3 A: Interactions between Exposure to Domestic Violence (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Affective Factor Psychopathy (SRP-SF AFF); Figure 3 B: Interactions

between Exposure to Domestic Violence (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Total scores of Psychopathy (SRP-SF total).

Importantly, PCEs also moderated the relationship between having a family member incarcerated and all psychopathy dimensions: interpersonal (b = −0.9570, p = 0.0023), affective (b = −0.8722, p= 0.0013), lifestyle (b = −0.7795, p = 0.0142), antisocial (b = −0.6227, p = 0.0538), and total psychopathy scores (b = −3.2981, p = 0.0007). Simple slopes analyses revealed that higher levels of PCEs (M = 10.00) substantially weakened the positive associations between familial incarceration and psychopathic traits. In contrast, at lower PCEs levels (M = 6.09), these associations remained positive and significant, indicating that the protective, buffering effect of PCEs was absent in those fewer PCEs (Figures 4A–E).

Figure 4 A

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Experiences of Imprisonment of a family member (ACEs) and Interpersonal Factor of Psychopathy

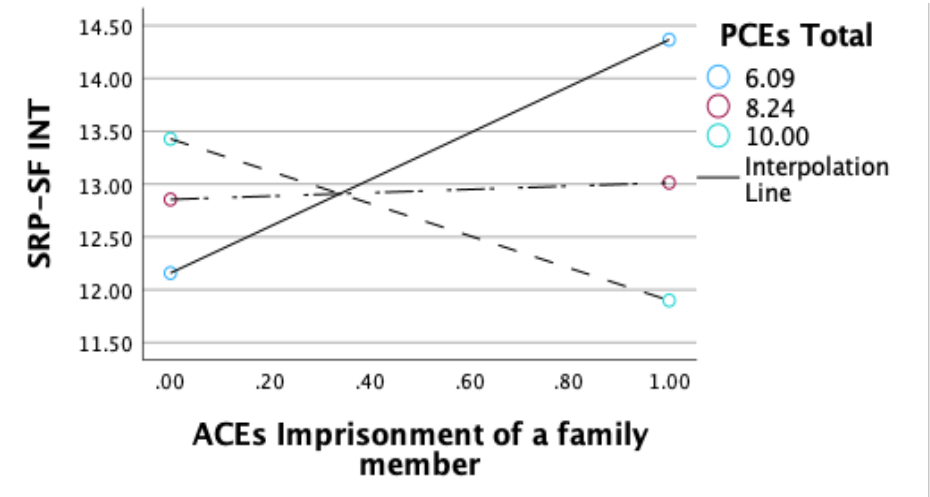


Figure 4 B

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Experiences of Imprisonment of a family member (ACEs) and Affective Factor of Psychopathy

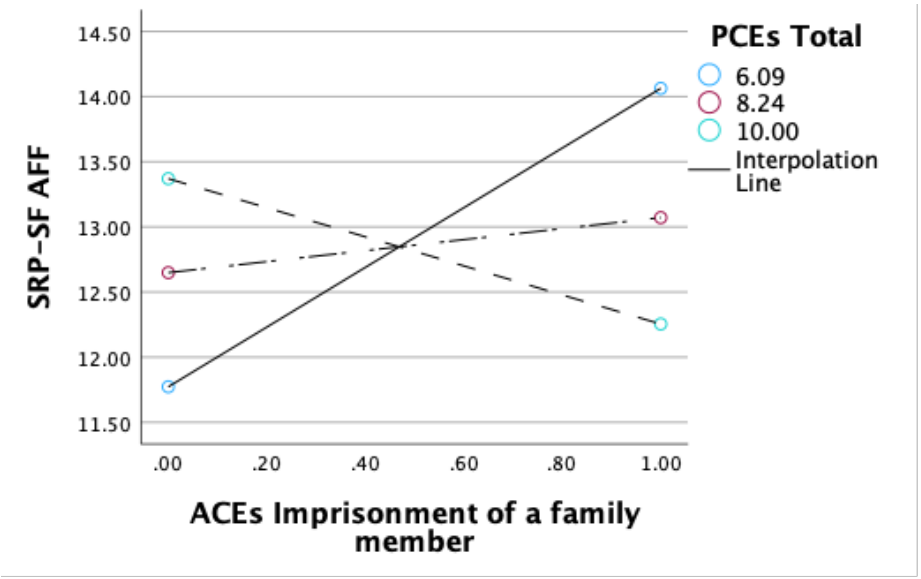


Figure 4 C

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Experiences of Imprisonment of a family member (ACEs) and Lifestyles Factor of Psychopathy

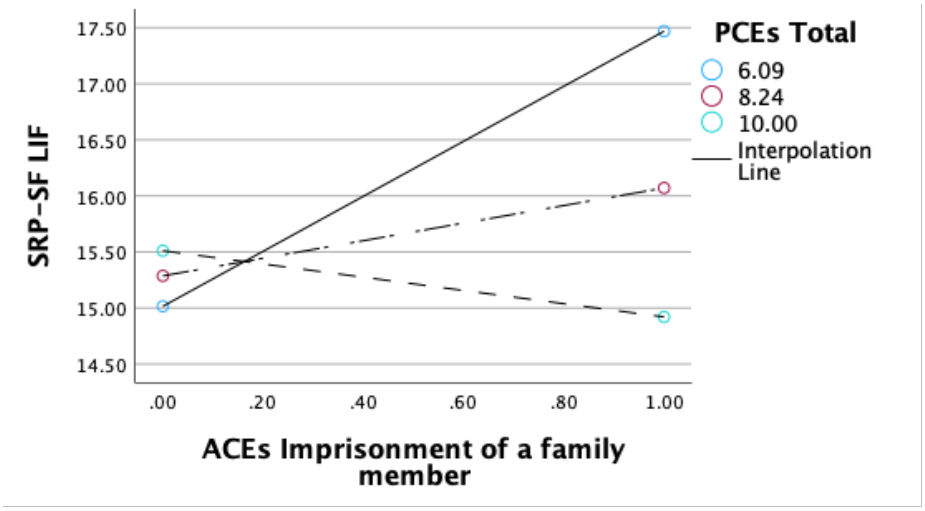


Figure 4 D

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Experiences of Imprisonment of a family member (ACEs) and Antisocial Factor of Psychopathy

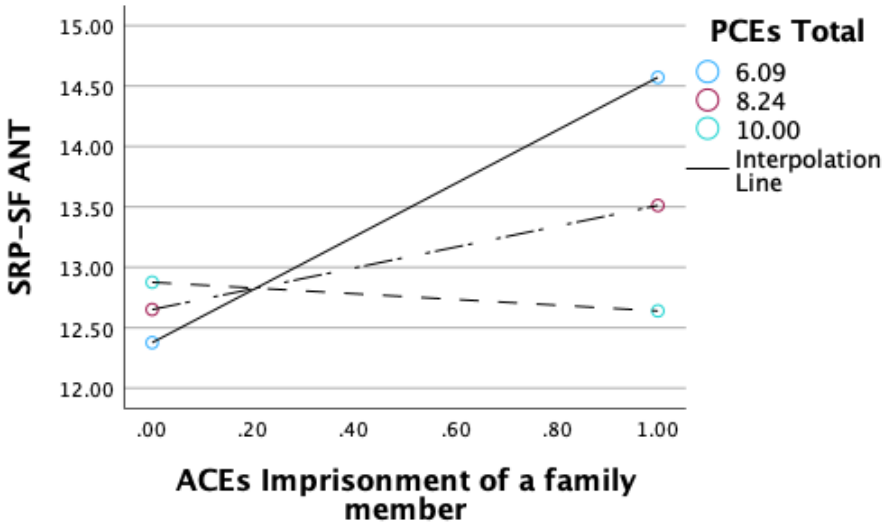
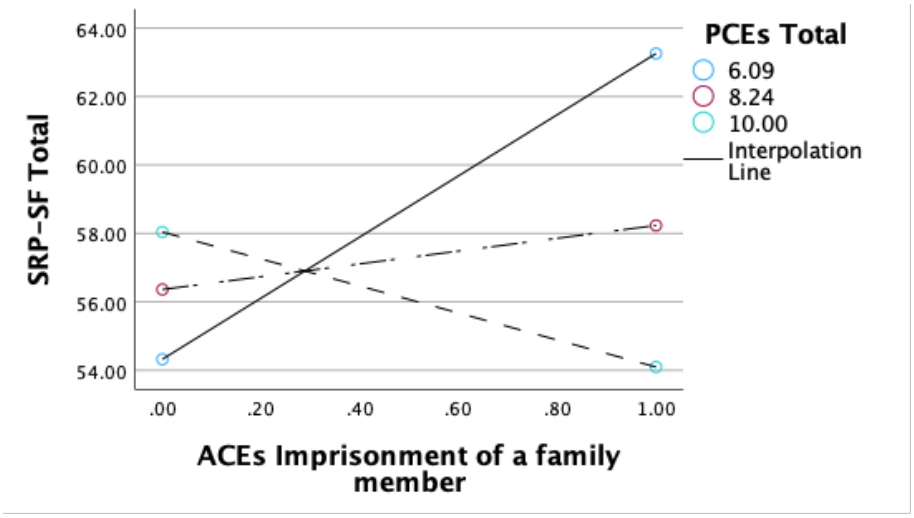


Figure 4 E

Moderating Effects of Benevolent Childhood Experiences (PCEs) on the Relationship Between Experiences of Imprisonment of a family member (ACEs) and Total Scores of Psychopathy



Note. Figure 4 A: Interactions between Experiences of Family Member Imprisonment (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Interpersonal Factors of Psychopathy (SRP-INT); Figure 4 B: Interactions between Experiences of Family Member Imprisonment (ACEs) and

Benevolent Childhood Experiences (PCEs total) in predicting Affective Factors of Psychopathy (SRP-AFF); Figure 4 C: Interactions between Experiences of Family Member Imprisonment (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Lifestyle Factors of Psychopathy (SRP-LIF); Figure 4 D: Interactions between Experiences of Family Member Imprisonment (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Antisocial Factors of Psychopathy (SRP-ANT); Figure 4 E: Interactions between Experiences of Imprisonment of Family Member (ACEs) and Benevolent Childhood Experiences (PCEs total) in predicting Total scores of Psychopathy (SRP-SF total).

Table 4

Moderation Role of PCEs in the Relationship Between ACEs and Psychopathic Traits, Controlling for EDS-20

Predictor variable	Outcomes	*b*	SE	*t*	*p*	95%CI
	INT					
	ACEs Total	0.4247	0.4949	0.8582	0.3920	-0.5526, 1.4021
	PCEs Total	0.1962	0.3748	0.5235	0.6013	-0.5440, 0.9365
	ACEs* PCEs	-0.0622	0.0564	-1.1032	0.2716	-0.1735, 0.0491
	EDS-20	-0.5607	0.0646	-8.6793	0.0000	-0.6883, -0.4331
	AFF					
	ACEs Total	0.5705	0.4242	1.3449	0.1806	-0.2673, 1.4082
	PCEs Total	0.4064	0.3213	1.2650	0.2077	-0.2281, 1.0409
	ACEs* PCEs	-0.0850	0.0483	-1.7585	0.0806	-0.1804, 0.0105
	EDS-20	-0.3373	0.0554	-6.0910	0.0000	-0.4467, -0.2279
	LIF					
	ACEs Total	0.2940	0.5010	0.5869	0.5581	-0.6955, 1.2836
ACEs Total	PCEs Total	-0.0467	0.3795	-0.1231	0.9022	-0.7962, 0.7028
	ACEs* PCEs	-0.0170	0.0571	-0.2971	0.7668	-0.1297, 0.0958
	EDS-20	-0.5679	0.0654	-8.6819	0.0000	-0.6971, -0.4387
	ANT					
	ACEs Total	0.9853	0.5017	1.9638	0.0513	-0.0056, 1.9761
	PCEs Total	0.4968	0.3800	1.3074	0.1930	-0.2537, 1.2473
	ACEs* PCEs	-0.0919	0.0572	-1.6084	0.1097	-0.2048, 0.0210
	EDS-20	-0.2627	0.0655	-4.0104	0.0001	-0.3920, -0.1333
	SRP-SF TOTAL					
	ACEs Total	2.1602	1.5430	1.4000	0.1635	-0.8872, 5.2077
	PCEs Total	0.9247	1.1687	0.7912	0.4300	-1.3835, 3.2328
	ACEs* PCEs	-0.2466	0.1758	-1.4031	0.1625	-0.5938, 0.1005
	EDS-20	-1.7763	0.2014	-8.8175	0.0000	-2.1741, -1.3784
Emotional abuse	INT					

	ACEs Total	0.1901	1.7826	0.1067	0.9152	-3.3304, 3.7107
	PCEs Total	-0.0687	0.3384	-0.2029	0.8395	-0.7370, 0.5997
	ACEs* PCEs	-0.1168	0.2029	-0.5755	0.5658	-0.5176, 0.2840
	EDS-20	-0.5785	0.0642	-9.0051	0.0000	-0.7054, -0.4516
	AFF					
	ACEs Total	1.8360	1.5320	1.1984	0.2325	-1.1898, 4.8618
	PCEs Total	0.3195	0.2909	1.0986	0.2736	-0.2549, 0.8940
	ACEs* PCEs	-0.2934	0.1744	-1.6826	0.0944	-0.6379, 0.0510
	EDS-20	-0.3440	0.0552	-6.2299	0.0000	-0.4530, -0.2349
	LIF					
	ACEs Total	-1.9160	1.8222	-1.0515	0.2946	-5.5148, 1.6828
	PCEs Total	-0.5734	0.3459	-1.6576	0.0994	-1.2567, 0.1098
	ACEs* PCEs	0.2245	0.2074	1.0825	0.2807	-0.1851, 0.6342
	EDS-20	-0.5848	0.0657	-8.9055	0.0000	-0.7145, -0.4551
	ANT					
	ACEs Total	0.5967	1.8484	0.3228	0.7472	-3.0539, 4.2473
	PCEs Total	-0.0808	0.3509	-0.2302	0.8182	-0.7738, 0.6123
	ACEs* PCEs	-0.0324	0.2104	-0.1542	0.8777	-0.4480, 0.3831
	EDS-20	-0.2720	0.0666	-4.0836	0.0001	-0.4036, -0.1405
	SRP-SF TOTAL					
	ACEs Total	0.7775	5.6251	0.1382	0.8902	-10.3321, 11.8871
	PCEs Total	-0.4406	1.0679	-0.4126	0.6804	-2.5498, 1.6685
	ACEs* PCEs	-0.2211	0.6404	-0.3453	0.7304	-1.4858, 1.0436
	EDS-20	-1.8217	0.2027	-8.9861	0.0000	-2.2221, -1.4213
Physical abuse	INT					
	ACEs Total	1.0546	1.6808	0.6275	0.5313	-2.2649, 4.3742
	PCEs Total	0.0533	0.2865	0.1860	0.8527	-0.5125, 0.6191
	ACEs* PCEs	-0.1706	0.1938	-0.8804	0.3800	-0.5533, 0.2121
	EDS-20	-0.5635	0.0648	-8.6941	0.0000	-0.6915, -0.4355
	AFF					

	ACEs Total	2.9797	1.4390	2.0707	0.0400	0.1377, 5.8217
	PCEs Total	0.4393	0.2453	1.7911	0.0752	-0.0451, 0.9237
	ACEs* PCEs	-0.3718	0.1659	-2.2414	0.0264	-0.6994, -0.0442
	EDS-20	-0.3266	0.0555	-5.8863	0.0000	-0.4362, -0.2170
	LIF					
	ACEs Total	1.2161	1.7001	0.7153	0.4755	-2.1415, 4.5737
	PCEs Total	-0.0736	0.2898	-0.2539	0.7999	-0.6459, 0.4987
	ACEs* PCEs	-0.0877	0.1960	-0.4473	0.6553	-0.4747, 0.2994
	EDS-20	-0.5664	0.0656	-8.6390	0.0000	-0.6959, -0.4369
	ANT					
	ACEs Total	2.7431	1.7101	1.6041	0.1107	-0.6343, 6.1205
	PCEs Total	0.2122	0.2915	0.7279	0.4677	-0.3635, 0.7878
	ACEs* PCEs	-0.2558	0.1971	-1.2976	0.1963	-0.6452, 0.1335
	EDS-20	-0.2626	0.0659	-3.9823	0.0001	-0.3929, -0.1324
	SRP-SF Total					
	ACEs Total	8.1570	5.2314	1.5593	0.1209	-2.1749, 18.4890
	PCEs Total	0.6053	0.8917	0.6789	0.4982	-1.1557, 2.3664
	ACEs* PCEs	-0.8989	0.6031	-1.4906	0.1381	-2.0900, 0.2922
	EDS-20	-1.7613	0.2017	-8.7303	0.0000	-2.1597, -1.3628
	INT					
	ACEs Total	1.9358	1.4728	1.3143	0.1906	-0.9730, 4.8445
	PCEs Total	0.0956	0.2220	0.4304	0.6675	-0.3429, 0.5340
	ACEs* PCEs	-0.2718	0.1794	-1.5150	0.1317	-0.6261, 0.0825
	EDS-20	-0.5516	0.0632	-8.7260	0.0000	-0.6764, -0.4267
Sexual abuse	AFF					
	ACEs Total	2.4734	1.2644	1.9562	0.0522	-0.0238, 4.9705
	PCEs Total	0.2612	0.1906	1.3703	0.1725	-0.1153, 0.6376
	ACEs* PCEs	-0.3392	0.1540	-2.2023	0.0291	-0.6434, -0.0350
	EDS-20	-0.3228	0.0543	-5.9488	0.0000	-0.4300, -0.2156
	LIF					

	ACEs Total	1.9164	1.4875	1.2883	0.1995	-1.0214, 4.8542
	PCEs Total	-0.0200	0.2242	-0.0891	0.9291	-0.4628, 0.4229
	ACEs* PCEs	-0.1667	0.1812	-0.9201	0.3589	-0.5246, 0.1911
	EDS-20	-0.5770	0.0638	-9.0378	0.0000	-0.7031, -0.4509
	ANT					
	ACEs Total	3.9807	1.4841	2.6822	0.0081	1.0496, 6.9118
	PCEs Total	0.2644	0.2237	1.1819	0.2390	-0.1774, 0.7062
	ACEs* PCEs	-0.4246	0.1808	-2.3486	0.0201	-0.7816, -0.0675
	EDS-20	-0.2766	0.0637	-4.3434	0.0000	-0.4024, -0.1508
	SRP-SF Total					
	ACEs Total	10.9006	4.5490	2.3963	0.0177	1.9163, 19.8848
	PCEs Total	0.6075	0.6857	0.8860	0.3770	-0.7468, 1.9618
	ACEs* PCEs	-1.2969	0.5541	-2.3405	0.0205	-2.3913, -0.2025
	EDS-20	-1.7737	0.1952	-9.0851	0.0000	-2.1593, -1.3881
Emotional neglect	INT					
	ACEs Total	0.4238	1.6357	0.2591	0.7959	-2.8066, 3.6543
	PCEs Total	-0.0532	0.2757	-0.1931	0.8472	-0.5977, 0.4913
	ACEs* PCEs	-0.0833	0.1952	-0.4266	0.6702	-0.4687, 0.3022
	EDS-20	-0.5473	0.0635	-9.6130	0.0000’	-0.6728, -0.4218
	AFF					
	ACEs Total	0.2774	1.4165	0.1958	0.8450	-2.5201, 3.0749
	PCEs Total	0.0395	0.2388	0.1653	0.8689	-0.4321, 0.5110
	ACEs* PCEs	-0.0552	0.1690	-0.3266	0.7444	-0.3890, 0.2786
	EDS-20	-0.3194	0.0550	-5.8032	0.0000	-0.4280, -0.2107
	LIF					
	ACEs Total	0.3549	1.6563	0.2143	0.8306	-2.9162, 3.6260
	PCEs Total	-0.1959	0.2792	-0.7017	0.4839	-0.7473, 0.3555
	ACEs* PCEs	-0.0328	0.1976	-0.1659	0.8684	-0.4231, 0.3775
	EDS-20	-0.5833	0.0643	-9.0657	0.0000	-0.7104, -0.4563
	ANT					

	ACEs Total	1.8323	1.6698	1.0974	0.2741	-1.4654, 5.1301
	PCEs Total	0.0841	0.2815	0.2987	0.7655	-0.4718, 0.6399
	ACEs* PCEs	-0.1817	0.1992	-0.9118	0.3632	-0.5752, 0.2118
	EDS-20	-0.2811	0.0649	-4.3337	0.0000	-0.4092, -0.1530
	SRP-SF Total					
	ACEs Total	2.7523	5.1056	0.5391	0.5906	-7.3313, 12.8359
	PCEs Total	-0.1934	0.8606	-0.2248	0.8224	-1.8931, 1.5062
	ACEs* PCEs	-0.3359	0.6092	-0.5514	0.5821	-1.5391, 0.8672
	EDS-20	-1.7755	0.1984	-8.9512	0.0000	-2.1673, -1.3838
	INT					
	ACEs Total	1.5843	1.6242	0.9754	0.3308	-1.6236, 4.7921
	PCEs Total	0.0271	0.2018	0.1344	0.8933	-0.3714, 0.4256
	ACEs* PCEs	-0.2001	0.2203	-0.9085	0.3650	-0.6351, 0.2349
	EDS-20	-0.5461	0.0634	-8.6093	0.0000	-0.6714, -0.4208
	AFF					
	ACEs Total	0.9858	1.4077	0.7003	0.4847	-1.7943, 3.7660
	PCEs Total	0.0892	0.1749	0.5103	0.6105	-0.2561, 0.4346
	ACEs* PCEs	-0.1221	0.1909	-0.6396	0.5233	-0.4991, 0.2549
	EDS-20	-0.3187	0.0550	-5.7967	0.0000	-0.4273, -0.2101
Physical neglect	LIF					
	ACEs Total	1.2993	1.6247	0.7997	0.4251	-1.9095, 4.5080
	PCEs Total	-0.0906	0.2018	-0.4488	0.6542	-0.4892, 0.3081
	ACEs* PCEs	-0.0279	0.2203	-0.1267	0.8993	-0.4630, 0.4072
	EDS-20	-0.5808	0.0635	-9.1541	0.0000	-.07061, -0.4555
	ANT					
	ACEs Total	3.4552	1.6230	2.1289	0.0348	0.2498, 6.6607
	PCEs Total	0.1493	0.2016	0.7406	0.4600	-0.2489, 0.5475
	ACEs* PCEs	-0.2936	0.2201	-1.3342	0.1840	-0.7283, 0.1410
	EDS-20	-0.2766	0.0634	-4.3632	0.0000	-0.4018, -0.1514
	SRP-SF Total					

	ACEs Total	7.7112	5.0159	1.5373	0.1262	-2.1952, 17.6176
	PCEs Total	0.1565	0.6231	0.2511	0.8020	-1.0742, 1.3872
	ACEs* PCEs	-0.6925	0.6802	-1.0182	0.3101	-2.0359, 0.6508
	EDS-20	-1.7655	0.1959	-9.0124	0.0000	-2.1523, -1.3786
Divorce or parental separation	INT					
	ACEs Total	-1.8640	2.6329	-0.7079	0.4800	-7.0640, 3.3361
	PCEs Total	-0.2005	0.2243	-0.8942	0.3726	-0.6434, 0.2424
	ACEs* PCEs	0.1062	0.3131	0.3391	0.7350	-0.5123, 0.7246
	EDS-20	-0.5654	0.0645	-8.7640	0.0000	-0.6928, -0.4380
	AFF					
	ACEs Total	-0.3752	2.2894	-0.1639	0.8700	-4.8968, 4.1463
	PCEs Total	-0.0057	0.1950	-0.0293	0.9767	-0.3908, 0.3794
	ACEs* PCEs	-0.0155	0.2723	-0.0569	0.9547	-0.5532, 0.5223
	EDS-20	-0.3299	0.0561	-5.8806	0.0000	-0.4406, -0.2191
	LIF					
	ACEs Total	-1.8947	2.6729	-0.7089	0.4794	-7.1736, 3.3842
	PCEs Total	-0.3736	0.2277	-1.6412	0.1027	-0.8233, 0.0760
	ACEs* PCEs	0.2724	0.3179	0.8570	0.3927	-0.3554, 0.9003
	EDS-20	-0.5736	0.0655	-8.7594	0.0000	-0.7030, -0.4443
	ANT					
	ACEs Total	0.9615	2.7134	0.3544	0.7235	-4.3975, 6.3205
	PCEs Total	-0.1253	0.2311	-0.5421	0.5885	-0.5817, 0.3312
	ACEs* PCEs	-0.0930	0.3227	-0.2881	0.7736	-0.7303, 0.5444
	EDS-20	-0.2818	0.0665	-4.2393	0.0000	-0.4131, -0.1505
	SRP-SF Total					
	ACEs Total	-4.2804	8.2554	-0.5185	0.6048	-20.5848, 12.0239
	PCEs Total	-0.8176	0.7032	-1.1628	0.2467	-2.2064, 0.5711
	ACEs* PCEs	0.3534	0.9818	0.3600	0.7194	-1.5857, 2.2925
	EDS-20	-1.8010	0.2023	-8.9042	0.0000	-2.2005, -1.4015
	INT					

	ACEs Total	1.0458	0.7047	1.4841	0.1398	-0.3459, 2.4375
	PCEs Total	0.1024	0.2034	0.5036	0.6152	-0.2993, 0.5042
	ACEs* PCEs	-0.1366	0.0884	-1.5450	0.1243	-0.3112, 0.0380
	EDS-20	-0.5619	0.0657	-8.5554	0.0000	-0.6916, -0.4322
	AFF					
	ACEs Total	1.6378	0.5971	2.7431	0.0068	0.4586, 2.8170
	PCEs Total	0.3274	0.1724	1.8994	0.0593	-0.0130, 0.6678
	ACEs* PCEs	-0.2287	0.0749	-3.0528	0.0027	-0.3766, -0.0807
	EDS-20	-0.3485	0.0556	-6.2635	0.0000	-0.4584, -0.2386
	LIF					
	ACEs Total	0.6912	0.7158	0.9656	0.3357	-0.7225, 2.1049
Exposure to domestic violence	PCEs Total	-0.1173	0.2066	-0.5678	0.5710	-0.5254, 0.2908
	ACEs* PCEs	-0.0777	0.0898	-0.8649	0.3884	-0.2550, 0.0997
	EDS-20	-0.5851	0.0667	-8.7703	0.0000	-0.7168, -0.4533
	ANT					
	ACEs Total	1.0210	0.7225	1.4132	0.1596	-0.4059, 2.4479
	PCEs Total	0.0123	0.2086	0.0592	0.9529	-0.3996, 0.4243
	ACEs* PCEs	-0.1235	0.0906	-1.3630	0.1748	-0.3026, 0.0555
	EDS-20	-0.2907	0.0673	-4.3175	0.0000	-0.4237, -0.1577
	SRP-SF Total					
	ACEs Total	4.5642	2.1827	2.0910	0.0381	0.2533, 8.8751
	PCEs Total	0.3080	0.6301	0.4887	0.6257	-0.9365, 1.5524
	ACEs* PCEs	-0.5890	0.2738	-2.1508	0.0330	-1.1298, -0.0481
	EDS-20	-1.8325	0.2034	-9.0083	0.0000	-2.2343, -1.4307
	INT					
	ACEs Total	1.0342	2.8982	0.3568	0.7217	-4.6898, 6.7582
	PCEs Total	-0.0175	0.2726	-0.0642	0.9489	-0.5559, 0.5209
Household substance abuse	ACEs* PCEs	-0.1222	0.3346	-0.3653	0.7154	-0.7830, 0.5385
	EDS-20	-0.5513	0.0644	-8.5549	0.0000	-0.6785, -0.4240
	AFF					
	ACEs Total	0.1406	2.4898	0.0565	0.9550	-4.7767, 5.0580

	PCEs Total	0.0434	0.2342	0.1852	0.8533	-0.4192, 0.5059
	ACEs* PCEs	-0.1228	0.2874	-0.4273	0.6697	-0.6905, 0.4448
	EDS-20	-0.3350	0.0554	-6.0521	0.0000	-0.4444, -0.2257
	LIF					
	ACEs Total	1.7600	2.9183	0.6031	0.5473	-4.0037, 7.5237
	PCEs Total	-0.1300	0.2745	-0.4734	0.6365	-0.6721, 0.4122
	ACEs* PCEs	-0.1136	0.3369	-0.3373	0.7364	-0.7790, 0.5517
	EDS-20	-0.5746	0.0649	-8.8556	0.0000	-0.7027, -0.4464
	ANT					
	ACEs Total	4.4661	2.9252	1.5268	0.1288	-1.3111, 10.2433
	PCEs Total	0.1365	0.2752	0.4961	0.6205	-0.4069, 0.6799
	ACEs* PCEs	-0.3754	0.3377	-1.1119	0.2679	-1.0423, 0.2915
	EDS-20	-0.2721	0.0650	-4.1835	0.0000	-0.4005, -0.1436
	SRP-SF Total					
	ACEs Total	5.5172	9.0296	0.6110	0.5421	-12.3162, 23.3506
	PCEs Total	-0.1626	0.8494	-0.1915	0.8484	-1.8401, 1.5148
	ACEs* PCEs	-0.5237	1.0423	-0.5024	0.6161	-2.5823, 1.5350
	EDS-20	-1.7751	0.2008	-8.8420	0.0000	-2.1716, -1.3786
	INT					
	ACEs Total	3.7438	2.6465	1.4146	0.1591	-1.4831, 8.9706
	PCEs Total	0.1043	0.2101	0.4965	0.6202	-0.3106, 0.5193
	ACEs* PCEs	-0.4710	0.3235	-1.4558	0.1474	-1.1100, 0.1680
	EDS-20	-0.5369	0.0639	-8.3962	0.0000	-0.6632, -0.4106
Mental illness or suicide in family	AFF					
	ACEs Total	2.6667	2.2850	1.1671	0.2449	-1.8460, 7.1795
	PCEs Total	0.1533	0.1814	0.8450	0.3994	-0.2050, 0.5116
	ACEs* PCEs	-0.4140	0.2793	-1.4822	0.1403	-0.9657, 0.1377
	EDS-20	-0.3146	0.0552	-5.6990	0.0000	-0.4237, -0.2056
	LIF					
	ACEs Total	-2.3389	2.6793	-0.8730	0.3840	-7.6304, 2.9526

	PCEs Total	-0.3742	0.2127	-1.7593	0.0804	-0.7943, 0.0459
	ACEs* PCEs	0.3695	0.3275	1.1282	0.2609	-0.2774, 1.0164
	EDS-20	-0.5889	0.0647	-9.0972	0.0000	-0.7168, -0.4611
	ANT					
	ACEs Total	3.6484	2.7126	1.3450	0.1805	-1.7090, 9.0058
	PCEs Total	0.0156	0.2154	0.0724	0.9424	-0.4097, 0.4409
	ACEs* PCEs	-0.4412	0.3316	-1.3304	0.1853	-1.0961, 0.2138
	EDS-20	-0.2712	0.0655	-4.1376	0.0001	-0.4006, -0.1417
	SRP-SF Total					
	ACEs Total	6.8864	8.2885	0.8308	0.4073	-9.4833, 23.2562
	PCEs Total	-0.1968	0.6580	-0.2991	0.7652	-1.4964, 1.1027
	ACEs* PCEs	-0.9215	1.0133	-0.9094	0.3645	-2.9227, 1.0797
	EDS-20	-1.7609	0.2003	-8.7931	0.0000	-2.1564, -1.3654
Imprisonment of a family member	INT					
	ACEs Total	8.0412	2.5496	3.1540	0.0019	3.0058, 13.0766
	PCEs Total	0.3251	0.2007	1.6200	0.1072	-0.0712, 0.7215
	ACEs* PCEs	-0.9570	0.3091	-3.0963	0.0023	-1.5674, -0.3466
	EDS-20	-0.5583	0.0617	-9.0486	0.0000	-0.6802, -0.4364
	AFF					
	ACEs Total	7.6063	2.1933	3.4679	0.0007	3.2745, 11.9382
	PCEs Total	0.4090	0.1727	2.3691	0.0190	0.0680, 0.7500
	ACEs* PCEs	-0.8722	0.2659	-3.2803	0.0013	-1.3973, -0.3471
	EDS-20	-0.3287	0.0531	-6.1920	0.0000	-0.4335, -0.2238
	LIF					
	ACEs Total	7.2044	2.5926	2.7788	0.0061	2.0839, 12.3248
	PCEs Total	0.1269	0.2041	0.6216	0.5351	-0.2762, 0.5299
	ACEs* PCEs	-0.7795	0.3143	-2.4800	0.0142	-1.4002, -0.1587
	EDS-20	-0.5907	0.0627	-9.4138	0.0000	-0.7146, -0.4667
	ANT					
	ACEs Total	5.9902	2.6444	2.2652	0.0249	0.7674, 11.2129

	PCEs Total	0.1279	0.2082	0.6144	0.5399	-0.2832, 0.5390
	ACEs* PCEs	-0.6227	0.3206	-1.9425	0.0538	-1.2559, 0.0104
	EDS-20	-0.2893	0.0640	-4.5198	0.0000	-0.4156, -0.1629
	SRP-SF Total					
	ACEs Total	29.0354	7.8679	3.6903	0.0003	13.4963, 44.5746
	PCEs Total	0.9522	0.6193	1.5375	0.1262	-0.2709, 2.1754
	ACEs* PCEs	-3.2981	0.9538	-3.4578	0.0007	-5.1818, -1.4143
	EDS-20	-1.8118	0.1904	-9.5154	0.0000	-2.1879, -1.4358

Note. b = regression coefficient; SE = Standard error; CI = Confidence interval; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; AI= Affective-Interpersonal Dimension; LA= Lifestyle-Antisocial Dimension; PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences.

Moderation Effects Without Controlling for Social Desirability

To assess the robustness of the previously observed effects, additional moderation analyses were conducted without controlling for social desirability (EDS-20), as shown in Table 5. Overall, the moderating effects of PCEs remained significant for the interpersonal, affective, and total psychopathy dimensions. Significant interactions were observed between PCEs and the following ACEs: physical abuse (affective: $b = -0.3701$, $p = 0.0442$), sexual abuse (affective: $b = -0.3401$, $p = 0.0468$; total: $b = -1.3020$, $p = 0.0576$), exposure to DV (affective: $b = -0.1615$, $p = 0.0521$), and familial incarceration (interpersonal: $b = -0.8207$, $p = 0.0317$; affective: $b = -0.7920$, $p = 0.0080$; total: $b = -2.8559$, $p = 0.0175$).

When social desirability was not controlled for, previously significant moderation effects between familial incarceration and both the lifestyle and antisocial psychopathy dimensions were no longer observed. Conversely, new significant moderation effects emerged: PCEs moderated the relationship between family history of mental illness or suicide and both the interpersonal ($b = -0.8195$, $p = 0.0345$) and affective ($b = -0.6182$, $p = 0.0430$) dimensions of psychopathy.

Table 5

Moderation Role of PCEs in the Relationship Between ACEs and Psychopathic Traits, Without Inclusion of EDS-20 as a Covariate

Predictor variable	Outcomes	*b*	SE	*t*	*p*	95%CI
ACEs Total	INT					
	ACEs Total	0.6316	0.5982	1.0559	0.2926	-0.5497, 1.8130
	PCEs Total	0.1981	0.4536	0.4366	0.6630	-0.6977, 1.0938
	ACEs* PCEs	-0.0593	0.0682	-0.8689	0.3862	-0.1940, 0.0755
	AFF					
	ACEs Total	0.6949	0.4690	1.4816	0.1404	-0.2314, 1.6212
	PCEs Total	0.4075	0.3557	1.1458	0.2536	-0.2949, 1.1099
	ACEs* PCEs	-0.0832	0.0535	-1.5556	0.1218	-0.1889, 0.0224
	LIF					
	ACEs Total	0.5036	0.6057	0.8314	0.4070	-0.6926, 1.6998
	PCEs Total	-0.0449	0.4593	-0.0977	0.9223	-0.9519, 0.8622
	ACEs* PCEs	-0.0140	0.0691	-0.2027	0.8397	-0.1504, 0.1224
	ANT					
	ACEs Total	1.0822	0.5242	2.0644	0.0406	0.0469, 2.1175
	PCEs Total	0.4977	0.3975	1.2520	0.2124	-0.2873, 1.2827
	ACEs* PCEs	-0.0906	0.0598	-1.5148	0.1318	-0.2086, 0.0275
	SRP-SF TOTAL					
	ACEs Total	2.8157	1.8748	1.5019	0.1351	-0.8869, 6.5182
	PCEs Total	0.9305	1.4216	0.6545	0.5137	-1.8771, 3.7380
	ACEs* PCEs	-0.2374	0.2138	-1.1102	0.2686	-0.6597, 0.1849
Emotional abuse	INT					
	ACEs Total	1.2644	2.1787	0.5804	0.5625	-3.0383, 5.5672
	PCEs Total	-0.0268	0.4145	-0.0647	0.9485	-0.8454, 0.7918
	ACEs* PCEs	-0.1513	0.2485	-0.6089	0.5435	-0.6422, 0.3395
	AFF					
	ACEs Total	2.4748	1.6996	1.4560	0.1473	-0.8819, 5.8314

	PCEs Total	0.3444	0.3234	1.0651	0.2884	-0.2942, 0.9830
	ACEs* PCEs	-0.3140	0.1939	-1.6194	0.1073	-0.6969, 0.0689
	LIF					
	ACEs Total	-0.8300	2.2189	-0.3741	0.7089	-5.2120, 3.5520
	PCEs Total	-0.5311	0.4222	-1.2581	0.2102	-1.3648, 0.3026
	ACEs* PCEs	0.1896	0.2531	0.7492	0.4548	-0.3102, 0.6895
	ANT					
	ACEs Total	1.1019	1.9325	0.5702	0.5693	-2.7146, 4.9184
	PCEs Total	-0.0611	0.3677	-0.1662	0.8682	-0.7872, 0.6650
	ACEs* PCEs	-0.0487	0.2204	-0.2208	0.8255	-0.4840, 0.3867
	SRP-SF TOTAL					
	ACEs Total	4.1604	6.8703	0.6056	0.5457	-9.4077, 17.7286
	PCEs Total	-0.3089	1.3071	-0.2363	0.8135	-2.8903, 2.2726
	ACEs* PCEs	-0.3298	0.7837	-0.4209	0.6744	-1.8776, 1.2179
Physical abuse	INT					
	ACEs Total	0.7892	2.0326	0.8802	0.3801	-2.2250, 5.8034
	PCEs Total	0.0201	0.3469	0.0578	0.9540	-0.6650, 0.7051
	ACEs* PCEs	-0.1676	0.2346	-0.7142	0.4761	-0.6309, 0.2958
	AFF					
	ACEs Total	3.4055	1.5811	2.1539	0.0327	0.2830, 6.5280
	PCEs Total	0.4201	0.2698	1.5568	0.1215	-0.1128, 0.9529
	ACEs* PCEs	-0.3701	0.1825	-2.0278	0.0442	-0.7305, -0.0096
	LIF					
	ACEs Total	1.9544	2.0517	0.9526	0.3423	-2.0976, 6.0063
	PCEs Total	-0.1070	0.3501	-0.3055	0.7604	-0.7984, 0.5845
	ACEs* PCEs	-0.0846	0.2368	-0.3574	0.7213	-0.5523, 0.3831
	ANT					
	ACEs Total	3.0855	1.7855	1.7281	0.0859	-0.4407, 6.6116
	PCEs Total	0.1967	0.3047	0.6455	0.5195	-0.4050, 0.7984
	ACEs* PCEs	-0.2544	0.2061	-1.2344	0.2188	-0.6614, 0.1526

	SRP-SF Total					
	ACEs Total	10.4529	6.3349	1.6500	0.1009	-2.0580, 22.9637
	PCEs Total	0.5015	1.0810	0.4639	0.6433	-1.6335, 2.6365
	ACEs* PCEs	-0.8895	0.7312	-1.2164	0.2256	-2.3336, 0.5546
Sexual abuse	INT					
	ACEs Total	2.2156	1.7850	1.2412	0.2163	-1.3096, 5.7409
	PCEs Total	-0.0050	0.2688	-0.0187	0.9851	-0.5358, 0.5258
	ACEs* PCEs	-0.2734	0.2175	-1.2569	0.2106	-0.7029, 0.1562
	AFF					
	ACEs Total	2.6372	1.3933	1.8927	0.0602	-0.1145, 5.3889
	PCEs Total	0.2023	0.2098	0.9643	0.3364	-0.2120, 0.6166
	ACEs* PCEs	-0.3401	0.1698	-2.0034	0.0468	-0.6754, -0.0048
	LIF					
	ACEs Total	2.2092	1.8240	1.2112	0.2276	-1.3930, 5.8113
	PCEs Total	-0.1252	0.2746	-0.4559	0.6491	-0.6676, 0.4172
	ACEs* PCEs	-0.1684	0.2222	-0.7576	0.4498	-0.6073, 0.2705
	ANT					
	ACEs Total	4.1211	1.5644	2.6343	0.0093	1.0316, 7.2106
	PCEs Total	0.2140	0.2356	0.9083	0.3651	-0.2512, 0.6792
	ACEs* PCEs	-0.4254	0.1906	-2.2317	0.0270	-0.8018, -0.0489
	SRP-SF Total					
	ACEs Total	1.8005	5.5879	2.1118	0.0363	0.7651, 22.8360
	PCEs Total	0.2841	0.8414	0.3377	0.7361	-1.3776, 1.9457
	ACEs* PCEs	-1.3020	0.6808	-1.9123	0.0576	-2.6465, 0.0426
Emotional neglect	INT					
	ACEs Total	1.1741	1.9718	0.5955	0.5524	-2.7200, 5.0683
	PCEs Total	-0.0943	0.3328	-0.2835	0.7772	-0.7516, 0.5629
	ACEs* PCEs	-0.1814	0.2352	-0.7712	0.4417	-0.6459, 0.2831
	AFF					
	ACEs Total	0.7152	1.5522	0.4608	0.6456	-2.3502, 3.7806

	PCEs Total	0.0155	0.2620	0.0591	0.9529	-0.5019, 0.5328
	ACEs* PCEs	-0.1125	0.1851	-0.6074	0.5445	-0.4781, 0.2532
	LIF					
	ACEs Total	1.1545	2.0306	0.5686	0.5704	-2.8558, 5.1648
	PCEs Total	-0.2397	0.3427	-0.6995	0.4852	-0.9166, 0.4371
	ACEs* PCEs	-0.1374	0.2422	-0.5671	0.5714	-0.6157, 0.3410
	ANT					
	ACEs Total	2.2177	1.7576	1.2618	0.2089	-1.2534, 5.6888
	PCEs Total	0.0630	0.2966	0.2122	0.8322	-0.5229, 0.6488
	ACEs* PCEs	-0.2321	0.2097	-1.1069	0.2700	-0.6461, 0.1820
	SRP-SF Total					
	ACEs Total	5.1862	6.2328	0.8321	0.4066	-7.1230, 17.4954
	PCEs Total	-0.3268	1.0519	-0.3107	0.7564	-2.4043, 1.7506
	ACEs* PCEs	-0.6542	0.7435	-0.8800	0.3802	-2.1225, 0.8140
Physical neglect	INT					
	ACEs Total	2.3114	1.9579	1.1806	0.2395	-1.5552, 6.1781
	PCEs Total	-0.0559	0.2433	-0.2299	0.8185	-0.5364, 0.4245
	ACEs* PCEs	-0.2918	0.2655	-1.0987	0.2736	-0.8162, 0.2327
	AFF					
	ACEs Total	1.4102	1.5424	0.9143	0.3619	-1.6358, 4.4562
	PCEs Total	0.0408	0.1916	0.2128	0.8317	-0.3377, 0.4193
	ACEs* PCEs	-0.1756	0.2092	-0.8393	0.4025	-0.5887, 0.2376
	LIF					
	ACEs Total	2.0727	1.9987	1.0370	0.3013	-1.8745, 6.0199
	PCEs Total	-0.1789	0.2483	-0.7203	0.4724	-0.6694, 0.3116
	ACEs* PCEs	-0.1254	0.2711	-0.4626	0.6443	-0.6608, 0.4100
	ANT					
	ACEs Total	3.8235	1.7097	2.2363	0.0267	0.4469, 7.2001
	PCEs Total	0.1073	0.2124	0.5049	0.6143	-0.3123, 0.5268
	ACEs* PCEs	-0.3401	0.2319	-1.4664	0.1445	-0.7980, 0.1179

	SRP-SF Total					
	ACEs Total	7.7112	5.0159	1.5373	0.1262	-2.1952, 17.6176
	PCEs Total	-0.1119	0.7627	-0.1468	0.8835	-1.6181, 1.3942
	ACEs* PCEs	-0.9888	0.8325	-1.1878	0.2367	-2.6328, 0.6552
	INT					
	ACEs Total	-2.5200	3.1951	-0.7887	0.4314	-8.8300, 3.7900
	PCEs Total	-0.4011	0.2708	-1.4809	0.1406	-0.9360, 0.1338
	ACEs* PCEs	0.3303	0.3789	0.8719	0.3846	-0.4179, 1.0786
	AFF					
	ACEs Total	-0.7580	2.5172	-0.3011	0.7637	-5.7292, 4.2132
	PCEs Total	-0.1227	0.2134	-0.5752	0.5660	-0.5441, 0.2987
	ACEs* PCEs	0.1153	0.2985	0.3862	0.6998	-0.4742, 0.7048
	LIF					
Divorce or parental	ACEs Total	-2.5604	3.2430	-0.7895	0.4310	-8.9650, 3.8443
separation	PCEs Total	-0.5771	0.2749	-2.0994	0.0373	-1.1200, -0.0342
	ACEs* PCEs	0.4999	0.3846	1.2999	0.1955	-0.2596, 1.2593
	ANT					
	ACEs Total	0.6345	2.8526	0.2224	0.8243	-4.9990, 6.2680
	PCEs Total	-0.2253	0.2418	-0.9316	0.3530	-0.7028, 0.2523
	ACEs* PCEs	0.0188	0.3383	0.0555	0.9558	-0.6493, 0.6868
	SRP-SF Total					
	ACEs Total	-6.3704	10.0705	-0.6326	0.5279	-26.2587, 13.5179
	PCEs Total	-1.4565	0.8536	-1.7062	0.0899	-3.1424, 0.2294
	ACEs* PCEs	1.0675	1.1942	0.8939	0.3727	-1.2909, 3.4259
	INT					
	ACEs Total	0.7732	0.8480	0.9118	0.3633	-0.9016, 2.4480
Exposure to	PCEs Total	-0.0950	0.2435	-0.3900	0.6971	-0.5758, 0.3859
domestic violence	ACEs* PCEs	-0.0283	0.1054	-0.2682	0.7889	-0.2364, 0.1799
	AFF					
	ACEs Total	1.4687	0.6639	2.2122	0.0284	0.1576, 2.7799

	PCEs Total	0.2049	0.1906	1.0752	0.2839	-0.1715, 0.5814
	ACEs* PCEs	-0.1615	0.0825	-1.9570	0.0521	-0.3244, 0.0015
	LIF					
	ACEs Total	0.4074	0.8683	0.4691	0.6396	-1.3074, 2.1222
	PCEs Total	-0.3229	0.2493	-1.2952	0.1971	-0.8152, 0.1695
	ACEs* PCEs	0.0351	0.1079	0.3255	0.7452	-0.1780, 0.2483
	ANT					
	ACEs Total	0.8800	0.7605	1.1571	0.2490	-0.6220, 2.3819
	PCEs Total	-0.0898	0.2183	-0.4112	0.6815	-0.5210, 0.3414
	ACEs* PCEs	-0.0675	0.0945	-0.7141	0.4762	-0.2542, 0.1192
	SRP-SF Total					
	ACEs Total	3.6751	2.6714	1.3757	0.1708	-1.6007, 8.9509
	PCEs Total	-0.3358	0.7670	-0.4379	0.6621	-1.8505, 1.1788
	ACEs* PCEs	-0.2357	0.3320	-0.7098	0.4788	-0.8914, 0.4201
Substance abuse in the family environment	INT					
	ACEs Total	-0.1561	3.4873	-0.0447	0.9644	-7.0432, 6.7311
	PCEs Total	-0.2714	0.3265	-0.8314	0.4070	-0.9161, 0.3733
	ACEs* PCEs	0.1207	0.4016	0.3006	0.7641	-0.6724, 0.9138
	AFF					
	ACEs Total	-0.5827	2.7499	-0.2119	0.8324	-6.0136, 4.8481
	PCEs Total	-0.1109	0.2574	-0.4309	0.6671	-0.6193, 0.3975
	ACEs* PCEs	0.0248	0.3167	0.0784	0.9376	-0.6006, 0.6502
	LIF					
	ACEs Total	0.5194	3.5508	0.1463	0.8839	-6.4932, 7.5319
	PCEs Total	-0.3946	0.3324	-1.1871	0.2369	-1.0511, 0.2619
	ACEs* PCEs	0.1396	0.4089	0.3414	0.7333	-0.6679, 0.9471
	ANT					
	ACEs Total	3.8786	3.0688	1.2639	0.2081	-2.1819, 9.9391
	PCEs Total	0.0112	0.2873	0.0390	0.9690	-0.5562, 0.5785
	ACEs* PCEs	-0.2555	0.3534	-0.7232	0.4706	-0.9534, 0.4423

	SRP-SF Total					
	ACEs Total	1.6845	10.9811	0.1534	0.8783	-20.0022, 23.3711
	PCEs Total	-0.9802	1.0280	-0.9535	0.3418	-3.0104, 1.0499
	ACEs* PCEs	0.2586	1.2645	0.2045	0.8382	-2.2387, 2.7558
	INT					
	ACEs Total	7.1011	3.1332	2.2664	0.0248	0.9134, 13.2889
	PCEs Total	0.1525	0.2515	0.6061	0.5453	-0.3443, 0.6492
	ACEs* PCEs	-0.8195	0.3843	-2.1325	0.0345	-1.5784, -0.0606
	AFF					
	ACEs Total	4.6343	2.4709	1.8755	0.0625	-0.2456, 9.5141
	PCEs Total	0.1815	0.1984	0.9149	0.3616	-0.2103, 0.5733
	ACEs* PCEs	-0.6182	0.3031	-2.0400	0.0430	-1.2167, -0.0197
	LIF					
Mental illness or	ACEs Total	1.3437	3.2556	0.4127	0.6803	-5.0858, 7.7732
suicide in family	PCEs Total	-0.3214	0.2614	-1.2298	0.2206	-0.8376, 0.1947
	ACEs* PCEs	-0.0127	0.3993	-0.0319	0.9746	-0.8013, 0.7758
	ANT					
	ACEs Total	5.3442	2.8133	1.8996	0.0593	-0.2118, 10.9002
	PCEs Total	0.0399	0.2259	0.1767	0.8600	-0.4061, 0.4859
	ACEs* PCEs	-0.6172	0.3450	-1.7887	0.0755	-1.2986, 0.0642
	SRP-SF Total					
	ACEs Total	17.8981	9.9575	1.7975	0.0741	-1.7669, 37.5632
	PCEs Total	-0.0390	0.7994	-0.0487	0.9612	-1.6177, 1.5398
	ACEs* PCEs	-2.0645	1.2212	-1.6905	0.0929	-4.4763, 0.3474
	INT					
	ACEs Total	7.0206	3.1252	2.2464	0.0260	0.8486, 13.1926
Imprisonment of a	PCEs Total	0.1263	0.2448	0.5160	0.6066	-0.3571, 0.6097
family member	ACEs* PCEs	-0.8207	0.3788	-2.1668	0.0317	-1.5688, -0.0727
	AFF					
	ACEs Total	7.0055	2.4335	2.8788	0.0045	2.1996, 11.8114

	PCEs Total	0.2920	0.1906	1.5320	0.1275	-0.0844, 0.6684
	ACEs* PCEs	-0.7920	0.2949	-2.6852	0.0080	-1.3745, -0.2095
LIF						
	ACEs Total	6.1246	3.2222	1.9008	0.0591	-0.2389, 12.4881
	PCEs Total	-0.0835	0.2524	-0.3308	0.7412	-0.5819, 0.4149
	ACEs* PCEs	-0.6353	0.3905	-1.6268	0.1058	-1.4066, 0.1360
ANT						
	ACEs Total	5.4614	2.7976	1.9521	0.0527	-0.0637, 10.9865
	PCEs Total	0.0249	0.2191	0.1135	0.9097	-0.4078, 0.4576
	ACEs* PCEs	-0.5521	0.3391	-1.6283	0.1054	-1.2218, 0.1175
SRP-SF Total						
	ACEs Total	25.7234	9.8163	2.6205	0.0096	6.3371, 45.1096
	PCEs Total	0.3070	0.7688	0.3994	0.6902	-1.2113, 1.8254
	ACEs* PCEs	-2.8559	1.1898	-2.4004	0.0175	-5.2055, -0.5062

Note. b = regression coefficient; SE = Standard error; CI = Confidence interval; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; AI= Affective-Interpersonal Dimension; LA= Lifestyle-Antisocial Dimension; PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences.

Discussion

This study clarifies the complex relationships among ACEs, PCEs, and psychopathic traits in female offenders, revealing important nuances in how specific adversities and protective factors interact across distinct dimensions of psychopathy.

The findings confirm the high prevalence of ACEs among incarcerated women, consistent with previous research highlighting frequent exposure to multiple forms of abuse and neglect in this population (Aizpurua et al., 2023; Felitti et al., 2019). Despite high levels of ACEs, participants also reported high levels of PCEs, which can coexist and retain protective effects even in the face of adversity (Almeida et al., 2023; Han et al., 2023). Although incarcerated populations are often associated with elevated psychopathic traits, the present sample exhibited relatively low average scores, which are nevertheless in line with prior findings in female offender samples (León-Mayer et al., 2019; Seara-Cardoso et al., 2019). This supports the idea that the manifestation of psychopathy in women may differ both qualitative and quantitatively from male patterns, reinforcing the need for gender-sensitive approaches in assessment and interpretation.

According to hypothesis 1 (H1), cumulative exposure to ACEs was significantly associated with total psychopathy scores, as well as with lifestyle and antisocial dimensions. These findings are consistent with prior evidence highlighting the high prevalence of early adversity among women involved in criminal behavior (DeLisi et al., 2019; Salekin & Lynam, 2010) and support the role of ACEs in the etiology of psychopathic traits (Moreira et al., 2020; Veltman et al., 2025). In the present study, the most frequently reported adversities were emotional and physical abuse, and household substance use. Neurodevelopmental models propose that prolonged trauma during childhood disrupts brain circuits critical for emotional regulation, empathy, and adaptive social functioning, particularly in regions such as the prefrontal cortex and amygdala (Teicher et al., 2016). These neurobiological alterations may underlie hallmark features of psychopathy, including emotional detachment, impulsivity, and antisocial behavior (Hare, 2003).

Hypothesis 2 postulated that PCEs would be negatively associated with psychopathic traits. The results supported this hypothesis partially, revealing a significant negative correlation between PCEs and the lifestyle dimension of psychopathy. This finding is consistent with previous studies indicating that higher levels of PCEs are linked to lower impulsivity (Craig et al., 2021) and reduced engagement in criminal behavior (Novak et al., 2022), reinforcing the notion that PCEs may promote the development of adaptive behavioral regulation. In this context, protective experiences such as consistent caregiving, emotional warmth, and exposure to prosocial role models may serve as buffers against behavioral

dysregulation, which is central to the lifestyle dimension – characterized by impulsivity, irresponsibility, and a tendency toward sensation-seeking (Hare, 2003). However, the protective effects of PCEs may be less effective against relationally disruptive adversity (Van Doorn et al., 2025), which can result in long-term emotional development and attachment systems impairments (Bowlby, 1969; Cunha et al., 2025; Fonagy & Bateman, 2016).

Importantly, the present study found that PCEs significantly moderate the associations between specific ACEs and psychopathic traits. This finding supports hypothesis 3, which posited that PCEs would buffer the relationships between ACEs and psychopathic traits. The results showed that the effects of certain ACEs were significantly reduced among individuals reporting high levels of PCEs. These findings align with the perspective that developmental trajectories remain malleable and that supportive experiences – particularly those occurring across critical periods of development – can harness neural plasticity to promote adaptive functioning, even in the aftermath of early adversity (Cicchetti & Toth, 2009).

Notably, PCEs moderated the relationship between physical abuse and the affective facet of psychopathy, as well as between sexual abuse and the affective, antisocial facets and total psychopathy scores. Specifically, higher levels of PCEs appeared to buffer the impact of physical abuse on affective psychopathic traits, and sexual abuse on affective and antisocial traits, as well as overall psychopathy in female offenders. These results are consistent with literature linking childhood physical and sexual abuse to the disinhibition dimension of psychopathy and significant difficulties in emotion regulation (Moreira et al., 2020), including impulsivity, heightened emotional reactivity, aggression, and affective/empathic desensitization (Poythress et al., 2006). The manifestation of antisocial traits, frequently associated with this dysregulation profile, may thus reflect the cumulative burden of these adverse experiences (Glenn, 2019; Hare, 2003). Our findings underscore the protective function of PCEs within the framework of developmental plasticity, highlighting their potential to foster more adaptive developmental trajectories even in the presence of early adversity (Cicchetti & Toth, 2009). These results support the concept of experience-dependent plasticity, wherein early PCEs promote effective emotional and behavioral regulation during sensitive periods of development. By enhancing these regulatory capacities, PCEs may attenuate the emergence of psychopathic traits, particularly those related to emotional detachment and behavioral dysregulation (Cunha et al., 2025; Moreira et al., 2020). Ultimately, this may reduce the likelihood of affective deficits, such as diminished responsiveness to others' distress, as well as impulsive and transgressive behaviors characteristic of psychopathic traits (Verona et al., 2023).

Furthermore, the study revealed that PCEs moderated the relationship between exposure to DV and both affective traits and total psychopathy scores, suggesting a protective role against the detrimental impacts of witnessing DV on the development of affective deficits and global psychopathic traits. These findings align with social learning theory (Bandura, 1977), which postulates that repeated observation of violent behaviors and exposure, without prosocial models, fosters dysfunctional interpersonal patterns (Dargis & Koenigs, 2017; Rhee et al., 2013), impairing empathy and promoting impulsivity and aggression as maladaptive coping strategies (Rhee et al., 2013). Additionally, co-occurring physical neglect in DV context has been linked to the lifestyle and antisocial dimensions of psychopathy, reflecting the profound impact of deprivation of basic needs - physical and emotional - on emotional regulation and social learning (DeLisi et al., 2019; Rhee et al., 2013).

Finally, PCEs significantly moderated the relationship between familial incarceration and all dimensions of psychopathy, including interpersonal, affective, lifestyle, antisocial, and psychopathy total scores. These results suggest that early emotionally stable and supportive environments may play a critical protective role in the face of severe familial adversity (Narayan et al., 2023). Parental incarceration is widely recognized as a profound developmental risk, often accompanied by cumulative stressors such as economic instability, disrupted parental care, social stigma, and weakened attachment bonds (Murray & Farrington, 2005), which are linked to emotional dysregulation and increased risk for antisocial and psychopathic traits (Garofalo et al., 2025). These findings should be understood within the context of intergenerational transmission of adversity and psychopathology, wherein criminal behavior, insecure attachment, and maladaptive personality patterns are often transmitted through both genetic and environmental pathways (Farrington et al., 2010). Within this framework, PCEs emerge as key protective factors that may interrupt these trajectories (Cunha et al., 2014; Han et al., 2023; Narayan et al., 2023). The moderating effect of PCEs across all psychopathy factors underscores their capacity to disrupt cycles of intergenerational risk, underscoring the importance of early interventions focused on strengthening relational security and resilience in vulnerable populations. Furthermore, longitudinal evidence shows that early adverse environments have a lasting impact on psychopathic traits and criminal behavior, emphasizing the key role of early life experiences in psychopathological development (Veltman et al., 2025).

Supplementary analyses revealed that even without statistically controlling for social desirability bias, the protective effects of PCEs on the interpersonal and affective dimensions of psychopathy remained significant. This suggests that these more internalized traits may be less prone to distortion by socially desirable responding and that PCEs continue to buffer the impact of ACEs on their development.

PCEs, such as parental support, affectionate caregiving, and access to social resources, provide a critical foundation for adaptive coping and the development of secure attachment, fostering positive interpersonal schemas (Van Doorn et al., 2025). These developmental processes appear to promote healthier emotional and relational functioning, thereby reducing the likelihood of psychopathic traits associated with emotional detachment and affective insensitivity (Verona et al., 2023). Interestingly, the emergence of new moderation effects between PCEs and a family history of mental illness or suicide may reflect individuals' tendencies to preserve a favorable self-image, often marked by high self-esteem or grandiosity (Hare, 2003). In contrast, moderation effects involving familial incarceration on the lifestyle and antisocial dimensions were no longer observed when social desirability was not accounted for, likely due to underreporting of socially undesirable traits such as impulsivity and aggression (Leistico et al., 2008). This pattern underscores the heightened vulnerability of observable behavioral traits to response biases, compared to more internalized traits, which appear to be more consistently shaped by environmental influences (Moreira et al., 2020; Patrick et al., 2009).

The present findings emphasize the need of gender-sensitive, trauma-informed interventions targeting emotional dysregulation and maladaptive relational patterns to reduce psychopathic traits among female offenders (Moreira et al., 2020). However, the lack of significant moderating effects of PCEs for certain adversities - such as physical and emotional abuse, physical neglect, parental separation or divorce, and household substance abuse - underscores the pervasive and enduring impact of these experiences on emotional development. These experiences can impair emotional understanding and regulation, particularly of anger and sadness, as children come to expect negative or inconsistent responses from their caregiver (Bowlby, 1969; Fonagy & Bateman, 2016). Consequently, early relational disruptions may foster emotional dysregulation, peer rejection, and interpersonal difficulties across development, factors associated with the later emergence of psychopathic traits (van Beeck et al., 2024).

Beyond the current findings, other mechanisms may mediate or moderate the complex relationships between childhood experiences and psychopathic traits. Notably, executive functioning deficits arising from early adversity can impair cognitive processes such as working memory and the ability to learn from consequences, which are crucial for adaptive behavior regulation (De Brito et al., 2013). Similarly, early attachment patterns and the quality of caregiving relationships influence the development of emotional regulation and empathy, core components related to the interpersonal and affective dimensions of psychopathy (Bowlby, 1969; Fonagy & Bateman, 2016; Han et al., 2023; van Beeck et al., 2024). Although these factors were not directly measured in the present study, their established role in the literature suggests they likely contribute to the observed associations. Moreover,

adversity-related executive dysfunction compromises impulse control and decision-making, contributing to the lifestyle and antisocial facets of psychopathy (De Brito et al., 2013). These multifaceted pathways underscore the complex nature of psychopathy development and highlight the importance of trauma-informed, gender-sensitive interventions.

Limitations

Despite the valuable insights provided by this study into the relationship between ACEs and psychopathic traits in incarcerated women, several limitations should be acknowledged. First, the reliance on self-reported measures may introduce bias, particularly due to social desirability or underreporting of traumatic and adverse experiences. The sensitive nature of ACEs can contribute to recall inaccuracies or minimization of experiences (Hardt & Rutter, 2004). Additionally, although SRP-SF is validated for assessing psychopathy in forensic populations (Ray et al., 2013), they remain susceptible to response distortion, especially given the manipulative tendencies characteristic of psychopathy. Second, the cross-sectional nature of the study further limits the ability to infer causal relationships between ACEs, PCEs, and psychopathic traits. Third, the sample size, although adequate to detect medium effect sizes based on a priori power analysis, was derived from a non-random convenience sample, which may affect the generalizability of findings and the detection of smaller effects (Etikan et al., 2016). Moreover, the scarcity of studies that include individuals of other genders limits the possibility of drawing comparisons or generalizing the observed patterns beyond women, highlighting the need for more inclusive future research. Finally, the exclusive focus on women incarcerated in prison settings may have biased the results. Although this context offers insights into a high-risk group, it may also inflate certain associations due to the unique characteristics of this population and limit the applicability of the results to broader female or non-forensic samples.

Future Research Directions

To deepen understanding of the pathways linking adverse and positive childhood experiences to psychopathic traits in women, future research should incorporate methodological enhancements and conceptual refinements. Employing objective, multi-informant assessments, such as structured clinical interviews and official records, can validate self-reports and mitigate biases from social desirability and recall errors. Longitudinal studies are crucial to clarify causal relationships and the evolving interplay between ACEs, PCEs, and psychopathic traits over time (DeLisi et al., 2019; Veltman et al., 2025). Future work should also move beyond dichotomous measures of PCEs to examine how the frequency, duration, and quality of PCEs modulate their protective effects. Investigating additional moderators and mediators, such as socioeconomic status, access to mental health care, social support, and attachment styles

(notably insecure or disorganized attachment), may further elucidate resilience mechanisms (Farrington et al., 2010; Fonagy & Bateman, 2016; van Beeck et al., 2024). Sampling should be expanded to include larger, more diverse populations, encompassing both incarcerated and community-based women, as well as other forensic cohorts. Comparative analyses across settings could clarify shared and unique risk pathways. Clinically, these findings underscore the importance of gender-sensitive, trauma-informed interventions. Adapted Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) addressing women-specific manifestations of distress shows promise (Tabone et al., 2022). Moreover, programs that cultivate PCEs, such as secure relationships, emotional support, and community engagement, may buffer the effects of adversity and enhance emotional regulation and resilience (Almeida et al., 2021). Integrating such approaches into forensic rehabilitation could improve outcomes for women offenders.

References

Aizpurua, E., Caravaca-Sánchez, F., & Wolff, N. (2023). Patterns of Childhood Adversities and Their Associations With Adult Victimization Among Incarcerated Men and Women in Spanish Prisons. *International Journal of Offender Therapy and Comparative Criminology*, *67*(1), 89–104. https://doi.org/10.1177/0306624X221102845

Almeida, T. C., Fernandes, R. M., & Cunha, O. (2023). The role of positive childhood experiences in the link between childhood maltreatment and affective lability in a sample of incarcerated men and women. *Child Abuse & Neglect*, *135*, 105969. https://doi.org/10.1016/j.chiabu.2022.105969

Almeida, T. C., Guarda, R., & Cunha, O. (2021). Positive childhood experiences and adverse experiences: Psychometric properties of the Benevolent Childhood Experiences Scale (BCEs) among the Portuguese population. *Child Abuse & Neglect*, *120*, 105179. https://doi.org/10.1016/j.chiabu.2021.105179

Almiro, P. A., Almeida, D., Ferraz, M., Ferreira, R., Silvestre, M. J., Perdiz, C., Dias, I. S., Gonçalves, S., Sousa, L. B., & Simões, M. R. (2017). *Social Desirability Scale (EDS-20)*. In M. R. Simões, L. S. Almeida, & M. M. Gonçalves (Eds.), *Forensic psychology: Assessment instruments* (pp. 335–352). Pactor.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Boullier, M., & Blair, M. (2018). Adverse childhood experiences. *Paediatrics and Child Health*, *28*(3), 132–137. https://doi.org/10.1016/j.paed.2017.12.008

Bowlby, J. (1969). *Attachment and loss: Attachment* (2nd Ed.). Basic Books.

Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: the coming of age of a discipline. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *50*(1-2), 16–25. https://doi.org/10.1111/j.1469-7610.2008.01979.x

Craig, J. M., Wolff, K. T., & Baglivio, M. T. (2021). Resilience in Context: The Association between Neighborhood Disadvantage and Cumulative Positive Childhood Experiences among Justice-Involved Youth. *Crime & Delinquency*, *67*(11), 1647-1675. https://doi.org/10.1177/00111287211029852

Cunha, O., Sousa, M., Pereira, B., Pinheiro, M., Machado, A. B., Caridade, S., & Almeida, T. C. (2025). Positive Childhood Experiences and Adult Outcomes: A Systematic Review. *Trauma, Violence, & Abuse*, 15248380241299434. https://doi.org/10.1177/15248380241299434

Dargis, M., & Koenigs, M. (2017). Witnessing domestic violence during childhood is associated with

psychopathic traits in adult male criminal offenders. *Law and Human Behavior*, *41*(2), 173–179. https://doi.org/10.1037/lhb0000226

De Brito, S. A., Viding, E., Kumari, V., Blackwood, N., & Hodgins, S. (2013). Cool and hot executive function impairments in violent offenders with antisocial personality disorder with and without psychopathy. *PloS one*, *8*(6), e65566. https://doi.org/10.1371/journal.pone.0065566

DeLisi, M., Drury, A. J., & Elbert, M. J. (2019). The etiology of antisocial personality disorder: The differential roles of adverse childhood experiences and childhood psychopathology. *Comprehensive Psychiatry*, *92*, 1–6. https://doi.org/10.1016/j.comppsych.2019.04.001

Delk, L. A., Bobadilla, L., & Lima, E. N. (2017). Psychopathic Traits Associate Differentially to Anger, Disgust and Fear Recognition among Men and Women. *Journal of Psychopathology and Behavioral Assessment*, *39*(1), 25–34. https://doi.org/10.1007/s10862-016-9561-y

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4. https://doi.org/10.11648/j.ajtas.20160501.11

Fair, H., & Walmsley, R. (2024). *World female imprisonment list (6th ed.): Women and girls in penal institutions, including pre-trial detainees/remand prisoners*. Institute for Crime & Justice Policy Research. Retrieved April 12 2023, from https://www.prisonstudies.org/sites/default/files/resources/downloads/world_female_imprisonment_list_6th_edition.pdf

Farrington, D. P., Ullrich, S., & Salekin, R. T. (2010). Environmental influences on child and adolescent psychopathy. In *Handbook of Child and Adolescent Psychopathy* (pp. 202–230). The Guilford Press.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Felitti V. J. (2002). The Relation Between Adverse Childhood Experiences and Adult Health: Turning Gold into Lead. *The Permanente Journal*, *6*(1), 44–47. https://doi.org/10.7812/TPP/02.994

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245–258. https://doi.org/10.1016/s0749-3797(98)00017-8

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (2019). REPRINT OF: Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *56*(6), 774–786. https://doi.org/10.1016/j.amepre.2019.04.001

Fonagy, P., & Bateman, A. W. (2016). Adversity, attachment, and mentalizing. *Comprehensive Psychiatry*, *64*, 59–66. https://doi.org/10.1016/j.comppsych.2015.11.006

Friestad, C., Åse-Bente, R., & Kjelsberg, E. (2014). Adverse childhood experiences among women prisoners: Relationships to suicide attempts and drug abuse. *International Journal of Social Psychiatry*, *60*(1), 40–46. https://doi.org/10.1177/0020764012461235

Garofalo, C., Delvecchio, E., Bogaerts, S., Sellbom, M., & Mazzeschi, C. (2025). Childhood trauma and psychopathy: The moderating role of resilience. *Psychological Trauma: Theory, Research, Practice and Policy*, *17*(3), 511–519. https://doi.org/10.1037/tra0001687

Glenn A. L. (2019). Early life predictors of callous-unemotional and psychopathic traits. *Infant Mental Health Journal*, *40*(1), 39–53. https://doi.org/10.1002/imhj.21757

Han, D., Dieujuste, N., Doom, J. R., & Narayan, A. J. (2023). A systematic review of positive childhood experiences and adult outcomes: Promotive and protective processes for resilience in the context of childhood adversity. *Child Abuse & Neglect*, *144*, 106346. https://doi.org/10.1016/j.chiabu.2023.106346

Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: Review of the evidence. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *45*(2), 260–273. https://doi.org/10.1111/j.1469-7610.2004.00218.x

Hayes, A. F. (2022). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach* (3 rd ed.). Retrieved April 16 2023, from https://www.guilford.com/books/Introduction-to-Mediation-Moderation-and-Conditional-Process-Analysis/Andrew-Hayes/9781462549030

Lehmann, A., & Ittel, A. (2012). Aggressive behavior and measurement of psychopathy in female inmates of German prisons—A preliminary study. *International Journal of Law and Psychiatry*, *35*(3), 190–197. https://doi.org/10.1016/j.ijlp.2012.02.007

Leistico, A. M., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the hare measures of psychopathy to antisocial conduct. *Law and Human Behavior*, *32*(1), 28–45. https://doi.org/10.1007/s10979-007-9096-6

León-Mayer, E., Rocuant-Salinas, J., Eisenbarth, H., Folino, J., & Neumann, C. (2019). Structural equation modeling of psychopathic traits in Chilean female offenders using the Self-Report Psychopathy-Short Form (SRP-SF) Scale: a comparison of gender-based item modifications versus standard items. *Brazilian Journal of Psychiatry*, *41*(1), 31–37. https://doi.org/10.1590/1516-4446-2018-0106

Levenson, J. S., Willis, G. M., & Prescott, D. S. (2015). Adverse childhood experiences in the lives of female sex offenders. *Sexual Abuse, 27*(3), 258–283. https://doi.org/10.1177/1079063214544332

Moreira, D., Moreira, D. S., Oliveira, S., Ribeiro, F. N., Barbosa, F., Fávero, M., & Gomes, V. (2020). Relationship between adverse childhood experiences and psychopathy: A systematic review. *Aggression and Violent Behavior*, *53*, 101452. https://doi.org/10.1016/j.avb.2020.101452

Murray, J., & Farrington, D. P. (2005). Parental imprisonment: effects on boys' antisocial behaviour and delinquency through the life-course. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *46*(12), 1269–1278. https://doi.org/10.1111/j.1469-7610.2005.01433.x

Narayan, A. J. (2023). Intergenerational resilience in the context of adverse childhood experiences (ACEs). In S. G. Portwood, M. J. Lawler, & M. C. Roberts (Eds.), *Handbook of adverse childhood experiences: A framework for collaborative health promotion* (pp. 13–27). Springer Nature Switzerland AG. https://doi.org/10.1007/978-3-031-32597-7_2

Narayan, A. J., Rivera, L. M., Bernstein, R. E., Harris, W. W., & Lieberman, A. F. (2018). Positive childhood experiences predict less psychopathology and stress in pregnant women with childhood adversity: A pilot study of the benevolent childhood experiences (BCEs) scale. *Child Abuse & Neglect*, *78*, 19–30. https://doi.org/10.1016/j.chiabu.2017.09.022

Novak, A., & Fagan, A. A. (2022). The conditioning effects of positive experiences on the ACEs-offending relationship in adolescence. *Child Abuse & Neglect*, *134*, 105915. https://doi.org/10.1016/j.chiabu.2022.105915

Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, *21*(3), 913–938. https://doi.org/10.1017/S0954579409000492

Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2016). *Manual for the Self-Report Psychopathy Scale.* Toronto: Multi-Health Systems.

Portugal | World Prison Brief. (n.d.). Retrieved 7 June 2025, from https://www.prisonstudies.org/country/portugal

Poythress, N. G., Skeem, J. L., & Lilienfeld, S. O. (2006). Associations among early abuse, dissociation, and psychopathy in an offender sample. *Journal of Abnormal Psychology*, *115*(2), 288–297. https://doi.org/10.1037/0021-843X.115.2.288

Ray, J. V., Hall, J., Rivera-Hudson, N., Poythress, N. G., Lilienfeld, S. O., & Morano, M. (2013). The relation between self-reported psychopathic traits and distorted response styles: a meta-analytic review. *Personality Disorders*, *4*(1), 1–14. https://doi.org/10.1037/a0026482

Rhee, S. H., Friedman, N. P., Boeldt, D. L., Corley, R. P., Hewitt, J. K., Knafo, A., Lahey, B. B., Robinson, J., Van Hulle, C. A., Waldman, I. D., Young, S. E., & Zahn-Waxler, C. (2013). Early concern and disregard for others as predictors of antisocial behavior. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *54*(2), 157–166. https://doi.org/10.1111/j.1469-7610.2012.02574.x

Salekin, R., & Lynam, D. (2010). Child and adolescent psychopathy: An introduction. In R. T. Salekin & D. R. Lynam (Eds.), *Handbook of Child and Adolescent Psychopathy*, (pp. 1–12). The Guilford Press.

Sanz-García, A., Gesteira, C., Sanz, J., & García-Vera, M. P. (2021). Prevalence of Psychopathy in the General Adult Population: A Systematic Review and Meta-Analysis. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.661044

Seara-Cardoso, A., Queirós, A., Fernandes, E., Coutinho, J., & Neumann, C. (2019). Psychometric Properties and Construct Validity of the Short Version of the Self-Report Psychopathy Scale in a Southern European Sample. *Journal of Personality Assessment*, *102*, 1–12. https://doi.org/10.1080/00223891.2019.1617297

Sellbom, M., & Drislane, L. E. (2021). The classification of psychopathy. *Aggression and Violent Behavior*, *59*. https://doi.org/10.1016/j.avb.2020.101473

Silva, S., & Maia, Â. (2008). Portuguese version of the *Family ACE Questionnaire (Childhood Adversity History Questionnaire)*. In A. Noronha, C. Machado, L. Almeida, M. Gonçalves, S. Martins, & V. Ramalho (Eds.), *Proceedings of the XIII International Conference on Psychological Assessment: Forms and Contexts* (pp. 359–362). Psiquilíbrios Edições.

Tabone, J. K., Rishel, C. W., Hartnett, H. P., Szafran, K. F., & Royse, R. (2022). Examining the Effects of Adverse Childhood Experiences and Gender on Trauma-Informed Intervention Outcomes. *Journal of Child & Adolescent Trauma*, *16*(1), 9–19. https://doi.org/10.1007/s40653-022-00456-3

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews*

Neuroscience, *17*(10), 652–666. https://doi.org/10.1038/nrn.2016.111

van Beeck, M., Bogaerts, S., Sellbom, M., Somma, A., Fossati, A., Brehmer, Y., ... Garofalo, C. (2024). The Relationship Between Experiencing Childhood Trauma and Psychopathic Personality Traits: The Mediating Role of Insecure Attachment. *Journal of Aggression, Maltreatment & Trauma*, *33*(9), 1055–1072. https://doi.org/10.1080/10926771.2024.2381558

Van Doorn, G., Dye, J., & Teese, R. (2025). Adverse and positive childhood experiences and their associations with dark personality traits. *Journal of Research in Personality, 115*, 104583. https://doi.org/10.1016/j.jrp.2025.104583

Veltman, E., Garofalo, C., Hill, J. M., Blokland, A., & Sellbom, M. (2025). Do early environmental factors influence the relationship between psychopathy and crime: Longitudinal findings from the transitions in Amsterdam study. *Journal of Criminal Justice*, *98*, 1-12. Article 102399. https://doi.org/10.1016/j.jcrimjus.2025.102399

Verona, E., McKinley, S. J., Hoffmann, A., Murphy, B. A., & Watts, A. L. (2023). Psychopathy facets, perceived power, and forms of aggression. *Personality Disorders*, *14*(3), 259–273. https://doi.org/10.1037/per0000562

Wolff, N., Frueh, B. C., Shi, J., Gerardi, D., Fabrikant, N., & Schumann, B. E. (2011). Trauma exposure and mental health characteristics of incarcerated females self-referred to specialty PTSD treatment. *Psychiatric Services, 62*(8), 954–958. https://doi.org/10.1176/ps.62.8.pss6208_0954

STUDY 4|ADVERSE CHILDHOOD EXPERIENCES, EMPATHY, AND PSYCHOPATHIC TRAITS IN INCARCERATED WOMEN: THE BUFFERING ROLE OF POSITIVE CHILDHOOD EXPERIENCES

The present article is under review in *Psychiatry, Psychology and Law*.

References:

Pinheiro, M., Cardoso, L.G., Gonçalves, R. A., & Cunha, O. (under review). The Moderating Role of Positive Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Psychopathic Traits in Incarcerated Women. *Psychiatry, Psychology and Law*

Pinheiro, M., Cardoso, L.G., Gonçalves, R. A., & Cunha, O. (2026, March 6). *Adverse Childhood Experiences, Psychopathic Traits, and Empathy in Incarcerated Women: The Protective Role of Positive Childhood Experiences* [Oral presentation]. 5º Psychology Doctoral Symposium U.NORTE. Faculty of Psychology, University of Minho, Braga, Portugal.

Abstract

Adverse childhood experiences (ACEs) may contribute to empathy deficits in adulthood, particularly incarcerated women with psychopathic traits, who exhibit affective and cognitive empathy. This cross-sectional study examines whether ACEs and psychopathic traits predict empathy in incarcerated women, and whether positive childhood experiences (PCEs) moderate these links. We hypothesized that ACEs and psychopathic traits would negatively predict empathy, with stronger effects on affective empathy, and that PCEs would attenuate these associations. One hundred and 164 Portuguese incarcerated women (M_{age} = 38.75, SD_{age} = 11.99) completed the ACEs Scale, the Benevolent Childhood Experiences Scale, the Self-Report Psychopathy Scale–Short Form, and the Basic Empathy Scale. Results revealed that psychopathic traits, particularly affective and antisocial factors, predicted lower empathy, especially affective empathy. PCEs moderated specific ACEs–empathy links but not psychopathy–empathy links. These findings highlight empathy as a context-dependent mechanism shaped by psychopathic traits, with PCEs offering selective protection.

Keywords: Adverse Childhood Experiences (ACEs); Affective empathy; Cognitive Empathy; Empathy; Incarcerated Women; Positive Childhood Experiences (PCEs); Psychopathic Traits

Adverse Childhood Experiences, Empathy, and Psychopathic Traits in Incarcerated Women: The Buffering Role of Positive Childhood Experiences

Introduction

Adverse Childhood Experiences (ACEs): Definition and Impact

ACEs encompass a range of negative events during childhood, including physical, emotional, or sexual abuse, neglect, and exposure to domestic violence (DV) or household dysfunction (Felitti et al., 2019). These experiences are widespread, with significantly higher rates among justice-involved populations, especially women (Wolff et al., 2011). ACEs tend to cluster, intensifying their effects on developmental trajectories (Cicchetti & Toth, 2009; Felitti et al., 2019). From a developmental psychopathology viewpoint, early adversity disrupts key processes such as attachment formation, emotion regulation, and interpersonal functioning (Cicchetti & Toth, 2009; Pinheiro et al., 2025a). This leads to long-term consequences, including heightened risks for personality pathology, dysfunctional interpersonal patterns, mental health challenges, empathic blunting, reduced prosocial behavior, and vulnerability to psychopathic traits, particularly callous–unemotional (CU) features (Felitti et al., 2019; Hare, 2003; Moreira et al., 2024). The cumulative impact of ACEs is especially pronounced in female forensic populations, highlighting the need to explore their role in socioemotional outcomes (Wolff et al., 2011).

Neurobiologically, chronic adversity alters neural systems vital for emotional processing, such as the amygdala (Wild & Poeppl, 2022). These changes contribute to deficits in affective empathy and mentalizing abilities, central to interpersonal dysfunction (Cicchetti & Toth, 2009).

Relationship between Empathy and Psychopathic Traits: Predisposition or Functional Consequence?

Psychopathy is conceptualized as a distinct clinical construct with emotional, interpersonal, and behavioral traits (Hare, 2003), differing from antisocial personality disorder (American Psychiatric Association [APA], 2013) and dissocial personality disorder (World Health Organization [WHO], 2022), and aligning more closely with the ICD-11's emphasis on emotional and interpersonal features (Wynn et al., 2012). Hare's four-factor model includes interpersonal (e.g., superficial charm, manipulativeness), affective (e.g., shallow affect, lack of empathy), lifestyle (e.g., impulsivity, irresponsibility), and antisocial (e.g., aggressive behavior, norm violation) dimensions, providing a comprehensive framework (Hare, 2003).

Sex differences in psychopathy expression are evident: women less often show overt charm, favoring relational manipulation (e.g., flirtation, emotional coercion), with subtler yet impactful affective

deficits (Wynn et al., 2012). Lifestyle traits manifest as impulsivity, affective dysregulation, self-harm, or unstable relationships, while antisocial behaviors are covert (e.g., theft, fraud) rather than physically aggressive (Verona & Vitale, 2006). These patterns often stem from emotional neglect, maltreatment, or insecure attachment, impairing internal working models and mentalizing (Cicchetti & Toth, 2009; Moreira et al., 2024; Pinheiro et al., 2025a).

Empathy is multidimensional, involving cognitive empathy (understanding mental states; Theory of Mind - ToM) and affective empathy (emotional resonance) (Kogler et al., 2020). Psychopathic individuals typically have impaired affective empathy but intact or enhanced cognitive empathy, used manipulatively - the "emotion paradox" (Brook & Kosson, 2013). They may excel at detecting emotional vulnerability for exploitation (Wheeler et al., 2009), and forensic inmates with high psychopathy perceive themselves as skilled in emotional perception and management (Pham et al., 2010). In women, deficits in both empathy domains link to relational dysfunction, with cognitive impairments persisting (Dadds et al., 2009).

The debate questions whether empathy deficits are developmental outcomes of ACEs or functional adaptations tied to psychopathic traits. One view sees them as consequences of adversity disrupting neural systems (e.g., amygdala, prefrontal cortex), reducing empathic concern and prosociality (Cicchetti & Toth, 2009). Longitudinal data show maltreatment-linked low empathy mediating adversity to psychopathic features (Rhee et al., 2021), framing deficits as vulnerabilities in female forensic groups with high ACEs and interpersonal/affective traits (Verona et al., 2013; Wolff et al., 2011).

Empathy development involves genetic/temperamental factors and early relations (Rhee et al., 2013). Affective synchrony in parent–child interactions predicts adolescent cognitive empathy (Levy et al., 2019), while neglect or violence disrupts empathy-related neural systems, affecting regulation and compassion (Teicher & Samson, 2016). ACEs associate with personality pathology and maladaptive patterns (Felitti et al., 2019; Moreira et al., 2024), fostering CU styles via unreinforced prosociality (Felitti et al., 2019). Protective factors like mentors or school belonging can enhance empathy and functioning (Almeida et al., 2021; Bethell et al., 2019; Craig et al., 2022; Narayan et al., 2018).

Alternatively, empathy may be context-sensitive and strategically modulated per the Response Modulation Hypothesis, down-regulating unless attended to (Newman & Baskin-Sommers, 2012). The Adaptive Psychopathy Hypothesis posits flexible empathy based on contexts like threats or goals (Mihailides et al., 2017), especially in women under victimization, leading to affective avoidance (Moreira et al., 2024). This duality echoes Machiavellianism's superficial engagement (Austin et al., 2007).

Protective Role of Positive Childhood Experiences (PCEs) for ACEs, Psychopathy, and Empathy

PCEs, including secure caregiving, belonging, and supportive socialization, buffer ACEs' risks in justice-involved women (Bethell et al., 2019; Cunha et al., 2025b; Narayan et al., 2018). PCEs enhance emotion regulation, mentalizing, and empathic responsiveness, supporting adaptive development in high-risk females (Craig et al., 2022). Modest PCEs (e.g., mentors, school connections) significantly improve empathy and relations, countering adversity (Almeida et al., 2021; Morris et al., 2021). In female offenders, PCEs mitigate CU traits and interpersonal/affective coldness by bolstering secure models and prosocial norms (Cicchetti & Toth, 2009). Early synchrony boosts cognitive empathy, and supportive discipline enhances regulation and concern (Levy et al., 2019; Narayan et al., 2018). Evidence links higher PCEs to reduced impulsivity, criminality, and psychopathy in forensic and community settings (Cunha et al., 2025a). Responsive caregiving curbs psychopathy's lifestyle dimension (Pinheiro et al., 2025b).

PCEs moderate specific adversities (e.g., abuse, DV, parental incarceration), attenuating effects on psychopathy scores (Pinheiro et al., 2025b). This involves promoting adaptive ER, like reappraisal, relevant for female offenders' relational manipulation and disinhibition (Cole & Diaz, 2024). PCEs also moderate ACEs' empathy impact: ACEs foster suppression and blunting, while PCEs support regulatory skills for empathic responding (Almeida et al., 2023). In forensics, PCEs mitigate deficits, fostering prosociality despite adversity (Pinheiro et al., 2025b), suggesting context-dependent deficits (Bethell et al., 2019; Narayan et al., 2018). PCEs interrupt intergenerational risks, enhancing resilience across psychopathy dimensions in females (Pinheiro et al., 2025b). However, integrated research on PCEs with ACEs, psychopathy, and empathy in female offenders is limited (Sharf et al., 2014). Given psychopathy's prevalence (~4.5% in adults, higher forensically) and women's ACE burden, a PCE-focused developmental approach is essential (Cunha et al., 2025a; Sanz-García et al., 2021; Wynn et al., 2012).

Current study

ACEs disrupt socioemotional processes, contributing to empathy deficits in incarcerated women, particularly with interpersonal/affective psychopathic traits, within a developmental psychopathology framework (Cicchetti & Rogosch, 2002; Verona et al., 2013). In contrast, a functional perspective views empathy as context-sensitive, modulated by psychopathy to enable emotion recognition without prosocial concern, termed the “emotion paradox,” preserving cognitive empathy (Brook & Kosson, 2013). In women, this may reflect defensive regulation under relational stress (Moreira et al., 2024). PCEs promote mental health, attachment, and empathy as protective factors (Almeida et al., 2021; Cunha et al., 2025a).

While some studies explored the relationship between ACEs, psychopathic traits, and empathy, few studies have focused on female offenders, a population with unique psychopathic phenotypes. Accordingly, this study aims to examine whether ACEs and psychopathic traits predict empathy (total, affective, and cognitive) in incarcerated women, and whether PCEs moderate these links.

Based on this framework, we propose the following hypotheses: H1: PCEs will be negatively associated with global psychopathy and all factors (Cunha et al., 2015; Narayan et al., 2018); H2: PCEs will be positively associated with empathy (Morris et al., 2021); H3: ACEs will be positively associated with global psychopathy and all factors (Cunha et al., 2025a); H4: ACEs will be negatively associated with total, affective, and cognitive empathy (Jolliffe & Farrington, 2004; Levy et al., 2019); H5: empathy will be negatively related to psychopathic traits, with affective empathy showing significant associations than cognitive empathy (Brook & Kosson, 2013); H6: affective empathy will show stronger negative associations with the interpersonal and affective factors of psychopathy, whereas cognitive empathy will exhibit weaker or inconsistent associations (Verona et al., 2013); H7: psychopathic traits will predict reductions in affective empathy (with stronger effects for the interpersonal and affective factors) and weaker/absent effects on cognitive empathy (Brook & Kosson, 2013; Verona & Vitale, 2006; Verona et al., 2013). H8: ACEs will predict lower levels of empathy (Almeida et al., 2023; Jolliffe & Farrington, 2004; Maia et al., 2025); H9: PCEs will attenuate the negative association between ACEs and empathy (particularly affective empathy), consistent with their role in promoting adaptive ER (Bethell et al., 2019); and H10: PCEs will moderate the negative relationship between psychopathic traits and empathy, weakening this association (Van Doorn et al., 2024).

Method

Participants

This exploratory cross-sectional study employed a convenience sampling approach. The inclusion criteria required: a) female individuals; b) aged 18 years or older; c) currently incarcerated; d) Portuguese speakers with adequate literacy skills to complete self-report measures; e) abstained from substance use for a minimum of six months; and f) without cognitive impairments.

The final sample comprised 164 incarcerated women, aged between 18 and 81 years (M = 38.75, SD = 11.99). The majority were Portuguese (n = 126; 76.8%), single (n = 83; 50.6%), and mothers (n = 135; 82.3%). Regarding educational attainment, the most common levels were the 10th, 11th, and 12th grades (n = 58; 35.4%). Most participants had been sentenced (n = 127; 77.4%), with sentences ranging from 9 to 300 months (M = 93.55, SD = 64.88). The majority were convicted of non-violent

crimes (*n* = 104; 64.4%), with drug trafficking being the most frequent charge (*n* = 77; 47.7%). Among those incarcerated for violent offenses (*n* = 60; 36.6%), homicide was the most reported crime (*n* = 23; 14.0%).

Table 1

Participants' Sociodemographic and Juridical-Legal Characteristics

Variables	*n*	%
Marital Status		
Single	83	50.6
Married / Civil Union	51	31.1
Divorced/Separated	22	13.4
Widowed	8	4.9
Nationality		
Portuguese	126	76.8
Brazilian	26	15.9
Others	12	7.3
Education		
Uneducated	4	2.4
1st, 2nd, 3rd, and 4th grade	29	17.7
5th and 6th grade	29	17.7
7th, 8th, 9th grade	33	20.1
10th, 11th, and 12th grade	58	35.4
Bachelor's or Master's Degree	11	6.7
Legal Situation		
Conviction	127	77.4
Preventive	37	22.6
Conviction		
Violent crimes	60	36.6
Murder	23	14.0
Non-violent crimes	104	64.4
Drug trafficking	77	47.7

Note. N= 164 participants.

Procedure

This study was approved by the Ethics Committee in Social Sciences and Humanities of the University of [blind for review]. Subsequently, authorization to conduct the research within the four national female correctional facilities was granted by the Directorate-General for Reintegration and Prison Services – Ministry of Justice (DGRSP-MJ). All procedures for data collection complied with Portuguese legislation and adhered to the ethical standards established by the Declaration of Helsinki.

The study was conducted in three distinct phases. Initially, participants were informed about the study's objectives, procedures, and the voluntary nature of participation. Confidentiality and anonymity

were assured, and written informed consent was obtained from all participants. In the second phase, participants completed self-report measures under the supervision of at least two researchers. Finally, individual interviews were conducted to collect detailed sociodemographic information, criminal history, and other relevant contextual data.

Measures

Sociodemographic and Juridical-Legal Questionnaire

A comprehensive questionnaire was used to collect sociodemographic (age, marital status, nationality, educational qualifications) and legal information (criminal history, length of sentence, recidivism).

Adverse Childhood Experiences Scale (ACEs)

The ACEs (Felitti et al., 2019; Portuguese version Silva & Maia, 2008) is a self-report measure assessing ten types of adversity experienced before age 16: emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, parental divorce/separation, DV exposure, household substance abuse, family mental illness/suicide, and family member imprisonment. Participants indicate "Yes" for experienced adversities, with a total score (0–10) calculated by summing distinct adverse experiences. In this study, the instrument showed good internal consistency (α = .90).

Benevolent Childhood Experiences Scale (BCEs)

The BCEs (Narayan et al., 2018; Portuguese version Almeida et al., 2021) assess the presence of PCEs between 0 and 18 years, using dichotomous response items ("Yes"/"No"). It is divided into three categories: perceived relational and internal security, positive and predictable quality of life, and interpersonal support (Almeida et al., 2021). The total score ranges from 0 to 10, resulting from the sum of the 10 items. The present sample revealed an adequate internal consistency (α = .77).

Self-Report Psychopathy Scale – Short Form (SRP-SF)

The SRP-SF (Paulhus et al., 2016; Portuguese version by Seara-Cardoso et al., 2020) is a 29-item self-report measure based on the PCL-R's four-factor structure, assessing psychopathic traits across four dimensions: interpersonal (INT; e.g., charm, manipulativeness), affective (AFF; e.g., lack of remorse, reduced empathy), lifestyle (LIF; e.g., impulsivity, sensation seeking), and antisocial (ANT; e.g., poor behavioral control, antisocial behaviors). Rated on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"), total scores ≥70 indicate higher psychopathic traits. In this study, the total scale showed

high internal consistency (α = .87), with acceptable consistency for INT (α = .76) and LIF (α = .74), but lower consistency for AFF (α = .54) and ANT (α = .57).

Basic Empathy Scale (BES)

The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006; Portuguese version by Anastácio et al., 2016) is a 20-item measure evaluating cognitive and affective empathy. Items are rated on a 5-point Likert scale (1 = "Strongly Disagree" to 5 = "Strongly Agree"), yielding scores for cognitive empathy, affective empathy, and global empathy. In this study, the total scale demonstrated good internal consistency (α = .73), with acceptable reliability for cognitive empathy (α = .69) and slightly lower but adequate reliability for affective empathy (α = .66).

Social Desirability Scale - 20 (EDS-20)

The EDS-20 (Almiro et al., 2017) is a self-report instrument designed to assess individuals' tendency to respond in a socially desirable manner, capturing both the denial of negative traits and the attribution of positive qualities. The scale consists of 20 dichotomous response items ("Yes" or "No"). In the present study, the scale demonstrated high internal consistency (α = .88).

Data analysis

All statistical analyses were conducted using IBM SPSS Statistics (version 29). Initially, descriptive statistics (including means, standard deviations, frequencies, and percentages) were calculated to characterize the sample and study variables. A priori power analyses in G*Power 3.1 (Faul et al., 2009) determined the required sample size.

Pearson's correlation coefficients were used to explore bivariate relationships between the variables under study. Additionally, independent samples t-tests were performed to examine differences in empathy scores between groups. Hierarchical regression analyses were performed to assess the possible predictive effects of ACEs and psychopathic traits on empathy, controlling for social desirability. Moderation analyses were conducted using Model 1 of the PROCESS macro for SPSS (version 4.1; Hayes, 2022) with 5,000 bootstrap samples and 95% bias-corrected confidence intervals, to investigate whether PCEs moderated the associations between ACEs and empathy (total, affective, and cognitive), as well as psychopathy and empathy (total, affective, and cognitive). In all moderation models, scores on the EDS-20 were included as a covariate to control for social desirability bias.

Results

Descriptive Analyses

Total psychopathy had a mean score of 57.25 (*SD* = 15.93), with the lifestyle factor showing the highest scores. The EDS-20 had a mean score of 10.93 (*SD* = 5.25), reflecting moderate levels of social desirability. Participants reported an average of 4.02 (*SD* = 3.03) ACEs, with emotional abuse and exposure to DV being the most reported. PCEs had a mean score of 8.24 (*SD* = 2.15).

Table 2

Descriptive Statistics for Study Measures, Scales, and Subscales

Variables	*N (%)*	*M*	*SD*	Min	Max
Psychopathy					
INT	164 (100)	13.10	5.04	5	32
AFF	164 (100)	12.95	3.95	7	27
LIF	164 (100)	15.60	5.22	7	31
ANT	164 (100)	13.01	4.51	7	27
Total	164 (100)	57.25	15.93	31	122
Social desirability					
Total	164 (100)	10.93	5.25	0	20
PCEs					
Total	164 (100)	8.24	2.15	1	10
ACEs					
Total	164 (100)	4.02	3.03	0	10
Type of ACEs					
Emotional abuse	87 (53.0)	0.94	0.938	0	2
Physical abuse	85 (51.8)	0.88	0.912	0	2
Sexual abuse	55 (33.5)	0.57	0.851	0	2
Emotional neglect	76 (46.3)	0.73	0.859	0	2
Physical neglect	53 (32.3)	0.43	0.684	0	2
Parental divorce/separation	65 (39.6)	0.40	0.491	0	1
Exposure to DV	65 (39.6)	0.90	1.358	0	6
Household substance abuse	88 (53.7)	0.54	0.500	0	1
Mental illness/suicide in family	41 (25.0)	0.25	0.434	0	1
Imprisonment of a family member	44 (26.8)	0.27	0.444	0	1
Empathy					
Total	164 (100)	77.06	10.117	50	97
Cognitive	164 (100)	37.08	5.260	21	45

Affective	164 (100)	39.97	7.071	23	55

Note. INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences.

Results revealed that 81.7% (n=134) of participants reported at least one ACE. Substance abuse in the family environment (53.7%), emotional abuse (53.0%), and physical abuse (51.8%) were the most frequently reported types of ACEs.

Correlations

Correlation analyses (see Table 3) showed that higher PCEs were associated with lower scores on the lifestyle factor of psychopathy. Conversely, greater ACEs correlated with higher scores on total psychopathy, lifestyle, and antisocial factors. Specific ACEs linked to psychopathy included physical abuse (associated with total, lifestyle, and antisocial factors), sexual abuse and parental divorce/separation (related to lifestyle), DV (associated with total and lifestyle), physical neglect (related to antisocial), and family substance abuse (associated with lifestyle and antisocial). Higher total empathy was associated with lower scores on affective and antisocial psychopathy dimensions and total psychopathy. Cognitive empathy negatively correlated with the affective dimension, while affective empathy showed negative associations with affective, antisocial, and total psychopathy. Higher social desirability was linked to fewer psychopathic traits across all dimensions, lower total psychopathy, and fewer ACEs. Strong positive correlations among ACE types indicated their frequent co-occurrence. Total ACEs showed no significant association with empathy (r = .000, p > .05), except for familial incarceration, which was linked to lower empathy. Cognitive and affective empathy were positively correlated with each other.

Table 3

Person Correlations Between Psychopathic Traits, Total PCEs, Total ACEs, and Empathy (n=164)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Psychopathy	1																				
2. INT	.880**	1																			
3. AFF	.784**	.656**	1																		
4. LIF	.868**	.672**	.610**	1																	
5. ANT	773**	.575**	.418**	.591**	1																
6. PCEs	-.138	-.102	-.040	-.164*	-.122	1															
7. ACEs	.183*	.109	.013	.249**	.219**	-.501**	1														
8. Emotional abuse	.083	.026	-.047	.144	.117	-.371**	.787**	1													
9. Physical abuse	.204**	.123	.086	.254**	.182*	-.373**	.758**	.682**	1												
10. Sexual abuse	.096	.043	-.003	.162*	.119	-.424**	.680**	.565**	.504**	1											
11. Emotional neglect	.045	.023	-.043	.022	.114	-.407**	.679**	.531**	.504**	.454**	1										
12. Physical neglect	.121	.057	-.007	.150	.186*	-.321**	.626**	.389**	.353**	.310**	.430**	1									
13. Parental divorce/separation	.099	.039	.030	.172*	.109	-.225**	.573**	.463**	.382**	.349**	.297**	.186*	1								
14. Exposure to DV	.154*	.118	.027	.201**	.122	-.272**	.709**	.537**	.532**	.401**	.397**	.400**	.363**	1							
15. Household substance abuse	.148	.106	-.035	.193*	.209**	-.245**	.565**	.326**	.303*	.194*	.202**	.407**	.228**	.353**	1						
16. Mental illness/suicide in family	.086	.087	-.006	.142	.083	-.288**	.547**	.289**	.359**	.395**	.254**	.173*	.223**	.396**	.282**	1					

17. Imprisonment of a family member	.114	.068	.089	.126	.130	-.222**	.338**	.101	.088	.095	.155*	.288**	.072	.044	.232**	.127	1				
18. Empathy	-.201**	-.126	-.273**	-.079	-.217**	.038	.000	.097	0.80	.073	.012	-.122	.031	.023	-.100	.054	-.162*	1			
19. Cognitive Empathy	-.133	-.082	-.244**	-.043	-.093	.084	.008	.118	.095	-032	.010	-.093	.027	.044	-.053	.055	-.139	.752**	1		
20. Affective Empathy	-.189*	-.119	-.210**	-.082	-.241**	-.009	-.006	.051	.044	.128	.009	-.105	.024	-.001	-.103	.036	-.128	.871**	.332**	1	
21. Social desirability	-.586**	-.570**	-.421**	-.591**	-.336**	-.234**	.107	-.191*	-.251**	-.105	-.045	-.061	-.210**	-.270**	-.168*	-.123	-.032	.031	.037	.016	1

Note. *p <.05, **p <.01; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences.

Linear Regression Models

Hierarchical regression analyses examined whether total psychopathy traits, ACEs, and PCEs predicted empathy dimensions while controlling for social desirability (see Table 4). For total empathy (Model 1), higher psychopathy significantly predicted lower scores, (β = −0.280, p = .004, SE = 0.060, 95% CI [−0.295, −0.059]). The overall model was significant, R^2 = .052, F(2, 161) = 4.44, p = .013, explaining 5.2% of the variance. The addition of ACEs, in Step 2, (β = -0.208, p = .628, SE = 0.262, 95% CI [−0.391, 0.645]), did not significantly improve the model fit, ΔR^2 = .000, F(3, 160) = 2.97, p = .034. Likewise, including PCEs, in Step 3, (β = 0.031, p = .729, SE = 0.422, 95% CI [−0.688, 0.981]), did not explain additional variance, ΔR^2 = .001, F(4, 159) = 2.24, p = .067.

For cognitive empathy (Model 2), psychopathy was not a significant predictor, (β = −0.169, p = .081, SE = 0.032, 95% CI [−0.118, 0.007]), and the model was nonsignificant, R^2 = .020, F(2, 161) = 1.66, p = .194, explaining only 2.0% of the variance. The inclusion of ACEs, in Step 2, (β = 0.026, p = .749, SE = 0.140, 95% CI [−0.232, 0.321]), did not significantly improve the model, ΔR^2 = .001, F(3, 160) = 1.13, p = .338. Similarly, the inclusion of PCEs, in Step 3, (β = 0.107, p = .238, SE = 0.222, 95% CI [−0.176, 0.703]), did not result in further improvement, ΔR^2 = .009, F(4, 159) = 1.20, p = .312.

For affective empathy (Model 3), higher psychopathy significantly predicted lower scores, (β = −.274, p = .004, SE = 0.042, 95% CI [−0.204, −0.038]). The model was significant, R^2 = .050, F(2, 161) = 4.20, p = .017, explaining 5.0% of the variance. The addition of ACEs, in Step 2, (β = 0.011, p = .891, SE = 0.185, 95% CI [−0.341, 0.392]), accounted for an additional 1.9% of the variance, ΔR^2 = .019, F(3, 160) = 2.79, p = .042, although ACEs were not themselves significant predictors. The inclusion of PCEs, in Step 3, (β = -0.035, p = .693, SE = 0.296, 95% CI [−0.701, 0.467]), did not further increase explained variance, ΔR^2 = .001, F(4, 159) = 2.12, p = .081.

As shown in Table 4, hierarchical linear regressions were conducted to examine whether psychopathy factors (interpersonal, affective, lifestyle, and antisocial), along with ACEs and PCEs, predicted total, cognitive, and affective empathy. In Model 1 (total empathy), higher affective traits (β = −0.382, p < .001, SE = 0.265, 95% CI [−1.503, −0.456]) and antisocial traits (β = −0.258, p = .009, SE = 0.218, 95% CI [−1.008, −0.148]) were significant predictors of lower total empathy scores. This model was significant, accounting for 12.8% of the variance (R^2 = .128, F(5,158) = 4.64, p < .001). The subsequent addition of ACEs, in Step 2, (ΔR^2 = .022, F(6,157) = 3.85, p = .001) and PCEs (ΔR^2 = .002, F(7,156) = 3.33, p = .002) did not meaningfully enhance the explained variance.

When predicting cognitive empathy (Model 2), only the affective factor significantly contributed, with higher scores associated with lower cognitive empathy (β = −0.379, p < .001, SE = 0.141, 95% CI [−0.784, −0.226]). The model explained 8.5% of the variance (R^2 = .085, F(5,158) = 2.95, p = .014). Adding ACEs (ΔR^2 = .000, F(6,157) = 2.46, p = .027) and PCEs (ΔR^2 = .010, F(7,156) = 2.37, p = .025) again did not improve prediction.

With respect to affective empathy (Model 3), both antisocial (β = −0.294, p = .003, SE = 0.155, 95% CI [−0.766, −0.156]) and affective traits (β = −0.265, p = .013, SE = 0.188, 95% CI [−0.846, −0.103]) predicted lower scores. This model accounted for 10.2% of the variance (R^2 = .102, F(5,158) = 3.58, p = .004). As in the other models, the inclusion of ACEs (ΔR^2 = .000, F(6,157) = 2.97, p = .009) and PCEs (ΔR^2 = .000, F(7,156) = 2.53, p = .017) did not add explanatory value.

Table 4

Hierarchical Linear Regression Analysis for Empathy: Contributions of ACEs and PCEs and Psychopathic (Total Traits and Factors) (n = 164)

	Total Empathy			Cognitive Empathy			Affective Empathy		
	b	*t*	*β*	*b*	*t*	*β*	*b*	*t*	*β*
Step 1									
Psychopathy	-0.177	-2.952*	-0.280	-0.056	-1.756	-0.169	-0.121	-2.892*	-0.274
Social desirability	-0.260	-1.408	-0.133	-0.063	-0.643	-0.062	-0.197	-1.527	-0.145
Step 2									
Psychopathy	-0.178	-2.954*	-0.281	-0.056	-1.767	-0.171	-0.122	-2.886*	-0.275
Social desirability	-0.252	-1.344	-0.129	-0.058	-0.582	-0.057	-0.194	-1.481	-0.143
ACEs	0.127	.266	-0.208	0.045	0.320	0.026	0.026	.138	0.011
Step 3									
Psychopathy	-0.176	-2.912*	-0.279	-0.053	-1.675	-0.162	-0.123	-2.900*	-0.278
Social desirability	-0.249	-1.320	-0.128	-0.051	-0.519	-0.051	-0.197	-1.496	-0.145
ACEs	0.122	.401	0.037	0.138	0.860	0.079	-0.016	-.074	-0.007
PCEs	0.147	.347	0.031	0.263	1.185	0.107	-0.117	-.396	-0.035
Step 1									
INT	0.231	0.952	0.115	0.114	0.883	0.109	0.117	0.679	0.083
AFF	-0.980	-3.695**	-0.382	-0.505	-3.578**	-0.379	-0.474	-2.522*	-0.265
LIF	0.415	1.793	0.214	0.184	1.496	0.183	0.231	1.405	0.170
ANT	-0.578	-2.653**	-0.258	-0.117	-1.008	-0.100	-0.461	-2.983**	-0.294
Social desirability	-0.048	-0.256	-0.025	0.015	0.144	0.014	-0.063	-0.469	-0.046
Step 2									
INT	0.228	0.933	0.114	0.111	0.854	0.106	0.117	0.674	0.083
AFF	-0.986	-3.662**	-0.384	-0.511	-3.567**	-0.383	-0.475	-2.485*	-0.265

LIF	0.420	1.788	0.217	0.190	1.515	0.188	0.231	1.383	0.170
ANT	-0.574	-2.600*	-0.256	-0.113	-0.960	-0.097	-0.461	-2.945**	-0.294
Social desirability	-0.053	-0.275	-0.027	0.010	0.101	0.010	-0.063	-0.463	-0.046
ACEs	-0.039	-0.148	-0.012	-0.038	-0.270	-0.022	-0.001	-0.006	0.000
Step 3									
INT	0.235	0.960	0.117	0.121	0.928	0.115	0.115	0.659	0.082
AFF	-0.986	-3.656**	-0.385	-0.512	-3.580**	-0.384	-0.474	-2.477*	-0.265
LIF	0.425	1.804	0.220	0.196	1.570	0.195	0.229	1.369	0.169
ANT	-0.578	-2.612*	-0.258	-0.118	-1.007	-0.101	-0.460	-2.927**	-0.293
Social desirability	-0.046	-0.238	-0.024	0.019	0.186	0.019	-0.065	-0.474	-0.048
ACEs	0.041	0.134	0.012	0.065	0.400	0.037	-0.024	-0.110	-0.010
PCEs	0.225	0.549	0.048	0.288	1.328	0.117	-0.063	-0.218	-0.019

Note. INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; PCEs = Positive Childhood Experiences; ACEs = Adverse Childhood Experiences; *****p <.05; ******p <.01.

Finally, hierarchical regression analyses were conducted to investigate the influence of different types of ACEs, psychopathy, and PCEs on total, cognitive, and affective empathy (see Table 5). For total empathy (Model 1), higher levels of total psychopathy were associated with significantly lower scores on total empathy (β = −0.280, p = .004, SE = 0.060, 95% CI [−0.295, −0.059]). The model reached statistical significance, explaining 5.2% of the variance (R^2 = .052, F(2,161) = 4.44, p = .013). The subsequent inclusion of specific ACEs (ΔR^2 = .057, F(12,151) = 1.54, p = .114) and PCEs (ΔR^2 = .001, F(13,150) = 1.43, p = .153) did not significantly enhance the explained variance.

In the case of cognitive empathy (Model 2), psychopathy did not emerge as a significant predictor (β = −0.169, p = .081, SE = 0.032, 95% CI [−0.118, 0.007]). The model was nonsignificant, accounting for only 2.0% of the variance (R^2 = .020, F(2,161) = 1.66, p = .194), and neither ACEs (ΔR^2 = .067, F(12,151) = 1.20, p = .289) nor PCEs (ΔR^2 = .005, F(13,150) = 1.17, p = .308) contributed additional explanatory power.

With regard to affective empathy (Model 3), total psychopathy significantly predicted lower affective empathy scores, (β = −0.274, p = .004, SE = 0.042, 95% CI [−0.204, −0.038]). The model was significant and explained 5.0% of the variance (R^2 = .050, F(2,161) = 4.20, p = .017). The inclusion of specific ACEs (ΔR^2 = .049, F(12,151) = 1.38, p = .180) and PCEs (ΔR^2 = .000, F(13,150) = 1.27, p = .237) did not produce significant improvements.

Table 5

Hierarchical Linear Regression Analysis for Empathy: Contributions of Types of ACEs, PCEs, and Psychopathic Traits (n = 164)

	Total Empathy				Cognitive Empathy				Affective Empathy			
	b [95% CI]	SE	*t*	*β*	*b* [95% CI]	SE	*t*	*β*	*b* [95% CI]	SE	*t*	*β*
Step 1												
Psychopathy	-0.177 [-0.295, -0.059]	0.060	-0.280**	-0.280	-0.056 [-0.118, 0.007]	0.032	-1.756	-0.169	-0.121 [-0.204, -0.038]	0.042	-2.892**	-0.274
Social desirability	-0.260 [-0.625, 0.105]	0.185	-0.133	-0.133	-0.063 [0.521, -0.256]	0.098	-0.643	-0.062	-0.197 [-0.453, 0.058]	0.129	-1.527	-0.145
Step 2												
Psychopathy	-0.158 [-0.280, -0.037]	0.061	-2.581*	-0.250	-0.043 [-0.107, 0.021]	0.032	-1.333	-0.131	-0.115 [-0.201, -0.030]	0.043	-2.673**	-0.261
Social desirability	-0.182 [-0.566, 0.201]	0.194	-0.939	-0.094	-0.001 [-0.203, 0.201]	0.102	-0.012	-0.001	-0.181 [-0.451, 0.089]	0.137	-1.327	-0.133
Emotional abuse	2.119 [-2.791, 7.028]	2.485	0.853	0.105	2.135 [-0.449, 4.719]	1.308	1.632	0.203	-0.017 [-3.468, 3.435]	1.747	-0.009	-0.001
Physical abuse	1.947 [-2.648, 6.542]	2.326	0.837	0.096	1.124 [-1.295, 3.543]	1.224	0.918	0.107	0.823 [-2.407, 4.054]	1.635	0.504	0.058
Sexual abuse	0.886 [-3.367, 5.139]	2.153	0.412	0.041	-1.730 [-3.969, 0.509]	1.233	-1.527	-0.156	2.616 [-0.374, 5.606]	1.513	1.729	0.175
Emotional neglect	-0.554 [-4.517, 3.409]	2.006	-0.276	-0.027	-0.267 [-2.353, 1.820]	1.056	-0.253	-0.025	-0.287 [-3.073, 2.499]	1.410	-0.204	-0.020
Physical neglect	-2.334 [-6.450, 1.783]	2.083	-1.120	-0.108	-1.077 [-3.244, 1.090]	1.097	-0.982	-0.096	-1.256 [-4.150, 1.638]	1.465	-0.858	-0.083
Parental divorce/separation	-0.305 [-3.938, 3.328]	1.839	-0.166	-0.015	-0.166 [-2.078, 1.747]	0.968	-0.171	-0.015	-0.139 [-2.693, 2.414]	1.293	-0.108	-0.010
Exposure to DV	-0.360 [-4.579, 3-860]	2.136	-0.168	-0.017	0.060 [-2.161, 2.282]	1.124	0.054	0.006	-0.420 [-3.386, 2.546]	1.501	-0.280	-0.029
Substance abuse in the family	-1.633 [-5.234, 1.968]	1.823	-0.896	-0.081	-0.587 [-2.482, 1.309]	0.959	-0.611	-0.056	-1.046 [-3.578, 1.485]	1.281	-0.817	-0.074
Mental illness/suicide in family	1.284 [-2.847, 5.416]	2.091	0.614	0.005	1.009 [-1.166, 3.184]	1.101	0.916	0.083	0.276 [-2.629, 3.180]	1.470	0.187	0.017
Imprisonment of a family member	-2.510 (-6.214, 1.193)	1.874	-1.399	-0.110	-1.235 [-3.185, 0.714]	0.987	-1.252	-0.104	-1.275 [-2.629, 3.180]	1.318	-0.968	-0.080
Step 3												

Psychopathy	-0.157 [-0.279, -0.035]	0.062	-2.549*	-0.248	-0.041 [-0.105, 0.023]	0.032	-1.277	-0.126	-0.116 [-0.202, -0.030]	0.043	-2.671**	-0.262
Social desirability	-0.182 [-0.567, 0.203]	0.195	-0.936	-0.093	-0.001 [-0.03, 0.201]	0.102	-0.010	-0.001	-0.181 [-0.452, 0.089]	0.137	-1.323	-0.133
Emotional abuse	2.140 [-2.785, 7.065]	2.493	0.859	0.106	2.164 [-0.422, 4.751]	1.309	1.653	0.206	-0.024 [-3.488, 3.439]	1.753	-0.014	-0.002
Physical abuse	1.995 [-2.621, 7.065]	2.336	0.854	0.099	1.189 [-1.236, 3.614]	1.227	0.969	0.113	0.806 [-2.440, 4.053]	1.643	0.491	0.057
Sexual abuse	1.035 [-3.310, 5.380]	2.199	0.471	0.048	-1.529 [-3.811, 0.753]	1.155	-1.324	-0.138	2.564 [-0.491, 5.620]	1.546	1.658	0.172
Emotional neglect	-0.432 [-4.464, 3.599]	2.040	-0.212	-0.021	-0.102 [-2.220, 2.014]	1.072	-0.096	-0.010	-0.329 [-3.165, 2.506]	1.435	-0.230	-0.023
Physical neglect	-2.281 [-6.420, 1.858]	2.095	-1.089	-0.106	-1.006 [-3.180, 1.168]	1.100	-0.914	-0.090	-1.275 [-4.185, 1.636]	1.473	-0.865	-0.085
Parental divorce/separation	-0.299 [-3.943, 3.345]	1.844	-0.162	-0.015	-0.158 [-2.071, 1.756]	0.969	-0.163	-0.015	-0.142 [-2.704, 2.421]	1.297	-0.109	-0.010
Exposure to DV	-0.391 [-4.626, 3.844]	2.144	-0.182	-0.019	0.018 [-2.206, 2.243]	1.126	0.016	0.002	-0.409 [-3.388, 2.569]	1.507	-0.271	-0.028
Substance abuse in the family	-1.595 [-5.213, 2.023]	1.831	-0.871	-0.079	-0.535 [-2.435, 1.365]	0.962	-0.557	-0.051	-1.060 [-3.604, 1.484]	1.288	-0.823	-0.075
Mental illness/suicide in family	1.352 [-6.170, 1.315]	2.106	0.642	0.058	1.100 [-1.085, 3.285]	1.106	0.994	0.091	0.252 [-2.674, 3.178]	1.481	0.170	0.015
Imprisonment of a family member	-2.428 [-0.700, 1.008]	1.894	-1.282	-0.107	-1.124 [-3.090, 0.842]	0.995	-1.130	-0.095	-1.304 [-3.936, 1.328]	1.332	-0.979	-0.082
PCEs	0.154 [-0.688, 0.981]	0.432	0.356	0.033	0.208 [-0.241, 0.656]	0.227	0.914	0.085	-0.054 [-0.654, 0.547]	0.304	-0.177	-0.016

Note. INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; PCEs = Positive Childhood Experiences; ACEs = Adverse Childhood Experiences; *****p <.05; ******p <.01.

Moderations analysis

Two moderations analyses were conducted using PROCESS Model 1, with social desirability as a covariate. First, total and each ACEs (independent variable) were examined as predictors of empathy (dependent variable), and PCEs as a moderator (see Table 6). Higher levels of PCEs were associated with greater levels of cognitive empathy (b = 0.981, p = .036), but PCEs did not moderate the relationships between emotional abuse and any empathy domain. Additionally, higher levels of physical abuse (b = 9.523, p = .024) and PCEs (b = 1.015, p = .014) predicted higher cognitive empathy, though their interaction showed a marginal effect (b = -0.903, p = .057). Finally, the presence of a family history of mental illness or suicide on affective empathy (b = -9.224, p = .041), lower levels of affective empathy, and this relationship was moderated by PCEs (b = 1.262, p = .022), indicating that higher PCEs attenuate the negative impact on affective empathy.

Table 6

Moderation Role of PCEs in the Relationship Between ACEs and Empathy, with Social Desirability as a Covariate (n = 164)

	b	SE	*t*	*p*	95%CI
Cognitive empathy (outcome)					
Emotional abuse	8.688	4.613	1.884	.062	[-0.4221, 17.7977]
PCEs	0.981	0.464	2.115	.036	[0.0651, 1.8975]
Interaction	-0.772	0.517	-1.494	.137	[-1.7923, 0.2484]
Social desirability	0.054	0.080	0.676	.500	[-0.1038, 0.2120]
Cognitive empathy (outcome)					
Physical abuse	9.523	4.171	2.283	.024	[1.2849, 17.7619]
PCEs	1.015	0.407	2.494	.014	[0.2112, 1.8178]
Interaction	-0.903	0.471	-1.919	.057	[-1.8320, 0.0263]
Social desirability	0.064	0.081	0.785	.434	[-0.0962, 0.2232]
Affective empathy (outcome)					
Mental illness/suicide in family	-9.224	4.479	-2.059	.041	[-18.0704, -0.3777]
PCEs	-0.535	0.356	-1.505	.134	[-1.2375, 0.1671]
Interaction	1.262	0.548	2.305	.022	[0.1809, 2.3438]
Social desirability	-0.004	0.108	-0.033	.974	[-0.2173, 0.2102]

Note. PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences; BES= Basic Empathy Scale; PCEs= Positive Childhood Experiences; ACEs= Adverse Childhood Experiences.

No other significant moderation or main effects were observed in the remaining models (cf. Supplementary materials 1).

Next, psychopathy (independent variable) was tested as a predictor of empathy (dependent variable), with PCEs as a moderator (see Table 7). PCEs did not significantly moderate the associations between psychopathy (total or factor scores) and any empathy factor. Total psychopathy scores were negatively associated with affective empathy (b = -0.203, p = .043), with similar negative effects for the interpersonal (b = - 0.694, p = .042) and lifestyle (b = -0.788, p = .049) factors.

Table 7

Moderation Role of PCEs in the Relationship Between Psychopathy and Empathy, with Social Desirability as a Covariate (n = 164)

	b	SE	*t*	*p*	95%CI
Affective empathy (outcome)					
Psychopathy	-0.203	0.100	-2.037	.043	[-0.3998, -0.0062]
PCEs	-0.793	0.816	-0.972	.332	[-2.4034, 0.8177]
Interaction	0.011	0.012	0.887	.376	[-0.0135, 0.0355]
Social desirability	-0.171	0.133	-1.291	.199	[-0.4331, 0.0907]
Affective empathy (outcome)					
INT	-0.694	0.339	-2.048	.042	[-1.3624, -0.0248]
PCEs	-0.955	0.654	-1.460	.146	[-2.2462, 0.3366]
Interaction	0.061	0.041	1.493	.139	[-0.0198, 0.1425]
Social desirability	-0.080	0.131	-0.615	.540	[-0.3380, 0.1776]
Affective empathy (outcome)					
LIF	-0.788	0.398	-1.980	.049	[-1.5741, -0.0021]
PCEs	-1.421	0.840	-1.691	.093	[-3.0810, 0.2384]
Interaction	0.079	0.047	1.686	.094	[-0.0136, 0.1719]
Social desirability	-0.030	0.134	-0.225	.822	[-0.2949, 0.2345]

Note. INT = Interpersonal Factor; LIF= Lifestyle Factor; PCEs= Positive Childhood Experiences.

No other significant moderation or main effects were observed in the remaining models (cf. Supplementary materials 2).

Discussion

This cross-sectional study examined whether ACEs and psychopathic traits predict empathy deficits and whether PCEs moderate the relationships between ACEs and empathy, and psychopathy and empathy, in incarcerated women, addressing a significant gap in research on this high-risk population with elevated adversity and psychopathic features (Verona et al., 2013; Wolff et al., 2011). Descriptive findings revealed a high prevalence of ACEs, particularly family substance use, emotional abuse, and

physical abuse, alongside a notable presence of PCEs. Despite their negative correlation, ACEs and PCEs frequently co-occurred, reflecting socioemotional developmental plasticity and suggesting that they may represent distinct experiential domains that do not always directly interact to shape outcomes (Bethell et al., 2019; Cunha et al., 2025a).

PCEs were inversely associated with total psychopathy scores and, more robustly, with the lifestyle factor (e.g., impulsivity, irresponsibility, sensation-seeking), providing partial support for hypothesis 1. This finding aligns with the perspective that secure attachment, consistent caregiving, and prosocial role modeling enhance adaptive regulatory functioning, mitigating the behavioral dysregulation characteristic of the lifestyle factor (Morris et al., 2021; Narayan et al., 2018, 2023). These results converge with prior studies linking higher PCEs to reduced impulsivity, lower criminal involvement, and decreased psychopathy scores in both forensic and community samples, indicating that protective experiences such as emotional support and stable socialization contexts can buffer adverse developmental trajectories even in high-adversity settings (Cunha et al., 2025b; Cunha et al., 2025a). Contrary to hypothesis 2, PCEs showed no direct association with empathy, despite prior evidence linking PCEs to enhanced empathic and compassionate functioning (Almeida et al., 2023; Bethell et al., 2019). This null finding may reflect the overriding influence of chronic adversity and psychopathic tendencies, which can suppress PCE effects, as well as incarceration-related stressors (e.g., isolation, victimization) that erode resilience (Brook & Kosson, 2013; Teicher & Samson, 2016; Wolff et al., 2011). The retrospective nature of PCE assessment may also mean protective effects are more pronounced developmentally than in adulthood (Almeida et al., 2021; Narayan et al., 2018).

In line with hypothesis 3, total ACEs scores positively correlated with total psychopathy, particularly the lifestyle and antisocial factors, consistent with elevated ACEs exposure among incarcerated women and their association with psychopathic traits and antisocial conduct (Cunha et al., 2025a; Braga et al., 2018). Early adversity likely impairs emotional regulation, moral reasoning, and empathy, contributing to behavioral disinhibition and rule-breaking tendencies (Almeida et al., 2023; Maia et al., 2025; Craig et al., 2022). Subtype analyses showed physical abuse and household substance abuse were associated with both lifestyle and antisocial psychopathy, suggesting exposure to harm and chaotic family environments fosters impulsive, risk-oriented behavior (Fox et al., 2015). Sexual abuse, parental separation, and DV correlated with lifestyle psychopathy, reinforcing instability and sensation-seeking, while physical neglect uniquely linked to the antisocial factor, indicating unmet needs contribute to disregard for social norms (Lynam et al., 2007). Individuals with high psychopathy often report violence exposure and victimization, and insufficient intervention may perpetuate empathy deficits and antisocial

coping strategies (Baskin-Sommers & Baskin, 2016; DeLisi et al., 2018). Contrary to hypothesis 4, only familial incarceration showed a significant negative association with total empathy, suggesting it uniquely harms empathic capacities due to emotional distress, stigma, and limited positive relational models (Murray & Farrington, 2008). The absence of broader ACEs-empathy associations underscores the complexity of this relationship in forensic populations, where adaptive mechanisms like emotional numbing or avoidance may obscure expected effects (Mihailides et al., 2017). Prior research is mixed, with some studies reporting empathy deficits post-maltreatment (Berzenski & Yates, 2022) and others suggesting enhanced perspective-taking via post-traumatic growth, moderated by resilience, social support, PCEs, executive functioning, and emotion regulation (Greenberg et al., 2018; Narayan et al., 2018; Kahhale et al., 2025).

Confirming hypothesis 5, total empathy and affective empathy negatively correlated with total psychopathy scores, while cognitive empathy showed no significant association, highlighting affective empathy deficits as a hallmark of psychopathy in incarcerated women, likely driven by emotional callousness and amygdala dysfunction (Wild & Poeppl, 2022). For hypothesis 6, affective empathy negatively correlated with the affective and antisocial factors but not the interpersonal factor, indicating emotional coldness and antisocial tendencies impair emotional resonance, potentially contributing to impulsive and norm-violating behaviors (Jolliffe & Farrington, 2004; Verona et al., 2013). Cognitive empathy's selective negative correlation with the affective factor suggests impaired emotional Theory of Mind, reliant on prefrontal-amygdala circuits disrupted by emotional insensitivity, while its lack of association with the antisocial factor indicates preserved cognitive abilities for strategic manipulation (Brook & Kosson, 2013; Shamay-Tsoory et al., 2007). Regression analyses (hypothesis 7) confirmed that psychopathic traits, particularly affective and antisocial factors, significantly predicted empathy deficits, with the affective factor exerting the strongest influence, corroborating the "emotion paradox" of intact cognitive understanding without genuine affective involvement (Newman & Baskin-Sommers, 2012). The affective factor negatively predicted cognitive empathy, reflecting reduced perspective-taking, while both affective and antisocial factors predicted lower affective empathy, suggesting emotional detachment may serve adaptive, goal-directed functions (Brook & Koson, 2013; Dadds et al., 2009).

Neither total nor specific ACEs significantly predicted empathy in regression models (hypothesis 8), suggesting their effects depend on interactions with factors like emotion regulation and social support, potentially obscured by nonlinear configurations, severity thresholds, or collinearity with psychopathy factors, consistent with equifinality and multifinality in developmental psychopathology (Cicchetti & Rogosch, 2002; Cicchetti & Sroufe, 2000). The moderating role of PCEs in the ACEs-empathy relationship

(hypothesis 9) was partially supported, with PCEs moderating only the association between family mental illness or suicide and affective empathy. This suggests that positive relational experiences, characterized by warmth and consistency, compensate for emotional unpredictability in such contexts, sustaining emotional resonance and mitigating empathic blunting (Murray & Farrington, 2008; Narayan et al., 2018). The absence of broader moderation across other ACEs types likely reflects the high cumulative adversity and psychosocial vulnerabilities in incarcerated women, limiting PCEs' buffering capacity against severe neurobiological disruptions (Teicher & Samson, 2016; Van Doorn et al., 2024). Contrary to hypothesis 10, PCEs did not moderate the psychopathy-empathy relationship, indicating their protective effects are insufficient to offset stable, deep-seated psychopathic traits, particularly affective empathy deficits, which are intrinsic to psychopathy (Brook & Kosson, 2013). This aligns with developmental psychopathology perspectives, where high adversity and vulnerability constrain resilience expression (Cicchetti & Rogosch, 2002; Masten, 2021; Van Doorn et al., 2024).

Limitations

Limitations include the cross-sectional design, which precludes causal inferences, as associations may reflect bidirectional or confounding influences (Cicchetti & Rogosch, 2002). Retrospective self-reports risk recall inaccuracies, social desirability bias, and underreporting of sensitive experiences like abuse or psychopathic traits, despite statistical controls (Paulhus et al., 2016). Suboptimal internal consistency for some psychopathy subscales (e.g., affective and antisocial factors, $\alpha \approx .55$) may have reduced effect sizes and reliability (Seara-Cardoso et al., 2020). The convenience sample limits generalizability to other populations, and exclusion criteria may introduce selection bias, while unmeasured confounders like current psychopathology or trauma severity could influence results (Moreira et al., 2024). Future research should adopt longitudinal designs to map causal pathways using prospective data, include diverse samples for broader generalizability, and employ multimethod approaches, such as empathy-specific behavioral tasks (e.g., Reading the Mind in the Eyes Test; Baron-Cohen et al., 2001), clinician-rated psychopathy assessments (e.g., PCL-R; Hare, 2003), and neuroimaging of empathy-related circuits (e.g., amygdala-prefrontal connectivity; Wild & Poeppl, 2022). Investigating mediators like emotion regulation or attachment security could clarify mechanisms (Almeida et al., 2023). Despite these constraints, the study's strengths include addressing a literature gap in justice-involved women, using multidimensional empathy and psychopathy assessments for nuanced insights, and advancing resilience-oriented forensic psychology through PCEs and a dual developmental-functional theoretical approach (Bethell et al., 2019; Hare, 2003; Mihailides et al., 2017; Newman & Baskin-Sommers, 2012).

Strengths and future directions

The findings emphasize the need for trauma-informed, resilience-based, and gender-responsive interventions for incarcerated women. ACEs, particularly familial incarceration, reduce empathy, necessitating interventions that address emotional consequences like stigma and relational disruption while promoting PCE-like experiences to mitigate impulsivity and antisocial tendencies (Murray & Farrington, 2008; Craig et al., 2022; Van Doorn et al., 2024). Trauma-Informed Care and Narrative Exposure Therapy can enhance affective empathy and trust, reducing avoidance and recidivism (Lehrer, 2021). Relational-Cultural Therapy builds on PCEs to foster mutual empathy and counter defensive regulation from victimization (Jordan, 2018). Compassion-Focused Therapy targets affective and antisocial psychopathy by reframing empathy as a motivational competency, addressing emotions like shame and guilt to promote prosocial intent (Taylor & Hocken, 2021). Restorative justice supports relational repair and reintegration (Van Doorn et al., 2024). The Women's Risk Needs Assessment integrates trauma, mental health, and relational factors to guide rehabilitation and reentry, prioritizing support over punishment (Van Voorhis et al., 2010).

Conclusion

This study highlights dual origins of empathy deficits in female offenders: as developmental consequences of ACEs or functional mechanisms in psychopathy. The familial incarceration seems uniquely to impair engagement, while protective factors may foster cognitive empathy in high-adversity contexts (Kogler et al., 2020; Murray & Farrington, 2008). Psychopathic traits, particularly affective and antisocial factors, robustly predicted reduced affective empathy, reflecting callousness and impaired emotional Theory of Mind, enabling strategic detachment and manipulative use of cognitive empathy (Newman & Baskin-Sommers, 2012). The lack of PCE moderation in psychopathy underscores the stability of these traits, limiting environmental influence (Lynam et al., 2007).

References

Almeida, T. C., Fernandes, R. M., & Cunha, O. (2023). Brief Measure of Affective Lability Among Portuguese Community and Justice Samples: Psychometrics and Measurement Invariance. *Crime & Delinquency*, *70*(4), 1361-1382. https://doi.org/10.1177/00111287221143931

Almeida, T. C., Guarda, R., & Cunha, O. (2021). Positive childhood experiences and adverse experiences: Psychometric properties of the Benevolent Childhood Experiences Scale (BCEs) among the Portuguese population. *Child Abuse & Neglect*, *120*, 105179. https://doi.org/10.1016/j.chiabu.2021.105179

Almiro, P. A., Almeida, D., Ferraz, M., Ferreira, R., Silvestre, M. J., Perdiz, C., Dias, I. S., Gonçalves, S., Sousa, L. B., & Simões, M. R. (2017). *Social Desirability Scale (EDS-20)*. In M. R. Simões, L. S. Almeida, & M. M. Gonçalves (Eds.), *Forensic Psychology: Assessment instruments* (pp. 335-352). Pactor.

American Psychiatric Association, DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5™* (5th ed.). American Psychiatric Publishing, Inc.. https://doi.org/10.1176/appi.books.9780890425596

Anastácio, S., Vagos, P., Nobre-Lima, L., Rijo, D., & Jolliffe, D. (2016). The Portuguese version of the Basic Empathy Scale (BES): Dimensionality and measurement invariance in a community adolescent sample. *European Journal of Developmental Psychology, 13*(5), 614–623. https://doi.org/10.1080/17405629.2016.1167681

Austin, E. J., Farrelly, D., Black, C., & Moore, H. (2007). Emotional intelligence, Machiavellianism and emotional manipulation: Does EI have a dark side? *Personality and Individual Differences, 43*(1), 179–189. https://doi.org/10.1016/j.paid.2006.11.019

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the Mind in the Eyes" Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *42*(2), 241–251.

Baskin-Sommers, A. R., & Baskin, D. (2016). Psychopathic traits mediate the relationship between exposure to violence and violent juvenile offending. *Journal of Psychopathology and Behavioral Assessment, 38*(3), 341–349. https://doi.org/10.1007/s10862-016-9535-0

Berzenski, S. R., & Yates, T. M. (2022). The development of empathy in child maltreatment contexts. *Child Abuse & Neglect*, *133*, 105827. https://doi.org/10.1016/j.chiabu.2022.105827

Bethell, C., Jones, J., Gombojav, N., Linkenbach, J., & Sege, R. (2019). Positive childhood experiences and adult mental and relational health in a statewide sample: Associations across adverse childhood experiences levels. *JAMA Pediatrics, 173*(11), e193007. https://doi.org/10.1001/jamapediatrics.2019.3007

Braga, T., Cunha, O., & Maia, Â. (2018). The enduring effect of maltreatment on antisocial behavior: A meta-analysis of longitudinal studies. *Aggression and Violent Behavior, 40,* 91–100. https://doi.org/10.1016/j.avb.2018.04.003

Brook, M., & Kosson, D. S. (2013). Impaired cognitive empathy in criminal psychopathy: evidence from a laboratory measure of empathic accuracy. *Journal of Abnormal Psychology*, *122*(1), 156–166. https://doi.org/10.1037/a0030261

Cicchetti, D., & Rogosch, F. A. (2002). A developmental psychopathology perspective on adolescence. *Journal of Consulting and Clinical Psychology, 70*(1), 6–20. https://doi.org/10.1037/0022-006X.70.1.6

Cicchetti, D., & Sroufe, L. A. (2000). The past as prologue to the future: The times, they've been a-changin' [Editorial]. *Development and Psychopathology, 12*(3), 255–264. https://doi.org/10.1017/S0954579400003011

Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: the coming of age of a discipline. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *50*(1-2), 16–25. https://doi.org/10.1111/j.1469-7610.2008.01979.x

Cunha, O., Sousa, M., Almeida, T. C., Guarda, R., & Cruz, A. R. (2025a). When Good Experiences Matter: Positive Childhood Experiences as a Moderator Between Adverse Childhood Experiences and Psychopathic Traits in Community and justice-Involved Samples. *Journal of Aggression, Maltreatment & Trauma*, 1–21. https://doi.org/10.1080/10926771.2025.2555564

Cunha, O., Sousa, M., Pereira, B., Pinheiro, M., Machado, A. B., Caridade, S., & Almeida, T. C. (2025b). Positive Childhood Experiences and Adult Outcomes: A Systematic Review. *Trauma, Violence & Abuse*, 15248380241299434. Advance online publication. https://doi.org/10.1177/15248380241299434

Craig, J., Wolff, K. & Baglivio, M. (2022). Clustering of adverse and positive childhood experiences: The nature and correlates of risk and protective factors. *Child Abuse & Neglec*t, 134. https://doi.org/10.1016/j.chiabu.2022.105878

Dadds, M. R., Hawes, D. J., Frost, A. D., Vassallo, S., Bunn, P., Hunter, K., & Merz, S. (2009). Learning to 'talk the talk: the relationship of psychopathic traits to deficits in empathy across

childhood. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *50*(5), 599–606. https://doi.org/10.1111/j.1469-7610.2008.02058.x

DeLisi, M., Fox, B. H., Fully, M., & Vaughn, M. G. (2018). The effects of temperament, psychopathy, and childhood trauma among delinquent youth: A test of DeLisi and Vaughn's temperament-based theory of crime. *International Journal of Law and Psychiatry*, *57*, 53–60. https://doi.org/10.1016/j.ijlp.2018.01.006

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using

G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41* (4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., et al. (2019). Reprint of: relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (ACE) study. *Am. J. Prev. Med. 14*, 774–786. https://doi.org/10.1016/j.amepre.2019.04.001

Fox, B. H., Perez, N., Cass, E., Baglivio, M. T., & Epps, N. (2015). Trauma changes everything: examining the relationship between adverse childhood experiences and serious, violent and chronic juvenile offenders. *Child Abuse & Neglect*, *46*, 163–173. https://doi.org/10.1016/j.chiabu.2015.01.011

Greenberg, D. M., Baron-Cohen, S., Rosenberg, N., Fonagy, P., & Rentfrow, P. J. (2018). Elevated empathy in adults following childhood trauma. *PloS one*, *13*(10), e0203886. https://doi.org/10.1371/journal.pone.0203886

Hare, R.D. (2003). *Manual for the revised psychopathy checklist* (2nd Ed.), Multi-Health Systems, Toronto.

Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behavior, 9*(5), 441–476. https://doi.org/10.1016/j.avb.2003.03.001

Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence*, *29*(4), 589–611. https://doi.org/10.1016/j.adolescence.2005.08.010

Jordan, J. V. (2018). *Relational–cultural therapy* (2nd ed.). American Psychological Association. https://doi.org/10.1037/0000063-000

Kahhale, I., Byrd, A., & Hanson, J. (2025). Early Life Adversity and Empathy: A Scoping Review of Past Research and Recommendations for Future Directions. *Clinical Child and Family Psychology Review*, *28*(2), 275–321. https://doi.org/10.1007/s10567-025-00516-8

Kogler, L., Müller, V. I., Werminghausen, E., Eickhoff, S. B., & Derntl, B. (2020). Do I feel or do I know? Neuroimaging meta-analyses on the multiple facets of empathy. *Cortex*, *129*, 341–355. https://doi.org/10.1016/j.cortex.2020.04.031

Lehrer D. (2021). Trauma-Informed Care: The Importance of Understanding the Incarcerated Women. *Journal of Correctional Health Care, 27*(2), 121–126. https://doi.org/10.1089/jchc.20.07.0060

Levy, J., Goldstein, A. & Feldman, R. (2019). The neural development of empathy is sensitive to caregiving and early trauma. *Nature Communications, 10*(1), 1–10. https://doi.org/10.1038/s41467-019-09927-y

Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, *116*(1), 155–165. https://doi.org/10.1037/0021-843X.116.1.155

Maia, B., Cruz, A. R., & Cunha, O. (2025). Adverse and Positive Childhood Experiences and Emotional Regulation Difficulties in a Sample of Incarcerated Men. *Behavioral Sciences, 15*(6), 828. https://doi.org/10.3390/bs15060828

Masten, A. S. (2021). Resilience in developmental systems: Principles, pathways, and protective processes in research and practice. In M. Ungar (Ed.), *Multisystemic resilience: Adaptation and transformation in contexts of change* (pp. 113–134). Oxford University Press. https://doi.org/10.1093/oso/9780190095888.003.0007

Mihailides, S., Galligan, R., & Bates, G. (2017). Adaptive Psychopathy: Empathy and Psychopathy are Not Mutually. *Journal of Forensic Psychology, 2* (3). https://doi.org/10.4172/2475-319X.1000125.

Moreira, D., Silva, C., Moreira, P., Pinto, T. M., Costa, R., Lamela, D., Jongenelen, I., & Pasion, R. (2024). Addressing the Complex Links between Psychopathy and Childhood Maltreatment, Emotion Regulation, and Aggression-A Network Analysis in Adults. *Behavioral Sciences, 14*(2), 115. https://doi.org/10.3390/bs14020115

Morris, A. S., Hays-Grudo, J., Zapata, M. I., Treat, A., & Kerr, K. L. (2021). Adverse and Protective Childhood Experiences and Parenting Attitudes: the Role of Cumulative Protection in Understanding Resilience. *Adversity and Resilience Science*, *2*(3), 181–192. https://doi.org/10.1007/s42844-021-00036-8

Murray, J., & Farrington, D. P. (2008). The effects of parental imprisonment on children. In M. Tonry (Ed.), *Crime and justice: A review of research* (Vol. 37, pp. 133–206). Chicago, IL: University of Chicago Press.

Narayan, A. J. (2023). Intergenerational resilience in the context of adverse childhood experiences (ACEs). In S. G. Portwood, M. J. Lawler, & M. C. Roberts (Eds.), *Handbook of adverse childhood experiences: A framework for collaborative health promotion* (pp. 13–27). Springer Nature Switzerland AG. https://doi.org/10.1007/978-3-031-32597-7_2

Narayan, A. J., Rivera, L. M., Bernstein, R. E., Harris, W. W., & Lieberman, A. F. (2018). Positive childhood experiences predict less psychopathology and stress in pregnant women with childhood adversity: A pilot study of the benevolent childhood experiences (BCEs) scale. *Child Abuse & Neglect, 78*, 19-30. https://doi.org/10.1016/j.chiabu.2017.09.022

Newman, J. P., & Baskin-Sommers, A. R. (2012). Early selective attention abnormalities in psychopathy: Implications for self-regulation. In M. I. Posner (Ed.), *Cognitive Neuroscience of Attention* (2nd ed., pp. 421–440). The Guilford Press.

Pham, T. H., Ducro, C., & Luminet, O. (2010). Psychopathy, alexithymia and emotional intelligence in a forensic hospital. *The International Journal of Forensic Mental Health, 9*(1), 24–32. https://doi.org/10.1080/14999013.2010.484641

Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2016). *Manual for the Self-Report Psychopathy Scale.* Toronto: Multi-Health Systems.

Pinheiro, M. L., Machado, A. B., Gonçalves, R. A., Caridade, S., & Cunha, O. (2025a). Exploring Attachment-Related Factors and Psychopathic Traits: A Systematic Review Focused on Women. *Behavioral Sciences*, *15*(9), 1293. https://doi.org/10.3390/bs15091293

Pinheiro, M., Machado, A. B., Gonçalves, R. A., & Cunha, O. (2025b). The Moderating Role of Positive Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Psychopathic Traits in Incarcerated Women. *Journal of Aggression, Maltreatment & Trauma*, 1–21. https://doi.org/10.1080/10926771.2025.2562542

Rhee, S. H., Friedman, N. P., Boeldt, D. L., Corley, R. P., Hewitt, J. K., Knafo, A., Lahey, B. B., Robinson, J., Van Hulle, C. A., Waldman, I. D., Young, S. E., & Zahn-Waxler, C. (2013). Early concern and disregard for others as predictors of antisocial behavior. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *54*(2), 157–166. https://doi.org/10.1111/j.1469-7610.2012.02574.x

Rhee, S. H., Woodward, K., Corley, R. P., du Pont, A., Friedman, N. P., Hewitt, J. K., Hink, L. K., Robinson, J., & Zahn-Waxler, C. (2021). The association between toddlerhood empathy deficits and antisocial personality disorder symptoms and psychopathy in adulthood. *Development and Psychopathology*, *33*(1), 173–183. https://doi.org/10.1017/S0954579419001676

Sanz-García, A., Gesteira, C., Sanz, J., & García-Vera, M. P. (2021). Prevalence of psychopathy in the general adult population: A systematic review and meta-analysis. *Frontiers in Psychology*, *12*, 3278. https://doi.org/10.3389/fpsyg.2021.661044

Seara-Cardoso, A., Queirós, A., Fernandes, E., Coutinho, J., & Neumann, C. (2020). Psychometric Properties and Construct Validity of the Short Version of the Self-Report Psychopathy Scale in a Southern European Sample. *Journal of Personality Assessment*, *102(4)*, 1–12. 457–468. https://doi.org/10.1080/00223891.2019.1617297

Shamay-Tsoory, S. G., & Aharon-Peretz, J. (2007). Dissociable prefrontal networks for cognitive and affective theory of mind: a lesion study. *Neuropsychologia*, *45*(13), 3054–3067. https://doi.org/10.1016/j.neuropsychologia.2007.05.021

Sharf, A., Kimonis, E. R., & Howard, A. (2014). Negative life events and posttraumatic stress disorder among incarcerated boys with callous-unemotional traits. *Journal of Psychopathology and Behavioral Assessment, 36*(3), 401–414. https://doi.org/10.1007/s10862-013-9404-z

Silva, S., & Maia, Â. (2008). Portuguese version of the *Family ACE Questionnaire (Childhood Adversity History Questionnaire)*. In A. Noronha, C. Machado, L. Almeida, M. Gonçalves, S. Martins, & V. Ramalho (Eds.), *Proceedings of the XIII International Conference on Psychological Assessment: Forms and Contexts* (pp. 359–362). Psiquilíbrios Editions.

Taylor, J., & Hocken, K. (2021). Hurt people hurt people: Using a trauma sensitive and compassion focused approach to support people to understand and manage their criminogenic needs. *Journal of Forensic Practice, 23*(3), 301–315. https://doi.org/10.1108/JFP-08-2021-0044

Teicher, M. H., & Samson, J. A. (2016). Annual research review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry, 57*(3), 241–266. https://doi.org/10.1111/jcpp.12507

Van Doorn, G., Dye, J., & Teese, R. (2024). The influence of Adverse and Positive Childhood Experiences on facets of empathy. *Child Abuse & Neglect*, 155, 106993. https://doi.org/10.1016/j.chiabu.2024.106993

Van Voorhis, P., Wright, E. M., Salisbury, E., & Bauman, A. (2010). Women's risk factors and their contributions to existing risk/needs assessment: The current status of a gender-responsive supplement. *Criminal Justice and Behavior, 37*(3), 261–288. https://doi.org/10.1177/0093854809357442

Verona, E., & Vitale, J. (2006). Psychopathy in Women: Assessment, Manifestations, and Etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 415–436). The Guilford Press.

Verona, E., Bresin, K., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of Abnormal Psychology*, *122*(4), 1088–1093. https://doi.org/10.1037/a0034062

Wheeler, S., Book, A., & Costello, K. (2009). Psychopathic traits and perceptions of victim vulnerability. *Criminal Justice and Behavior, 36*(6), 635–648. https://doi.org/10.1177/0093854809333958

Wild, L. M., & Poeppl, T. B. (2022). Zur Neurobiologie der Psychopathie [On the neurobiology of psychopathy]. *Forensische Psychiatrie, Psychologie, Kriminologie, 16*(3), 259–264. https://doi.org/10.1007/s11757-022-00720-0

Wolff, N., Frueh, B. C., Shi, J., Gerardi, D., Fabrikant, N., & Schumann, B. E. (2011). Trauma exposure and mental health characteristics of incarcerated females self-referred to specialty PTSD treatment. *Psychiatric Services, 62*(8), 954–958. https://doi.org/10.1176/ps.62.8.pss6208_0954

World Health Organization. (2022). *ICD-11: International Statistical Classification of Diseases for Mortality and Morbidity Statistics* (11th revision). Retrieved April 5 2025, from https://icd.who.int/browse/2025-01/mms/en#941859884%2Funspecified

Wynn, R., Høiseth, M. H., & Pettersen, G. (2012). Psychopathy in women: theoretical and clinical perspectives. *International Journal of Women's Health*, *4*, 257–263. https://doi.org/10.2147/IJWH.S25518

Supplementary materials 1

Moderation Role of PCEs in the Relationship Between ACEs and Empathy, with EDS-20 as a Covariate (n = 164)

Predictor variable	Outcomes	F *(df1, df2)*	*p (model)*	*b*	SE	*t*	*p*	95%CI
ACEs Total	BES Total	F (4, 159) = .124	.974					
	ACEs Total			-0.107	1.216	-0.088	.930	[-2.5090, 2.2955]
	PCEs Total			0.089	0.921	0.096	.924	[-1.7308, 1.9081]
	ACEs* PCEs			0.026	0.139	0.185	.854	[-0.2481, 0.2993]
	Social desirability			0.064	0.159	0.405	.686	[-0.2493, 0.3780]
	Cognitive empathy	F (4, 159) = .766	.549					
	ACEs Total			0.766	0.627	1.220	.224	[-0.4736, 2.0047]
	PCEs Total			0.728	0.475	1.533	.127	[-0.2102, 1.6668]
	ACEs* PCEs			-0.074	0.072	-1.041	.299	[-0.2156, 0.0668]
	Social desirability			0.043	0.082	0.522	.602	[-0.1190, 0.2045]
	Affective empathy	F (4, 159) = .286	.887					
	ACEs Total			-0.872	0.848	-1.0281	.3055	[-2.5480, 0.8034]
	PCEs Total			-0.640	0.643	-0.9954	.3211	[-1.9088, 0.6295]
	ACEs* PCEs			0.100	0.097	1.0344	.3025	[-0.0909, 0.2909]
	Social desirability			0.022	0.111	0.1948	.8458	[-0.1972, 0.2403]
Emotional abuse	BES Total	F (4, 159) = .972	.425					
	Emotional abuse			11.501	8.990	1.279	.203	[-6.2535, 29.2561]
	PCEs Total			1.196	0.904	1.323	.188	[-0.5895, 2.9818]
	Emotional abuse * PCEs			-0.997	1.007	-0.990	.324	[-2.9857, 0.9916]

	Social desirability			0.089	0.156	0.571	.569	[-0.2187, 0.3967]
	Cognitive empathy							
	Emotional abuse			8.688	4.613	1.884	.062	[-0.4221, 17.7977]
	PCEs Total	F (4, 159) = 2.07	.088	0.981	0.464	2.115	.036	[0.0651, 1.8975]
	Emotional abuse * PCEs			-0.772	0.517	-1.494	.137	[-1.7923, 0.2484]
	Social desirability			0.054	0.080	0.676	.500	[-0.1038, 0.2120]
	Affective empathy							
	Emotional abuse			2.814	6.347	0.443	.658	[-9.7221, 15.3491]
	PCEs Total	F (4, 159) = .159	.959	0.215	0.638	0.337	.737	[-1.0459, 1.4756]
	Emotional abuse * PCEs			-0.225	0.711	-0.317	.752	[-1.6292, 1.1790]
	Social desirability			0.035	0.110	0.318	.751	[-0.1823, 0.2522]
Physical abuse	BES Total							
	Physical abuse			5.281	8.175	0.646	.519	[-10.8654, 21.4263]
	PCEs Total	F (4, 159) = .608	.658	0.609	0.797	0.764	.446	[-0.9654, 2.1831]
	Physical abuse * PCEs			-0.325	0.922	-0.353	.725	[-2.1462, 1.4959]
	Social desirability			0.103	0.159	0.650	.517	[-0.2101, 0.4160]
	Cognitive empathy							
	Physical abuse	F (4, 159) = 2.16	.076	9.523	4.171	2.283	.024	[1.2849, 17.7619]
	PCEs Total			1.015	0.407	2.494	.014	[0.2112, 1.8178]

	Physical abuse * PCEs			-0.903	0.471	-1.919	.057	[-1.8320, 0.0263]
	Social desirability			0.064	0.081	0.785	.434	[-0.0962, 0.2232]
	Affective empathy							
	Physical abuse			-4.243	5.735	-0.740	.461	[-15.5702, 7.0843]
	PCEs Total			-0.406	0.559	-0.725	.469	[-1.5101, 0.6988]
	Physical abuse * PCEs	F (4, 159) = .309	.872	0.578	0.647	0.893	.373	[-0.6998, 1.8553]
	Social desirability			0.040	0.111	0.355	.723	[-0.1802, 0.2591]
	BES Total							
	Sexual abuse			1.310	6.755	0.194	.846	[-12.0296, 14.6505]
	PCEs Total			0.317	0.571	0.555	.579	[-0.8112, 1.4459]
	Sexual abuse * PCEs	F (4, 159) = .493	.741	0.133	0.823	0.162	.872	[-1.4920, 1.7578]
	Social desirability			0.065	0.155	0.418	.677	[-0.2413, 0.3707]
Sexual abuse	Cognitive empathy							
	Sexual abuse			3.784	3.506	1.079	.282	[-3.1408, 10.7090]
	PCEs Total			0.433	0.297	1.461	.146	[-0.1526, 1.0190]
	Sexual abuse * PCEs	F (4, 159) = .624	.646	-0.469	0.427	-1.099	.273	[-1.3129, 0.3741]
	Social desirability			0.032	0.080	0.395	.694	[-0.1271, 0.1906]
	Affective empathy							
	Sexual abuse	F (4, 159) = 1.07	.373	-2.474	4.688	-0.528	.598	[-11.7315, 6.7843]
	PCEs Total			-0.116	0.397	-0.292	.771	[-0.8990, 0.6673]

	Sexual abuse * PCEs			0.602	0.571	1.055	.293	[-0.5253, 1.7300]
	Social desirability			0.033	0.108	0.307	.760	[-0.1794, 0.2453]
Emotional neglect	BES Total	F (4, 159) = .334	.855					
	Emotional neglect			7.664	7.779	0.985	.326	[-7.6985, 23.0264]
	PCEs Total			0.801	0.745	1.075	.284	[-0.6704, 2.2722]
	Emotional neglect * PCEs			-0.823	0.890	-0.925	.356	[-2.5803, 0.9341]
	Social desirability			0.051	0.155	0.332	.741	[-0.2545, 0.3572]
	Cognitive empathy	F (4, 159) = .704	.590					
	Emotional neglect			4.761	4.026	1.183	.239	[-3.1900, 12.7122]
	PCEs Total			0.598	0.386	1.550	.123	[-0.1637, 1.3593]
	Emotional neglect * PCEs			-0.493	0.461	-1.070	.286	[-1.4024, 0.4166]
	Social desirability			0.028	0.080	0.354	.724	[-0.1299, 0.1866]
	Affective empathy	F (4, 159) = .086	.987					
	Emotional neglect			2.903	5.454	0.532	.595	[-7.8681, 13.6739]
	PCEs Total			0.203	0.522	0.389	.698	[-0.8284, 1.2347]
	Emotional neglect * PCEs			-0.330	0.624	-0.529	.597	[-1.5622, 0.9018]
	Social desirability			0.023	0.109	0.212	.832	[-0.1914, 0.2374]
	BES Total	F (4, 159) = .621	.648					

	Physical neglect			-3.155	6.525	-0.483	.629	[-16.0422, 9.7330]
	PCEs Total			-0.047	0.512	-0.091	.928	[-1.0570, 0.9641]
	Physical neglect * PCEs			0.068	0.799	0.086	.932	[-1.5100, 1.6466]
	Social desirability			0.045	0.155	0.293	.770	[-0.2602, 0.3507]
Physical neglect	Cognitive empathy	F (4, 159) = .654	.625					
	Physical neglect			1.636	3.392	0.482	.630	[-5.0624, 8.3339]
	PCEs Total			0.271	0.266	1.018	.310	[-0.2546, 0.7958]
	Physical neglect * PCEs			-0.312	0.415	-0.752	.453	[-1.1326, 0.5080]
	Social desirability			0.031	0.080	0.382	.703	[-0.1280, 0.1895]
	Affective empathy	F (4, 159) = .649	.629					
	Physical neglect			-4.790	4.559	-1.051	.295	[-13.7951, 4.2144]
	PCEs Total			-0.317	0.358	-0.887	.377	[-1.0231, 0.3890]
	Physical neglect * PCEs			0.381	0.558	0.682	.497	[-0.7222, 1.4834]
	Social desirability			0.015	0.108	0.134	.893	[-0.1989, 0.2279]
Divorce or parental separation	BES Total	F (4, 159) = .173	.952					
	Divorce or parental separation			1.321	6.474	0.204	.839	[-11.4657, 14.1079]
	PCEs Total			0.231	0.552	0.419	.676	[-0.8582, 1.3201]
	Divorce or parental			-0.039	0.770	-0.050	.960	[-1.5595, 1.4820]

	separation * PCEs Social desirability			0.070	0.159	0.439	.661	[-0.2436, 0.3829]
	Cognitive empathy							
	Divorce or parental separation			1.713	3.354	0.511	.610	[-4.9114, 8.3370]
	PCEs Total			0.299	0.286	1.045	.298	[-0.2658, 0.8627]
	Divorce or parental separation * PCEs Social desirability	F (4, 159) = .466	.760	-0.136	0.399	-0.342	.733	[-0.9242, 0.6514]
				0.037	0.082	0.456	.649	[-0.1249, 0.1997]
	Affective empathy							
	Divorce or parental separation			-0.392	4.532	-0.086	.931	[-9.3427, 8.5593]
	PCEs Total			-0.068	0.386	-0.175	.861	[-0.8299, 0.6949]
	Divorce or parental separation * PCEs Social desirability	F (4, 159) = .051	.995	0.098	0.539	0.181	.857	[-0.9669, 1.1622]
				0.032	0.111	0.290	.772	[-0.1871, 0.2515]
Exposure to domestic violence	BES Total							
	Exposure to DV	F (4, 159) = .266	.900	5.136	6.582	0.780	.436	[-7.8627, 18.1347]
	PCEs Total			0.498	0.576	0.865	.388	[-0.6397, 1.6365]

	Exposure to DV * PCEs			-0.518	0.782	-0.663	.509	[-2.0624, 1.0263]
	Social desirability			0.064	0.161	0.400	.690	[-0.2533, 0.3819]
	Cognitive empathy							
	Exposure to DV			3.518	3.402	1.034	.303	[-3.2014, 10.2377]
	PCEs Total			0.426	0.298	1.431	.155	[-0.1621, 1.0145]
	Exposure to DV * PCEs	F (4, 159) = .734	.570	-0.321	0.404	-0.794	.428	[-1.1194, 0.4773]
	Social desirability			0.044	0.083	0.530	.597	[-0.1201, 0.2082]
	Affective empathy							
	Exposure to DV			1.618	4.613	0.351	.726	[-7.4926, 10.7283]
	PCEs Total			0.072	0.404	0.179	.858	[-0.7254, 0.8699]
	Exposure to DV * PCEs	F (4, 159) = .047	.996	-0.197	0.548	-0.360	.720	[-1.2795, 0.8854]
	Social desirability			0.020	0.113	0.180	.858	[-0.2023, 0.2428]
Substance abuse in the family environment	BES Total							
	Substance abuse in the family environment			-5.777	7.053	-0.819	.414	[-19.7055, 8.1523]
	PCEs Total	F (4, 159) = .493	.741	-0.244	0.663	-0.368	.714	[-1.5540, 1.0664]
	Substance abuse in the family environment * PCEs			0.460	0.814	0.565	.573	[-1.1478, 2.0680]

	Social desirability			0.034	0.157	0.215	.830	[-0.2760, 0.3434]
	Cognitive empathy							
	Substance abuse in the family environment			0.149	3.673	0.0405	.968	[-7.1057, 7.4036]
	PCEs Total			0.220	0.346	0.6359	.526	[-0.4627, 0.9021]
	Substance abuse in the family environment * PCEs	F (4, 159) = .357	.839	-0.056	0.424	-0.1313	.896	[-0.8931, 0.7818]
	Social desirability			0.024	0.082	0.2895	.773	[-0.1377, 0.1849]
	Affective empathy							
	Substance abuse in the family environment			-5.926	4.918	-1.205	.230	[-15.6377, 3.7866]
	PCEs Total			-0.464	0.463	-1.002	.318	[-1.3771, 0.4501]
	Substance abuse in the family environment * PCEs	F (4, 159) = .688	.601	0.516	0.568	0.909	.365	[-0.6054, 1.6369]
	Social desirability			0.010	0.109	0.092	.927	[-0.2059, 0.2260]
	BES Total	F (4, 159) = 1.149	.336					

	Mental illness or suicide in family			-9.650	6.428	-1.501	.135	[-22.3449, 3.0460]
	PCEs Total			-0.356	0.510	-0.698	.487	[-1.3638, 0.6519]
	Mental illness or suicide in family * PCEs			1.456	0.786	1.853	.066	[-0.0959, 3.0081]
	Social desirability			0.029	0.155	0.187	.852	[-0.2778, 0.3357]
Mental illness or suicide in family	Cognitive empathy							
	Mental illness or suicide in family	F (4, 159) = .673	.612	-0.425	3.362	-0.127	.900	[-7.0652, 6.2144]
	PCEs Total			0.179	0.267	0.672	.503	[-0.3479, 0.7063]
	Mental illness or suicide in family * PCEs			0.194	0.411	0.472	.638	[-0.6179, 1.0055]
	Social desirability			0.033	0.081	0.401	.689	[-0.1279, 0.1930]
	Affective empathy							
	Mental illness or suicide in family	F (4, 159) = 1.401	.236	-9.224	4.479	-2.059	.041	[-18.0704, -0.3777]
	PCEs Total			-0.535	0.356	-1.505	.134	[-1.2375, 0.1671]
	Mental illness or suicide in family * PCEs			1.262	0.548	2.305	.022	[0.1809, 2.3438]
	Social desirability			-0.004	0.108	-0.033	.974	[-0.2173, 0.2102]
	BES Total	F (4, 159) = 1.174	.324					

		Imprisonment of a family member			-7.030	6.340	-1.109	.269	[-19.5524, 5.4923]
		PCEs Total			-0.183	0.499	-0.367	.714	[-1.1688, 0.8026]
		Imprisonment of a family member * PCEs			0.425	0.769	0.554	.581	[-1.0926, 1.9435]
		Social desirability			0.054	0.153	0.352	.726	[-0.2491, 0.3570]
	Cognitive empathy								
		Imprisonment of a family member			-1.190	3.306	-0.360	.719	[-7.7197, 5.3396]
Imprisonment of a family member		PCEs Total			0.148	0.260	0.567	.571	[-0.3664, 0.6616]
		Imprisonment of a family member * PCEs	F (4, 159) = .941	.442	-0.038	0.401	-0.096	.924	[-0.8299, 0.7533]
		Social desirability			0.028	0.080	0.344	.731	[-0.1305, 0.1856]
	Affective empathy								
		Imprisonment of a family member			-5.840	4.445	-1.314	.191	[-14.6194, 2.9395]
		PCEs Total	F (4, 159) = .924	.452	-0.331	0.350	-0.945	.346	[-1.0218, 0.3604]
		Imprisonment of a family member * PCEs			0.464	0.539	0.861	.391	[-0.6006, 1.5280]

	Social desirability	0.026	0.108	0.246	.806	[-0.1860, 0.2389]

Note. b = Regression Coefficient; t = t-test value; β = Standardized regression coefficient; SRP-SF = Self-Report Psychopathy Scale; ; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; PCEs Total= Total of Positive Childhood Experiences; ACEs Total= Total Number of Adverse Childhood Experiences; **p <.05; **p <.01.

Supplementary materials 2

Moderation Role of PCEs in the Relationship Between Psychopathy and Empathy, with EDS-20 as a Covariate (n = 164)

Predictor variable	Outcomes	F *(df1, df2)*	*p (model)*	*b*	SE	*t*	*p*	95%CI
SRP-SF Total	BES Total							
	SRP-SF Total			-0.184	0.143	-1.285	.201	[-0.4654, 0.0985]
	PCEs Total	F (4, 159) = 2.200	.071	-0.001	1.169	-0.001	1.000	[-2.3085, 2.3069]
	SRP-SF Total* PCEs			0.001	0.018	0.058	.954	[-0.0341, 0.0361]
	Social desirability			-0.259	0.190	-1.362	.175	[-0.6341, 0.1165]
	Cognitive empathy							
	SRP-SF Total			0.020	0.075	0.260	.795	[-0.1287, 0.1677]
	PCEs Total	F (4, 159) = 1.305	.271	0.792	0.614	1.290	.199	[-0.4208, 2.0050]
	SRP-SF Total* PCEs			-0.010	0.009	-1.068	.287	[-0.0284, 0.0085]
	Social desirability			-0.088	0.100	-0.877	.382	[-0.2849, 0.1096]
	Affective empathy							
	SRP-SF Total			-0.203	0.100	-2.037	.043	[-0.3998, -0.0062]
	PCEs Total	F (4, 159) = 2.327	.059	-0.793	0.816	-0.972	.332	[-2.4034, 0.8177]
	SRP-SF Total* PCEs			0.011	0.012	0.887	.376	[-0.0135, 0.0355]
	Social desirability			-0.171	0.133	-1.291	.199	[-0.4331, 0.0907]
SRP-SF INT	BES Total							
	SRP-SF INT			-0.624	0.487	-1.280	.202	[-1.5853, 0.3383]
	PCEs Total	F (4, 159) = .889	.472	-0.457	0.940	-0.486	.628	[-2.3139, 1.4004]
	SRP-SF INT* PCEs			0.040	0.059	0.683	.496	[-0.0764, 0.1570]
	Social desirability			-0.108	0.188	-0.574	.567	[-0.4784, 0.2629]
	Cognitive empathy							
	SRP-SF INT	F (4, 159) = .635	.638	0.070	0.254	0.276	.783	[-0.4316, 0.5717]
	PCEs Total			0.498	0.491	1.016	.311	[-0.4706, 1.4667]
	SRP-SF INT* PCEs			-0.021	0.031	-0.682	.496	[-0.0819, 0.0398]

	Social desirability			-0.028	0.098	-0.282	.779	[-0.2209, 0.1658]
	Affective empathy							
	SRP-SF INT			-0.694	0.339	-2.048	.042	[-1.3624, -0.0248]
	PCEs Total	F (4, 159) = 1.308	.269	-0.955	0.654	-1.460	.146	[-2.2462, 0.3366]
	SRP-SF INT* PCEs			0.061	0.041	1.493	.139	[-0.0198, 0.1425]
	Social desirability			-0.080	0.131	-0.615	.540	[-0.3380, 0.1776]
	BES Total							
	SRP-SF AFF			-0.670	0.540	-1.241	.217	[-1.7358, 0.3962]
	PCEs Total	F (4, 159) = 3.700	.007	0.440	0.997	0.441	.660	[-1.5291, 2.4085]
	SRP-SF AFF * PCEs			-0.019	0.066	-0.288	.774	[-0.1489, 0.1110]
	Social desirability			-0.217	0.166	-1.301	.195	[-0.5452, 0.1122]
	Cognitive empathy							
	SRP-SF AFF			-0.104	0.282	-0.369	.712	[-0.6607, 0.4525]
SRP-SF AFF	PCEs Total	F (4, 159) = 3.340	.012	0.703	0.521	1.351	.179	[-0.3248, 1.7311]
	SRP-SF AFF * PCEs			-0.035	0.034	-1.029	.305	[-0.1032, 0.0325]
	Social desirability			-0.105	0.087	-1.213	.227	[-0.2771, 0.0662]
	Affective empathy							
	SRP-SF AFF			-0.566	0.384	-1.472	.143	[-1.3245, 0.1931]
	PCEs Total	F (4, 159) = 2.144	.078	-0.263	0.710	-0.371	.711	[-1.6648, 1.1380]
	SRP-SF AFF* PCEs			0.016	0.047	0.350	.727	[-0.0761, 0.1089]
	Social desirability			-0.111	0.119	-0.938	.350	[-0.3451, 0.1229]
	BES Total							
	SRP-SF LIF			-0.639	0.574	-1.114	.267	[-1.7719, 0.4936]
	PCEs Total	F (4, 159) = .479	.751	-0.868	1.211	-0.717	.475	[-3.2602, 1.5238]
	SRP-SF LIF * PCEs			0.058	0.068	0.859	.392	[-0.0755, 0.1918]
SRP-SF LIF	Social desirability			-0.022	0.193	-0.116	.908	[-0.4037, 0.3591]
	Cognitive empathy							
	SRP-SF LIF	F (4, 159) = .418	.796	0.149	0.298	0.499	.618	[-0.4405, 0.7384]
	PCEs Total			0.553	0.630	0.878	.382	[-0.6916, 1.7978]
	SRP-SF LIF * PCEs			-0.021	0.035	-0.598	.551	[-0.0906, 0.0485]

	Social desirability			0.008	0.101	0.078	.938	[-0.1906, 0.2063]
	Affective empathy							
	SRP-SF LIF			-0.788	0.398	-1.980	.049	[-1.5741, -0.0021]
	PCEs Total	F (4, 159) = 1.070	.373	-1.421	0.840	-1.691	.093	[-3.0810, 0.2384]
	SRP-SF LIF* PCEs			0.079	0.047	1.686	.094	[-0.0136, 0.1719]
	Social desirability			-0.030	0.134	-0.225	.822	[-0.2949, 0.2345]
	BES Total							
	SRP-SF ANT			-0.558	0.547	-1.020	.309	[-1.6373, 0.5218]
	PCEs Total	F (4, 159) = 2.054	.089	-0.004	1.014	-0.004	.997	[-2.0062, 1.9985]
	SRP-SF ANT * PCEs			0.005	0.068	0.077	.939	[-0.1291, 0.1396]
	Social desirability			-0.094	0.161	-0.584	.560	[-0.4114, 0.2237]
	Cognitive empathy							
	SRP-SF ANT			0.103	0.289	0.358	.721	[-0.4673, 0.6739]
SRP-SF ANT	PCEs Total	F (4, 159) = .703	.591	0.550	0.536	1.026	.307	[-0.5086, 1.6081]
	SRP-SF ANT * PCEs			-0.027	0.036	-0.736	.463	[-0.0975, 0.0445]
	Social desirability			-0.003	0.085	-0.031	.976	[-0.1705, 0.1652]
	Affective empathy							
	SRP-SF ANT			-0.661	0.379	-1.746	.083	[-1.4086, 0.0866]
	PCEs Total	F (4, 159) = 2.835	.026	-0.554	0.702	-0.789	.432	[-1.9403, 0.8330]
	SRP-SF ANT* PCEs			0.032	0.047	0.674	.502	[-0.0613, 0.1248]
	Social desirability			-0.091	0.111	-0.819	.414	[-0.3112, 0.1287]

Note. b = regression coefficient; SE = Standard error; CI = Confidence interval; F = F test value; *df1* = Numerator degrees of freedom; *df2* = Denominator degrees of freedom; SRP-SF = Self-Report Psychopathy Scale; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; AI= Affective-Interpersonal Dimension; LA= Lifestyle-Antisocial Dimension; PCEs= Positive Childhood Experiences

CHAPTER IV | AN INTEGRATIVE MODEL OF THE COGNITIVE, EMOTIONAL, AND DEVELOPMENTAL MECHANISMS OF PSYCHOPATHY AND EMPATHY IN INCARCERATED WOMEN

STUDY 5 | LINKING CHILDHOOD ADVERSITY TO PSYCHOPATHIC TRAITS AND EMPATHY IN INCARCERATED WOMEN: THE ROLE OF EXECUTIVE FUNCTIONING AND EMOTIONAL PROCESSING

The present article is currently under review in *Psychology, Crime & Law* as a revised manuscript following peer-review.

References:

Pinheiro, M., Cardoso, L.G., Gonçalves, R. A., & Cunha, O. (under review). Linking Childhood Adversity to Psychopathic Traits and Empathy in Incarcerated Women: The Role of Executive Functioning and Emotional Processing. *Psychology, Crime & Law.*

Abstract

Adverse childhood experiences (ACEs) are associated with emotional dysregulation and antisocial behavior, yet the mechanisms linking early adversity to psychopathic traits in women remain insufficiently understood. This study examined how ACEs relate to psychopathic traits in incarcerated women, based on theoretically derived hypotheses, by analyzing their associations with executive functioning (EF), emotional processing, as well as the differential links between psychopathic traits and affective versus cognitive empathy in a sample of 164 incarcerated women (M_{age} = 38.75 years, SD_{age} = 11.99). Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to test hypothesized relationships. ACEs were associated with higher EF and lower emotional valence and dominance, but not with arousal. EF was associated with fewer emotional-processing difficulties, which, in turn, were associated with higher psychopathic traits. Psychopathy was linked to reduced affective, but not cognitive, empathy. Findings are consistent with the recalibration perspective, suggesting early adversity may be linked to cognitively efficient yet emotionally constrained profiles in women, with implications for trauma-informed interventions, prevention, and research.

Keywords: Adverse Childhood Experiences (ACEs); Emotional Processing (EP); Empathy; Executive Functioning (EF); Incarcerated Women; Psychopathy

Linking Childhood Adversity to Psychopathic Traits and Empathy in Incarcerated Women: The Role of Executive Functioning and Emotional Processing

Introduction

Psychopathy constitutes a multifaceted personality construct characterized by interpersonal manipulation, affective detachment, impulsivity, and chronic antisocial behavior (Hare, 2003), reflecting disturbances in emotional and cognitive systems implicated in empathy, moral reasoning, and behavioral regulation (Patrick, 2018). Hare's (2003) four-factor model delineates psychopathic traits into four interconnected dimensions: interpersonal (e.g., pathological lying, superficial charm, grandiosity), affective (e.g., callousness, shallow affect, absence of empathy or guilt), lifestyle (e.g., need for stimulation, impulsivity, parasitic orientation), and antisocial (e.g., juvenile delinquency, poor behavioral control, criminal versatility) (Hare, 2003). Although psychopathy has been widely studied across forensic, community, and university samples, much of the foundational literature and assessment frameworks were developed mainly in male populations (Rogstad & Rogers, 2008). This male-centered foundation has important implications for the conceptualization and assessment of psychopathy, as it may limit the extent to which existing models capture gender-specific developmental pathways and phenotypic expressions (Eisenbarth et al., 2012).

Converging evidence indicates that psychopathy in women constitutes a distinct developmental and clinical variant compared to men, influenced by gendered development trajectories and socialization processes (Cunha et al., 2025b; Forouzan & Cooke, 2005; Wynn et al., 2012). Accordingly, psychopathic traits in women tend to differ not only in overall levels, which are generally lower, but also in their facet configuration, with evidence suggesting lower interpersonal and affective scores and a relatively greater prominence of lifestyle-related traits in female incarcerated samples (Cunha et al., 2025b). Emerging evidence further suggests that these differences extend beyond structural variations in psychopathy to include distinct functional associations with aggressive behavior. Specifically, affective traits appear to be more strongly related to physical aggression in women, whereas antisocial traits may be more closely associated with indirect forms of aggression in men; in contrast, interpersonal traits seem to show comparable associations with verbal aggression across gender (Thomson et al., 2019).

Women often display interpersonal traits such as flirtation, seduction, or social manipulation rather than overt dominance or deception (Forouzan & Cooke, 2005; Rogstad & Rogers, 2008). Affective issues may overlap with emotional dependency or sexual promiscuity, often serving gendered roles (Forouzan & Cooke, 2005; Rogstad & Rogers, 2008). Lifestyle traits include impulsivity, like self-injury or

minor fraud, contrasting men's thrill-seeking (Forouzan & Cooke, 2005). Women's antisocial behaviors are typically indirect, such as gossip or social exclusion, rather than physical aggression (Forouzan & Cooke, 2005; Wynn et al., 2012). These differences demonstrate how gender socialization shapes the expression of psychopathy (Cunha et al., 2025b; Wynn et al., 2012).

Adverse Childhood Experiences and Their Interplay with Executive Functioning, Emotional Processing, and Psychopathy

Adverse childhood experiences (ACEs), including abuse, neglect, and household dysfunction (Felitti et al., 1998), are associated with antisocial outcomes and elevated psychopathic traits (Pinheiro, Machado et al., 2025). Recent studies suggest that ACEs have been associated with patterns of impulsivity, irresponsibility, behavioral dysregulation, and norm-violating behavior in women with psychopathic traits, particularly in the context of physical abuse, sexual abuse, physical neglect, and exposure to domestic violence (DV) (Pinheiro, Machado et al., 2025). These findings reinforce the view that, in this population, psychopathy may emerge partly from developmental trajectories shaped by early trauma, family dysfunction, and relational vulnerability (Pinheiro, Machado et al., 2025), and may be linked to secondary psychopathy, which is characterized by impulsivity, affective instability, and reactive aggression (Hicks et al., 2012). Developmental trajectories may also differ by gender, with some evidence suggesting that, in women, exposure to relational trauma and emotional dysregulation may be more pronounced (Verona & Vitale, 2018).

Early adversity may affect the development of fronto-limbic networks involved in control and emotion regulation (Blair & Raver, 2016; Pechtel & Pizzagalli, 2011). Exposure to ACEs has been associated with alterations in neural networks involved in threat detection, emotional salience, associative learning, and the top-down modulation of affective responses - namely in the amygdala, hippocampus, and prefrontal regions - suggesting neurodevelopmental reorganization in systems underlying emotional processing and behavioral adaptation (Teicher et al., 2016). Furthermore, recent studies indicate that the effects of ACEs on psychopathic traits may operate through intermediate socio-emotional mechanisms, particularly insecure attachment, suggesting that ACEs may compromise relational security and contribute to affective detachment, egocentrism, and later antisocial tendencies (van Beeck et al., 2024).

Thus, rather than merely contributing to a general increase in psychopathological risk, ACEs may also be associated with alterations in the maturation of neural networks involved in the regulation of emotional responses and and in the integration of limbic reactivity with cortical control (Gerin et al., 2023). In this sense, they may reflect one possible neurobiological pathway linking early adversity to later

socioemotional maladjustment (Gerin et al., 2023).Within this framework, the Dimensional Model of Adversity and Psychopathology (DMAP; McLaughlin & Sheridan, 2016) proposes that distinct forms of adversity may be associated with different neurodevelopmental pathways, thereby providing an account of these alterations. Specifically, threat-related experiences (e.g., abuse) have been associated with alterations in neural systems involved in salience detection and emotional learning, including heightened amygdala reactivity and changes in fronto-limbic circuitry, which may bias attention toward threat and amplify emotional responses (McLaughlin et al., 2019). By contrast, deprivation-related experiences (e.g., neglect) have been linked to reduced environmental stimulation, which may influence experience-dependent processes such as synaptic pruning and contribute to structural and functional alterations in frontoparietal networks implicated in executive functioning (EF) and sociocognitive development (McLaughlin et al., 2019). Taken together, these pathways suggest that ACEs may not exert uniform effects, but may instead be associated with distinct alterations in affective salience and cognitive control systems, resulting in neurobehavioral patterns that vary according to the predominant dimension of adversity (McLaughlin & Sheridan, 2016).

This differentiation can be further considered from an ecobiodevelopmental perspective, according to which ACEs mat act as sources of “toxic stress”, particularly when they are chronic, recurrent, and not buffered by protective relationships, potentially contributing to sustained activation of stress-response systems and dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis (McEwen, 2017). Throughout development, this physiological burden may be associated with lasting alterations in fronto-limbic circuits, namely in the amygdala, hippocampus, and prefrontal cortex, with possible implications for emotional salience detection, associative learning, contextual memory, and the inhibitory regulation of affective responses (Shonkoff et al., 2012; McEwen, 2017). Dysregulation of the HPA axis has been proposed as an important mechanism in the modulation of EF, emotional processing, and aggressive behavior (Mbiydzenyuy & Qulu, 2024). Alterations in cortisol levels, whether reflecting hyperactivation or hyporeactivity, have been associated with dysfunctions in the prefrontal cortex, amygdala, and hippocampus, which may, in turn, affect inhibitory control, decision-making, and emotional regulation (Mbiydzenyuy & Qulu, 2024). Such alterations may contribute to hyperreactivity to threatening stimuli and decreased top-down control, potentially fostering biased emotional processing patterns and a greater likelihood of aggressive responses (Mbiydzenyuy & Qulu, 2024), as has been observed in individuals with psychopathic traits. In line with this view, evidence suggests that stress-related HPA axis dysfunction may be associated with antisocial and psychopathic traits, especially among individuals exposed to ACEs (Fairchild et al., 2018). The association between psychopathic traits and

HPA axis hypoactivity has been supported by findings of attenuated cortisol responses to arousal, particularly in relation to traits such as manipulative egocentrism, externalization of blame, and lack of planning (Johnson et al., 2014), as well as by the absence of increased cortisol in response to induced stress, especially in men with high levels of psychopathic traits (O'Leary et al., 2007). EF, including high-level skills like planning, inhibitory control, and cognitive flexibility, is crucial for emotional regulation and goal-oriented actions (Zelazo & Cunningham, 2007). The literature consistently shows that exposure to childhood trauma has been associated with impairments in executive functions, particularly in domains related to self-regulation and cognitive control (Ford & Delker, 2018). These deficits may be partly explained by trauma-related dysregulation of the HPA axis, since chronic stress exposure in childhood has been linked to repeated activation of the stress response system, altered cortisol regulation, and structural and functional changes in stress-sensitive brain regions, particularly the prefrontal cortex, hippocampus, and amygdala, all of which are central to executive and emotional functioning (Cross et al., 2017). In line with this view, evidence from healthy adults suggests that early ACEs are associated with poorer inhibitory control, with the stress response emerging as a relevant factor in cognitive performance, particularly under high-interference conditions (Victor et al., 2024). Difficulties in self-regulation, in turn, have been consistently linked to aggression, violence, and antisocial behaviors, suggesting that EF may represent a key mechanism in explaining the relationship between ACEs and the development of psychopathic traits (Ford & Delker, 2018).

The literature on EF and psychopathy shows mixed results: some studies find executive deficits in individuals with high psychopathic traits (Bagshaw et al., 2014), while others find no link (Dolan, 2012) or even better performance on some EF tasks (Sellbom & Verona, 2007). This work suggests varied EF profiles in psychopathy, with some impairments tied to disinhibited behaviors and others showing preserved or enhanced "cold EF,' enabling strategic or goal-driven actions (Baskin-Sommers et al., 2015). Furthermore, the literature shows that the manifestation of EF seems to differ according to gender, with deficits in EF - inhibition, cognitive flexibility, and planning - generally being more evident in women than in men (Burghart et al., 2024). In addition, the greater emotional instability that characterizes female psychopathy (Beryl et al., 2014) may manifest in greater impairments in EF (Burghart et al., 2024).

Given that childhood trauma may also disrupt emotion regulation through fronto-limbic alterations and prolonged HPA-axis activation (Cross et al., 2017), examining EF in women may be particularly relevant for understanding how early adversity contributes to psychopathic traits through both cognitive-control and affect-regulation pathways. Research in women further suggests that psychopathic traits are associated with maladaptive personality profiles marked by detachment and disinhibition, and that

alexithymia may partly explain how these dysfunctional configurations contribute to psychopathic features (Garofalo et al., 2019). From this perspective, emotional processing deficits may reflect not only reduced empathic response, but also broader difficulties in identifying, interpreting, and regulating affective states (Pinheiro et al., 2024). Emotional processing (EP), the ability to perceive, interpret, and integrate affective cues, is central to psychopathy's affective dimension (Pinheiro et al., 2024).

Consistent with gender-differences, women with psychopathic traits tend to exhibit deficits in EP, particularly in domains such as emotion recognition and affective responsiveness, whereas men more consistently display generalized emotional hypo-reactivity, especially to fear and distress cues (Efferson & Glenn, 2018). Individuals exposed to ACEs often show hyperreactivity to threat and reduced response to distress cues, indicating selective tuning of emotions to environmental demands (Teicher & Samson, 2016). In psychopathy, this imbalance appears as diminished empathy and weakened aversive conditioning, caused by paralimbic system dysfunction (Anderson & Kiehl, 2014), with similar patterns observed in female forensic and community samples (Pinheiro et al., 2024). To account for these patterns, theoretical models have been proposed that link EP deficits in psychopathy to both attentional and neurobiological mechanisms. The Response Modulation Hypothesis (RMH) proposes that psychopathic individuals have attentional bottlenecks that restrict emotional cue processing during goal-oriented tasks (Hamilton & Newman, 2018; Kiehl, 2006). Within this framework, deficits in emotional responding are not conceptualized solely as a primary absence of affect, but rather as a failure to integrate contextually relevant emotional and inhibitory information when attentional resources are narrowly focused (Smith & Lilienfeld, 2015). Although both males and females with psychopathic traits tend to exhibit abnormalities in attention and error processing, deficits such as response perseveration and passive avoidance learning appear to be more characteristic of males, suggesting potential gender differences in inhibitory control and behavioral regulation (Efferson & Glenn, 2018). In contrast, the Paralimbic Dysfunction Model (PDM) attributes these deficits to dysconnectivity between the amygdala and prefrontal regions (Kiehl, 2006). These models are supported by female samples, showing reduced defensive startle responses, difficulties in categorizing negative emotions, and altered amygdala–prefrontal connectivity during moral and emotional tasks (Pinheiro et al., 2024).

In this affective–interpersonal framework, empathy seems to be a context-dependent expression of psychopathic traits rather than a fundamental deficit. Contemporary theories distinguish affective empathy (i.e., emotional resonance) from cognitive empathy (i.e., understanding others' mental states) (Shamay-Tsoory, 2011). Psychopathic traits are linked to impaired affective empathy, while cognitive empathy is often preserved or used strategically, especially in forensic populations (Blair, 2007; Shamay-

Tsoory, 2011). This dissociation suggests empathic functioning is secondary to affective-interpersonal dysfunction. Functional models propose empathic engagement is downregulated in goal-oriented or threatening situations, fostering emotionally detached and instrumental social strategies (Blair, 2005). In women, these patterns are common in relational settings, where reduced affective empathy coexists with intact cognitive understanding, shaped by past adversity and gender socialization (Wynn et al., 2012). Gender differences have also been observed in moral processing, with males higher in psychopathy showing greater endorsement of direct harm and stronger emotional reactivity to unfairness, whereas females tend to exhibit increased acceptance of unfair outcomes and a greater reliance on indirect or manipulative forms of harm, potentially reflecting differences in emotional engagement and social-cognitive processing (Efferson & Glenn, 2018).

Contemporary approaches conceptualize emotional responses along three orthogonal dimensions: valence (pleasant–unpleasant), arousal (low–high activation), and dominance (perceived control) (Bradley & Lang, 2007). Evidence shows this structure captures altered emotional patterns in psychopathy: among women offenders, higher psychopathy scores are linked to less positive evaluations of neutral stimuli and different responses to unpleasant images, including increased arousal and reduced dominance, indicating emotional dysregulation and reduced perceived control (Pinheiro et al., 2025).

Within the Integrated Emotion Systems (IES) model (Blair et al., 2005) and the Triarchic Model of Psychopathy (Patrick et al., 2009), interpersonal-affective traits are associated with decreased negative valence and blunted arousal when processing others' distress, which is consistent with amygdala hyporeactivity and reduced defensive motivation (Levenston et al., 2000). In women, these traits are linked to attenuated defensive responses to victims' suffering and reduced limbic engagement (Pinheiro et al., 2024). These patterns align with Pinheiro et al. (2025), which showed that higher interpersonal-affective traits correspond to less aversive subjective evaluations of specific negative stimuli, suggesting neural attenuation mirrors subjective ratings of valence and arousal. In contrast, lifestyle-antisocial traits involve heightened emotional activation and increased perceptions of dominance during provocation or frustration, reflecting reactive impulsivity and a stronger orientation toward approach-related behavior (Louise von Borries et al., 2012). In women, these traits are closely linked to negative affect, alexithymia, and overall emotional dysregulation (Pinheiro et al., 2024). Consistent, Pinheiro et al. (2025) found that elevated lifestyle-antisocial scores were associated with higher arousal and lower dominance when exposed to unpleasant stimuli, suggesting intensified emotional reactivity with diminished regulatory control. Importantly, these gender-based differences are not restricted to behavioral expression but extend to partially distinct patterns of emotional reactivity, cognitive functioning, and moral processing associated

with psychopathic traits (Efferson & Glenn, 2018). Compared to males, females with psychopathic traits tend to exhibit less pervasive deficits in EP, particularly in emotion recognition and responsiveness to affective stimuli, suggesting a more context-dependent and potentially compensatory pattern of emotional functioning (Efferson & Glenn, 2018).

Overall, psychopathy seems to involve a complex pattern of emotional dysfunction with hypo-reactivity or hyper-reactivity, depending on the psychopathic domain (Blair, 2006), a pattern also observed in incarcerated women, whose valence, arousal, and dominance ratings vary according to psychopathic traits (Pinheiro et al., 2025).

Current study

Although ACEs are considered a major risk factor for emotional dysregulation, cognitive deficits, and antisocial behavior (Moreira et al., 2020; Pinheiro, Machado et al., 2025), few studies examine how early adversity interacts with emotional and EF to influence psychopathic traits, especially among women. Women who have committed crimes often report high levels of ACEs (Hicks et al., 2012; Pinheiro, Machado et al., 2025), contributing to distinct psychopathic profiles (Wynn et al., 2012). The present study tests a structural equation model integrating five key constructs: ACEs, EF, EP (and emotional dimensions), Empathy, and Psychopathy. This approach provides a focused and exploratory framework for clarifying developmental mechanisms specific to female psychopathy, which may inform trauma-responsive practices.

ACEs are conceptualized as cumulative environmental stressors that may impair executive and emotional systems, core regulatory mechanisms underpinning adaptive social behavior. Early adversity may disrupt inhibitory control, cognitive flexibility, and emotion recognition (Blair & Raver, 2016), increasing vulnerability to psychopathic traits. Psychopathy is modeled as a latent construct with four interrelated factors (Hare, 2003) – interpersonal, affective, lifestyle, and antisocial. Emotional dimensions – valence, arousal, and dominance – were modeled separately, with each dimension specified as an independent indicator of emotional responding to affective stimuli. The model suggests that deficits in EF and EP functions partially mediate the link between ACEs and psychopathy, indicating that early adversity may influence psychopathy both directly and indirectly through regulatory mechanisms.

Concretely, this study aims to (1) examine the association between ACEs and psychopathic traits in women who have committed crimes, (2) test whether EF and EP mediate the relationship between ACEs and psychopathy, (3) explore the association between psychopathy and EP, focusing on valence,

arousal, and dominance, and (4) investigate the association between of psychopathy and affective versus cognitive empathy.

Based on the scientific evidence and theoretical models described above, the following hypotheses were formulated: (H1) ACEs will be positively associated with psychopathic traits; (H2) ACEs will be negatively associated with EF, reflecting impairments in regulatory and affective systems; (H3) EF will be negatively associated with difficulties in EP; (H4) Higher scores in EP – that represent difficulties in EP – will be positively associated with psychopathic traits; (H5) EF and EP will mediate the relationship between ACEs and psychopathic traits; (H6) Psychopathic traits will be associated with altered emotional responding, as reflected in valence, arousal, and dominance dimensions; and (H7) Psychopathic traits will be negatively associated with affective empathy, whereas cognitive empathy will be relatively preserved.

Method

Participants

This cross-sectional exploratory study employed a convenience sampling method. Participants were female inmates aged 18 or older, currently incarcerated, and proficient in Portuguese with sufficient literacy skills to complete self-report measures. Participants had to abstain from substance use for at least six months and show no cognitive impairments that could hinder task understanding or informed consent.

The sample included 164 female inmates, with an average age of 38.75 years (*SD* = 11.99), ranging from 18 to 81 years. Most were Portuguese (76.8%, *n* = 126), followed by Brazilian participants (15.9%, *n* = 26) and individuals from other nationalities (7.3%, *n* = 12). The majority was convicted (77.4%, *n* = 127), while 22.6% (*n* = 37) was on remand. Of those convicted, 63.4% (*n* = 104) were convicted of non-violent crimes.

Procedure

This study was approved by the Ethics Committee for Social Sciences and Humanities [CEICSH 153/2022], and the General Directorate of Reintegration and Prison Services – Ministry of Justice (DGRSP-MJ). All procedures followed Portuguese laws and conformed to the ethical standards of the Declaration of Helsinki.

Data collection was conducted in four female correctional facilities in Portugal across three phases. First, potential participants were invited to attend an information session within the prison

facilities, explaining the study's goals, procedures, voluntary participation, anonymity, and absence of compensation or penalty for refusal. Those who agreed signed a written informed consent form, confirming their voluntary involvement. Second, participants completed the emotional processing task with 30 IAPS images presented in a fixed order in prison classrooms. They were informed that images included pleasant, unpleasant, and neutral content and reminded of their right to withdraw. After brief training on the Self-Assessment Manikin (SAM; Bradley & Lang, 1994), each image was displayed for six seconds, followed by a 15-second interval during which participants rated their emotional experience on valence, arousal, and dominance, by selecting the figures that best represented their emotional responses on the SAM.

Third, participants completed self-report instruments and individual interviews collecting sociodemographic, legal and criminological information. At least two researchers were present to ensure standardized administration, clarify questions, safeguard ethical conduct, and provide emotional support during questionnaire completion.

Measures

Sociodemographic and Juridical-Legal Questionnaire

A questionnaire was used to assess sociodemographic (e.g., age, educational qualifications) and legal variables (e.g., length of sentence, recidivism). This information was collected by the researcher during a semi-structured interview.

Adverse Childhood Experiences Scale (ACEs)

The ACEs (Felitti et al., 1998; Portuguese version: Silva & Maia, 2008) is a self-report questionnaire aimed at assessing experiences of adversity before the age of 16. The survey consists of 17 dichotomous questions ("Yes"/"No"), assessing ten types of adversity: emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, divorce or parental separation, exposure to domestic violence (DV), substance abuse in the family environment, mental illness or suicide, and imprisonment of a family member. The total adversity score ranges between 0 and 10. This sample showed good reliability, with a Cronbach's alpha of .90.

Emotional Processing Scale (EPS-25)

The EPS-25 (Baker et al., 2010; Portuguese version: Torres & Leitão, 2015) is a 25-item self-report measure comprising five factors that assess EP: suppression, avoidance, unregulated emotion, impoverished emotional experience, and signs of unprocessed emotions. Each item is rated on a 10-point

Likert scale (0 = “completely disagree” to 9 = “completely agree”), where higher scores suggest worse emotional regulation. In this study, the scale showed high reliability, with a total Cronbach’s alpha of .93.

Frontal Assessment Battery (FAB)

The FAB (Dubois et al., 2000; Portuguese version: Lima et al., 2008) is a brief bedside screening instrument administered by the researcher to rapidly assess EF associated with frontal lobe integrity. It comprises six subtests targeting distinct domains: (a) conceptualization (similarities task); (b) mental flexibility (phonemic fluency); (c) motor programming (Luria’s motor series); (d) sensitivity to interference (conflicting instructions); (e) inhibitory control (go/no-go task); and (f) environmental autonomy (prehension behavior suppression). In this study, FAB showed a Cronbach’s alpha of .68.

International Affective Picture System (IAPS)

The International Affective Picture System (IAPS; Lang et al., 1997) is a database of 1,196 color photos developed within an emotion model, normed on valence, arousal, and dominance (Bradley & Lang, 2007). For this study, 30 images were chosen based on a systematic review on emotional processing and psychopathy in women (Pinheiro et al., 2024) and were presented by the researcher. These images were selected to ensure they were appropriate and validated for similar experiments. The final set included 10 pleasant, 10 unpleasant, and 10 neutral images, representing a balanced affective spectrum.

Self-Assessment Manikin (SAM)

The SAM (Bradley & Lang, 1994) is a self-report instrument that assesses three dimensions of affective experience—valence (1 sad to 9 happy), arousal (1 low to 9 high), and dominance (1 dominated to 9 high control)—using a nine-point scale. Participants should select the SAM figures that best represent their emotional experience after viewing the selected IAPS images. For this study, mean scores for valence, arousal, and dominance were calculated across all images (pleasant, unpleasant, and neutral). In this study, SAM showed good psychometric properties: Valence (α = .76), Arousal (α = .91), and Dominance (α = .93).

Self-Report Psychopathy Scale – Short Form (SRP-SF)

The SRP-SF (Paulhus et al., 2016; Portuguese version: Seara-Cardoso et al., 2020) is a 29-item self-report instrument based on the four-factor structure of the Psychopathy Checklist-Revised (PCL-R), assessing the interpersonal (INT), affective (AFF), lifestyle (LIF), and antisocial (ANT) factors. Items are rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). In the present sample, the

total scale had high internal consistency (α = .87), with the INT (α = .76) and LIF (α = .74) subscales also acceptable. However, the AFF (α = .54) and ANT (α = .57) subscales had lower consistency.

Basic Empathy Scale (BES)

The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006; Portuguese version: Anastácio et al., 2016) is a 20-item self-report measure assessing empathy. It uses a 5-point Likert scale (1 = "Strongly Disagree" to 5 = "Strongly Agree") to produce scores for cognitive, affective, and global empathy. This study's overall scale showed good internal consistency (α = .73), with acceptable reliability for cognitive empathy (α = .69) and adequate reliability for affective empathy (α = .66).

Data Analysis

This study used a cross-sectional, exploratory design following STROBE guidelines for observational studies (von Elm et al., 2007).

Before structural equation modeling, all continuous variables were standardized to z-scores (M = 0, SD = 1) to facilitate model estimation and the interpretation of standardized coefficients. All relevant statistical assumptions, including normality, linearity, and the presence of outliers, were formally assessed prior to analysis, and no extreme violations were detected. This study used R (version 4.2) for data analysis, the *psych* package (Revelle, 2025) for descriptive statistics, and the *seminr* package (Ray et al., 2024) for Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM was deemed appropriate given the relatively small sample size, the large number of relationships under investigation and the exploratory nature of the study (cf. Hair et al., 2021). Psychopathy was modeled as a reflective latent construct indicated by the interpersonal, affective, lifestyle, and antisocial factors, capturing their shared variance as a global psychopathic trait. All other variables in the model were defined as composite constructs. There was no significant missing data; all analyses used complete cases.

In the structural model, ACEs were specified as exogenous predictors of EF, psychopathy, and the three emotional dimensions (valence, dominance, and arousal). EF acted as a mediator between ACEs and EP, which in turn predicted psychopathy. Psychopathy was modelled as a predictor of emotional dimensions (valence, dominance, and arousal) and of cognitive and affective components of empathy.

Results

Descriptive Analyses

Descriptive statistics for all study variables are presented in Table 1. Participants presented low/moderate levels of psychopathic traits, with the lifestyle facet showing the highest mean. ACEs were

highly prevalent, with 81.7% (n = 134) reporting at least one event. The most frequently reported ACEs were substance abuse in the home environment, emotional abuse, and physical abuse. The total EPS-25 score suggested difficulties in EP, with the highest means observed in the subscales for signals of unprocessed emotion and suppression. Empathy was moderate to high overall, with affective empathy slightly higher than cognitive empathy. Aggregate emotional responses to visual stimuli (SAM) revealed neutral to positive valence, high arousal, and moderate perceived dominance.

Table 1

Descriptive Statistics for Study Measures, Scales, and Subscales

Measures	*N (%)*	*M*	*SD*	Min	Max
SRP-SF					
INT	164 (100)	13.1	5.04	5	32
AFF	164 (100)	13.0	3.95	7	27
LIF	164 (100)	15.6	5.22	7	31
ANT	164 (100)	13.0	4.51	7	27
Total	164 (100)	57.3	15.93	31	122
ACEs					
Total	164 (100)	4.02	3.03	0	10
Number of ACEs experienced					
Emotional abuse	87 (53.0)	0.94	0.938	0	2
Physical abuse	85 (51.8)	0.88	0.912	0	2
Sexual abuse	55 (33.5)	0.57	0.851	0	2
Emotional neglect	76 (46.3)	0.73	0.859	0	2
Physical neglect	53 (32.3)	0.43	0.684	0	2
Divorce or parental separation	65 (39.6)	0.40	0.491	0	1
Exposure to DV	65 (39.6)	0.90	1.358	0	6
Household substance abuse	88 (53.7)	0.54	0.500	0	1
Mental illness or suicide in family	41 (25.0)	0.25	0.434	0	1
Imprisonment of a family member	44 (26.8)	0.27	0.444	0	1
EPS-25					

Total	164 (100)	23.9	9.86	0	45
Suppression	164 (100)	5.38	2.51	0	9
Signs of Unprocessed Emotion	164 (100)	5.55	2.50	0	9
Controllability of Emotion	164 (100)	3.43	2.55	0	9
Avoidance	164 (100)	5.18	2.07	0	9
Emotional Experience	164 (100)	4.41	2.39	0	9
Executive Functions	164 (100)	15.70	2.49	6	18
Basic Empathy Scale					
Total	164 (100)	77.1	10.1	50	97
Cognitive empathy	164 (100)	37.1	5.26	21	45
Affective empathy	164 (100)	40.0	7.07	23	55
SAM					
Valence	164 (100)	4.94	1.18	1	9
Pleasant	164 (100)	7.85	1.17	2	9
Unpleasant	164 (100)	2.03	1.18	1	9
Neutral	164 (100)	5.79	1.18	2	9
Arousal	164 (100)	7.09	1.79	1	9
Pleasant	164 (100)	6.75	1.87	1	9
Unpleasant	164 (100)	7.42	1.70	1	9
Neutral	164 (100)	4.51	1.96	1	9
Dominance	164 (100)	5.70	2.30	1	9
Pleasant	164 (100)	6.09	2.36	1	9
Unpleasant	164 (100)	4.71	2.25	1	9
Neutral	164 (100)	6.30	2.30	1	9

Note. Min= Minimum; Max= Maximum; SRP-SF= Self-Report Psychopathy Scale – Short Form; INT = Interpersonal Factor; AFF= Affective Factor; LIF= Lifestyle Factor; ANT= Antisocial Factor; EDS-20= Social Desirability Scale - 20 Items; PCEs= Benevolent Childhood Experiences Scale; ACEs= Adverse Childhood Experiences Questionnaire; EPS-25 = Emotional Processing Scale; SAM= Self-Assessment Manikin

Preliminary Analyses

Firstly, Pearson correlation analyses revealed all psychopathy dimensions were strongly interrelated. Both affective and cognitive empathy correlated negatively with psychopathy traits.

Specifically, higher levels of affective empathy were associated with lower levels of the affective (r = -.210, p = .007) and antisocial (r = -.241, p = .002) factors of psychopathy, whereas cognitive empathy was only related to lower levels of the affective factors (r = -.244, p = .002). Higher levels of EF were linked to higher scores on the psychopathy lifestyle factor (r = .196, p = .012), as well as to affective empathy (r = .169, p = .030) and cognitive empathy (r = .254, p = .001). Similarly, higher EP scores were associated with higher scores on the interpersonal (r = .214, p = .006) and affective (r = .219, p = .005) factors of psychopathy, as well as lower levels of cognitive empathy (r = -.229, p = .003) and EF (r = -.175, p = .025). Finally, ACEs were associated with higher scores on the lifestyle (r = .249, p = .001) and antisocial (r = .219, p = .005) factors of psychopathy, as well as with higher levels of EF (r = .168, p = .032).

Measurement Model

The reflective construct of psychopathy was assessed for reliability and validity. All four indicators loaded strongly on the latent variable (interpersonal = .743, affective = .842, lifestyle = .772, and antisocial = .702). Reliability indices indicated good internal consistency (Cronbach's α = .85, Composite Reliability = .85). Convergent validity was supported by an average variance extracted (AVE) of .588.

Composite single-indicator constructs (ACEs, EF, EP, emotional responses -valence, dominance, and arousal-, and cognitive and affective empathy) were modelled as composites, meaning that internal consistency measures are not applicable but are assumed valid. Discriminant validity, assessed via Heterotrait-Monotrait Ratio of Correlations (HTML ratio), computed from construct correlations, was satisfactory (all HTML < |.332|).

Structural Model

Structural paths were estimated and significance assessed with 5,000 bootstrap samples. Variance inflation factor (VIF) values for all endogenous constructs were very low, ranging from 1.01 to 1.07, well below the recommended threshold of 5.0. This indicates that collinearity among predictors was not a concern in the model. Structural model results are in Figure 1.

[insert here Figure 1]

The PLS-SEM model accounted for modest amounts of variance in the endogenous constructs, with R^2 values ranging from 0.012 to 0.071 and adjusted R^2 values from 0.000 to 0.059, indicating generally low explanatory power. Specifically, constructs such as ACEs, EF, EP, and the cognitive component of empathy showed very limited variance explained, while psychopathy and emotional response dominance had slightly higher R^2 values, but all remained below 0.1.

Consistent with the low explained variance, out-of-sample prediction using 5-fold cross-validation indicated limited predictive capability. Across the endogenous constructs, *RMSE* values ranged approximately from 0.987 to 1.013 and *MAE* values from 0.703 to 0.822, which were generally comparable to those obtained from linear regression models (*RMSE* = 0.931 to 1.014, *MAE* = 0.675 to 0.801).

Regarding the model, contrary to expectations, ACEs were significantly associated with higher EF and showed no direct association with psychopathic traits. Moreover, ACEs were associated with lower values in the dominance and valence domains of emotions, but were associated with arousal. In turn, EF was associated with lower levels of EP, which in turn predicted higher psychopathy traits. These findings are consistent with an indirect association from ACEs to psychopathy traits via EF and EP was marginally significant (β = -.01, *SD* = .004, *95% CI* = [-0.02, 0.0002]). Psychopathy was associated with lower affective empathy, whereas no significant associations were found for cognitive empathy or the emotional dimensions of dominance, valence, and arousal.

Table 2

Relations between variables

	β	Bootstrap *Mean*	Bootstrap *SD*	*T*	95% CI
Executive Function > Emotional Processing	-0.175	-0.175	0.059	-2.97	[-0.288: -0.058]
Emotional Processing > Psychopathy	0.192	0.19	0.089	2.155	[0.001: 0.352]
Adverse Child Experience > Executive Function	0.168	0.167	0.074	2.271	[0.019: 0.305]
Adverse Child Experience > Psychopathy	0.162	0.161	0.098	1.645	[-0.044: 0.328]
Adverse Child Experience > Arousal	-0.053	-0.056	0.08	-0.662	[-0.212: 0.099]
Adverse Child Experience > Valence	-0.195	-0.194	0.067	-2.912	[-0.329: -0.071]
Adverse Child Experience > Dominance	-0.183	-0.183	0.078	-2.35	[-0.333: -0.028]
Psychopathy > Arousal	-0.089	-0.088	0.093	-0.961	[-0.265: 0.093]
Psychopathy > Valence	0.067	0.066	0.079	0.855	[-0.087: 0.218]
Psychopathy > Dominance	-0.146	-0.148	0.077	-1.906	[-0.295: 0.004]

Psychopathy > Empathy Cognitive	-0.155	-0.155	0.09	-1.716	[-0.318: 0.036]
Psychopathy > Empathy Affective	-0.211	-0.209	0.078	-2.71	[-0.353: -0.048]

Discussion

This study examined pathways from ACEs to psychopathic traits in incarcerated women using a structural equation model incorporating EF, EP, emotional responses dimensions, and empathy. Contrary to our initial hypothesis (H1) and contrary to cumulative – risk perspectives suggesting that ACEs are associated with higher levels of psychopathic traits (Pinheiro, Machado et al., 2025), no direct association between ACEs and psychopathic traits was found, consistent with multidimensional models. For example, DMAP suggests threat and deprivation-related adversities are associated with differences in emotional learning and regulation via distinct neurocognitive pathways (McLaughlin & Sheridan, 2016), while the ecobiodevelopmental framework highlights relational buffering (e.g., caregiver responsiveness) as moderating early stress's negative neurodevelopmental effects (Shonkoff & Garner, 2012). Positive childhood experiences (PCEs) may attenuate ACEs' impact on maladaptive personality traits (Cunha et al., 2025c; Pinheiro, Machado et al., 2025), suggesting that relational protection might preserve regulatory competencies despite emotional blunting (Cunha et al., 2025a; Pinheiro, Machado et al., 2025). PCEs, including secure attachment relationships, stable caregiving environments, and supportive community contexts, have been consistently associated with better emotional regulation, greater empathy, and increased resilience across both community and high-risk populations (e.g., Almeida et al., 2023). Importantly, evidence suggests that PCEs may be linked to lower levels of psychopathic traits and reduced behavioral dysregulation, even among individuals with significant exposure to adversity (e.g., Cunha et al., 2025a). Within resilience frameworks, PCEs may operate both as promotive factors, directly enhancing adaptive functioning, and as protective factors, potentially attenuating the negative associations between ACEs and maladaptive outcomes (Cunha et al., 2025a). Although PCEs were not directly assessed in the present study, the absence of a direct association between ACEs and psychopathic traits may be consistent with the presence of unmeasured protective relational experiences that contribute to more adaptive developmental trajectories. This interpretation aligns with developmental psychopathology principles, which emphasize that outcomes emerge from dynamic interactions between risk and protective processes over time, rather than from isolated exposure to adversity (Masten, 2006).

Contrary to expectations (H2), the findings also show that exposure to ACEs was associated with enhanced EF, rather than negatively as hypothesized and contradicting neurobiological models of stress-

related prefrontal dysfunction (Pechtel & Pizzagalli, 2011). However, this result aligns with the stress acceleration hypothesis, which suggests that adversity may be associated with accelerated prefrontal maturation, supporting vigilance, behavioral inhibition, and short-term planning in threatening environments (Frankenhuis & Nettle, 2020). This may reflect a protective response, where cold EF is associated with survival-oriented decision-making under emotional pressure (Colautti et al., 2022). The FAB primarily measures cold EF (i.e., abstraction, inhibitory control, and resistance to interference) which often remains preserved or improves following adversity, whereas hot EF, regulating emotion-driven decisions, is typically impaired by maltreatment (Dubois et al., 2000; Colautti et al., 2022; Zelazo & Cunningham, 2007). Therefore, the existing pattern probably indicates the preservation of cold EF rather than overall cognitive function.

Enhanced EF was linked to fewer difficulties in EP, supporting H3 and aligning with evidence that stronger EF supports adaptive emotion regulation (Joormann & Stanton, 2016). However, difficulties in EP, such as suppression, avoidance, and disruption in integrating emotional experiences (Baker et al., 2010), were associated with higher levels of psychopathic traits. Difficulties in EP were associated with higher levels of psychopathic traits, supporting H4. This supports theories that psychopathy involves affective detachment and paralimbic dysfunction, marked by reduced emotional cue integration and blunted response to distress signals (Anderson & Kiehl, 2014). These findings align with developmental trauma research showing that chronic relational maltreatment typically is associated with emotional suppression, dissociation, and affective blunting as adaptive responses to persistent threat (Bartlett et al., 2021). These coping strategies may initially protect individuals but often solidify into long-term patterns of emotional constriction and impaired affective resonance (Tottenham & Sheridan, 2010).

Taken together, these findings are consistent with H5, indicating that the relationship between ACEs and psychopathic traits may be partly accounted for by regulatory mechanisms, particularly via emotional processing, with EF contributing through its influence on emotional regulation. Individuals exposed to adversity may retain, or even refine, cognitive components of EP, such as the rapid threat detection or inferring other's intentions (Pollak & Sinha, 2002), explaining the relative preservation of EF and cognitive empathy in psychopathy. This pattern broadly consistent with adaptive calibration and life-history models, which propose that prolonged stress exposure may recalibrate socioemotional and neurocognitive systems toward heightened vigilance, efficient cognitive control, and strategic social behavior, accompanied by reduced emotional sensitivity and attenuated affective integration (Del Giudice et al., 2011). Within the developmental adaptation hypothesis (Del Giudice et al., 2011), these outcomes may reflect functional adjustments to harsh environments. From this perspective, the combination of

preserved EF and constrained EP may represent a context-specific adaptative response to persistent relational threat (Del Giudice et al., 2011), consistent with accounts of secondary psychopathy, characterized by emotional avoidance, increased stress responses, and preserved cognitive control (Hicks et al., 2012). However, alternative explanations should also be considered when interpreting this path. First, this association may partly reflect measurement-related factors, as the FAB primarily assesses cold EF, including abstraction, inhibitory control, and resistance to interference, rather than hot executive processes involved in affectively driven decision-making Colautti et al., 2022; (Dubois et al., 2000; Zelazo & Cunningham, 2007). Thus, the observed pattern may reflect preservation or relative enhancement of specific cognitive control functions rather than globally better EF in individuals with higher psychopathic traits. Second, the prison context itself may promote adaptive cognitive strategies, because correctional environments require sustained vigilance, behavioral monitoring, inhibitory control, and strategic social functioning under chronic stress and interpersonal threat (Van Voorhis et al., 2010; Wright & Cain, 2018). In women with histories of adversity, these contextual demands may reinforce cognitive adaptations oriented toward short-term control and environmental monitoring, which may contribute to the observed associations between EF and psychopathic traits (Matos et al., 2017; van Ginneken et al., 2019).

Contrary to H6, psychopathic traits were not associated with the SAM emotional dimensions (valence, arousal, dominance). This is consistent with evidence showing that psychopathic emotional deficits are more reliably detected through implicit physiological metrics, such as reduced startle potentiation (Vaidyanathan et al., 2011), diminished amygdala reactivity (Marsh et al., 2008), and facial mimicry (Kosson et al., 2002), rather than explicit self-report. According to the RMH, individuals with elevated psychopathic traits selectively allocate attention to goal-relevant stimuli at the expense of peripheral emotional information (Hamilton & Newman, 2018), enabling them to produce normative self-reported ratings despite underlying neurobiological atypicalities.

Conversely, ACEs correlated with lower ratings of valence and dominance, aligning with research suggesting that early adversity may promote negative emotional appraisals and reduced perceived control (Teicher & Samson, 2016). The lack of associations between ACEs and arousal may align with evidence suggesting that threat-related adversity is more closely associated with evaluative emotional schemas than with baseline autonomic activation (McLaughlin et al., 2019).

Finally, according to H7, the results are consistent with the commonly reported pattern of reduced affective empathy alongside relatively preserved cognitive empathy in individuals with higher psychopathic traits (Blair, 2005). This pattern may be interpreted in light of the IES model, which proposes that deficits in affective empathy are related to early disruptions in the processing of others' distress cues, potentially

linked to amygdala dysfunction, while cognitive perspective-taking and mentalizing abilities may remain comparatively preserved (Blair, 2007). Similarly, meta-analytic evidence suggests substantial deficits in emotional resonance, whereas impairments in cognitive empathy and theory-of-mind tend to be smaller or non-significant (Song et al., 2023). The relative preservation of cognitive empathy may reflect the use of more deliberate inferential strategies, allowing individuals with psychopathic traits to understand others' mental states without necessarily sharing their emotional experiences (Shamay-Tsoory, 2011).

Limitations

This study presents several methodological limitations. First, its cross-sectional design precludes causal inferences about the developmental pathways linking ACEs, EF, EP, psychopathic traits, and empathy. Although ACEs refer to retrospective reports of childhood experiences, all study variables, including EF, EP, and psychopathic traits, were assessed at the same time point, and therefore the temporal ordering assumed in the tested model cannot be empirically established. Consequently, the observed indirect effects should be interpreted as statistical associations rather than evidence of causal or developmental mediation. Longitudinal research is needed to clarify temporal sequencing and determine whether observed patterns reflect stable developmental mechanisms or context-dependent adaptations (e.g., Sheridan & McLaughlin, 2020).

Second, reliance on self-report measures can introduce biases such as impression management, limited introspective accuracy, and social desirability, especially in forensic settings (Paulhus et al., 2016). Third, emotional responses to visual stimuli were assessed in group settings, possibly limiting emotional expression and introduced compliance bias. Fourth, the study did not include measures of PCEs, buffering, or relational resilience, which seem to be possible moderators of adversity outcomes, especially in women (Cunha et al., 2025a; Pinheiro, Machado et al., 2025). Future research should include clinician-rated assessments (e.g., the PCL-R), multimethod EF batteries, and behavioral EP tasks, and comprehensive screening protocols. Fifth, using a global EPS-25 score may obscure differences between emotional experience and regulation, which may relate differently to psychopathy. Sixth, some scales used in the model exhibited lower internal consistency (e.g., SRP-SF affective and antisocial subscales, BES cognitive and affective subscales), which may have attenuated observed associations and reduced the reliability of the estimated relationships between constructs, thereby affecting the robustness of structural paths and reducing the precision of latent construct estimation. Seventh, although the sample was drawn from all Portuguese female prisons in mainland Portugal, the relatively small sample size constitutes a relevant limitation, reflecting the overall low number of incarcerated women in the

Portuguese prison system and limiting both statistical power and the generalizability of the findings to other incarcerated populations, community samples, or cross-cultural contexts. Eighth, the structural model was complex relative to the available sample, which may have limited statistical power and contributed to some instability in parameter estimates. As the model was exploratory and developed within this study, no established population parameters were available for a priori power calculation. Consequently, findings should be interpreted cautiously, and future studies with larger samples are needed to confirm the stability of estimates. Additionally, the explained variance of the model was relatively low, indicating that it accounts for only a limited proportion of variability in the outcome variables. This suggests that psychopathic traits and associated processes may be influenced by additional factors not captured in the present model, such as relational, contextual, and environmental variables. Despite these constraints, integrating adversity, EF, EP, emotional dimensions, and empathy provides theoretically meaningful insights into women with psychopathic traits and generates testable hypotheses for future longitudinal and multimethod research with greater statistical power.

Clinical and Policy Implications

Neurobiological findings have important clinical and policy implications. HPA-axis recalibration and amygdala–prefrontal dysconnectivity (McEwen, 2017) suggests that interventions should target stress physiology and affective circuitry. Trauma-informed frameworks that lower hypervigilance, improve emotional safety, and stabilize stress-response systems could be crucial in forensic treatment settings. Similarly, domain-specific emotional deficits, characterized by preserved cognitive control but compromised affective empathy, suggests that treatment should focus on affective resonance, emotional integration, and interpersonal sensitivity. Preservation or enhancement of cold EF suggests that trauma-exposed women retain cognitive capacities useful for treatment, supporting their responsiveness to cognitively demanding interventions even in prison. A meta-analysis has shown that interventions (mainly individual ones) involving targeted trauma processing (e.g., Trauma-Focused Cognitive Behavioral Therapy) reduce trauma-related symptoms among incarcerated populations (Malik et al., 2023). EP difficulties were involved in an indirect association between ACEs and psychopathic traits, interventions should address emotional awareness, integration, and regulation (Blair & Raver, 2016), while deficits in affective empathy highlight the value of emotion-focused, experiential, and relational therapeutic therapies over purely cognitive methods, although this pattern should be interpreted with caution given the cross-sectional nature of the data and the lack of temporal separation between EF, EP, and psychopathy.

Importantly, incorporating PCEs into clinical assessment and intervention frameworks may provide additional insights into resilience and adaptive functioning. The systematic assessment of PCEs allows the identification of relational and psychological resources that may operate as active protective mechanisms, rather than merely reflecting the absence of adversity (Bethell et al., 2019). Within relational theory perspectives, which emphasize the centrality of interpersonal connections in women's development, PCEs may reflect early experiences of safety, validation, and mutuality that support self-worth, trust, and help-seeking behaviors (Covington, 2007). In correctional settings, where relational disruption, institutional stress, and separation from support systems are prevalent, these protective relational experiences may be particularly relevant for promoting emotional regulation, adaptive coping, and engagement in rehabilitation processes (Ansbro, 2008). Empirical evidence further suggests that PCEs are associated with better emotional functioning and lower psychopathological risk among incarcerated women (Sousa et al., 2025), reinforcing their potential role in shaping more adaptive developmental trajectories.

From a policy perspective, early prevention to reduce ACEs exposure should be prioritized, including support for parental mental health, caregiving sensitivity, household stability, and safe environments (Shonkoff & Garner, 2012). Within correctional settings, programs that promote relational safety, prosocial modeling, and emotional skill-building may reduce emotional blunting and improve engagement. Screening for ACEs, EP deficits, and empathy profiles can enhance case formulation, risk prediction, and personalized treatment planning, particularly for women, for whom psychopathy and deep-rooted criminal lifestyles are strong indicators of institutional misconduct and prison adjustment. (Pinheiro et al., 2021). Finally, integrating trauma-informed frameworks across justice, social, and mental health systems is critical for addressing interconnected developmental pathways.

Conclusion

This study suggests that ACEs may not directly cause psychopathy, but may instead influence interdependent regulatory systems, contributing to adaptations that preserve cognitive control while constraining emotional responsiveness. In women, this may be reflected in more strategic yet emotionally blunted profiles, pointing to heterogeneity in developmental pathways. These findings are broadly consistent with resilience- and adaptation-oriented models, emphasizing the dynamic interplay among EF, EP, and empathy in relation to psychopathic traits. By drawing attention to potentially female-specific neurocognitive and affective patterns, the study may help refine etiological models and underscore the importance of considering adaptive calibration and relational modulation in understanding psychopathy.

References

Almeida, T. C., Fernandes, R. M., & Cunha, O. (2023). The role of positive childhood experiences in the link between childhood maltreatment and affective lability in a sample of incarcerated men and women. *Child Abuse & Neglect*, *135*, 105969. https://doi.org/10.1016/j.chiabu.2022.105969

Anastácio, S., Vagos, P., Nobre-Lima, L., Rijo, D., & Jolliffe, D. (2016). The Portuguese version of the Basic Empathy Scale (BES): Dimensionality and measurement invariance in a community adolescent sample. *European Journal of Developmental Psychology*, *13*(5), 614–623. https://doi.org/10.1080/17405629.2016.1167681

Anderson, N. E., & Kiehl, K. A. (2014). Psychopathy and aggression: when paralimbic dysfunction leads to violence. *Current Topics in Behavioral Neurosciences*, *17*, 369–393. https://doi.org/10.1007/7854_2013_257

Ansbro, M. (2008). Using attachment theory with offenders. *Probation Journal*, *55*(3), 231-244. https://doi.org/10.1177/0264550508092812

Bagshaw, R., Gray, N. S., & Snowden, R. J. (2014). Executive function in psychopathy: the Tower of London, Brixton Spatial Anticipation and the Hayling Sentence Completion Tests. *Psychiatry Research*, *220*(1-2), 483–489. https://doi.org/10.1016/j.psychres.2014.07.031

Baker, R., Thomas, S., Thomas, P. W., Gower, P., Santonastaso, M., & Whittlesea, A. (2010). The Emotional Processing Scale: scale refinement and abridgement (EPS-25). *Journal of Psychosomatic Research*, *68*(1), 83–88. https://doi.org/10.1016/j.jpsychores.2009.07.007

Bartlett, B. A., Lebeaut, A., Zegel, M., Johnson, A., & Vujanovic, A. A. (2021). Childhood maltreatment severity and suicidal ideation among adults receiving acute-care psychiatric inpatient services: The role of distress tolerance. *Psychological Trauma: Theory, Research, Practice and Policy*, *13*(3), 333–337. https://doi.org/10.1037/tra0000663

Baskin-Sommers, A. R., Brazil, I. A., Ryan, J., Kohlenberg, N. J., Neumann, C. S., & Newman, J. P. (2015). Mapping the association of global executive functioning onto diverse measures of psychopathic traits. *Personality Disorders*, *6*(4), 336–346. https://doi.org/10.1037/per0000125

Beryl, R., Chou, S., & Völlm, B. (2014). A systematic review of psychopathy in women within secure settings. *Personality and Individual Differences, 71,* 185–195. https://doi.org/10.1016/j.paid.2014.07.033

Bethell, C., Jones, J., Gombojav, N., Linkenbach, J., & Sege, R. (2019). Positive Childhood Experiences and Adult Mental and Relational Health in a Statewide Sample: Associations Across Adverse

Childhood Experiences Levels. *JAMA Pediatrics*, *173*(11), e193007. https://doi.org/10.1001/jamapediatrics.2019.3007

Blair R. J. (2005). Applying a cognitive neuroscience perspective to the disorder of psychopathy. *Development and Psychopathology*, *17*(3), 865–891. https://doi.org/10.1017/S0954579405050418

Blair R. J. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends in Cognitive Sciences*, *11*(9), 387–392. https://doi.org/10.1016/j.tics.2007.07.003

Blair, C., & Raver, C. C. (2016). Poverty, Stress, and Brain Development: New Directions for Prevention and Intervention. *Academic Pediatrics, 16*, S30–S36. https://doi.org/10.1016/j.acap.2016.01.010

Blair, R. J., Peschardt, K. S., Budhani, S., Mitchell, D. G., & Pine, D. S. (2006). The development of psychopathy. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *47*(3-4), 262–276. https://doi.org/10.1111/j.1469-7610.2006.01596.x

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The Self-Assessment Manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry, 25*(1), 49–59. https://doi.org/10.1016/0005-7916(94)90063-9

Bradley, M. M., & Lang, P. J. (2007). The International Affective Picture System (IAPS) in the Study of Emotion and Attention. Em J. A. Coan & J. J. B. Allen (Eds.), *Handbook of Emotion Elicitation and Assessment* (p. 0). Oxford

Burghart, M., Schmidt, S., & Mier, D. (2024). Executive functions in psychopathy: a meta-analysis of inhibition, planning, shifting, and working memory performance. *Psychological Medicine, 54*(11), 2823–2837. https://doi.org/10.1017/S0033291724001259

Colautti, L., Antonietti, A., & Iannello, P. (2022). Executive Functions in Decision Making under Ambiguity and Risk in Healthy Adults: A Scoping Review Adopting the Hot and Cold Executive Functions Perspective. *Brain Sciences*, *12*(10), 1335. https://doi.org/10.3390/brainsci12101335

Covington, S.S. (2007). The Relational Theory of Women's Psychological Development: Implications for the Criminal Justice System. In R. Zaplin (Ed.), *Female Offenders: Critical Perspectives and Effective Interventions* (pp. 135-164). Sudbury, MA: Jones and Bartlett.

Cross, D., Fani, N., Powers, A., & Bradley, B. (2017). Neurobiological Development in the Context of Childhood Trauma. *Clinical Psychology: Science and Practice*, *24*(2), 111–124. https://doi.org/10.1111/cpsp.12198

Cunha, O., Pinheiro, M., & Conde, A. R. (2025b). Psychopathy and Violent Offenses: A Comparison Between Incarcerated Men and Women in Portugal. *Deviant Behavior*, 1–19. https://doi.org/10.1080/01639625.2025.2543048

Cunha, O., Sousa, M., Almeida, T. C., Guarda, R., & Cruz, A. R. (2025c). When Good Experiences Matter: Positive Childhood Experiences as a Moderator Between Adverse Childhood Experiences and Psychopathic Traits in Community and justice-Involved Samples. *Journal of Aggression, Maltreatment & Trauma, 34*(9), 1-21. https://doi.org/10.1080/10926771.2025.2555564

Cunha, O., Sousa, M., Pereira, B., Pinheiro, M., Machado, A. B., Caridade, S., & Almeida, T. C. (2025a). Positive childhood experiences and adult outcomes: A systematic review. *Trauma, Violence, & Abuse, 26*(5), 991–1010. https://doi.org/10.1177/15248380241299434

Del Giudice, M., Ellis, B. J., & Shirtcliff, E. A. (2011). The Adaptive Calibration Model of stress responsivity. *Neuroscience and Biobehavioral Reviews, 35*(7), 1562–1592. https://doi.org/10.1016/j.neubiorev.2010.11.007

Delfin, C., Andiné, P., Hofvander, B., Billstedt, E., & Wallinius, M. (2018). Examining Associations Between Psychopathic Traits and Executive Functions in Incarcerated Violent Offenders. *Frontiers in Psychiatry*, *9*, 310. https://doi.org/10.3389/fpsyt.2018.00310

Dolan M. (2012). The neuropsychology of prefrontal function in antisocial personality disordered offenders with varying degrees of psychopathy. *Psychological Medicine*, *42*(8), 1715–1725. https://doi.org/10.1017/S0033291711002686

Dubois, B., Slachevsky, A., Litvan, I., & Pillon, B. (2000). The FAB: a Frontal Assessment Battery at bedside. *Neurology*, *55*(11), 1621–1626. https://doi.org/10.1212/wnl.55.11.1621

Efferson, L. M., & Glenn, A. L. (2018). Examining gender differences in the correlates of psychopathy: A systematic review of emotional, cognitive, and morality-related constructs. *Aggression and Violent Behavior, 41,* 48–61. https://doi.org/10.1016/j.avb.2018.05.009

Eisenbarth, H., Osterheider, M., Nedopil, N., & Stadtland, C. (2012). Recidivism in female offenders: PCL-R lifestyle factor and VRAG show predictive validity in a German sample. *Behavioral Sciences & the Law*, *30*(5), 575–584. https://doi.org/10.1002/bsl.2013

Fairchild, G., Baker, E., & Eaton, S. (2018). Hypothalamic-Pituitary-Adrenal Axis Function in Children and Adults with Severe Antisocial Behavior and the Impact of Early Adversity. *Current Psychiatry Reports*, *20*(10), 84. https://doi.org/10.1007/s11920-018-0952-5

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V.,Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the

leading causes of death in adults. The adverse childhood experiences (ACE) study. *The American Journal of Preventive Medicine, 14*(4), 245–258. https://doi.org/10.1016/s0749-3797(98)00017-8

Ford, J. D., & Delker, B. C. (2018). Polyvictimization in childhood and its adverse impacts across the lifespan: Introduction to the special issue. *Journal of Trauma & Dissociation*, *19*(3), 275–288. https://doi.org/10.1080/15299732.2018.1440479

Forouzan, E., & Cooke, D. J. (2005). Figuring out *la femme fatale*: Conceptual and assessment issues concerning psychopathy in females. *Behavioral Sciences & the Law, 23*(6), 765–778. https://doi.org/10.1002/bsl.669

Frankenhuis, W. E., & Nettle, D. (2020). Current debates in human life history research. *Evolution and Human Behavior, 41*(6), 469–473. https://doi.org/10.1016/j.evolhumbehav.2020.09.005

Garofalo, C., Virgilio, C., Bogaerts, S., & Schimmenti, A. (2019). Dark Ladies: Maladaptive Personality Domains, Alexithymia, and the Dark Triad in Women. *Clinical Neuropsychiatry*, *16*(5-6), 221–228. https://doi.org/10.36131/clinicalnpsych2019050605

Gerin, M. I., Viding, E., Herringa, R. J., Russell, J. D., & McCrory, E. J. (2023). A systematic review of childhood maltreatment and resting state functional connectivity. *Developmental Cognitive Neuroscience*, *64*, 101322. https://doi.org/10.1016/j.dcn.2023.101322

Gowin, J. L., Green, C. E., Alcorn, J. L., 3rd, Swann, A. C., Moeller, F. G., & Lane, S. D. (2013). The role of cortisol and psychopathy in the cycle of violence. *Psychopharmacology*, *227*(4), 661–672. https://doi.org/10.1007/s00213-013-2992-1

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) using R*. Classroom Companion: Business (pp. 75-90). Springer. https://doi.org/10.1007/978-3-030-80519-7_4

Hamilton, R. B., & Newman, J. P. (2018). The response modulation hypothesis: Formulation, development, and implications for psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 80–93). The Guilford Press.

Hare, R.D. (2003). *Manual for the revised psychopathy checklist* (2nd Ed.). Multi-Health Systems, Toronto.

Herzog, J. I., & Schmahl, C. (2018). Adverse Childhood Experiences and the Consequences on Neurobiological, Psychosocial, and Somatic Conditions Across the Lifespan. *Frontiers in Psychiatry*, *9*, 420. https://doi.org/10.3389/fpsyt.2018.00420

Hicks, B. M., Carlson, M. D., Blonigen, D. M., Patrick, C. J., Iacono, W. G., & Mgue, M. (2012). Psychopathic personality traits and environmental contexts: Differential correlates, gender differences, and genetic mediation. *Personality Disorders*, *3*(3), 209–227. https://doi.org/10.1037/a0025084

Johnson, M. M., Caron, K. M., Mikolajewski, A. J., Shirtcliff, E. A., Eckel, L. A., & Taylor, J. (2014). Psychopathic traits, empathy, and aggression are differentially related to cortisol awakening response. *Journal of Psychopathology and Behavioral Assessment, 36*(3), 380–388. https://doi.org/10.1007/s10862-014-9412-7

Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence, 29*(4), 589–611. https://doi.org/10.1016/j.adolescence.2005.08.010

Joormann, J., & Stanton, C. H. (2016). Examining emotion regulation in depression: A review and future directions. *Behaviour Research and Therapy*, *86*, 35–49. https://doi.org/10.1016/j.brat.2016.07.007

Kiehl K. A. (2006). A cognitive neuroscience perspective on psychopathy: evidence for paralimbic system dysfunction. *Psychiatry Research*, *142*(2-3), 107–128. https://doi.org/10.1016/j.psychres.2005.09.013

Kosson, D. S., Suchy, Y., Mayer, A. R., & Libby, J. (2002). Facial affect recognition in criminal psychopaths. *Emotion, 2*(4), 398–411. https://doi.org/10.1037/1528-3542.2.4.398

Lang, P.J., Bradley, M.M., & Cuthbert, B.N. (1997) International Affective Picture System (IAPS): Technical Manual and Affective Ratings. *NIMH Center for the Study of Emotion and Attention*, 39-58.

Leitão, B. & Torres, S. (2015). EPS: Student & Community – Portuguese. In R. Baker, P. Thomas, S. Thomas, M. Santonastaso, E. Corrigan (Eds.), *Emotional Processing Scale Norms Booklet – Version 1.* Oxford, UK: Hogrefe.

Levenston, G. K., Patrick, C. J., Bradley, M. M., & Lang, P. J. (2000). The psychopath as observer: emotion and attention in picture processing. *Journal of Abnormal Psychology*, *109*(3), 373–385. https://doi.org/10.1037/0021-843X.109.3.373

Lima, C. F., Meireles, L. P., Fonseca, R., Castro, S. L., & Garrett, C. (2008). The Frontal Assessment Battery (FAB) in Parkinson's disease and correlations with formal measures of executive functioning. *Journal of Neurology*, *255*(11), 1756–1761. https://doi.org/10.1007/s00415-008-0024-6

Louise von Borries, A. K., Volman, I., de Bruijn, E. R., Bulten, B. H., Verkes, R. J., & Roelofs, K. (2012). Psychopaths lack the automatic avoidance of social threat: relation to instrumental aggression. *Psychiatry Research*, *200*(2-3), 761–766. https://doi.org/10.1016/j.psychres.2012.06.026

Malik, N., Facer-Irwin, E., Dickson, H., Bird, A., & MacManus, D. (2023). The Effectiveness of Trauma-Focused Interventions in Prison Settings: A Systematic Review and Meta-Analysis. *Trauma, Violence & Abuse*, *24*(2), 844–857. https://doi.org/10.1177/15248380211043890

Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., Towbin, K. E., Leibenluft, E., Pine, D. S., & Blair, R. J. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous-unemotional traits and disruptive behavior disorders. *The American Journal of Psychiatry*, *165*(6), 712–720. https://doi.org/10.1176/appi.ajp.2007.07071145

Masten, A. S., & Gewirtz, A. H. (2006). Vulnerability and Resilience in Early Child Development. In K. McCartney & D. Phillips (Eds.), *Blackwell handbook of early childhood development* (pp. 22–43). Blackwell Publishing. https://doi.org/10.1002/9780470757703.ch2

Matos, Raquel, Cunha, M.I., Carvalho, P.M., Tavares, R., & Miranda Pereira, L. (2017). Women in prison in Portugal. In P.H. van Kempen & M. Krabbe (Eds.) *Women in prison: the Bangkok rules and beyond* (pp. 613-644). Cambridge: Intersentia

Mbiydzenyuy, N. E., & Qulu, L. A. (2024). Stress, hypothalamic-pituitary-adrenal axis, hypothalamic-pituitary-gonadal axis, and aggression. *Metabolic Brain Disease*, *39*(8), 1613–1636. https://doi.org/10.1007/s11011-024-01393-w

McEwen B. S. (2017). Neurobiological and Systemic Effects of Chronic Stress. *Chronic Stress, 1*, 1–17. https://doi.org/10.1177/2470547017692328

McLaughlin, K. A., & Sheridan, M. A. (2016). Beyond Cumulative Risk: A Dimensional Approach to Childhood Adversity. *Current Directions in Psychological Science*, *25*(4), 239–245. https://doi.org/10.1177/0963721416655883

McLaughlin, K. A., Weissman, D., & Bitrán, D. (2019). Childhood Adversity and Neural Development: A Systematic Review. *Annual Review of Developmental Psychology*, *1*, 277–312. https://doi.org/10.1146/annurev-devpsych-121318-084950

O'Leary, M. M., Loney, B. R., & Eckel, L. A. (2007). Gender differences in the association between psychopathic personality traits and cortisol response to induced stress.

Psychoneuroendocrinology, *32*(2), 183–191. https://doi.org/10.1016/j.psyneuen.2006.12.004

Patrick, C. J. (Ed.). (2018). *Handbook of psychopathy* (2nd ed.). The Guilford Press.

Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, *21*(3), 913–938. https://doi.org/10.1017/S0954579409000492

Paulhus, D.L., Neumann, C. S., & Hare, R. D. (2016). *Manual for the Self-Report Psychopathy scale* (4th ed.). Multi-Health Systems.

Pechtel, P., & Pizzagalli, D. A. (2011). Effects of early life stress on cognitive and affective function: an integrated review of human literature. *Psychopharmacology*, *214*(1), 55–70. https://doi.org/10.1007/s00213-010-2009-2

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2021). Criminal lifestyle, psychopathy, and prison adjustment among female inmates. *Journal of Criminal Justice, 76,* 1–10. https://doi.org/10.1016/j.jcrimjus.2021.101849

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2024). Emotional Processing and Psychopathy Among Women: A Systematic Review. *Deviant Behavior*, *45*(10), 1366–1390. https://doi.org/10.1080/01639625.2023.2295527

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2025). Emotional Processing of Pictures and Psychopathic Traits in Women Who Committed Crimes. *Women & Criminal Justice*, 1–24. https://doi.org/10.1080/08974454.2025.2576209

Pinheiro, M., Machado, A. B., Gonçalves, R. A., & Cunha, O. (2025). The Moderating Role of Positive Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Psychopathic Traits in Incarcerated Women. *Journal of Aggression, Maltreatment & Trauma*, *34*(9), 1468–1488. https://doi.org/10.1080/10926771.2025.2562542

Pollak, S. D., & Sinha, P. (2002). Effects of early experience on children's recognition of facial displays of emotion. *Developmental Psychology*, *38*(5), 784–791. https://doi.org/10.1037//0012-1649.38.5.784

R Core Team. (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austrcitia. https://www.R-project.org/

Ray, S., Danks, N., & Calero Valdez, A. (2024). *seminr: Building and estimating structural equation models*. R package version 2.3.4. https://CRAN.R-project.org/package=seminr

Revelle, W. (2025). *Psych: Procedures for Psychological, Psychometric, and Personality Research* (R package version 2.5.3.). Northwestern University, Evanston, Illinois. https://CRAN.R-project.org/package=psych

Rogstad, J. E., & Rogers, R. (2008). Gender differences in contributions of emotion to psychopathy and antisocial personality disorder. *Clinical Psychology Review, 28*(8), 1472–1484. https://doi.org/10.1016/j.cpr.2008.09.004

Seara-Cardoso, A., Queirós, A., Fernandes, E., Coutinho, J., & Neumann, C. (2020). Psychometric properties and construct validity of the short version of the self-report psychopathy scale in a Southern European sample. *Journal of Personality Assessment, 102*(4), 457–468. https://doi.org/10.1080/00223891.2019.1617297

Sellbom, M., & Verona, E. (2007). Neuropsychological correlates of psychopathic traits in a non-incarcerated sample. *Journal of Research in Personality, 41*(2), 276–294. https://doi.org/10.1016/j.jrp.2006.04.001

Shamay-Tsoory S. G. (2011). The neural bases for empathy. *The Neuroscientist*, *17*(1), 18–24. https://doi.org/10.1177/1073858410379268

Sheridan, M. A., & McLaughlin, K. A. (2020). Neurodevelopmental mechanisms linking ACEs with psychopathology. In G. J. G. Asmundson & T. O. Afifi (Eds.), *Adverse childhood experiences: Using evidence to advance research, practice, policy, and prevention* (pp. 265–285). Elsevier Academic Press. https://doi.org/10.1016/B978-0-12-816065-7.00013-6

Shonkoff, J. P., Garner, A. S., Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, & Section on Developmental and Behavioral Pediatrics (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, *129*(1), e232–e246. https://doi.org/10.1542/peds.2011-2663

Silva, S., & Maia, Â. (2008). Portuguese version of the Family ACE questionnaire (Childhood Adversity History Questionnaire). In A. Noronha, C. Machado, L. Almeida, M. Gonçalves, S. Martins, & V. Ramalho (Eds.), *Proceedings of the XIII International Conference on Psychological Assessment: Forms and Contexts* (pp. 359–362). Psiquilíbrios Edições.

Smith, S. F., & Lilienfeld, S. O. (2015). The response modulation hypothesis of psychopathy: A meta-analytic and narrative analysis. *Psychological Bulletin, 141*(6), 1145–1177. https://doi.org/10.1037/bul0000024

Song, Z., Jones, A., Corcoran, R., Daly, N., Abu-Akel, A., & Gillespie, S. M. (2023). Psychopathic traits and theory of mind task performance: A systematic review and meta-analysis. *Neuroscience and Biobehavioral Reviews*, *151*, 105231. https://doi.org/10.1016/j.neubiorev.2023.105231

Sousa, M., Gonçalves, T., Caridade, S., de Castro-Rodrigues, A., Maia, Â., & Cunha, O. (2025). The Effectiveness of Trauma-Focused Interventions With Individuals Who Perpetrated Crimes: A Systematic Review. *Trauma, Violence, & Abuse*, *0*(0). https://doi.org/10.1177/15248380251397413

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews Neuroscience*, *17*(10), 652–666. https://doi.org/10.1038/nrn.2016.111

Thomson, N. D., Bozgunov, K., Psederska, E., & Vassileva, J. (2019). Sex differences on the four-facet model of psychopathy predict physical, verbal, and indirect aggression. *Aggressive Behavior*, *45*(3), 265–274. https://doi.org/10.1002/ab.21816

Torres, S., Baker, R., & Leitão, B. (2025). Psychometric properties of the Portuguese version of the Emotional Processing Scale [Manuscript in preparation]. Faculty of Psychology and Education Sciences, University of Porto

Tottenham, N., & Sheridan, M. A. (2010). A review of adversity, the amygdala and the hippocampus: a consideration of developmental timing. *Frontiers in Human Neuroscience*, *3*, 68. https://doi.org/10.3389/neuro.09.068.2009

Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, *120*(1), 253–258. https://doi.org/10.1037/a0021224

van Beeck, M., Bogaerts, S., Sellbom, M., Somma, A., Fossati, A., Brehmer, Y., Jankovic, M., & Garofalo, C. (2024). The Relationship Between Experiencing Childhood Trauma and Psychopathic Personality Traits: The Mediating Role of Insecure Attachment. *Journal of Aggression, Maltreatment & Trauma*, *33*(9), 1055–1072. https://doi.org/10.1080/10926771.2024.2381558

van Ginneken, E. F. J. C., Palmen, H., Bosma, A. Q., & Sentse, M. (2019). Bearing the Weight of Imprisonment: The Relationship Between Prison Climate and Well-Being. *Criminal Justice and Behavior*, *46*(10), 1385-1404. https://doi.org/10.1177/0093854819867373

Van Voorhis, P., Wright, E. M., Salisbury, E., & Bauman, A. (2010). Women's Risk Factors and Their Contributions to Existing Risk/Needs Assessment: The Current Status of a Gender-Responsive Supplement. *Criminal Justice and Behavior*, *37*(3), 261-288. https://doi.org/10.1177/0093854809357442

Verona, E., & Vitale, J. (2018). Psychopathy in women: Assessment, manifestations, and etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 509–528). The Guilford Press.

Victor, T.S., Jacquet, B. & El Massioui, F. (2024). Exploring stress response's role in executive function impairments among adults with early adverse childhood experiences. *Scientific Report, 14*, 4081. https://doi.org/10.1038/s41598-024-53819-1

von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. (2007). The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. *Annals of Internal Medicine, 147*(8), 573–577. https://doi.org/10.7326/0003-4819-147-8-200710160-00010

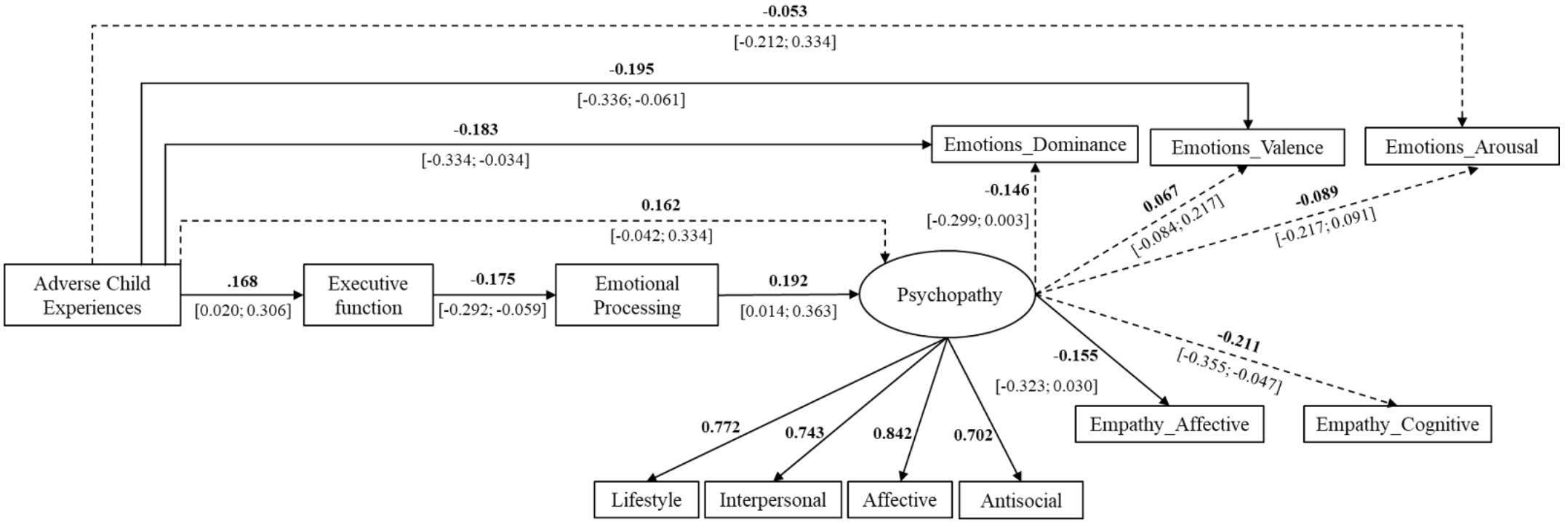
Wright, E. M., & Cain, C. M. (2018). Women in prison. In J. Wooldredge & P. Smith (Eds.), *The Oxford handbook of prisons and imprisonment* (pp. 163–188). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199948154.013.9

Wynn, R., Høiseth, M. H., & Pettersen, G. (2012). Psychopathy in women: theoretical and clinical perspectives. *International Journal of Women's Health*, *4*, 257–263. https://doi.org/10.2147/IJWH.S25518

Zelazo, P. D., & Cunningham, W. A. (2007). Executive Function: Mechanisms Underlying Emotion Regulation. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 135–158). The Guilford Press.

Figure 1

Tested model



PART III | CONCLUSION

INTEGRATIVE CONCLUSION

This doctoral thesis aimed to deepen the understanding of emotional processing and psychopathic traits in women within a prison context, by exploring and analyzing the emotional, cognitive, and mechanisms underlying and resulting from psychopathic traits, thereby providing a broader understanding of the phenomena associated with the phenotypic expression of psychopathy in women.

In this compiled scientific work, the studies included were designed to address the overall objective of the thesis and its specific aims: (1) to characterize emotional processing in incarcerated women with psychopathic traits; (2) to assess emotional processing in incarcerated women with these traits; (3) to examine the influence of developmental trajectories and empathic factors on individual differences in psychopathic traits among incarcerated women; and (4) to develop an integrated model encompassing emotional, cognitive, and developmental aspects of incarcerated women with psychopathic traits.

Accordingly, the general conclusion focuses, on the one hand, on the contributions derived from the studies conducted, which consistently advance the characterization and understanding of emotional processing and psychopathic traits in incarcerated women, including implications for the assessment and intervention of this group in prison settings, as well as contributions to the management of the female prison system, particularly in the presence of psychopathic traits. On the other hand, it addresses the limitations of the present work and outlines recommendations for future research, some of which are envisaged as directions for subsequent studies.

Although the main findings and contributions of each study were discussed individually in their respective sections, this integrative conclusion proposes a structured synthesis of the central conclusions, focusing on the understanding and characterization of emotional processing in incarcerated women with psychopathic traits, as well as on the implications for assessment, intervention, and the management of the female prison system.

The findings of this work reinforce the need to conceptualize psychopathic traits in women as a dynamic phenomenon, shaped by the cumulative impact of developmental experiences and emerging from the interaction between developmental trajectories and social and relational contexts, rather than as a static constellation of traits. From this perspective, the present thesis offers a theoretically comprehensive and robust framework for understanding emotional processing in incarcerated women with psychopathic traits.

1. Main Findings and Contributions to the Characterization and Understanding of Emotional Processing and Psychopathy in Incarcerated Women

The body of knowledge produced through the present doctoral thesis facilitated the systematic characterization of the specific emotional profile associated with psychopathic traits among incarcerated women, but also an in-depth understanding of the underlying mechanisms for this specific emotional profile. The overall evidence of this thesis does not support the idea of a general emotion deficit among these individuals, as supported by the literature (Brook et al., 2013). Instead, the overall evidence points to a specific and selective emotional configuration, which is modulated by various environmental, developmental, cognitive, and empathic factors and which may vary depending on the specific facets of psychopathy.

The theoretical framework of the current research (see Study 1) confirmed the existing empirical findings on women's psychopathy and emotional processing. The empirical findings indicate that, although psychopathic traits in women share features with the classical definition of psychopathy, including manipulation of others, shallow emotions, and antisocial behaviors (Hare, 2003), women's psychopathy may also present distinct characteristics, particularly in its possible association with relationship quality and interpersonal experiences (De Brito et al., 2021). The findings of the systematic review, included in the current thesis, consistently confirmed that women with psychopathic traits experience difficulties in processing and understanding emotions (Edwards et al., 2019), difficulties in emotional classification, such as negative emotions, including fear and sadness (Eisenbarth et al., 2013), and alexithymia-related characteristics, including difficulties in identifying and defining emotions (Lamoureux & Glenn, 2021).

These difficulties are consistent with neurofunctional evidence pointing to reduced limbic and paralimbic activity, especially concerning the activation of the amygdala, during emotional and moral processing (Harenski et al., 2014). Additionally, these difficulties are associated with disrupted brain circuits concerning socio-emotional integration and the inference of emotional states, especially concerning the superior temporal region and the temporoparietal junction (Yoder et al., 2021). Research has found reduced autonomic responses at the physiological level concerning heart rate and skin conduction responses to threat-related stimuli or fear-provoking stimuli (Verona et al., 2013; Lamoureux & Glenn, 2021). Furthermore, studies have indicated reduced modulation of the startle reflex, particularly in response to aversive stimuli involving victim suffering (Verona et al., 2013). This is in line with the findings supporting a specific and context-sensitive emotional configuration in women with psychopathic traits, particularly in affective

empathic processing and in integrating signals of others' suffering into moral and emotional decision making (Anderson & Kiehl, 2014; Blair, 2005, 2007).

This profile is theoretically aligned with the hypothesis of paralimbic dysfunction, according to which reduced autonomic response to aversive stimuli and diminished defensive behavior coexist with impairments in aversive learning and the integration of affective value in decision-making, and which are believed to be related to reduced sensitivity to the suffering of others and disturbed moral judgment (Anderson & Kiehl, 2014; Kiehl, 2006). From this theoretical perspective, psychopathic traits can coexist with preserved cognitive appraisal but still impair the use of emotional information for moral reasoning and adaptive social functioning, a profile consistent with Cleckley's mask of sanity (Cleckley, 1941). Furthermore, from a neurofunctional point of view, psychopathic traits in women are associated with alterations in neural networks involved in moral decision-making, affective empathic responses, and metallization processes, with impairments and implications in the evaluation of emotional consequences of one's own and others' behavior (Yoder et al., 2021). A decrease in functional connectivity between the amygdala, alterations in the activity of the anterior cingulate cortex and the prefrontal cortex, as well as alterations in the temporal regions and parietal areas, have been observed (see study 1). In this thesis, this theoretical reasoning is further corroborated by evidence that cognitive empathic competence and cold EF (see studies 4 and 5) can be preserved even when affective-emotional integration is impaired, particularly in the face of motivationally irrelevant emotional information.

One of the main contributions of this work is that it demonstrates that emotional processing in women with psychopathic traits appears to vary according to psychopathy factors (see study 1). Specifically, Factor 1 (interpersonal-affective) seems to be associated with reduced empathic capacity and diminished defensive reactivity (e.g., a reduced startle reflex), suggesting that the most prominent emotional dysfunction in women may lie in reduced sensitivity to vicarious suffering rather than in a fear deficit per se (Verona et al., 2013). This specificity is consistent with the idea that interpersonal-affective characteristics are associated with difficulties in emotional management and empathic responses (Edwards et al., 2019). In contrast, Factor 2 (lifestyle-antisocial) appears to be more closely linked to alexithymia traits and the processing of emotions with negative valence (e.g., fear, anger) (Eisenbarth et al., 2013), and by data showing that secondary psychopathy is linked to patterns of negative affect in incarcerated women (Pinheiro et al., 2019). This difference in nature indicates a deeper understanding of the emotional processing of psychopathy in women, where interpersonal-affective traits are seen as indicators of a more

fundamental deficit in affective empathy and moral-emotional inhibition, as opposed to the dynamics of emotional dysregulation of antisocial-impulsive traits, which are more closely linked to externalizing pathways and developmental trajectories (Hicks & Patrick, 2006).

From the perspective of emotional appraisal, the results of this thesis allowed for a better understanding of the impact of psychopathic traits on the appraisal of visual stimuli (pleasant, difficult, and neutral) in incarcerated women (see study 2). Specifically, incarcerated women with psychopathic traits showed preservation in the appraisal of stimulus valence (e.g., ability to recognize negative or positive stimuli), indicating that the cognitive appraisal of emotional valence is preserved. This preservation of valence processing indicates that the basic perceptual decoding of emotional information is not impaired. On the other hand, differences were found in the appraisal of activation and dominance. The study points to a reduction in emotional reactivation (less arousal) of neutral stimuli, which can be understood in the context of the Response Modulation Hypothesis (RMH) (Patterson & Newman, 1993), according to which people with psychopathic traits have difficulty allocating attentional resources to contextual information when it is not directly relevant to their immediate goals (Hamilton & Newman, 2018). In this context, the attenuation of arousal in response to neutral stimuli likely reflects lower motivational salience, rather than perceptual incapacity, aligning with evidence of atypical patterns of selective attention in incarcerated women with psychopathic traits (Vitale et al., 2007). Emotional activation, therefore, appears to depend strongly on the perceived relevance of the stimulus to the goal, corroborating the notion that affective mobilization depends heavily on the motivational relevance of the stimulus and its alignment with the dominant attentional focus (Hamilton & Newman, 2018; Lorenz & Newman, 2002). On the other hand, women with psychopathic traits rated lower perceived dominance, especially for unpleasant and neutral stimuli. This lower perceived control in emotionally ambiguous or unpleasant situations is in line with defensive disengagement strategies, such as emotional suppression and selective distancing. These results are theoretically in line with theories of paralimbic dysfunction (Kiehl, 2006) and physiological data that show reduced defensive reactivity and fear-potentiated startle responses in psychopathy (Verona et al., 2013). Instead of showing a lack of emotions, these results show the use of regulation strategies characterized by reduced autonomic mobilization and limited affective involvement when the stimuli are not sufficiently salient or when they are emotionally unpleasant. In summary, these results show that emotional processing in incarcerated women with psychopathic traits is

characterized by the preservation of valence appraisal, reduced affective mobilization for neutral stimuli, and reduced perceived control for unpleasant or ambiguous situations.

In the process of contributing to the understanding of emotional processing in women with psychopathic traits, the findings of this thesis also enabled the further understanding of the role of developmental factors, specifically ACEs and PCEs, in influencing emotional profiles and psychopathic traits (see studies 3 and 4). This approach is supported by the perspective of developmental psychopathology, which has explained how the impact of adverse circumstances can lead to the reorganization of emotional and empathic systems, influenced by transactional processes between the individual and the environment (Cicchetti & Rogosch, 2002; Hawes & Allen, 2023; Teicher & Samson, 2016). The findings have offered strong evidence of the link between ACEs and psychopathic traits, specifically lifestyle and antisocial facets, which suggests that early life experiences of abuse, neglect, domestic violence (DV), and dysfunctional family experiences seem to impact on behavioral dysregulation and the propensity for an impulsive lifestyle characterized by rule-breaking (Moreira et al., 2020). This finding is consistent with models that highlight the transactional processes by which adversity reorganizes emotional and regulatory systems over time (Cicchetti & Rogosch, 2002) and with neurodevelopmental models that have shown the effects of early trauma on the disruption of prefrontal and paralimbic systems involved in emotional regulation, inhibitory control, and learning about consequences (De Brito et al., 2013; Teicher & Samson, 2016). Longitudinal data support cumulative adversity as a risk factor for the presence of psychopathic traits and delinquent outcomes (Veltman et al., 2025), confirming the importance of the cumulative burden of ACEs in the development of the phenotypic manifestation of psychopathic traits in women.

Fundamentally, this thesis demonstrates that PCEs exerted significant protective effects by mitigating the impact of several ACEs. More specifically, they mitigated the association between physical abuse and the affective facet of psychopathy, between sexual abuse and the affective and antisocial facets of psychopathy, between exposure to domestic violence (DV) and both the affective facet and total psychopathic traits and between having an incarcerated family member and the interpersonal, affective, and lifestyle facets, as well as total psychopathy (see study 3). In contrast, in the context of empathy, PCEs significantly moderated the association between a family history of mental illness or suicide and affective empathy (see study 4). These findings align with intergenerational risk perspectives (Farrington et al., 2010) while simultaneously highlighting the importance of developmental plasticity. The role of PCEs in mitigating the effects of sexual abuse

and exposure to DV on the affective and antisocial facets of psychopathy in women (see study 3), reinforcing the idea that consistent and emotionally available support may mitigate the behavioral and affective consequences of unstable and dysfunctional family environments by promoting self-regulation skills and protecting the capacity for emotional responsiveness and behavioral regulation (Cicchetti & Toth, 2009; Bethell et al., 2019; Narayan et al., 2018; Fonagy & Luyten, 2018). In this sense, the function of PCEs is not merely to reflect the absence of adversity, but rather to represent active protective mechanisms that interrupt cycles of vulnerability (Bethell et al., 2019).

Regarding empathy, PCEs moderated the link between the experience of mental illness or suicide within the family context and affective empathy (see study 4). Specifically, high levels of PCEs among incarcerated women appeared to mitigate the negative effects of this risk factor on the ability to emotionally connect, suggesting that relational experiences characterized by support, stability, and affective validation may buffer the potentially disorganizing effects of unstable family environments with emotionally unstable members on the development of affective empathy (Levy et al., 2019; Fonagy & Luyten, 2018). Accordingly, the results of these studies confirm the relevance of intergenerational risk models, suggesting that the relationship with the criminal justice system, family instability, and chronic relational disruption contribute to the intergenerational transmission of emotional instability and maladaptive personality traits (Hawes & Allen, 2023; Farrington et al., 2010). Moreover, they highlight that intergenerational risk factors can calibrate emotional development (Del Giudice et al., 2011), promoting self-regulation skills and secure relationships, reducing vulnerability to impulsivity and affective empathic deficits (Cicchetti & Toth, 2009; Narayan et al., 2018; Fonagy & Luyten, 2018), which are central characteristics of psychopathy.

Within the broader effort to elucidate emotional processing in incarcerated women with psychopathic traits, empathy was investigated as a key socioemotional outcome to help clarify whether empathic difficulties are better explained by early adversity or by psychopathic traits (see study 5). ACEs did not have a significant impact on empathic difficulties. On the other hand, psychopathic traits in incarcerated women, specifically the affective and antisocial facets, were strongly associated with difficulties in affective empathy, with intact cognitive empathy (see study 4). This pattern is consistent with the view that empathic difficulties in psychopathy are better explained by inferences based on affectivity than by mental states (van Dongen, 2020), as corroborated by neurobiological data showing decreased activation in key regions that mediate affective empathy, such as the amygdala and anterior cingulate cortex (Wild & Poeppl, 2022). The

preservation of cognitive empathy may facilitate instrumental mentalization, allowing accurate reading of others' states without affective involvement, which may support manipulative interpersonal strategies that identify others' vulnerabilities for personal gain (Aradhye & Vonk, 2014; Verona et al., 2013). In women, these patterns can manifest in more subtle, relational ways, consistent with specific female phenotypic expressions (Verona & Vitale, 2018).

Within the broader objective of this doctoral thesis, a structural equation model was developed and tested to integrate the main constructs studied throughout the research into a single theoretical framework encompassing developmental, cognitive, and socio-emotional fundamentals, thereby enabling a more comprehensive analysis of their interrelationships. Contrary to deficit-based assumptions linking ACEs to general cognitive impairment (Pechtel & Pizzagalli, 2011), the model indicated that ACEs were associated with improved EF, particularly cold EF, including abstraction, cognitive flexibility, and planning (see study 5). This pattern can be explained by the stress acceleration hypothesis (Callaghan & Tottenham, 2016) or the adaptive calibration model (Del Giudice et al., 2011), which postulate that, in high-threat and adverse environments, the early maturation of vigilance mechanisms, behavioral control, and strategic decision-making becomes essential for survival (Frankenhuis & Nettle, 2020). Thus, the identified profile suggests that incarcerated women with psychopathic traits exhibit efficient executive processing capacity, which in turn is associated with fewer difficulties in emotional processing (e.g., emotional suppression, avoidance). This apparent emotion regulation should be understood in light of psychopathological models that argue that, in the face of prolonged exposure to threatening contexts, the adoption of emotional suppression and avoidance strategies is plausible, sometimes accompanied by dissociative mechanisms, which emerge as functional responses to unpredictable and potentially hostile environments (Pechtel & Pizzagalli, 2011). Furthermore, the prison context can interact in this configuration, given that it is a system characterized by diffuse psychological control, self-monitoring, and individual accountability, encouraging forms of self-regulation guided by internalized institutional norms (Crewe, 2011). In these environments, the preservation of EF may represent a functional response to the demands of behavioral predictability, emotional restraint, and strategic self-management, promoting predominantly instrumental regulatory patterns to achieve their goals (e.g., intimate visit, precarious). It is important to note that some studies have shown that psychopathic traits are characterized by efficiency in EF, particularly at the level of cold EF (Diamond, 2013; Salehinejad et al., 2021), a pattern typically observed in women with high

levels of interpersonal-affective traits - associated with goal-oriented executive control (Gao & Raine, 2010).

2. Implications for the Assessment in Forensic Settings: The Importance of Psychopathic Traits and Emotional Processing in Women

The main conclusions of this doctoral thesis, especially regarding emotional processing and psychopathic traits in incarcerated women, call for a rethinking of psychological assessment practices in Portuguese women's prisons. Given the current assessment practices, structural limitations are evident that condition the depth and scope of the (re)evaluative process when these women enter the prison environment and during their stay.

The assessment in the prison setting is usually conducted within a multidisciplinary framework (e.g., health professionals, psychiatrists, clinical psychologists, and security personnel) that promotes collective decision-making. It is also shaped by the demands of the context. Portugal currently operates with a prison density exceeding its official capacity (Prison Insider, 2025). These conditions, coupled with the documented scarcity of human resources and the low staff-to-prisoner ratios (Prison Insider, 2025), create an institutional environment in which assessment is frequently geared toward the immediate containment of risk, prioritizing responses to requests, procedural requirements, and administrative demands at the expense of a longitudinal, dynamic, and comprehensive psychological assessment (Liebling et al., 2019). Within this context, initial screening procedures, such as the mandatory assessment conducted within the first 72 hours following prison admission, involve a structured clinical appraisal that includes the collection of personal and family history, evaluation of physical and mental health status, screening for substance use, suicide risk, and potential vulnerability factors, as well as the identification of immediate intervention needs and referral to specialized services when required, being primarily oriented toward stabilization and risk management (Matos et al., 2017). This reality contributes to an assessment process that often relies on observable and self-reported indicators, which may be particularly susceptible to bias in individuals with psychopathic traits (Paulhus et al., 2016). As suggested by the findings of the present study, these individuals may display greater impression management and dissimulation skills, with women showing a tendency to rely on instrumental interpersonal strategies, defensive disengagement, and emotional suppression. In women, this limitation is particularly relevant, as the expression of psychopathy tends to be less behaviorally disruptive and more subtly manifested at the emotional, empathic, and interpersonal level, thereby

increasing the risk that these traits will be underidentified during the 72-hour assessment and subsequent reassessments throughout the prison sentence (Forouzan & Cooke, 2005; Verona & Vitale, 2018).

Although the 72-hour assessment represents an essential moment for organizing initial screening procedures, its brief nature and priority focus on security, institutional adaptation, and immediate management make it difficult to systematically integrate information about personality characteristics, developmental history, ACEs and PCEs, as well as difficulties in emotional processing, empathy, and emotion regulation. These domains, whose relevance to understanding psychopathic traits in women is largely supported by the results of this thesis, tend to be undervalued, not due to a lack of clinical relevance, but due to inherent contextual limitations, as mentioned. This limitation is consistent with the literature suggesting that prison assessment models prioritize static risk factors (i.e., prior criminal history and the seriousness of the current offense), often relying on static measures of criminal history (Hardyman & Van Voorhis, 2004) than on dynamic risk and need factors (i.e., emotional, developmental, and behavioral variables), particularly in the case of women (Skeem et al., 2009; Wright et al., 2007).

These findings directly relate to current criticisms of the RNR model when applied to justice-involved women (de Castro Rodrigues et al., 2026). Although the RNR model has been shown to be effective primarily in male samples, it is organized around the central eight criminogenic factors, with antisocial personality patterns, antisocial cognitions, and criminal associates identified as the core targets of risk management (Bonta & Andrews, 2023). Nevertheless, emerging research suggests that, in women, gender-neutral risk factors (i.e., employment, education, and antisocial attitudes) may not adequately capture trauma exposure, relationship instability, mental health vulnerabilities, and maladaptive developmental pathways that influence offending and institutional behavior (Bloom et al., 2003; de Castro Rodrigues et al., 2026; Messina & Esparza, 2022; Wright et al., 2007). In this regard, the limitation of the RNR model is not merely interventive but fundamentally evaluative, as classification tools grounded in the central eight may underrepresent trauma-related psychopathology, attachment disruptions, and socioemotional dysregulation empirically associated with recidivism and prison maladaptation in women (Messina & Esparza, 2022), patterns that were empirically corroborated in the developmental and emotional configurations identified in this research.

In the Portuguese context, where women account for 7.1% of the prison population (Prison Insider, 2025), available evidence points to a high prevalence of psychosocial vulnerability among

incarcerated women (de Castro Rodrigues et al., 2026a). Portuguese research further suggests that women's involvement in crime is often associated with economic need, psychological survival, substance abuse, opportunities, and cultural aspirations linked to social pressure and consumerism (de Castro Rodrigues et al., 2026b). These findings are consistent with the broader literature, which shows that women's pathways into crime are frequently shaped by histories of victimization, mental health difficulties, and socioeconomic marginalization (Tubex & Gately, 2025). Importantly, similar patterns have been observed in Portuguese samples, including high levels of ACEs, such as abuse, neglect, and family dysfunction, alongside substance use and exposure to structural vulnerabilities (de Castro Rodrigues et al., 2026a), profiles that were consistent with the psychosocial and development patters observed in the incarcerated women included in this research. The cumulative impact of ACEs on increased substance use, self-harm, depression, anxiety, and suicidal ideation among incarcerated women is well-documented (de Castro Rodrigues et al., 2026c; Tubex & Gately, 2025) and has been empirically reflected in the developmental and emotional configurations identified in this thesis. It is important to emphasize that the results of the studies that constitute this thesis demonstrated that psychopathic traits and patterns of emotional processing in women are embedded in developmental trajectories shaped by ACEs and, in several cases, moderated by PCEs, rather than being reducible to static antisocial dispositions.

The systematic assessment of PCEs, and other resilient developmental experiences is clinically and forensically relevant because it allows the identification of relational and psychological resources that may operate as active protective mechanisms, rather than merely reflecting the absence of adversity (Bethell et al., 2019). Within the framework of Relational Theory (Covington, 2007), which holds that women's psychological development is fundamentally organized around the quality of interpersonal connections and experiences of connection versus disconnection (Covington, 2007), PCEs may signal early relationships characterized by validation, safety, and mutuality. Such relational foundations are theorized to support the development of self-worth, interpersonal trust, and the capacity to seek and use support under conditions of stress. In prison settings, where the institutional environment itself may contribute to the reactivation of past experiences of shame, isolation, and relational violation, the identification of PCEs assumes particular importance (Covington, 2007). Furthermore, incarcerated women in the Portuguese context deal, in the process of adapting to prison, with separation from family, loss of autonomy, psychological suffering, and the restrictions of a highly regulated environment (de Castro Rodrigues

et al., 2026d). Thus, the experience of secure and development-promoting relationships can favor the consolidation of adaptive coping strategies, greater emotion regulation, and greater involvement in rehabilitation and reintegration processes, insofar as they promote perceptions of relational self-efficacy and availability of support (Ansbro, 2008; Mikulincer et al., 2003). These relational experiences are particularly salient for women, given that PCEs – especially the presence of supportive adults and safe relational environments – have been associated with better emotion regulation and lower psychopathological risk in incarcerated samples (Sousa et al., 2025). Empirical evidence further indicates that women are more likely than men to resort to active coping strategies, seek social support, and employ religious or spiritual coping strategies during incarceration (Pavićević et al., 2025), which may constitute relevant protective resources for planning a future reintegration trajectory and critical skills for navigating stressful institutional environments (Maia et al., 2025). Therefore, the assessment of PCEs should not be conceptualized as ancillary to the evaluation of ACEs but as a fundamental part of a comprehensive developmental formulation, because the simultaneous evaluation of adversity and protective relational experiences enables more precise estimation of resilience profiles and variability in adaptive functioning, particularly among incarcerated women. This approach is particularly relevant for informing individualized intervention planning and understanding factors that may support institutional adjustment and successful community reintegration following release (Mourão et al., 2025).

It is important to note that many women with personality disorders do not receive adequate treatment in the prison context, given that antisocial personality disorders are the focus of most cognitive restructuring programs in prisons, which seek to modify criminal behaviors by addressing antisocial tendencies (Bloom et al., 2003). Furthermore, individuals with psychopathic traits place significant demands on security, law enforcement, and specialized prison management systems, making their identification and assessment a priority within the justice and criminal justice systems (Arboleda-Flórez, 2020).

According to the conclusions of this thesis, psychopathic traits in women are differentially associated with distinct emotional and developmental configurations. Specifically, the results point to a robust relationship between affective and antisocial facets, with difficulties in affective empathy and preserved cognitive empathy. Thus, incarcerated women appear to have the capacity to engage in instrumental mentalization and goal-oriented interpersonal strategies, although they lack the affective resonance that normally inhibits harmful behavior, which has been described as an "emotional paradox" within the psychopathic construct in the literature (Sandvik et al., 2014). For

women, this split between affective and cognitive empathy has important clinical and forensic implications, as the tendency to conceptualize empathy as a unitary construct may obscure profiles that require differentiated interventions (Campos et al., 2022). Instruments such as the Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001) are often used to assess this capacity through emotion recognition tasks. However, particularly in the case of incarcerated women with psychopathic traits, RMET performance should be interpreted with caution, as the test primarily captures the cognitive dimension of empathy and may not adequately reflect the affective deficits most relevant to antisocial behavior (Sandvik et al., 2014), which were also evident in the findings of the present investigation. In women's prison settings, a differentiated assessment of empathy is therefore essential, not only for characterizing risk, but also for identifying preserved empathic resources that may be mobilized in rehabilitation and social reintegration programs (Taheri et al., 2025; Covington, 2007).

Accumulated evidence indicates that psychopathic traits in women present specific challenges in terms of construct validity and measurement. Using traditional cutoffs of measures such as the PCL-R, prevalence rates in female groups are likely lower, and there is concern about the potential for under-identification (Forouzan & Cooke, 2005; Verona & Vitale, 2018). Classification models that focus primarily on antisocial behaviors and criminal history may overlook broader interpersonal and affective styles, particularly in incarcerated women, whose psychopathic profiles may be expressed in complex, emotionally dysregulated, or contextually adaptive ways rather than in overtly disruptive forms (Verona & Vitale, 2018). This underscores the importance of assessment strategies that are sensitive to the gendered expression of psychopathic features (Verona & Vitale, 2018), as well as to their phenotypic manifestations across the different facets of psychopathy. The findings of this work also have important implications for assessment, particularly regarding the conceptualization of psychopathy in women as a categorical construct and the need to examine its specific facets or factors, taking into account the role of each dimension in different outcomes. In this sense, a dimensional approach would allow for the identification of interpersonal-affective vulnerabilities that may not be captured by behavioral indicators alone (Coid & Ullrich, 2010), despite their clear relevance for treatment planning and risk assessment.

The need for multi-method approaches in the assessment of incarcerated women (Smith et al., 2021), integrating self-reported, observational data and, whenever possible, behavioral or psychophysiological indicators, is equally evident given the findings of this thesis. Scientific

evidence indicates that assessments of individuals with psychopathic traits should include five steps: review of medical records, clinical interviews, observations in prison, application of risk scales, and use of diagnostic tools (Arboleda-Flórez, 2020). The integration of differentiated measures of cognitive and affective empathy, alongside indicators of emotional regulation, represents a critical advancement, superseding purely behavioral or procedural risk assessment models by incorporating developmental variables with high predictive value (Andrews & Bonta, 2010; Blair, 2007). Robust scientific evidence (Blair, 2005; Decety & Cowell, 2014) demonstrates that specific deficits within these psychobiological domains - particularly salient in women with psychopathic traits - constitute significant predictors of prison maladaptation, self-regulatory failure (Edwards et al., 2019), and persistent criminal recidivism (Pinheiro et al., 2020; 2025a). Consequently, embedding these emotional and interpersonal markers into initial intake protocols facilitates a more nuanced understanding of the mechanisms underlying deviant conduct and enables rehabilitation strategies that are clinically precise and targeted toward individual vulnerability factors.

Given its implications for the assessment of incarcerated women, the Women's Risk/Need Assessment (WRNA) stands out as a model that operationalizes a truly gender-responsive approach by integrating criminogenic factors with domains derived from pathways to female offending (Van Voorhis et al., 2010; Wright et al., 2007). Beyond classic static and dynamic factors, the WRNA incorporates variables identified by feminist criminology as central to women's trajectories to crime (e.g., self-efficacy, parental stress, parental involvement, relational dysfunction, history of childhood and adult abuse, family support, unsafe housing, dynamic and historical mental health, educational resources, and hostility), substantially expanding the purpose of gender-neutral models (Van Voorhis, 2010). This conceptual broadening is particularly relevant to assessment practice with women because it reflects empirical evidence that victimization, relational instability, and socioeconomic vulnerabilities are not merely contextual factors but structuring elements of women's offending trajectories (Pemberton et al., 2025). Additionally, the WRNA introduces an explicit logic for assessing strengths, including scales of self-efficacy, parental involvement, relational support, and educational resources, operationalizing the notion that competence beliefs, support networks, and educational capital can function as protective factors that mitigate risk (Van Voorhis et al., 2010). Including the WRNA domains in the assessment of women who had committed crimes enables gender-sensitive adaptation and a methodology grounded in empirical research demonstrating that these variables contribute to understanding risk, the need for

intervention, and reintegration trajectories (Pemberton et al., 2025). Overall, this evidence reinforces the need for an integrated assessment approach in the Portuguese female prison settings that combines structured risk screening with developmental formulation and core emotional markers - properly integrated into the Personal Rehabilitation Plan (*Plano Pessoal de Reabilitação*) or Therapeutic Rehabilitation Plan (*Plano Terapêutico de Reabilitação*) - to reduce under-identification of psychopathic traits and to support treatment planning, especially among women with psychopathic traits.

3. Implications for Intervention in Women with Psychopathic Traits in a Prison Setting

This doctoral dissertation calls for a comprehensive reflection on the potential direct implications for gender-sensitive interventions in the context of incarcerated women, grounded in the empirical and conceptual findings presented. It is important to note that, to maximize the effectiveness of intervention and rehabilitation in this context, a personalized and comprehensive assessment (e.g., assessment of dispositional characteristics, resources, and deficits) is indispensable. At the same time, continuous and systematic monitoring of therapeutic gains and intra-individual changes throughout the course of incarceration is necessary, since prison adaptation is dynamic and sensitive to changes in the institutional climate, the relational network, and symptomatology (Lanciano et al., 2022).

Before addressing the main implications of this thesis's findings for intervention, it is essential to contextualize the models that link the deprivation perspective (Sykes, 1958) — which holds that psychological distress stems from the structural conditions of prison itself, namely the loss of autonomy, relational breakdown, and institutional control — and the importation perspective (Irwin & Cressey, 1962) — which proposes that individuals bring pre-existing vulnerabilities into the prison context, such as a history of trauma, psychopathology, and personality traits that shape adaptation to the environment. These integrated perspectives acknowledge that prison constitutes a potent stressor, but that its effects are mediated by individual characteristics and the subjective perception of the prison environment (Lanciano et al., 2022). This framework is particularly relevant for women with psychopathic traits, whose emotional and developmental profiles identified in this thesis reveal trajectories marked by cumulative adversity, but also strategic patterns of adaptation to the prison context (i.e., emotional suppression, avoidance, instrumental management of relationships, preservation of cold EF and cognitive empathy), which may mask clinical vulnerabilities and reduce the visibility of psychological and behavioral risk.

Considering these issues, the intervention should be based on a multilevel framework, integrating, on the one hand, universal measures focused on the prison environment and, on the other hand, selective strategies targeting at-risk groups and interventions based on individualized clinical assessments (Malik et al., 2023). In this context, it is evident that the application of a Trauma-Informed Care (TIC) approach is a priority, which is defined as an organizational approach based on safety, trust, collaboration, and the prevention of re-traumatization in a prison context, in collaboration with Trauma-Specific Interventions (TSI) defined as a set of interventions aimed at processing and directly working through the ACEs of incarcerated women (Lomani & Brooker, 2022). The prison context is identified as a trigger and activator of traumatic experiences in its structure, defined by its coercive and non-autonomous character, its high levels of noise, and its culture of control, surveillance, and punishment, which can potentially trigger and activate traumatic responses and compromise the application of trauma-specific interventions, particularly in the context of a lack of institutional continuity and predictability (Lomani & Brooker, 2022; Miller & Najavits, 2012). Thus, trauma-informed care should form a cornerstone of organizational culture and involve a commitment from management, a whole-prison approach, phased training (i.e., trauma-informed, trauma-skilled, trauma-enhanced), as well as co-creation with incarcerated women who have experienced adverse life events, reinforcing the need for systemic prison reform (Lomani & Brooker, 2022; Miller & Najavits, 2012).

Given the findings of this study regarding the prevalence of reported ACEs and their impact on both emotional and empathic processing, as well as on the relationship with psychopathic traits in incarcerated women, the adoption of trauma-focused interventions in the prison setting is warranted. The literature is consistent and shows that the majority of women in prison report a high prevalence of ACEs, poorer prison adjustment (Liu et al., 2021), and experiences of poly-victimization in childhood (Lomani & Brooker, 2022), reinforcing that traumatic experiences are structural in these women's life trajectories, as corroborated by the results of this thesis. The relevance of adversity and trauma in clinical assessment within the female prison context has been evident, with recognition that women exhibit a higher prevalence of PTSD compared to incarcerated men, which is associated with a higher risk of suicide, poorer response to intervention, and a higher risk of recidivism (Sousa et al., 2025). Scientific evidence indicates that trauma-focused interventions have a significant impact on reducing PTSD and trauma-related symptoms (Malik et al., 2023). Their effectiveness appears to be greater when therapeutic work specifically targets

traumatic memories and post-traumatic meanings, often in individual settings, rather than focusing exclusively on stabilization and being delivered primarily in group formats (Malik et al., 2023).

Furthermore, it is important to note that a meta-analysis examining the effectiveness of trauma-focused interventions in prison settings highlighted three key factors for the effectiveness of this intervention: 1) trauma-focused intervention depends on institutional conditions that ensure continuity and a minimum degree of predictability; 2) the intervention should not be limited to general stabilization when clinical profiles indicate a need for targeted intervention; 3) it reinforces the need for coordination between operational and clinical logic, since transfers, scheduling conflicts, lockdowns, and unexpected releases can compromise effectiveness and increase the risk of decompensation and institutional retraumatization (Malik et al., 2023). This framework is particularly relevant for women with psychopathic traits, insofar as the regulatory strategies characterized by avoidance, emotional suppression, and strategic adaptation — including the preservation of cold EF and cognitive empathy — identified in this thesis may influence how these women engage in therapeutic processes within a prison setting. Although the available evidence does not allow us to assert that institutional inconsistencies directly exacerbate such strategies in this specific subgroup, the literature on trauma and the prison context demonstrates that institutional unpredictability and the discontinuity of intervention programs can compromise emotional stability and therapeutic gains in populations with a history of cumulative adversity (Gee & Reed, 2013; Malik et al., 2023; Miller & Najavits, 2012). In this regard, it is prudent to consider that women with profiles marked by defensive regulation and low affective engagement require particularly structured conditions of predictability and continuity to foster consistent therapeutic engagement (Lomani & Brooker, 2022).

In this context, therapeutic responsiveness in women with psychopathic traits, particularly about emotional and behavioral manifestations, should be understood as a central clinical goal. The dissociation between preserved cognitive empathy and diminished affective empathy, evidenced in this study, may support formally adequate engagement, but with limited impact on emotional integration and sustained behavioral change, favoring patterns of instrumental adherence and low generalization of therapeutic gains. At the same time, it is important to recognize that intervention models overly focused on the categorization of personality disorders, without the explicit integration of a trauma-informed approach, tend to prioritize behavioral stabilization and institutional control, which may obscure the understanding of the developmental and traumatic distress underlying these women's trajectories (Player, 2016; Trebilcock et al.,

2019). Trauma-focused interventions are defined as structured psychotherapeutic approaches that directly target trauma-related symptoms, namely re-experiencing, avoidance, hypervigilance, and negative changes in cognitions and emotions, using psychological models specifically developed for such interventions (Sousa et al., 2025). Trauma-focused interventions include interventions based on exposure and reprocessing of traumatic memories, reducing the psychophysiological arousal associated with trauma and promoting adaptive reprocessing (e.g., Eye Movement Desensitization and Reprocessing (EMDR); Shepherd et al., 2000; Trauma-focused writing interventions; Malik et al., 2023). Also included are structured cognitive-behavioral interventions that seek to modify dysfunctional beliefs, reduce maladaptive behavior, and foster emotion regulation strategies (i.e., Trauma-Focused Cognitive Behavioral Therapy; Cohen & Mannarino, 2015; Cognitive Processing Therapy; Resick et al., 2008). In parallel, competency-based interventions such as Seeking Safety Interventions seek to emphasize stabilization, coping, and training in affective self-regulation, and are frequently discussed as particularly relevant for individuals with complex trauma and psychiatric comorbidity (Heckman et al., 2007; Najavits, 2002). Empirical evidence also supports specific trauma programs developed especially for women in the criminal justice system, such as Helping Women Recover, Beyond Trauma (Covington, 2022), and Beyond Violence (Covington, 2013), which have demonstrated significant reductions in symptoms of PTSD, depression, anxiety, and anger in samples of incarcerated women (Messina et al., 2014; 2016).

This evidence becomes particularly relevant when considered in conjunction with the evidence presented in this thesis, which points to a positive relationship between adversity and psychopathic traits in incarcerated women, as well as the importance of understanding the findings through the possible influence of the prison environment, which can be seen as a risk amplifier in terms of emotional mechanisms in this specific group of women, and may influence and shape the processes of change during intervention. Studies show that the prison context rarely provides the psychological safety conditions necessary for trauma-specific interventions and therefore argue that such interventions require caution and may be more appropriate in the community (Lomani & Brooker, 2022; Malik et al., 2023). The findings of this thesis show that, although the basic decoding of emotional valence is intact in women with psychopathic traits, difficulties persist in emotional engagement in response to others' suffering and in translating this information into morally informed and socially adaptive choices, particularly in terms of affective empathy, as also corroborated by scientific evidence in the literature (Blair, 2005; 2007). Recent evidence among

women shows that difficulties with emotion regulation are associated with aggression and that this association is partially mediated by criminal thought patterns (Zeyrek-Rios et al., 2025), which is consistent with the General Model of Aggression (Allen et al., 2018), in which intense affective states, when insufficiently regulated, skew situational assessment and are potentiated by cognitive schemas that legitimize aggressive action (Allen et al., 2018). In the specific case of women with psychopathic traits, and in light of the findings of this study, the amplification of risk appears to depend less on deficits in understanding others than on a decoupling between social-cognitive processing and affective responsiveness to harm, thereby enabling the instrumental use of social information (Blair, 2005; 2007).

That said, it is essential to implement structured programs that promote self-regulation and aggression management skills among women in prison settings, in line with trauma-informed and gender-sensitive principles. One such intervention is Beyond Violence (Covington, 2013) which follows a social-ecological approach to address aspects such as the relationship between thoughts, emotions, and behavior, identifying cognitive distortions, recognizing emotional states and bodily states, managing anger, understanding trauma effects and early adverse experiences, communicating, conflict resolution, decision-making and reparation skills (Covington, 2013; King, 2017). The program also incorporates grounding, breathing, mindfulness, and body-based practices, aiming to increase emotional awareness and self-regulation (Covington, 2013). Although it has demonstrated a significant effect in reducing trauma symptoms and mental health indicators in women in the justice system, there is no specific data available on its effect regarding psychopathic traits in women in prison settings. However, it should be noted that the method follows a structured approach that can improve emotion regulation and behavioral modulation in relation to trauma history (Covington, 2013; King, 2017).

Furthermore, it is important to highlight the potential significance of Dialectical Behavior Therapy (DBT) in the forensic context. DBT was developed by Linehan (2015), initially designed for individuals with high levels of emotional dysregulation and chronic self-harming behaviors, and organized according to a biosocial model that integrates validation, behavioral change, and structured skills training. The intervention is based on an explicit hierarchy of target behaviors, the systematic use of chain analysis of problematic episodes, and the teaching of skills in emotion regulation, distress tolerance, interpersonal effectiveness, and mindfulness (Linehan, 2015). In a forensic context, specific adaptations have been proposed for individuals who had committed crimes with psychopathic traits, emphasizing greater structure, a clear definition of contingencies,

a focus on violent behaviors, and rigorous monitoring of behaviors that interfere with treatment (Galietta & Rosenfeld, 2012). However, empirical evidence for DBT applied specifically to psychopathy remains limited (Galietta & Rosenfeld, 2012), and its isolated application, disconnected from a trauma-centered approach and without integration with trauma-specific interventions when clinically indicated, may prove insufficient for women with a history of polytraumatization and complex trauma, particularly when traumatic needs remain unaddressed (Lomani & Brooker, 2022).

Given the findings of this study regarding emotional processing and the ACEs experienced by women, Schema-Focused Therapy may offer a relevant conceptual framework for addressing persistent emotional and relational patterns, including avoidance, emotional detachment, and overcompensation strategies, to reduce maladaptive early schemas, improve self-regulation, and addressing dynamic risk factors associated with violence and recidivism (Bernstein et al., 2007; Sousa et al., 2024). This approach is particularly relevant for women's life trajectories marked by cumulative adversity and maladaptive relationships, in which coping strategies centered on control, distrust, and emotional distancing may perpetuate weak empathic engagement and the instrumental use of others; therefore, therapeutic work must prioritize the integration of emotional states, interpersonal meanings, and social and moral decision-making criteria (Bernstein et al., 2007). In forensic populations, Schema-Focused Therapy requires rigorous conditions of preparation and therapeutic fidelity, a higher dose and longer duration of intervention, and specific strategies to minimize institutional dropout and variability, in order to more validly test its impact on dynamic risk factors (Doyle et al., 2016).

Furthermore, it is important to emphasize the relevance of Compassion-Focused Therapy (Gilbert, 2009), which is effective in promoting self-compassion and reducing self-criticism and external shame — processes central to the emotional regulation of individuals with a history of cumulative adversity (Brown & Ashcroft, 2025). In psychopathic traits, the identified phenotypic manifestations can be understood as adaptive strategies developed in contexts of chronic threat and a lack of secure attachment experiences, implying a calibration of the motivational system marked by hyperactivation of the threat system and underactivation of the soothing system (da Silva & Rijo, 2022; Gilbert, 2019). In this regard, Silva et al. (2021) developed a compassion-based program, PSYCHOPATHY.COMP, which was implemented in a juvenile forensic setting in Portugal. The program has shown promising preliminary results in reducing disruptive behaviors and psychopathic traits, as well as in promoting therapeutic engagement, through the restoration of

balance between emotional regulation systems and structured Compassionate Mind Training (Ribeiro da Silva et al., 2021). In the context of women's prisons, given the findings of the studies comprising this doctoral dissertation, Compassion-Focused Therapy may be clinically promising for women with psychopathic traits, as it promotes the modulation of emotional reactivity, emotional integration, and the consolidation of socially adjusted and empathetic behavioral and relational patterns. Indeed, there are very concrete results in women in forensic settings indicating that the application of Compassion-Focused Therapy (f-CFT) promotes gains in social adjustment, understanding of the "tricky brain," reduction of self-judgmental patterns, and the development of new strategies for managing distress and self-harm (Taylor, 2025).

Given the results of the studies included in this doctoral dissertation, which suggest that core deficits in women with psychopathic traits appear to lie in affective empathy rather than in the ability to infer emotional states, Mentalization-Based Treatment (MBT) (Bateman & Fonagy, 2013) may be relevant, focusing on an intervention that integrates cognitive and affective components rather than simply strengthening the capacity for mentalization. Thus, in the domain of social cognition and relational processes, mentalization-based approaches are conceptually aligned with the need to reduce automatic responses in threatening contexts and in the face of unpleasant emotional stimuli, as well as to increase reflection on one's own and others' mental states, with experimental evidence and trials in populations with personality disorders and antisocial comorbidity (Bateman et al., 2016). Nevertheless, this approach requires further investigation, especially in women, as some of the available empirical evidence suggests that MBT-based interventions may produce short-term reductions in psychopathic traits and emotional dysregulation, although high rates of criminal recidivism are observed in the medium and long term (Mohajerin et al., 2024).

With regard to the impact on executive functions in women with psychopathic traits, although the findings indicate that overall EF is preserved, this does not rule out the existence of significant difficulties in attentional control, cognitive flexibility, and the integration of contextual cues, dimensions that may be impaired in the participants of this study, as suggested in the discussions accompanying these results. Scientific evidence involving individuals with psychopathic traits shows a tendency toward selective attentional allocation to the dominant stimulus or goal, limiting the integration of essential contextual information (e.g., affective cues, inhibitory signals, indicators of harm), which results in biased decision-making despite the apparent preservation of executive functions (Baskin-Sommers et al., 2015). Consistent with this, cognitive remediation

models focused on contextual attention have shown that interventions tailored to cognitive-affective deficits promote specific improvements not only in trained tasks, but also in independent laboratory tasks assessing the same cognitive-affective process, suggesting changes in the mechanisms underlying attentional deficits rather than mere task-specific learning (Baskin-Sommers et al., 2015). It is important to note that such effects emerged exclusively when training was deficit-matched, reinforcing the relevance of a clinical approach guided by functional processes and specific intervention needs (Baskin-Sommers et al., 2015). Thus, given the findings of this thesis, interventions targeting attentional flexibility and the integration of contextual cues may be relevant, although it is acknowledged that the available evidence remains predominantly limited to laboratory indicators, lacking robust demonstration of impact on concrete outcomes for the female prison population (Baskin-Sommers et al., 2015).

About the effectiveness of programs based on cognitive-behavioral therapy (CBT) (e.g., Moving On; Van Dieten, 2010), evidence from the prison setting suggests that these types of interventions for women tend to produce consistent results only when their therapeutic integrity is maintained (i.e., sufficient dosage, adequate duration, small group sizes), as well as the generalization of skills (i.e., modeling, behavioral rehearsal, gradual practice, and homework assignments) (Duwe & Clark, 2015). When these elements are compromised by logistical constraints (e.g., overcrowded classes, elimination of role-play and training exercises), the intervention may lose effectiveness and fail to yield positive outcomes (e.g., reduced recidivism rates) (Duwe & Clark, 2015). Thus, rather than merely offering programs, the planning and evaluation of interventions must incorporate explicit criteria for fidelity and implementation conditions; otherwise, behavioral change and therapeutic gains may be compromised.

The women involved in the study reported a high prevalence of ACEs, and the literature consistently shows that they are more likely to find themselves, throughout their lifetimes, in exploitative, coercive relationships marked by intimate partner violence, often assuming a central role as caregivers (HM Prison & Probation Service, 2020). In this context, the relational disruption associated with incarceration, including the loss or weakening of contact with children and the dissolution of support networks, constitutes a factor with a significant impact on emotional well-being and emotional and behavioral regulation (HM Prison & Probation Service, 2020). Relational dynamics are not limited to the period of incarceration; a prison environment characterized by respectful and trusting relationships between incarcerated individuals and staff is associated with

lower levels of unhappiness and a greater sense of social acceptance one year after release (Schnittker, 2025).

This interpretation aligns with the empirical findings included in this thesis, in which PCEs emerge as potential protective and buffering factors, conceptualized as internal and relational resources that can be activated in a prison setting. The centrality of the bond is also evidenced by incarcerated women who, when conceptualizing restorative justice, emphasize the repair of relational harm, the need to be heard, the search for forgiveness, and the reconstruction of family ties as core dimensions of the process of change (Peleg-Koriat & Weimann-Saks, 2025). Concurrently, recent studies demonstrate that greater visit frequency and shorter geographical distance between the prison and the place of residence are associated with less reliance on maladaptive coping strategies and greater emotional and institutional stability, suggesting a regulatory effect of social bonds on the management of prison stress (Pavićević et al., 2025). These results are consistent with theoretical models that attribute a buffering function to social support in high-stress contexts, positing that multiple sources of support reinforce psychological resilience and reduce vulnerability to maladaptive responses (Ben-Zur, 2019). In this context, intervention strategies should not be limited to reducing behavioral risk or modifying cognitive processes in isolation but should structurally integrate the reconstruction and reorganization of relational networks into the Individual Readaptation Plan (*Plano Individual de Readaptação*). This perspective finds additional support in models centered on relational health among incarcerated women, which advocate for interventions based on a continuum of care, combining psychoeducational components, brief interventions focused on critical moments, and systemic work with family members or significant others (e.g., Strengthening Connections, Booth et al., 2025). For women with cumulative histories of adversity and relational vulnerability, fostering a relationally safe prison environment, informed by trauma and grounded in dignity, and integrating it with formal strategies to maintain and strengthen family and community bonds constitutes a foundational pillar for enhancing well-being, institutional stability, and sustained social reintegration, reducing the risk of recidivism and promoting more consistent and resilient trajectories of change (Booth et al., 2025). Relational-Cultural Therapy (Covington, 2007) posits that psychological growth in incarcerated women occurs through mutually empathetic and development-promoting relational bonds. In contexts of trauma and incarceration, fostering secure relationships based on mutuality and respect serves as a mechanism for protection and recovery (Covington et al., 2003). This perspective justifies institutional interventions that strengthen family and community ties, reduce isolation,

promote social support as an integral part of risk reduction and social reintegration, and create prison environments that provide safety and respect (Covington et al., 2003).

These implications for interventions with incarcerated women exhibiting psychopathic traits should be grounded in incremental and measurable goals: they should include planning for the continuity of the intervention during the transition to the community, as well as factors that directly impact adherence and the sustainability of change (HM Prison & Probation Service, 2020). Furthermore, the evaluation of the intervention's effectiveness should include indicators of psychological change (Sousa et al., 2024) and not merely the monitoring of behavioral indicators (e.g., recidivism, impulsivity), as changes in schemas, emotion regulation, and empathic responsiveness may constitute preconditions for stable behavioral changes and may interfere with treatment, particularly in contexts where behavioral expression may be contingent on institutional surveillance and where apparent adaptation may reflect conformity rather than psychological transformation.

Concerning interventions targeting psychopathic traits in women, this study emphasizes that psychopathy should not be reduced to a diagnostic category but rather understood as a complex pattern of functioning that requires intensive, structured, rigorously implemented, and gender-sensitive interventions (Polaschek & Daly, 2013). Thus, intervention should not be limited to screenings and scores but should incorporate developmental frameworks, focusing on trajectories of adversity, attachment patterns, relational dynamics, and the functions of antisocial behavior, integrating risk, need, and responsiveness (HM Prison & Service, 2020).

4. Implications for the Management of the Prison System and Public Policies for Criminal Justice for Women in the Portuguese Context

The findings of this thesis have implications that extend beyond the strictly clinical and individual level, directly impacting the organization of prison establishments, risk assessment and management models, and public policies on criminal justice aimed at women. By demonstrating that psychopathic traits in incarcerated women are associated with selective emotional profiles, difficulties in terms of affective empathy, preservation of cognitive empathy skills, and cold executive functions, as well as developmental trajectories marked by cumulative adversity and partially cushioned by early positive experiences (Pinheiro et al., 2024; 2025a), this research supports the need for prison and criminal policy responses that are more sensitive to gender (Van Voorhis et al., 2010).

This is especially relevant in the Portuguese context, where women constitute a numerical minority in the Portuguese prison population, accounting for 7.1% of prisoners at the end of 2025, while the overall prison occupancy level stood at 103.4% of official capacity, indicating persistent structural pressure within the system (World Prison Brief, 2025). Portugal was condemned by the European Court for Human Rights in 2019 and 2020 for violating Article n°3 of the European Convention for the Protection of Human Rights (Council of Europe, 1950), which affirms that the material conditions of detention in certain prisons in Portugal were found to have constituted "inhuman and degrading treatment". Most of the prisons in Portugal are quite old and do not provide adequate conditions for housing people (i.e., temperature in cells, humidity, lack of hot water), and some of the situations found at the prison infringe the General Regulations of Penitentiary Institutions (Council of Europe, 2020) and some articles contemplated by the Code of Execution of Sentences and Measures Deprivation Liberty (Prison Insider, 2025). This demonstrates the need for prison policy to take into account the guidelines established by the international community regarding human rights and the need for the development of criminal justice policies that take into account the importance of the dignity and security of all individuals (Council of Europe, 2006; United Nations Office on Drugs and Crime [UNODC], 2011).

On the Prison Insider platform (2025), it is possible to access the evaluation report carried out on Portuguese prisons, where it can be read that there are few programs available to support people with addiction-related problems (e.g., methadone through opioid agonist therapy), health professionals and guards are not adequately trained to intervene and respond to the needs of people with mental disorders, continuity of health care is not guaranteed, the separation of different categories in prison is not effective, there are forms of degrading treatment (e.g., physical and verbal violence), detainees cannot always be close to their families, and many other issues that give a negative rating to the treatment provided by the Portuguese prison system to incarcerated individuals (Prison Insider, 2025). Consequently, prison environments characterized by unpredictability, weak relational continuity, and limited psychosocial support can reinforce the defensive and emotionally distant patterns identified in this thesis, namely emotional suppression, reduced affective mobilization, and instrumental, goal-oriented behavior, corroborating the scientific evidence that demonstrates that the prison climate and institutional legitimacy are fundamental for psychological adjustment, therapeutic engagement, and post-release reintegration (Auty & Liebling, 2020). From a public policy perspective, these findings highlight the importance

of prison governance models that prioritize institutional legitimacy, relational stability, and rehabilitative engagement as central dimensions of prison management (Liebling et al., 2012).

From the perspective of prison system management, one major implication of this thesis is the need to reframe women's imprisonment as a process that must be guided not only by security concerns but also by relational stability, psychological intervention, and continuity of rehabilitative opportunities (UNODC, 2011). In women with psychopathic traits, this is particularly important because the present findings indicate that their functioning cannot be reduced to static antisocial behavior, as it reflects complex interactions between adverse developmental experiences (Pinheiro et al., 2025b). International frameworks, such as the United Nations Bangkok Rules, have explicitly acknowledged that women in contact with the criminal justice system tend to have unique social paths characterized by high levels of victimization, caregiving responsibilities, and socioeconomic marginalization (UNODC, 2011). From a policy perspective, this argument also provides support for the development of trauma-informed criminal justice policies that have the capacity to acknowledge that women's institutional adaptation is likely influenced by their pre-experience of abuse, violence, and adversity, and that an unpredictable environment is likely to exacerbate women's re-traumatization rather than promote change (Miller & Najavits, 2012; Tripodi et al., 2022).

The European Prison Rules further emphasize that women in prison require protection from physical, mental, and sexual abuse, as well as access to specialized services when they have histories of trauma, abuse, or other forms of vulnerability, including services that reduces retraumatization, promote predictable routines, support meaningful professional continuity, and create conditions for gradual behavioral and emotional change (Penal Reform International & Council of Europe, 2023). This recommendation is especially relevant considering the present findings. The women included in this study present a developmental process that frequently involves ACEs, family dysfunction, and violence, with implications for the development of affective deficits (Pinheiro et al., 2025b). These trajectories are fundamental to understanding how psychopathic traits are expressed in women and how they respond to and adapt to incarceration. Thus, prison management should not be limited to maintaining order and preventing illicit conduct, but should also ensure psychological safety, protect women from retraumatization, and provide access to specialized and continuous support capable of addressing the developmental and relational mechanisms associated with maladaptive functioning (Penal Reform International & Council of Europe, 2023). In addition, because ACEs are strongly associated with later mental

health problems, substance use, and criminal behavior across the life course, the implications of these findings extend beyond prison management itself and reinforce the importance of early preventive public policies, including school retention strategies, family support programs, and socioeducational interventions directed at girls exposed to cumulative psychosocial risk (Hughes et al., 2017; Penal Reform International & Council of Europe, 2023)

Furthermore, from a prison management perspective, one of the main implications of this thesis is the need to conceptualize female incarceration within a relational and developmental framework rather than through purely custodial paradigms (Bloom et al., 2003; Van Voorhis et al., 2010; Penal Reform International & Council of Europe, 2023; Young & Haynie, 2022). Portuguese legislation formally establishes social reintegration as a fundamental objective of sentences, including prison sentences, and provides for individualized rehabilitation planning through specific instruments such as the Individual Readaptation Plan (*Plano Individual de Readaptação*) (cf. *Decreto-Lei No. 115/2009, de 12 de Outubro*[1]; *Decreto-Lei No. 51/2011, de 11 de Abril*[2]). However, ethnographic and institutional analyses of Portuguese prisons have consistently identified a discrepancy between the rehabilitative aims defined in legislation and the operational priorities of prison administration, which often remain dominated by security management and institutional constraints (Cunha, 2014). This gap between legal principles and institutional practice underscores the need for public policies capable of translating reintegration objectives into operational frameworks supported by adequate resources, professional training, and community partnerships (Dores et al., 2013).

This discrepancy becomes particularly problematic when considered in light of the mechanisms identified in this thesis. Women's incarceration should be organized according to a rehabilitative and relational logic, rather than through a uniform and gender-neutral regime (Penal Reform International & Council of Europe, 2023; Young & Haynie, 2022). This is particularly important for women with psychopathic traits, whose apparent institutional adaptation may coexist

[1] Article 5.º of the Code for the Enforcement of Sentences and Deprivation of Liberty Measures (*Código da Execução das Penas e Medidas Privativas da Liberdade)* - "to prepare the female prisoner for life in freedom and in the community, following the development of her responsibilities and the acquisition of skills that enable her to adopt a socially responsible way of life, without committing crimes, and to provide for her needs after release, as well as to establish the appropriate measures and activities for the prisoner's treatment and their respective duration and phasing."

[2] General Regulation of Prison Establishments (*Regulamento Geral dos Estabelecimentos Prisionais [RGEP]*) - "the individualized treatment and the resocialization process of each prisoner begin with the development of the Individual Readaptation Plan by the services responsible for supervising the execution of the sentence, with the participation of the security staff (prison officers) and clinical services."

with affective disconnection, emotional suppression, and strategic interpersonal functioning (de Castro Rodrigues et al., 2026c; Pinheiro et al., 2024). Prison administration should create conditions that support genuine psychological and social rehabilitation, including stable professional relationships, continuity in psychosocial care, protection against institutional retraumatization, and structured opportunities for progressive reintegration, as foreseen by international norms that repeatedly emphasize that female incarceration cannot be adequately governed by models designed for male prison populations (UNODC, 2011). International correctional research increasingly emphasizes that prison systems designed primarily for male populations may fail to respond adequately to the specific developmental, relational, and social needs of women (Penal Reform International & Council of Europe, 2023; Van Voorhis et al., 2010). In this respect, public policy should also recognize that women's adjustment to imprisonment is shaped not only by formal programs and staff practices, but also by the informal relational organization of prison life (Young & Haynie, 2022)

Moreover, longitudinal and comparative studies indicate that prison environments characterized by high unpredictability, frequent use of disciplinary measures, and reduced opportunities for autonomy are associated with a higher prevalence of self-harm, worsening of traumatic symptoms, and lower therapeutic engagement (Liebling et al., 2019). It is important to emphasize that Rule 34 (the Nelson Mandela Rules) further emphasizes that prison policies for women should be coordinated with individualized needs assessments that consider histories of trauma, caregiving responsibilities, physical and psychological needs, and priorities for safe reintegration into the community (UNODC, 2015). For women with psychopathic traits, this issue is especially relevant because institutional adjustment and behavioral compliance may coexist with emotional disengagement and instrumental relational patterns (Međedović et al., 2024; Pinheiro et al., 2021). In such cases, the absence of disciplinary infractions or overt behavioral disruption may be misinterpreted as evidence of psychological stabilization, despite the persistence of core affective and interpersonal features of psychopathy, given that institutional indicators of prison adjustment do not necessarily capture underlying personality traits or socioemotional functioning among incarcerated women (Pinheiro et al., 2021). Therefore, prison management systems should move beyond behavioral indicators as the primary markers of adaptation and adopt multidimensional frameworks that capture socioemotional functioning, therapeutic engagement, and developmental vulnerability, given that prison compliance does not necessarily reflect genuine psychological change or rehabilitation (Liebling et al., 2012).

On the other hand, resocialization work with incarcerated women is fundamental – training, work, education, and the development of measures to make sentences more flexible (e.g., temporary releases and parole) – at an early stage, to avoid the desocializing effects of incarceration, allowing for progressive preparation for release (Santos, 2003). Thus, prison management must integrate structural components and support networks, mitigating the impact of the disruption of relationships and support networks during the incarceration process, and research consistently demonstrates that family contact and relational continuity during incarceration contribute to better institutional adaptation and lower recidivism rates (Auty & Liebling, 2020; HM Prison & Probation Service, 2020). From a public policy perspective, these findings support the development of correctional models that reduce the institutional isolation of prisons and promote structured interaction with community actors throughout the sentence (EuroPris, n.d.). One example of this approach is the expansion of open prison regimes and Social Insertion Centers in the Spanish prison system, where individuals can maintain employment, education, and family contact while serving part of their sentence under supervised conditions (Fernández Gómez, 2023). Recent reforms, particularly Directive 6/2020[3], introduced the possibility of direct entry into Social Insertion Centers, allowing certain individuals to begin serving their sentence in an open regime without first passing through ordinary prisons (EuroPris, n.d.). This policy reflects a shift toward individualized sentencing pathways that seek to avoid the criminogenic and socially disruptive effects of unnecessary exposure to closed prison environments while facilitating gradual reintegration into the community (Fernández Gómez, 2023).

Comparative European evidence shows that models with greater prison openness to the community, such as those implemented in Spain and other countries in southern and northern Europe, are associated with lower recidivism rates, greater continuity of mental health care, and less relational disruption, when compared to traditional closed regimes (Mastrobuoni & Terlizzese, 2022; Moles-López & Añaños, 2021). Evidence from Spain further indicates that engagement in education and vocational training during incarceration is associated with higher perceived autonomy, stronger employability expectations, and more favorable reintegration perspectives among women, even in the presence of severe structural disadvantage, which reinforces the policy relevance of expanding prison-based socioeducational and vocational opportunities tailored to

[3] General Secretariat of Penitentiary Institutions (*Secretaría General de Instituciones Penitenciarias*), Ministerio of the Interior (Spain). (2020, December 17). *Instrucción 6/2020: Protocolo de ingreso directo en medio abierto* [Directive] (*Instruction 6/2020: Protocol for direct admission into the open regime* [Directive]). Retrieved January 10, 2026, from https://www.europris.org/wp-content/uploads/2023/03/Directive-6-2020-Direct-entry-open-regime.pdf

women's specific needs and trajectories (Añaños et al., 2020; Añaños-Bedriñana et al., 2019). Meta-analytic evidence indicates that social reintegration programs, designed to support individuals during the transition from prison to the community, are associated with reductions in recidivism (Byrne, 2020).

Interventions that begin during incarceration and continue after release appear to produce stronger effects than those implemented exclusively before or after release, highlighting the importance of continued support and sustained engagement throughout the prison-to-community transition (Byrne, 2020; Koehler & Lösel, 2025). These findings suggest that reintegration strategies should prioritize coordinated, community-linked interventions that address dynamic needs and responsiveness factors, rather than being solely based on institutional responses focused on containment (Koehler & Lösel, 2025). They also support correctional policies that strengthen positive peer relationships within prison settings, including peer-support programs, mentoring initiatives between incarcerated women, and conflict mediation structures grounded in trusted interpersonal networks, given that such arrangements may facilitate cooperation, reduce interpersonal tensions, and provide informal support under conditions of confinement (Young & Haynie, 2022). In this regard, prison administrations may also benefit from incorporating social network perspectives into institutional management, since mapping informal relational structures within prison units could help identify socially influential individuals, detect social isolation among vulnerable prisoners, and support the development of interventions that foster prosocial leadership and collective support structures within incarcerated communities (Haynie et al., 2018; Young & Haynie, 2022).

Finally, the conclusions of this thesis reinforce the importance of strengthening educational approaches in prison environments that go beyond formal classroom teaching and actively promote the development of practical, social, and civic skills (Loureiro & Pinto, 2022). Furthermore, recent research has shown that the effectiveness of educational and training programs in Portuguese prisons has limitations regarding their impact on post-release employment (Cunha et al., 2026). Evidence from prison education initiatives indicates that nontraditional educational programmes, vocational training, and structured socioeducational activities can contribute to improving self-image, strengthening interpersonal relationships, and preparing individuals for life after release (Loureiro & Pinto, 2022; Mielitz & Franko, 2022). In several European correctional systems, individualized intervention plans already integrate educational opportunities, work training, and

social programmes with the explicit goal of facilitating gradual reintegration into society following imprisonment (Loureiro & Pinto, 2022; Mielitz & Franko, 2022).

Recent research on prison education highlights the transformative potential of dialogic and experiential learning approaches that promote active participation and critical reflection among incarcerated individuals (Martinovic et al., 2025). Programs such as the Inside-Out Prison Exchange bring together university students and incarcerated participants in shared learning environments, fostering mutual learning processes and encouraging the development of social and cognitive competencies (Martinovic et al., 2025). Importantly, these experiences can also support incarcerated individuals in reconstructing more positive identities beyond the stigmatized "prisoner" label, thereby facilitating processes of personal transformation that are relevant for reintegration (Martinovic et al., 2025). Similarly, emerging studies have pointed to the potential of service-learning methodologies within prison education (Amores & De la Calle Maldonado, 2024). Service-learning initiatives combine experiential learning with community-oriented engagement, enabling incarcerated individuals to participate in socially meaningful activities that connect personal reflection with collective responsibility (Amores & De la Calle Maldonado, 2024). For example, programs implemented in European correctional settings have involved incarcerated participants in projects aimed at supporting vulnerable groups, often through the sharing of personal experiences and life trajectories, which can foster introspection, strengthen social commitment, and promote the development of social and civic competencies that are essential for successful reintegration after release (Amores & De la Calle Maldonado, 2024).

5. General Limitations

This doctoral dissertation presents significant empirical and theoretical contributions, previously identified, to our understanding of emotional processing and psychopathic traits in incarcerated women. However, it also has certain limitations that must be acknowledged to contextualize the interpretation of the results and provide useful guidance for future research.

The first limitation to note is related to the cross-sectional nature of the studies. Although the study results support theoretically consistent associations between the variables, the cross-sectional design of the studies prevents a robust determination of the temporal order among the variables; therefore, the results should be interpreted as statistical associations between variables, and it is not possible to infer causal relationships or the temporal direction between them (Spector, 2019). For example, although ACEs have been associated with specific facets of psychopathy in

women, the study design does not allow for an accurate determination of whether ACEs directly contributed to the development of psychopathic traits, as the relationship may be mediated by unmeasured variables. This limitation is particularly relevant in the field of developmental psychopathology, since developmental processes are often conceptualized as dynamic, involving transactional and bidirectional mechanisms between individual and contextual characteristics over time (Cicchetti & Toth, 2009; Sameroff, 2009). Thus, ACEs may influence the development of certain psychopathic traits, but these same traits may also shape how women interpret, evoke, or respond to environmental contexts.

A second limitation concerns the use of self-report measures, which, although indispensable in this study for accessing the subjective developmental and emotional experiences of the women in the study, are also susceptible to memory bias and retrospective reconstruction processes subject to reconstruction effects (Sato & Kawahara, 2011). It is important to note that retrospective reports (e.g., ACEs and PCEs) depend on reconstructed cognitive processes and may be influenced by current beliefs, emotional state, and individual characteristics, compromising the accuracy of the reported information (Althubaiti, 2016) and the validity of the associations observed in this study. Furthermore, self-report instruments are also subject to the influence of social desirability processes, reflecting the tendency to provide acceptable responses, which may occur deliberately through impression management strategies or unconsciously through self-deception processes, compromising the validity of responses to the measures (Paulhus, 2002). This concern is particularly relevant to the present study, as psychopathy has been conceptually linked to characteristics such as deception, interpersonal manipulation, and lying (e.g., Verona & Vitale, 2018), which may compromise the validity of self-report measures. However, empirical evidence suggests that response distortion in individuals with psychopathic traits does not necessarily manifest as generalized positive impression management (Ray et al., 2013).

A third limitation relates to the characteristics of the sample, given that the empirical studies were conducted with women in prison settings, a specific context marked by its own institutional, social, and psychological dynamics (McKendy & Ricciardelli, 2021), which limits the generalizability of the results to other contexts, particularly community settings. On the other hand, it is important to note that the psychological functioning of the women in the study may be compromised, given the prevalence of reported traumatic and adverse experiences (Lomani & Brooker, 2022). Naturally, the prison environment, given its specific characteristics, may have shaped behavioral and emotional expression, fostering adaptive strategies such as hypervigilance

and instrumental interpersonal adjustment as survival strategies (Mazher & Arai, 2025). In this regard, the influence of uncontrolled variables in empirical studies (e.g., adaptation to prison, length of sentence, prior psychopathology, access to intervention programs) cannot be ruled out, as these may have influenced the results obtained.

A fourth limitation is the small sample size, which prevents the generalization of the results. This is a challenge frequently encountered in research conducted in Portuguese prisons, particularly with women (e.g., Pinheiro et al., 2021). The small sample size may compromise statistical power, increasing the probability of type II errors, which limits the robustness of the results obtained (Faber & Fonseca, 2014). Additionally, in more complex analytical models, such as structural equation models, small samples can compromise the stability of estimates and prevent the adequate estimation of parameters (Willaby et al., 2015).

A fifth limitation relates to the use of static images in the assessment of emotional processing. Although widely used in emotion research, these images lack temporal continuity and do not adequately capture the dynamic, multimodal, and contextual nature of emotional experiences (Schurig et al., 2026). This gap raises concerns regarding the generalization of results from experiments conducted in controlled/laboratory settings to emotional experiences in the real world, potentially leading to the assessment of decontextualized emotional processing that does not necessarily reflect how emotional information is processed in real-life or everyday situations (Schurig et al., 2026). The use of self-report measures in the assessment of emotional processing may not fully capture the complexity of the emotional response, given that it involves multiple response systems, including behavioral and physiological ones (Ciuk et al., 2015). Furthermore, emotional processing involves autonomic and neurophysiological responses, such as heart rate variability, brain activation patterns, or electrodermal activity, which are not accessible through self-report measures (Hall et al., 2023).

The sixth limitation concerns the results regarding the EF of the study participants, which should be interpreted with great caution. Neuropsychological performance in prison populations can be influenced by multiple uncontrolled factors preceding incarceration and resulting from the hardships of incarceration and the prison environment (e.g., psychiatric medication, substance use, sleep disorders, cognitive deficits, impoverished environment, lack of cognitive stimulation) (Meijers et al., 2015). On the other hand, EF is not a unitary construct (Diamond, 2013), and the seemingly preserved performance among participants does not rule out impairments in certain domains (e.g., attentional control, decision-making) (Friedman & Miyake, 2017). Furthermore, the

lack of normative data for prison samples limits the validity of the results obtained, since performance is often interpreted based on general population benchmarks, which may be inappropriate for this context (Gonçalves et al., 2026).

A seventh limitation concerns the absence of intersectional analyses. According to the literature, multiple social and structural positions should not be understood in isolation, as they jointly shape individuals' experiences and can produce distinct patterns of vulnerability and adjustment (Bauer et al., 2021). In the present study, sociodemographic variables (e.g., age, nationality, socioeconomic status) and legal-criminal variables (e.g., length of sentence, violent and non-violent crimes, recidivism status) were not considered in an integrated manner in the analyses, which may have limited the identification of distinct profiles among subgroups and a deeper understanding of the phenomena under study.

Finally, a significant limitation concerns the lack of follow-up data, particularly regarding the process of prison adaptation, responsiveness to intervention, and post-release outcomes. Although this study contributes to the understanding of emotional processing and psychopathic traits in incarcerated women, it did not explore the predictive validity of the identified profiles. Thus, it remains unclear whether emotional, empathic, and developmental profiles are associated with distinct trajectories in therapeutic engagement, prison adaptation, or post-release outcomes (i.e., completion of sentence or parole), such as social reintegration and criminal recidivism. From a clinical and forensic perspective, the lack of longitudinal data limits the application of these findings to gender-sensitive risk assessment and rehabilitation planning (e.g., Zarling et al., 2022).

6. Recommendations for Future Research

In terms of recommendations for future research, the literature highlights the need to go beyond and further explore the mechanisms underlying the relationship between developmental experiences, emotional processing, and psychopathic traits in women (Pinheiro et al., 2019; 2024). The use of a longitudinal design would allow for the examination of the temporal sequence and dynamic nature of the associations between the variables under study, given the repeated collection of data from the same individuals over time, enabling the analysis of developmental trajectories from childhood through adulthood and the identification of patterns of change and stability over time (Anderson, 2019). In the field of developmental psychopathology, given the transactional and bidirectional processes between individuals and the context (Sameroff, 2009), a longitudinal design would allow for a more precise identification of the temporal sequence of

associations between variables, the identification of critical periods of vulnerability and resilience throughout development, and the recognition of periods or experiences of change that are particularly relevant for early intervention (Rutter, 2012). In addition, this approach will allow for the testing of more complex models (Anderson, 2019), incorporating potential mediating variables (e.g., emotional dysregulation, attachment styles, alexithymia) and moderating variables (e.g., social support, resilience, coping strategies) to gain a deeper understanding of the topic.

Furthermore, future research should prioritize a research protocol based on methodological triangulation, integrating multi-method and multi-informant approaches, to overcome the limitations inherent in relying exclusively on self-report measures. Methodological triangulation, understood as the combination of different methods and data sources in the study, allows for increased rigor, validity, and interpretive depth in the research (Arias Valencia, 2022). In this sense, the integration of quantitative (e.g., psychometric instruments) and qualitative (e.g., clinical interviews, observational checklists, review of clinical and prison records) would enable a robust and holistic assessment of the individual (Creswell, 2014), simultaneously capturing the measurable dimension and the subjective experience of emotional processing and psychopathic traits in incarcerated women.

Concerning the assessment of emotional processing, future research should reconsider the use of dynamic stimuli (e.g., videos depicting dynamic emotions) that more closely approximate real-world emotional experiences and more accurately reflect the dynamic and contextual nature of emotions (Schuring et al., 2026). In contrast to static stimuli, such as those derived from the International Affective Imagery System (IAPS) used in this thesis, dynamic stimuli allow for sustained emotional engagement over time and reduce habituation effects, thus providing a more temporally robust assessment of emotional reactivity (Carvalho et al., 2012). The literature suggests that the use of dynamic stimuli increases the ecological validity of experimental tasks, enabling a more representative assessment of emotional processes compared to traditionally used static stimuli (Li et al., 2022). Additionally, dynamic stimuli are particularly suited to capturing complex social interactions and context-dependent emotional responses, which are often central to understanding affective dysfunctions (Carvalho et al., 2012). In particular, the use of non-auditory dynamic stimuli — film clips with different levels of valence, arousal, and dominance, as proposed in paradigms such as the Emotional Movie Database (EMDB) — allows for greater experimental control over sensory input and enables their subsequent integration into multimodal experimental designs, including the addition of auditory probes or cross-modal (intermodal)

interference tasks (Carvalho et al., 2012). Beyond the use of dynamic visual stimuli, current evidence supports the use of Virtual Reality (VR), as immersive and interactive virtual environments enhance the ecological validity of emotion elicitation procedures by providing more realistic, dynamic, and contextually rich emotional experiences (Polo et al., 2025). Compared to traditional static stimuli, VR-based paradigms allow a more ecologically valid and representative assessment of emotional processing (Polo et al., 2025). Moreover, these paradigms offer complementary advantages for integration with physiological and neurophysiological assessment methods. EMDB paradigms have been widely employed in combination with neuroimaging and electrophysiological techniques, including event-related potentials (ERP) and functional magnetic resonance imaging (fMRI), enabling fine-grained examination of the temporal dynamics and neural correlates of emotional processing under controlled conditions (Carvalho et al., 2012). In contrast, VR paradigms are particularly well-suited for the continuous acquisition of peripheral physiological signals, such as electrodermal activity and cardiovascular measures, allowing the real-time monitoring of autonomic responses within immersive and ecologically valid environments (Polo et al., 2025).

Future studies would benefit from the use of neurophysiological and psychophysiological indicators for a more in-depth analysis of the automatic and physiological processes of the emotional response (Ciuk et al., 2015). Research has shown that psychopathic traits are associated with alterations in neural reactivity to emotional stimuli, including atypical brain patterns, attenuated electrodermal responses, and variations in heart rate (Pinheiro et al., 2024). In this regard, the integration of neurophysiological measures (e.g., brain activity recordings) and psychophysiological measures (e.g., cortisol, heart rate, electrodermal response) can contribute to a more effective characterization of emotional processing in this population, as they are less susceptible to self-report biases.

Given the inherent limitations of research conducted in prison settings, it is essential to replicate these studies in different contexts, particularly community settings. Additionally, future research should also adopt an intersectional analysis that takes into account different age groups, such as younger incarcerated women and older women, given the increasing aging of the prison population and the evidence that older incarcerated women have specific mental, physical, functional, and social needs, often exacerbated by life trajectories, chronic illness, social isolation, and barriers to accessing care before, during, and after incarceration (Thimmesch et al., 2025). Taking these age-related differences into account may contribute to a better identification of

intervention needs in this population, given the specificities identified, as well as to a deeper understanding of how emotional processing and the expression of psychopathic traits manifest and change across the life course (Maurer et al., 2022).

It is important to emphasize that this research could benefit from replication in different cultural contexts, recognizing the potential influence of sociocultural factors on emotional patterns, life trajectories, and the manifestation of psychopathic traits. The literature has shown that cultural factors influence emotional perception through mechanisms of differential allocation of attention, interpretation of emotional cues, knowledge of cultural norms of emotional expression, and conceptualization of emotions (Li et al., 2025). These variations can influence how emotional stimuli are recognized and processed, limiting the generalization of results to other cultural contexts. Cross-cultural replication could provide a comprehensive view of the relationships between emotional processing and psychopathic traits in incarcerated women. Future developments include replicating this research in partnership with the *Centro de Apoio Psicológico e de Investigação de Moçambique*[4].

Future studies should consider including emotional variables that were not assessed in the present investigation (i.e., emotional regulation, emotional intelligence, alexithymia), as these constructs play a central role in how individuals identify, interpret, and utilize emotional information, directly influencing psychopathic traits (Burghart & Mier, 2022; Edwards et al., 2019; Velotti et al., 2024). Empirical evidence suggests that high levels of emotional intelligence in women appear to be associated with the use of relational manipulation strategies and strategic interpersonal behaviors (Bacon & Regan, 2016), indicating that certain emotional competencies can be mobilized for instrumental purposes, not necessarily implying greater affective empathy.

In addition, exploring other possible directions in the relationships among the variables under study could provide valuable insights for future research, particularly regarding the role of ACEs in alterations in emotional processing, using emotional stimuli (e.g., static or dynamic). Thus, exploring the extent to which early adversity may be associated with deficits in emotional processing tasks would help clarify whether ACEs can contribute to specific patterns across the dimensions of emotional processing (valence, arousal, and dominance), since the literature supports the view that ACEs are associated with alterations in the processes of perception, interpretation, and response to emotional stimuli (Teicher & Samson, 2016).

[4] https://capimmz.com/sobre-nos/

Finally, future research must foster a connection between empirical knowledge and the development, adaptation, and impact assessment of empirically informed and gender-sensitive interventions aimed at the emotional and interpersonal functioning of incarcerated women with psychopathic traits. Integrating the findings of this research can contribute to the development of gender-sensitive and trauma-informed intervention programs tailored to the needs of women in a prison setting. Furthermore, it will be essential to invest in the systematic evaluation of the effectiveness of these interventions, including not only behavioral indicators but also changes in underlying psychological processes, namely emotional regulation, empathic responsiveness, and emotional integration, promoting a more comprehensive and sustained approach to rehabilitation in prison and social reintegration in the community.

7. Conclusion: From Data to Lived Experience

This doctoral thesis sought to move beyond deficit-based perspectives on the phenotypic manifestations of psychopathic traits in incarcerated women, emphasizing a dimensional understanding of psychopathic traits through their core facets, interpersonal, affective, lifestyle, and antisocial. By integrating developmental, emotional, and cognitive mechanisms, this work provides a comprehensive and systemic account of emotional processing in women who have committed crimes, highlighting the role of contextual and developmental factors in shaping the phenotypic expression of psychopathy.

Across the studies, psychopathic traits in incarcerated women do not emerge as a global emotional deficit, but rather as a selective and context-dependent configuration, grounded in developmental trajectories marked by adversity and, in some cases, modulated by protective experiences. This configuration is characterized by a dissociation between preserved cognitive capacities, particularly cognitive empathy and EF, and reduced affective responsiveness and emotional integration. Specifically, the findings indicate that incarcerated women with psychopathic traits retain the ability to accurately identify and cognitively appraise emotional stimuli, as reflected in the preservation of valence processing, as well as intact cognitive empathy. In parallel, EF, particularly cold executive processes such as cognitive flexibility, abstraction, and planning, appears preserved or even efficient, especially in the context of developmental adversity.

However, these preserved cognitive capacities coexist with reduced affective engagement, evidenced by diminished emotional reactivity, particularly lower arousal to neutral stimuli and reduced perceived dominance in unpleasant and ambiguous contexts, as well as consistent

difficulties in affective empathy. This pattern suggests that emotional information is processed at a cognitive level but is not fully integrated at an affective level, limiting emotional resonance and the incorporation of affective signals into decision-making. Consequently, the ability to accurately understand others may coexist with limited emotional involvement, facilitating forms of interpersonal functioning that rely on cognitive appraisal and strategic processing, rather than affective engagement. These findings may help explain how women who committed crimes can navigate social interactions effectively while remaining relatively insensitive to the emotional consequences of their behavior for others.

These findings should be interpreted in light of the prison context in which these women are serving their sentences. Although the functional implications of the prison context and adaptation to it have not been directly assessed in this thesis, the coexistence of preserved cognitive abilities and reduced affective involvement may facilitate forms of adaptation to highly regulated and rigorously supervised environments. In these contexts, the ability to maintain behavioral control, strategically interpret social cues, and limit emotional reactivity can function as adaptive mechanisms, supporting compliance with institutional demands. From this perspective, emotional disengagement and instrumental interpersonal function may not only reflect socio-emotional configurations but also act as reinforcers of context-sensitive strategies that promote adjustment and psychological survival in the prison environment.

The results also highlight that these patterns do not emerge in isolation but are embedded in life histories marked by cumulative adversity. Participants reported high rates of ACEs, including physical and sexual abuse, emotional neglect, exposure to DV, substance abuse within the family, and familial incarceration. These developmental trajectories are rarely systematically addressed upon entry into the prison system, nor are they consistently integrated into intervention planning, despite evidence that such experiences may be exacerbated within the prison environment. Moving from data to lived experience, one episode during data collection remains particularly illustrative of the gap between psychological suffering and institutional response. During one of the data collection sessions, a woman entered the room visibly distressed, crying, with her young child beside her and her arms covered in blood. When asked what had happened, she stated, in a state of visible anguish, that she had harmed herself because she was “suffering a lot.” Immediate contact with prison staff was made to ensure access to clinical support. However, the initial response she received was framed in disciplinary terms, focusing on the consequences of her behavior rather than on her psychological state. In a subsequent interaction, the same woman

reported having been sanctioned, including the restriction of contact with her family, which further intensified her distress. This episode, although singular, reflects a broader structural issue: the difficulty in recognizing and responding to manifestations of psychological suffering within prison settings. It underscores the need for trauma-informed practices and specialized training for prison staff, so that behaviors rooted in distress are addressed as clinical signals rather than solely as disciplinary infractions.

On a broader level, these findings point to the importance of prison environments that promote psychological safety, relational continuity, and meaningful rehabilitation opportunities. Without such conditions, the same adaptive strategies identified in this thesis, such as emotional suppression and instrumental interpersonal functioning, may be reinforced rather than transformed. Importantly, this work also highlights that trajectories of adversity coexist, in some cases, with protective developmental experiences capable of mitigating risk. This dual perspective reinforces the importance of considering both vulnerability and resilience in understanding psychopathy in women.

The work developed within this doctoral program, in addition to its empirical contributions, represents a significant scientific contribution to the study of psychopathy in female samples who committed crimes in the Portuguese context, standing out from most research on the construct of psychopathy, which is mostly conducted with male samples. By focusing on incarcerated women and integrating psychopathic traits, developmental trajectories, and cognitive and emotional mechanisms, this doctoral work addresses a structural gap in national research, contributing to a possible in-depth and gender-sensitive understanding of psychopathy.

At the international level, these empirical studies can contribute to and support current debates on the phenotypic expression and conceptualization of psychopathy in women, mainly because the results challenge traditional models largely derived from male samples. Thus, it is believed that this work promotes the advancement of the literature, providing empirical support for the need to incorporate gender-specific pathways, emotional mechanisms, and developmental contexts in the study of psychopathy.

From a clinical, forensic and policy perspective, further highlight the need for gender-sensitive, and trauma-informed approaches that integrate emotional, developmental, and relational domains into both assessment and intervention practices. They support the design of rehabilitation and reintegration strategies that move beyond standardized models, incorporating the specific emotional, relational, and developmental profiles of women who committed crimes.

Ultimately, this research reinforces the importance of rethinking psychopathy not as a homogeneous and deterministic construct, but as a multidimensional and context-dependent phenomenon, whose expression varies according to gender, life history, and social and prison environments. In sum, this thesis positions psychopathic traits in women as a dynamic and contextually embedded pattern of functioning. Understanding it requires moving from isolated variables to integrated systems, from static traits to developmental processes, and from data to lived experience. It is precisely at this intersection that more effective, humane, and scientifically grounded responses can be developed, both within and beyond the criminal justice system.

References

Allen, J. J., Anderson, C. A., & Bushman, B. J. (2018). The general aggression model. *Current Opinion in Psychology*, *19*, 75–80. https://doi.org/10.1016/j.copsyc.2017.03.034

Althubaiti A. (2016). Information bias in health research: definition, pitfalls, and adjustment methods. *Journal of Multidisciplinary Healthcare*, *9*, 211–217. https://doi.org/10.2147/JMDH.S104807

Amores, A., & De la Calle Maldonado, C. (2024). Service learning in non-formal education in a penitentiary center. *European Public & Social Innovation Review*, *9*, 1–14. https://doi.org/10.31637/epsir-2024-545

Añaños-Bedriñana, F., García-Vita, M. M., & Raya-Miranda, R. (2019). Dropout, autonomy and reintegration in Spain: A study of the life of young women on temporary release. *Frontiers in Psychology, 10*, 1509. https://doi.org/10.3389/fpsyg.2019.01509

Añaños, F., Galán-Casado, D., & García-Vita, M. M. (2020). Education as a key element in the social reintegration of women in prison. *International Journal of Educational Development, 77*, 102224. https://doi.org/10.55905/revconv.17n.2-085

Anderson, N. E., & Kiehl, K. A. (2014). Psychopathy and aggression: when paralimbic dysfunction leads to violence. *Current Topics in Behavioral Neurosciences*, *17*, 369–393. https://doi.org/10.1007/7854_2013_257

Anderson, S. J. (2019). Longitudinal study designs. In P. Liamputtong (Ed.), *Handbook of research methods in health social sciences* (pp. 603–622). Springer. https://doi.org/10.1007/978-981-10-5251-4_70

Andrews, D. A., & Bonta, J. (2010). *The psychology of criminal conduct* (5th ed.). Routledge.

Ansbro, M. (2008). Using attachment theory with offenders. *Probation Journal*, *55*(3), 231-244. https://doi.org/10.1177/0264550508092812

Aradhye, C., & Vonk, J. (2014). Theory of mind in vulnerable and grandiose narcissism. In A. Besser (Ed.), *Handbook of the psychology of narcissism: Diverse perspectives* (pp. 347–361). Nova Science Publishers.

Arboleda-Flórez, J. (2020). The psychopath in prison. In A. R. Felthous & H. Saß (Eds.), *The Wiley international handbook on psychopathic disorders and the law* (2nd ed., pp. 513–532). Wiley. https://doi.org/10.1002/9781119159322.ch69

Arias Valencia, M. M. (2022). Principles, scope, and limitations of the methodological triangulation. *Investigacion y Educacion en Enfermeria*, *40*(2), e03. https://doi.org/10.17533/udea.iee.v40n2e03

Auty, K. M., & Liebling, A. (2020). Exploring the relationship between prison social climate and reoffending. *Justice Quarterly*, *37*(2), 358–381. https://doi.org/10.1080/07418825.2018.1538421

Bacon, A. M., & Regan, L. (2016). Manipulative relational behaviour and delinquency: sex differences and links with emotional intelligence. *The Journal of Forensic Psychiatry & Psychology*, *27*(3), 331–348. https://doi.org/10.1080/14789949.2015.1134625

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the Mind in the Eyes" Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. *Journal of Child Psychology and Psychiatry, 42*(2), 241–251. https://doi.org/10.1111/14697610.00715

Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2015). Altering the cognitive-affective dysfunctions of psychopathic and externalizing offender subtypes with cognitive remediation. *Clinical Psychological Science, 3*(1), 45–57. https://doi.org/10.1177/2167702614560744

Bateman, A., & Fonagy, P. (2013). Mentalization-based treatment. *Psychoanalytic Inquiry*, *33*(6), 595–613. https://doi.org/10.1080/07351690.2013.835170

Bateman, A., O'Connell, J., Lorenzini, N., Gardner, T., & Fonagy, P. (2016). A randomised controlled trial of mentalization-based treatment versus structured clinical management for patients with comorbid borderline personality disorder and antisocial personality disorder. *BMC Psychiatry*, *16*(1), 304. https://doi.org/10.1186/s12888-016-1000-9

Bauer, G. R., Churchill, S. M., Mahendran, M., Walwyn, C., Lizotte, D., & Villa-Rueda, A. A. (2021). Intersectionality in quantitative research: A systematic review of its emergence and applications of theory and methods. *SSM - Population Health*, *14*, 100798. https://doi.org/10.1016/j.ssmph.2021.100798

Ben-Zur, H. (2019). Transactional Model of Stress and Coping. In: Zeigler-Hill, V., Shackelford, T. (Eds.), *Encyclopedia of Personality and Individual Differences* (pp. 1–4). Springer. https://doi.org/10.1007/978-3-319-28099-8_2128-1

Bernstein, D. P., Arntz, A., & de Vos, M. (2007). Schema focused therapy in forensic settings: Theoretical model and recommendations for best clinical practice. *The International Journal of Forensic Mental Health, 6*(2), 169–183. https://doi.org/10.1080/14999013.2007.10471261

Bethell, C. D., Jones, J., Gombojav, N., Linkenbach, J., & Sege, R. (2019). Positive childhood experiences and adult mental and relational health in a statewide sample. *JAMA Pediatrics, 173*(11), e193007. https://doi.org/10.1001/jamapediatrics.2019.3007

Blair, R. J. R. (2005). Applying a cognitive neuroscience perspective to the disorder of psychopathy. *Development and Psychopathology, 17*(3), 865–891. https://doi.org/10.1017/S0954579405050418

Blair, R. J. R. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends in Cognitive Sciences, 11*(9), 387–392. https://doi.org/10.1016/j.tics.2007.07.003

Bloom, B., Owen, B., & Covington, S. (2003). *Gender-Responsive Strategies: Research, Practice, and Guiding Principles for Women Offenders.* U.S. Department of Justice, National Institute of Corrections. Retrieved April 2, 2026, from https://www.govinfo.gov/content/pkg/GOVPUB-J16_100-PURL-LPS33526/pdf/GOVPUB-J16_100-PURL-LPS33526.pdf

Bonta, J., & Andrews, D.A. (2023). *The Psychology of Criminal Conduct* (7th ed.). Routledge. https://doi.org/10.4324/9781003292128

Booth, A. T., Welsh, E. T., Jayasinghe, A., Elliott, A., Tsorlinis, K., Story, K., Lefebour, L., & McIntosh, J. E. (2025). Family-centered support for women prisoners to reduce recidivism risk: The 'Strengthening Connections' Service. *International Journal of Offender Therapy and Comparative Criminology*. Advance online publication. https://doi.org/10.1177/0306624X251389984

Brook, M., Brieman, C. L., & Kosson, D. S. (2013). Emotion processing in Psychopathy Checklist-assessed psychopathy: A review of the literature. *Clinical Psychology Review*, *33*(8), 979–995. https://doi.org/10.1016/j.cpr.2013.07.008

Brown, N., & Ashcroft, K. (2025). The effectiveness of compassion focused therapy for the three flows of Compassion, self-criticism, and shame in clinical populations: A systematic review. *Behavioral Sciences*, *15*(8), 1031. https://doi.org/10.3390/bs15081031

Burghart, M., & Mier, D. (2022). No feelings for me, no feelings for you: A meta-analysis on alexithymia and empathy in psychopathy. *Personality and Individual Differences, 194,* 1–11. https://doi.org/10.1016/j.paid.2022.111658

Byrne, J.M. (2020). The effectiveness of prison programming: A review of the research literature examining the impact of Federal, State, and Local Inmate Programming on Post-Release Recidivism. *Federal Probation, 84*(1), 3–20.

Callaghan, B. L., & Tottenham, N. (2016). The stress acceleration hypothesis: Effects of early-life adversity on emotion circuits and behavior. *Current Opinion in Behavioral Sciences*, *7*, 76–81. https://doi.org/10.1016/j.cobeha.2015.11.018

Campos, C., Pasion, R., Azeredo, A., Ramião, E., Mazer, P., Macedo, I., & Barbosa, F. (2022). Refining the link between psychopathy, antisocial behavior, and empathy: A meta-analytical approach across different conceptual frameworks. *Clinical Psychology Review*, *94*, Article 102145. https://doi.org/10.1016/j.cpr.2022.102145

Carvalho, S., Leite, J., Galdo-Álvarez, S., & Gonçalves, O. F. (2012). The Emotional Movie Database (EMDB): A self-report and psychophysiological study. *Applied Psychophysiology and Biofeedback*, *37*(4), 279–294. https://doi.org/10.1007/s10484-012-9201-6

Cicchetti, D., & Rogosch, F. A. (2002). A developmental psychopathology perspective on adolescence. *Journal of Consulting and Clinical Psychology, 70*(1), 6–20. https://doi.org/10.1037/0022-006X.70.1.6

Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: the coming of age of a discipline. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *50*(1-2), 16–25. https://doi.org/10.1111/j.1469-7610.2008.01979.x

Ciuk, D., Troy, A., & Jones, M. (2015). Measuring Emotion: Self-Reports vs. Physiological Indicators. *SSRN Electronic Journal*. http://dx.doi.org/10.2139/ssrn.2595359

Cleckley, H. (1941). *The mask of sanity; an attempt to reinterpret the so-called psychopathic personality.* Mosby.

Cohen, J. A., & Mannarino, A. P. (2015). Trauma-focused cognitive behavior therapy for traumatized children and families. *Child and Adolescent Psychiatric Clinics of North America*, *24*(3), 557–570. https://doi.org/10.1016/j.chc.2015.02.005

Coid, J., & Ullrich, S. (2010). Antisocial personality disorder is on a continuum with psychopathy. *Comprehensive Psychiatry*, *51*(4), 426–433. https://doi.org/10.1016/j.comppsych.2009.09.006

Council of Europe. (1950). *European Convention on Human Rights*. Retrieved April 17, 2026, from https://www.echr.coe.int/documents/d/echr/convention_ENG

Council of Europe. (2006). *Short guide to the European Prison Rules*. Retrieved April 17, 2026, https://cdn.penalreform.org/wp-content/uploads/2022/03/PRI-CoE_Short-guide-to-the-European-Prison-Rules.pdf

Council of Europe. (2020). *Recommendation Rec (2006)2-rev of the Committee of Ministers to member States on the European Prison Rules*. Retrieved April 17, 2026, https://dgrsp.justica.gov.pt/Portals/16/Legislacao/Justica%20Penal/RPEuropeias.pdf?ver=2020-08-06-161754-313

Covington, S. (2013). *Beyond Violence: A prevention program for criminal justice-involved women*. John Wiley & Sons, Inc.

Covington, S. (2022). Creating a trauma-informed Justice system for women. In Gelsthorpe L. (Ed.), *The Wiley handbook on what works with girls and women in conflict with the law: A critical review of theory, practice, and policy* (pp. 172–184). John Wiley & Sons Ltd. https://doi.org/10.1002/9781119874898.ch12

Covington, S. S. (2003). A woman's journey home: Challenges for female offenders and their children. In J. Travis & M. Waul (Eds.), *Prisoners once removed: The impact of incarceration and reentry on children, families, and communities* (pp. 67–93). Urban Institute Press.

Covington, S.S. (2007). The Relational Theory of Women's Psychological Development: Implications for the Criminal Justice System. In R. Zaplin (Ed.), *Female Offenders: Critical Perspectives and Effective Interventions* (2nd ed., pp. 135-164). Sudbury, Mass: Jones and Bartlett Publishers.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: Sage.

Crewe, B. (2011). Soft power in prison: Implications for staff–prisoner relationships, liberty and legitimacy. *European Journal of Criminology*, *8*(6), 455-468. https://doi.org/10.1177/1477370811413805

Cunha, M., I. (2014). New directions in prison ethnography. *Configurações 13* (1), 47-68. https://doi.org/10.4000/configuracoes.2389

Cunha, O., Cruz, A. R., Rodrigues, A. de C., & Paulino, P. (2026, fevereiro). *Mind the gap: Education and social (re)integration after imprisonment*. Observatório Social – Fundação la Caixa. Retrieved April 17, 2026, from https://oobservatoriosocial.fundacaolacaixa.pt/en/-/mind-the-gap-education-and-social-re-integration-after-imprisonment

da Silva, D. R., & Rijo, D. (2022). Compassion focused therapy in forensic settings. In P. Gilbert & G. Simos (Eds.), *Compassion focused therapy: Clinical practice and applications* (1st ed., pp. 505–518). Routledge.

De Brito, S. A., Forth, A. E., Baskin-Sommers, A. R., Brazil, I. A., Kimonis, E. R., Pardini, D., Frick, P. J., Blair, R. J. R., & Viding, E. (2021). Psychopathy. *Nature Reviews Disease primers*, *7*(1), 49. https://doi.org/10.1038/s41572-021-00282-1

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026). The gap between best practices and reality: A systematic review on the interventions with incarcerated women. *Trauma, Violence, & Abuse*. Advance online publication. https://doi.org/10.1177/15248380261439135

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026a, September 11–12). *Layers of vulnerability in incarcerated women* [Poster presentation]. Women Behind Bars – Female Portuguese Inmates Symposium, ISPA, Lisbon, Portugal.

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026b, September 11–12). *The motivations for Crime Commission* [Poster presentation]. Women Behind Bars – Female Portuguese Inmates Symposium, ISPA, Lisbon, Portugal.

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026c, September 11–12). *Emotional Needs of Incarcerated Women in Portugal* [Poster presentation]. Women Behind Bars – Female Portuguese Inmates Symposium, ISPA, Lisbon, Portugal.

de Castro Rodrigues, A., Candus, F., Cruz, A. R., Gelsthorpe, L., Knittel, S., Sousa, M., Thouars da Silva, E., & Cunha, O. (2026d, September 11–12). *The Burdens of Incarceration* [Poster presentation]. Women Behind Bars – Female Portuguese Inmates Symposium, ISPA, Lisbon, Portugal.

Decety, J., & Cowell, J. M. (2014). The complex relation between morality and empathy. *Trends in Cognitive Sciences*, *18*(7), 337–339. https://doi.org/10.1016/j.tics.2014.04.008

Decreto-Lei 115/2009, de 12 de outubro: Código da Execução das Penas e Medidas Privativas da Liberdade. Diário da República. Retrieved April 17, 2026, from https://diariodarepublica.pt/dr/legislacao-consolidada/lei/2009-34515975

Decreto-Lei n.º 51/2011, de 11 de abril: Aprova o Regulamento Geral dos Estabelecimentos Prisionais. (2011). Diário da República. Retrieved April 17, 2026, from https://diariodarepublica.pt/dr/legislacao-consolidada/decreto-lei/2011-108045548

Del Giudice, M., Ellis, B. J., & Shirtcliff, E. A. (2011). The Adaptive Calibration Model of stress responsivity. *Neuroscience and Biobehavioral Reviews*, *35*(7), 1562–1592. https://doi.org/10.1016/j.neubiorev.2010.11.007

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135–168. https://doi.org/10.1146/annurev-psych-113011-143750

Dores, A. P., Pontes, N., & Loureiro, R. (2013, September). *Prison conditions in Portugal* (2nd ed.). Antigone Edizioni. Retrieved February 15, 2026, from https://www.prisonobservatory.org

Doyle, M., Tarrier, N., Shaw, J., Dunn, G., & Dolan, M. (2016). Exploratory trial of schema-focussed therapy in a forensic personality disordered population. *Journal of Forensic Psychiatry and Psychology*, *27*(2), 232-247. https://doi.org/10.1080/14789949.2015.1107119

Duwe, G., & Clark, V. (2015). *Moving on: An outcome evaluation of a gender-responsive, cognitive-behavioral program for female offenders*. Minnesota Department of Corrections. Retrieved February 15, 2026, from https://mn.gov/doc/assets/Moving_On_Evaluation_-_July_2015_tcm1089-272836.pdf

Edwards, B. G., Ermer, E., Salovey, P., & Kiehl, K. A. (2019). Emotional intelligence in incarcerated female offenders with psychopathic traits. *Journal of Personality Disorders*, *33*(3), 370–393. https://doi.org/10.1521/pedi_2018_32_349

Eisenbarth, H., Angrilli, A., Calogero, A., Harper, J., Olson, L. A., & Bernat, E. (2013). Reduced negative affect response in female psychopaths. *Biological Psychology*, *94*(2), 310–318. https://doi.org/10.1016/j.biopsycho.2013.07.007

EuroPris. (n.d.). *EuroPris: Promoting professional prison practice*. Retrieved March 14, 2026, from https://www.europris.org

Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. *Dental Press Journal of Orthodontics*, *19*(4), 27–29. https://doi.org/10.1590/2176-9451.19.4.027-029.ebo

Farrington, D. P. (2010). The developmental evidence base: Psychosocial research. In G. J. Towl & D. A. Crighton (Eds.), *Forensic psychology* (pp. 113–132). Wiley Blackwell.

Fernández Gómez, C. (2023). *A new approach for open prisons in Spain*. EuroPris. Retrieved February 25, 2026, from https://www.europris.org/wp-content/uploads/2023/03/Paper-on-open-prisons-Carlos-Fernandez-Spain.pdf

Fonagy, P., & Luyten, P. (2018). Attachment, mentalizing, and the self. In W. J. Livesley & R. Larstone (Eds.), *Handbook of personality disorders: Theory, research, and treatment* (2nd ed., pp. 123–140). The Guilford Press.

Forouzan, E., & Cooke, D. J. (2005). Figuring out la femme fatale: Conceptual and assessment issues concerning psychopathy in females. *Behavioral Sciences & the Law*, 23(6), 765–778. https://doi.org/10.1002/bsl.669

Frankenhuis, W. E., & Nettle, D. (2020). Current debates in human life history research. *Evolution and Human Behavior, 41*(6), 469–473. https://doi.org/10.1016/j.evolhumbehav.2020.09.005

Friedman, N. P., & Miyake, A. (2017). Unity and diversity of executive functions: Individual differences as a window on cognitive structure. *Cortex*, *86*, 186–204. https://doi.org/10.1016/j.cortex.2016.04.023

Galietta, M., & Rosenfeld, B. (2012). Adapting Dialectical Behavior Therapy (DBT) for the treatment of psychopathy. *The International Journal of Forensic Mental Health, 11*(4), 325–335. https://doi.org/10.1080/14999013.2012.746762

Gao, Y., & Raine, A. (2010). Successful and unsuccessful psychopaths: a neurobiological model. *Behavioral Sciences & the Law*, *28*(2), 194–210. https://doi.org/10.1002/bsl.924

Gee, J., & Reed, S. (2013). The HoST programme: A pilot evaluation of modified dialectical behaviour therapy with female offenders diagnosed with borderline personality disorder. *European Journal of Psychotherapy & Counselling, 15*(3), 233–252. https://doi.org/10.1080/13642537.2013.810659

Gilbert, P. (2009). Introducing compassion-focused therapy. *Advances in Psychiatric Treatment*, *15*(3), 199–208. https://doi.org/10.1192/apt.bp.107.005264

Gilbert, P. (2019). Explorations into the nature and function of compassion. *Current Opinion in Psychology*, *28*, 108–114. https://doi.org/10.1016/j.copsyc.2018.12.002

Gonçalves, I., Oliveira, J., Cruz, A. R., Maia, I., Gamito, P., & Carvalho, J. (2026). Cognitive dysfunction and criminal behavior: Investigating executive functions in convicted individuals. *International Journal of Cognitive Sciences, 2*(1), 2. https://doi.org/10.3390/ijcs2010002

Hall, K. J., Van Ooteghem, K., & McIlroy, W. E. (2023). Emotional state as a modulator of autonomic and somatic nervous system activity in postural control: A review. *Frontiers in Neurology*, *14*, 1188799. https://doi.org/10.3389/fneur.2023.1188799

Hamilton, R. B., & Newman, J. P. (2018). The response modulation hypothesis: Formulation, development, and implications for psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 80–93). The Guilford Press.

Hardyman P. L., & Van Voorhis P. (2004). *Developing gender-specific classification systems for women offenders*. Department of Justice, National Institute of Corrections. Washington, DC.

Hare, R.D. (2003). *Manual for the revised psychopathy checklist* (2nd ed.). Multi-Health Systems, Toronto.

Harenski, C. L., Harenski, K. A., & Kiehl, K. A. (2014). Neural processing of moral violations among incarcerated adolescents with psychopathic traits. *Developmental Cognitive Neuroscience*, *10*, 181–189. https://doi.org/10.1016/j.dcn.2014.09.002

Hawes, D. J., & Allen, J. L. (2023). A developmental psychopathology perspective on adverse childhood experiences (ACEs): Introduction to the Special Issue. *Research on Child and Adolescent Psychopathology*, *51*(12), 1715–1723. https://doi.org/10.1007/s10802-023-01100-w

Haynie, D. L., Whichard, C., Kreager, D. A., Schaefer, D. R., & Wakefield, S. (2018). Social networks and health in a prison unit. *Journal of Health and Social Behavior*, *59*(3), 318–334. https://doi.org/10.1177/0022146518790935

Heckman, C. J., Cropsey, K. L., & Olds-Davis, T. (2007). Posttraumatic stress disorder treatment in correctional settings: A brief review of the empirical literature and suggestions for future research. *Psychotherapy: Theory, Research, Practice, Training, 44*(1), 46–53. https://doi.org/10.1037/0033-3204.44.1.46

Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger-hostility. *Journal of Abnormal Psychology, 115*(2), 276–287. https://doi.org/10.1037/0021-843X.115.2.276

HM Prison and Probation Service & NHS England. (2020). *Practitioner guide: Working with people in the criminal justice system showing personality difficulties* (3rd ed.). Retrieved February 25, 2026, from https://assets.publishing.service.gov.uk/media/619e6dbb8fa8f5037e8ccb2c/6.5151_HMPPS_Working_with_Offenders_with_Personality_Disorder_accessible_version_.pdf

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet. Public health*, *2*(8), e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4

Irwin, J., & Cressey, D. R. (1962). Thieves, convicts and the inmate subculture. *Social Problems, 10*(2), 142–155. https://doi.org/10.2307/799047

Kiehl, K. A. (2006). A cognitive neuroscience perspective on psychopathy: evidence for paralimbic system dysfunction. *Psychiatry Research*, *142*(2-3), 107–128. https://doi.org/10.1016/j.psychres.2005.09.013

King, E. A. (2017). Outcomes of trauma-informed interventions for incarcerated women: A review. *International Journal of Offender Therapy and Comparative Criminology, 61*(6), 667–688. https://doi.org/10.1177/0306624X15603082

Koehler, J., & Lösel, F. (2025). A meta-evaluative synthesis of the effects of custodial and community-based offender rehabilitation. *European Journal of Criminology*, *22*(1), 3-29. https://doi.org/10.1177/14773708241256501

Lamoureux, V. A., & Glenn, A. L. (2021). An analysis of conscious fear and automatic threat response in psychopathy. *Personality Disorders: Theory, Research, and Treatment, 12*(2), 171–181. https://doi.org/10.1037/per0000406

Lanciano, T., de Leonardis, L., & Curci, A. (2022). The psychological effects of imprisonment: The role of cognitive, psychopathic and affective traits. *Europe's journal of psychology*, *18*(3), 262–278. https://doi.org/10.5964/ejop.3995

Levy, J., Yirmiya, K., Goldstein, A., & Feldman, R. (2019). The neural basis of empathy and empathic behavior in the context of chronic trauma. *Frontiers in Psychiatry*, *10*, 562. https://doi.org/10.3389/fpsyt.2019.00562

Li, Q., Zhao, Y., Gong, B., Li, R., Wang, Y., Yan, X., & Wu, C. (2022). Visual affective stimulus database: A validated set of short videos. *Behavioral Sciences*, *12*(5), 137. https://doi.org/10.3390/bs12050137

Li, R., Quang, H., Filipčíková, M., Xu, Y., Kumfor, F., Spehar, B., & McDonald, S. (2025). Why do cultures affect facial emotion perception? A systematic review. *Journal of Cross-Cultural Psychology*, *56*(6), 680-710. https://doi.org/10.1177/00220221251334811

Liebling, A., Hulley, S., & Crewe, B. (2012). Conceptualising and measuring the quality of prison life. *The British Journal of Criminology, 52*(2), 358–375.

Liebling, A., Laws, B., Lieber, E., Auty, K., Schmidt, B.E., Crewe, B., Gardom, J., Kant, D., & Morey, M. (2019). Are hope and possibility achievable in prison?. *The Howard Journal of Crime and Justice*, *58*, 104-126. https://doi.org/10.1111/hojo.12303

Linehan, M. M. (2015). *DBT® skills training manual* (2nd ed.). The Guilford Press.

Liu, H., Li, T. W., Liang, L., & Hou, W. K. (2021). Trauma exposure and mental health of prisoners and ex-prisoners: A systematic review and meta-analysis. *Clinical Psychology Review*, *89*, 102069. https://doi.org/10.1016/j.cpr.2021.102069

Lomani, J., & Brooker, C. (2022). Trauma-informed care in women's prisons: A co-produced rapid literature review. *OSF Preprints*. https://doi.org/10.31219/osf.io/mxa93

Lorenz, A. R., & Newman, J. P. (2002). Deficient response modulation and emotion processing in low-anxious Caucasian psychopathic offenders: results from a lexical decision task. *Emotion, 2*(2), 91–104. https://doi.org/10.1037/1528-3542.2.2.91

Loureiro, A., & Pinto, J. A. (Eds.). (2022). *Prison education: Paths and challenges.* Universidade de Trás-os-Montes e Alto Douro. Retrieved February 12, 2026, from https://apenp.pt/images/Noticias/Prison_Education/Educacao_nas_Prisoes_-_Prison_Education.pdf

Maia, B., Cruz, A. R., & Cunha, O. (2025). Adverse and positive childhood experiences and emotional regulation difficulties in a sample of incarcerated men. *Behavioral Sciences, 15*(6), 828. https://doi.org/10.3390/bs15060828

Malik, N., Facer-Irwin, E., Dickson, H., Bird, A., & MacManus, D. (2023). The effectiveness of trauma-focused interventions in prison settings: A systematic review and meta-analysis. *Trauma, Violence & Abuse*, *24*(2), 844–857. https://doi.org/10.1177/15248380211043890

Martinovic, M., Kennedy, K., & A'Vard, T. (2025). Transcending the prison walls through transformative learning: The Australian Inside-Out Prison Exchange Program. *Safer Communities*, *24*(4), 377–390. https://doi.org/10.1108/SC-03-2025-0027

Mastrobuoni, G., & Daniele, T. (2022). Leave the door open? Prison conditions and recidivism. *American Economic Journal: Applied Economics, 14*(4), 200–233. https://doi.org/10.1257/app.20190038

Matos, Raquel, Cunha, M.I., Carvalho, P.M., Tavares, R., & Miranda Pereira, L. (2017). Women in prison in Portugal. In P.H. van Kempen & M. Krabbe (Eds.) *Women in prison: the Bangkok rules and beyond* (pp. 613-644). Cambridge: Intersentia

Maurer, J. M., Edwards, B. G., Harenski, C. L., Decety, J., & Kiehl, K. A. (2022). Do psychopathic traits vary with age among women? A cross-sectional investigation. *The Journal of Forensic Psychiatry & Psychology*, *33*(1), 112–129. https://doi.org/10.1080/14789949.2022.2036220

Mazher, S., & Arai, T. (2025). Behind bars: A trauma-informed examination of mental health through importation and deprivation models in prisons. *European Journal of Trauma & Dissociation, 9*(1), Article 100516. https://doi.org/10.1016/j.ejtd.2025.100516

McKendy, L., & Ricciardelli, R. (2021). The pains of imprisonment and contemporary prisoner culture in Canada. *The Prison Journal*, *101*(5), 528-552. https://doi.org/10.1177/00328855211048166

Međedović, J., Drndarević, N., & Ilijić, L. (2024). Unfavorable prison social climate links dark tetrad traits with self-reported institutional misconduct. *Personality and Individual Differences, 227,* 1–7. https://doi.org/10.1016/j.paid.2024.112707

Meijers, J., Harte, J. M., Jonker, F. A., & Meynen, G. (2015). Prison brain? Executive dysfunction in prisoners. *Frontiers in Psychology*, *6*, 43. https://doi.org/10.3389/fpsyg.2015.00043

Messina, N. P., & Esparza, P. (2022). Poking the bear: The inapplicability of the RNR principles for justice-involved women. *Journal of Substance Abuse Treatment, 140,* 1–9. https://doi.org/10.1016/j.jsat.2022.108798

Messina, N. P., Braithwaite, J., Calhoun, S., & Kubiak, S. (2016). Examination of a violence prevention program for female offenders. *Violence and Gender*, *3*(3), 143-149. https://doi.org/10.1089/vio.2015.0048

Messina, N., Calhoun, S., & Braithwaite, J. (2014). Trauma-informed treatment decreases posttraumatic stress disorder among women offenders. *Journal of Trauma & Dissociation*, *15*(1), 6–23. https://doi.org/10.1080/15299732.2013.818609

Mielitz, V., & Franko, P. (2022). Prison education in Slovenia. In A. Loureiro & J. A. Pinto (Eds.), *Prison education: Paths and challenges* (pp. 32–37). Universidade de Trás-os-Montes e Alto Douro. Retrieved April 9, 2026, from https://apenp.pt/images/Noticias/Prison_Education/Educacao_nas_Prisoes_-_Prison_Education.pdf

Mikulincer, M., Shaver, P.R. & Pereg, D. (2003). Attachment theory and affect regulation: The dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion 27*, 77–102. https://doi.org/10.1023/A:1024515519160

Miller, N. A., & Najavits, L. M. (2012). Creating trauma-informed correctional care: A balance of goals and environment. *European Journal of Psychotraumatology*, *3*(1). https://doi.org/10.3402/ejpt.v3i0.17246

Mohajerin, B., Shamsi, A., & Howard, R. (2024). A randomized controlled trial comparing mentalization-based therapy with the unified protocol in the treatment of psychopathy and comorbid borderline + antisocial personality disorders. *Clinical Psychology & Psychotherapy*, *31*(4). https://doi.org/10.1002/cpp.3047

Moles-López, E., & Añaños, F. T. (2021). Factors of prison recidivism in women: a socioeducational and sustainable development analysis. *Sustainability, 13*(11), 5822. https://doi.org/10.3390/su13115822

Moreira, D., Sá Moreira, D., Oliveira, S., Ribeiro, F. N., Barbosa, F., Fávero, M., & Gomes, V. (2020). Relationship between adverse childhood experiences and psychopathy: A systematic review. *Aggression and Violent Behavior, 53,* Article 101452. https://doi.org/10.1016/j.avb.2020.101452

Mourão, A., Sousa, M., Ferreira, M., Gonçalves, L., Caridade, S., & Cunha, O. (2025). Beyond recidivism: A systematic review exploring comprehensive criteria for successful reintegration after prison release. *Criminal Justice and Behavior*, *52*(8), 1173-1199. https://doi.org/10.1177/00938548251335322

Najavits, L. M. (2002). *Seeking safety: A treatment manual for PTSD and substance abuse.* Guilford Press.

Narayan, A. J., Rivera, L. M., Bernstein, R. E., Harris, W. W., & Lieberman, A. F. (2018). Positive childhood experiences predict less psychopathology and stress in pregnant women with childhood adversity: A pilot study of the benevolent childhood experiences (BCEs) scale. *Child Abuse & Neglect*, *78*, 19–30. https://doi.org/10.1016/j.chiabu.2017.09.022

Patterson, C. M., & Newman, J. P. (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. *Psychological Review, 100*(4), 716–736. https://doi.org/10.1037/0033-295X.100.4.716

Paulhus, D. L. (2002). Socially desirable responding: The evolution of a construct. In H. I. Braun, D. N. Jackson, & D. E. Wiley (Eds.), *The role of constructs in psychological and educational measurement* (pp. 49–69). Lawrence Erlbaum Associates Publishers.

Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2016). *Manual for the Hare Self-Report Psychopathy scale*. Toronto, Ontario, Canada: Multi-Health Systems.

Pavićević, O., Ilijić, L., & Međedović, J. (2025). *Coping with imprisonment: A comprehensive study of coping mechanisms in prison environments*. Institute of Criminological and Sociological Research. https://doi.org/10.47152/PrisonLIFE.D4.4

Pechtel, P., & Pizzagalli, D. A. (2011). Effects of early life stress on cognitive and affective function: An integrated review of human literature. *Psychopharmacology*, *214*(1), 55–70. https://doi.org/10.1007/s00213-010-2009-2

Peleg-Koriat, I., & Weimann-Saks, D. (2025). Unchained voices: Exploring incarcerated women's pathways to restorative justice. *Legal and Criminological Psychology*, 1-15. https://doi.org/10.1111/lcrp.70016

Pemberton, S., Long, J., Holdsworth, E., Mackenzie, K., Ruprai, D., & Summers, R. (2025). *Women's Risk Needs Assessment UK Validation: Preliminary Findings Report.* Women, Crime & Justice Research Group, University of Birmingham. Retrieved April 14, 2026, from https://socialwork.utah.edu/_resources/documents/research/pemberton_et_al_2025_wrna_validation.pdf

Penal Reform International & Council of Europe. (2023). *Guidance document on the European Prison Rules.* Retrieved January 6, 2026, from https://cdn.penalreform.org/wp-content/uploads/2023/05/EPR-Guidance-Doc.pdf

Pinheiro, M. L., Machado, A. B., Gonçalves, R. A., Caridade, S., & Cunha, O. (2025a). Exploring attachment-related factors and psychopathic traits: A systematic review focused on women. *Behavioral sciences*, *15*(9), 1293. https://doi.org/10.3390/bs15091293

Pinheiro, M., Cunha, O., & Gonçalves, R. A. (2019). Emotions, affections, and psychopathy among female prisoners. *International Journal of Offender Therapy and Comparative Criminology*, *64*(6-7), 708-729. https://doi.org/10.1177/0306624X19895976

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2021). Criminal lifestyle, psychopathy, and prison adjustment among female inmates. *Journal of Criminal Justice, 76,* 1–10. https://doi.org/10.1016/j.jcrimjus.2021.101849

Pinheiro, M., Gonçalves, R. A., & Cunha, O. (2024). Emotional processing and psychopathy among women: A systematic review. *Deviant Behavior, 45*(10), 1366–1390. https://doi.org/10.1080/01639625.2023.2295527

Pinheiro, M., Machado, A. B., Gonçalves, R. A., & Cunha, O. (2025b). The moderating role of positive childhood experiences in the relationship between adverse childhood experiences and psychopathic traits in incarcerated women. *Journal of Aggression, Maltreatment & Trauma, 34*(9), 1-21. https://doi.org/10.1080/10926771.2025.2562542

Player, E. (2016). The offender personality disorder pathway and its implications for women prisoners in England and Wales. *Punishment & Society*, *19*(5), 568-589. https://doi.org/10.1177/1462474516672883

Polaschek, D. L. L., & Daly, T. E. (2013). Treatment and psychopathy in forensic settings. *Aggression and Violent Behavior, 18*(5), 592–603. https://doi.org/10.1016/j.avb.2013.06.003

Polo, E. M., Iacomi, F., Rey, A. V., Ferraris, D., Paglialonga, A., & Barbieri, R. (2025). Advancing emotion recognition with Virtual Reality: A multimodal approach using physiological signals and machine

learning. *Computers in Biology and Medicine*, *193*, Article 110310. https://doi.org/10.1016/j.compbiomed.2025.110310

Prison Insider. (2025). Portugal: prisons in 2025. Retrieved January 12, 2026, from https://www.prison-insider.com/en/countryprofile/portugal-2025

Ray, J. V., Hall, J., Rivera-Hudson, N., Poythress, N. G., Lilienfeld, S. O., & Morano, M. (2013). The relation between self-reported psychopathic traits and distorted response styles: A meta-analytic review. *Personality Disorders*, *4*(1), 1–14. https://doi.org/10.1037/a0026482

Resick, P. A., Galovski, T. E., Uhlmansiek, M. O., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology*, *76*(2), 243–258. https://doi.org/10.1037/0022-006X.76.2.243

Ribeiro da Silva, D., Rijo, D., Brazão, N., Paulo, M., Miguel, R., Castilho, P., Vagos, P., Gilbert, P., & Salekin, R. T. (2021). The efficacy of the PSYCHOPATHY.COMP program in reducing psychopathic traits: A controlled trial with male detained youth. *Journal of Consulting and Clinical Psychology, 89*(6), 499–513. https://doi.org/10.1037/ccp0000659

Rutter, M. (2012). Resilience as a dynamic concept. *Development and psychopathology*, *24*(2), 335–344. https://doi.org/10.1017/S0954579412000028

Salehinejad, M. A., Ghanavati, E., Rashid, M. H. A., & Nitsche, M. A. (2021). Hot and cold executive functions in the brain: A prefrontal-cingular network. *Brain and Neuroscience Advances*, *5*, 23982128211007769. https://doi.org/10.1177/23982128211007769

Sameroff, A. (2009). The transactional model. In A. Sameroff (Ed.), *The transactional model of development: How children and contexts shape each other* (pp. 3–21). American Psychological Association. https://doi.org/10.1037/11877-001

Sandvik, A. M., Hansen, A. L., Johnsen, B. H., & Laberg, J. C. (2014). Psychopathy and the ability to read the "language of the eyes": Divergence in the psychopathy construct. *Scandinavian Journal of Psychology, 55*(6), 585–592. https://doi.org/10.1111/sjop.12138

Santos, B. S. (2003). The Social Reintegration of Prisoners. A contribution to the debate on prison system reform. In *Permanent Observatory of Portuguese Justice* (Org.). Centre for Social Studies: Faculty of Economics of the University of Coimbra. (1-494).

Sato, H., & Kawahara, J. (2011). Selective bias in retrospective self-reports of negative mood states. *Anxiety, Stress, and Coping*, *24*(4), 359–367. https://doi.org/10.1080/10615806.2010.543132

Schnittker, J. (2025). Trusting relationships in prison and well-being after release. *SSM - Mental Health, 8*, Article 100539. https://doi.org/10.1016/j.ssmmh.2025.100539

Schurig, H., Stender, E. M., Hennig, J., Ohme, M., Seidel, M., & Ehrlich, S. (2026). NEVi: Negative Emotional Video dataset - Categorizing stimulus intensity ratings based on valence and arousal. *Scientific Data*, *13*(1), 322. https://doi.org/10.1038/s41597-026-06870-8

Shepherd, J., Stein, K., & Milne, R. (2000). Eye movement desensitization and reprocessing in the treatment of post-traumatic stress disorder: A review of an emerging therapy. *Psychological Medicine, 30*(4), 863–871. https://doi.org/10.1017/S0033291799002366

Skeem, J. L., Polaschek, D. L. L., & Manchak, S. (2009). Appropriate treatment works, but how?: Rehabilitating general, psychopathic, and high-risk offenders. In J. L. Skeem (Ed.) & K. S. Douglas & S. O. Lilienfeld (Ed.), *Psychological science in the courtroom: Consensus and controversy* (pp. 358–384). The Guilford Press.

Smith, J. M., Gacono, C. B., & Cunliffe, T. B. (2021). The PCL-R, PAI, and Rorschach as predictors of institutional misconduct with incarcerated women. *Women & Criminal Justice*, *32*(6), 483–501. https://doi.org/10.1080/08974454.2021.1976699

Sousa, M., Gonçalves, T., Caridade, S., de Castro-Rodrigues, A., Maia, Â., & Cunha, O. (2025). The effectiveness of trauma-focused interventions with individuals who perpetrated crimes: A systematic review. *Trauma, Violence, & Abuse*. Advance online publication. https://doi.org/10.1177/15248380251397413

Sousa, M., Gouveia, C., Cunha, O., & de Castro Rodrigues, A. (2024). The effectiveness of schema therapy in individuals who committed crimes: A systematic review. *Trauma, Violence, & Abuse*, *25*(5), 3631-3642. https://doi.org/10.1177/15248380241254082

Spector, P. E. (2019). Do not cross me: Optimizing the use of cross-sectional designs. *Journal of Business and Psychology, 34*(2), 125–137. https://doi.org/10.1007/s10869-018-09613-8

Sykes, G. M. (1958). *The society of captives*. Princeton, NJ: Princeton University Press.

Taheri, S., Khaneghahi, S., & Fardin, M. A. (2025). The effect of emotional intelligence on empathy with the mediating role of helping behaviors in female prisoners with anti-social personality disorder. *Middle East Journal of Rehabilitation and Health Studies, 12*(2), Article e147954. https://doi.org/10.5812/mejrh-147954

Taylor, J. (2025). Applications of compassion-focused therapy in forensic settings: The development of forensic-CF. *Journal of Forensic Practice,* 1–16. https://doi.org/10.1108/JFP-06-2025-0057

Teicher, M. H., & Samson, J. A. (2016). Annual research review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry, 57*(3), 241–266. https://doi.org/10.1111/jcpp.12507

Thimmesch, A., Aponte, C., Krueger, K.J., Knittel, A.K., & Emerson, A. (2025). A scoping review of research to address older women's health during and after incarceration. *Women's Health*, *21*. https://doi.org/10.1177/17455057251392754

Trebilcock, M., Worrall, L., Ryan, B., Shrubsole, K., Jagoe, C., Simmons-Mackie, N., Bright, F., Cruice, M. Pritchard, M. & Le Dorze, Guylaine (2019). Increasing the intensity and comprehensiveness of aphasia services: Identification of key factors influencing implementation across six countries. *Aphasiology*, *33*(7), 865–887. https://doi.org/10.1080/02687038.2019.1602860

Tripodi, S. J., Killian, M. O., Gilmour, M., Curley, E., Herod, L. (2022). Trauma-informed care groups with incarcerated women: An alternative treatment design comparing seeking safety and STAIR. *Journal of the Society for Social Work and Research, 13*(3), 511–531. https://doi.org/10.1086/712732

Tubex, H., & Gately, N. (2025). Women's pathways into prison: Cycles of harm. *Women & Criminal Justice, 35*(1), 1–17. https://doi.org/10.1080/08974454.2025.2532433

United Nations Office on Drugs and Crime. (2011). *United Nations Rules for the Treatment of Women Prisoners and Non-custodial Measures for Women Offenders (the Bangkok Rules) with their Commentary*. Retrieved January 12, 2026, from https://www.unodc.org/documents/justice-and-prison-reform/Bangkok_Rules_ENG_22032015.pdf

United Nations Office on Drugs and Crime. (2015). *United Nations standard minimum rules for the treatment of prisoners (the Nelson Mandela Rules)*. Retrieved January 12, 2026, from https://www.unodc.org/documents/justice-and-prison-reform/GA-RESOLUTION/E_ebook.pdf

Van Dieten, M. (2010). *Moving On: A Program for At-Risk Women. Modules 1 and 6 Facilitator's Guide.* Center City, MN: Hazeldon.

van Dongen J. D. M. (2020). The empathic brain of psychopaths: From social science to neuroscience in empathy. *Frontiers in psychology*, *11*, 695. https://doi.org/10.3389/fpsyg.2020.00695

Van Voorhis, P., Wright, E. M., Salisbury, E., & Bauman, A. (2010). Women's Risk Factors and Their Contributions to existing risk/needs assessment: The current status of a gender-responsive supplement. *Criminal Justice and Behavior*, *37*(3), 261–288.

Velotti, P., Bruno, S., Rogier, G., Beomonte Zobel, S., Vacchino, M., Garofalo, C., & Kosson, D. S. (2024). Psychopathy and impairments in emotion regulation: A systematic review and meta-analysis. *Clinical Psychology Review*, *113*, 102482. https://doi.org/10.1016/j.cpr.2024.102482

Veltman, E., Garofalo, C., Hill, J. M., Blokland, A., & Sellbom, M. (2025). Do early environmental factors influence the relationship between psychopathy and crime: Longitudinal findings from the transitions in Amsterdam study. *Journal of Criminal Justice, 98*, 1–12. Article 102399. https://doi.org/10.1016/j.jcrimjus.2025.102399

Verona, E., & Vitale, J. (2018). Psychopathy in women: Assessment, manifestations, and etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 509–528). The Guilford Press.

Verona, E., Bresin, K., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of abnormal psychology*, *122*(4), 1088–1093. https://doi.org/10.1037/a0034062

Vitale, J. E., Brinkley, C. A., Hiatt, K. D., & Newman, J. P. (2007). Abnormal selective attention in psychopathic female offenders. *Neuropsychology*, *21*(3), 301–312. https://doi.org/10.1037/0894-4105.21.3.301

Wild, L. M., & Poeppl, T. B. (2022). Zur Neurobiologie der Psychopathie [On the neurobiology of psychopathy]. *Forensische Psychiatrie, Psychologie, Kriminologie, 16*(3), 259–264. https://doi.org/10.1007/s11757-022-00720-0

Willaby, H. W., Costa, D. S. J., Burns, B. D., MacCann, C., & Roberts, R. D. (2015). Testing complex models with small sample sizes: A historical overview and empirical demonstration of what Partial Least Squares (PLS) can offer differential psychology. *Personality and Individual Differences, 84,* 73–78. https://doi.org/10.1016/j.paid.2014.09.008

Wright, E.M., Salisbury, E.J., & Van Voorhis, P. (2007). Predicting the prison misconduct of women offenders: The importance of gender-responsive needs. *Journal of Contemporary Criminal Justice, 23*(4). https://doi.org/10.1177/1043986207309595

Yoder, K. J., Harenski, C., Kiehl, K. A., & Decety, J. (2021). Neural responses to morally laden interactions in female inmates with psychopathy. *NeuroImage. Clinical*, *30*, 102645. https://doi.org/10.1016/j.nicl.2021.102645

Young, J. T. N., & Haynie, D. L. (2022). Trusting the untrustworthy: The social organization of trust among incarcerated women. *Justice Quarterly*, *39*(3), 553–584. https://doi.org/10.1080/07418825.2020.1807588

Zarling, A., Scheffert, R., & Russell, D. (2022). Predictors of retention and recidivism of justice-involved women in a community-based gender-responsive CBT Program. *Criminal Justice and Behavior*, *49*(3), 291-310.

Zeyrek-Rios, E. Y., Çetinöz, E., Erten, İ., Gürsoy, A., & Gönültaş, M. B. (2025). Relationship between emotion regulation and aggression mediated by criminal thinking in women convicted of violent offenses. *Women's Studies International Forum, 113,* 1–9. https://doi.org/10.1016/j.wsif.2025.103179