Universidade do Minho
Escola de Psicologia

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Dissertação de Mestrado
Mestrado em Psicologia Clínica na Infância e na Adolescência

Trabalho efetuado sob a orientação do
Professor Doutor José Ferreira-Alves
do
Professor Doutor Michael Basseches
e da
Professora Doutora Ângela Brandão

junho de 2025

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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.

Braga, June 12th 2025

Marta Franco Oliveira

Seguro de Mim Mesmo? O Papel da Cognição Epistémica na Formação da Identidade

Resumo

A formação de identidade não oferece uma solução única nem um único procedimento para chegar até ela, pelo que as competências cognitivas operatório-formais desenvolvidas na adolescência não parecem ser suficientes para explicar a sua resolução. Uma vez que a formação de identidade envolve a confrontação de perspetivas diferentes e, por vezes, contraditórias, da realidade, torna-se relevante estudar de que forma poderá ser influenciada por competências cognitivas pós-formais, como a cognição epistémica. Assim, o nosso principal objetivo foi explorar a relação entre a cognição epistémica e processos de identidade, ao nível vocacional, de estudantes universitários. Este estudo realça o potencial papel de certos pressupostos epistemológicos na forma como os indivíduos refletem acerca das suas escolhas vocacionais, do seu significado e do seu alinhamento pessoal. Também enfatiza o papel do ensino superior na promoção do pensamento dialético. Os resultados sugerem que a promoção do desenvolvimento do pensamento pós-formal, através de programas educativos que incentivam o pensamento crítico e o raciocínio complexo, pode capacitar os indivíduos para se envolverem com maior profundidade nos seus percursos vocacionais e de avaliar de forma crítica aquilo que melhor se alinha com os seus valores e objetivos.

Palavras-chave: Adultez Emergente; Cognição Epistémica; Esquema de Perry; Identidade; Pensamento Dialético

Sure of Myself? The Role of Epistemic Cognition in Identity Formation

Abstract

Identity formation doesn't offer a single solution or a single procedure for reaching it, so the formal operational cognitive skills developed in adolescence don't seem to be enough to explain its resolution. Since identity formation involves confronting different and sometimes contradictory perspectives of reality, it is relevant to study how it can be influenced by post-formal cognitive skills, such as epistemic cognition. Thus, the main aim of this study was to explore the relationship between epistemic cognition and identity processes, at the vocational level, of university students. This study highlights the potential role of particular epistemic assumptions in how individuals reflect on their career choices, their meaning, and their personal alignment. It also emphasizes the role of higher education in fostering dialectical thinking. These findings suggest that promoting post-formal thought, through educational programs that nurture critical thinking and complex reasoning, may empower individuals to engage more deeply with their vocational paths and to critically evaluate what aligns best with their values and goals.

Keywords: Dialectical Thinking; Emerging Adulthood; Epistemic Cognition; Identity; Perry's Scheme

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Introduction

Emerging adulthood is marked by great instability, yet it also presents numerous opportunities. It corresponds to the period between the end of adolescence (around 18 years old) and the entry into stable adult roles, such as marriage, parenthood, and work (in most industrialized societies, between the ages of 25 and 29). Although the process of identity formation begins in adolescence, it intensifies during emerging adulthood, as individuals are able to explore different possibilities for their future. They form their vision of the world, question their own beliefs and values, and seek to find out who they are, what they enjoy and what they are good at (Arnett, 2015).

Erikson's Psychosocial Development Theory states that at the end of adolescence, the "identity versus identity diffusion" crisis arises. To transition from a role of receiver, which is characteristic of childhood, to a role of giver, which is characteristic of adulthood, adolescents undergo changes in the way they view the world and project themselves in the future, imagining possible paths (Kroger & Marcia, 2011). According to Sneed et al.'s (2006) literature review, the normative resolution of this crisis involves forming a sense of wholeness and experiencing continuity between one's self-conception and the self as perceived by others. When individuals are unable to create their commitments and identifications, which give them a sense of direction, they enter a state of confusion (Crocetti et al., 2008).

Based on Erikson's theory, James Marcia proposed two criteria for identity formation: exploration, which refers to the deliberation and experimentation of different life plans and roles; and commitment, which refers to the individual's investment in a given plan. These two criteria gave rise to four identity statuses: identity achievement, foreclosure, moratorium, and identity diffusion (Kroger & Marcia, 2011). From Marcia's perspective, a mature identity implies strong, self-conscious, and self-chosen commitments (Moshman, 1999). Despite being very influential, Marcia's model was criticized for not capturing the process through which individuals form, question, and change their identity throughout their lives (Crocetti et al., 2008; Sneed et al., 2006). New models have therefore been proposed, trying to reflect the lifelong process that constitutes identity formation (Sneed et al., 2006). One example is the Three Factor Model (Crocetti et al., 2008), which is made up of three processes: 1) commitment, which refers to the lasting choices that individuals have made and the self-confidence that derives from these choices; 2) in-depth exploration, which represents the level at which individuals reflect on their current commitments, reflecting on their choices, talking to others about them and looking for additional information; and 3) reconsideration of commitment, which involves comparing current commitments with alternative ones because they are no longer satisfactory (Crocetti et al., 2008). Through the interaction

between commitment and reconsideration of commitment, people revise their commitments because they no longer consider them adequate (identity formation cycle). Through the interaction between commitment and in-depth exploration, they validate their current commitments, reflect on their meaning, invest in maintaining them, and ensure they are aligned with their potential (identity maintenance cycle). When in-depth exploration leads to uncertainty about current commitments, they can be reconsidered. Based on combinations of different levels of the three factors, individuals can be classified into five identity statuses: achievement, early closure, moratorium, searching moratorium, and diffusion (Crocetti et al., 2008).

As identity formation involves considering abstract ideas, as well as actively questioning and exploring different possibilities before committing to a particular ideal, it makes sense that it usually begins with the development of formal operational thinking in adolescence (Moshman, 1999). According to Piaget's Cognitive Development Model, this refers to the capacity to think abstractly and to apply deductive and inductive reasoning, which enables individuals to generate and consider hypothetical possibilities (Moshman, 1999). Although possibilities are considered by children since early stages of cognitive development, they are then regarded as extensions of reality. Adolescents who have acquired formal operational thought, in contrast, view reality as the realization of a particular possibility. The development of hypothetico-deductive reasoning contributes to this exploration of possibilities, as it enables adolescents to consider the logical implications of a set of premises, whether or not they accept those premises. This new capacity enables them to employ advanced forms of argumentation, problem-solving, decision-making, judgment, and planning (Moshman, 1999).

In Piaget's model, formal operations is the final stage of cognitive development, which is generally achieved around the age of 15 (Moshman, 1999). However, this view has been criticized for overlooking the cognitive development that continues in late adolescence and adulthood. Additionally, while formal operations are effective for abstract and logical problem-solving, they may not be sufficient for addressing more complex, real-world issues that are dynamic and open to multiple perspectives (Basseches, 1984), as it is argued that formal operational thought doesn't take into consideration the existence of mutual incompatible formal systems (Kramer, 1983). The solution of these more complex issues, known as ill-structured problems, appears to require more advanced forms of thought, also referred to as post-formal thought, such as epistemic cognition.

According to Kitchener (1983), ill-structured problems, contrary to puzzles, don't have a single unequivocal solution. There are two or more complementary conceptualizations or potentially valid solutions, so no specific procedure guarantees the correct or absolute solution. Individuals must develop

a reasonable solution, integrating diverse data, from evidence and experts' opinions, to reasoning and argumentation. Based on one's beliefs about the limits, certainty, and criteria of knowledge (epistemic cognition), the nature of problems and the available solutions are evaluated differently (Kitchener, 1983). Some individuals believe there is an objective reality which can be absolutely known, which means they are unable to differentiate between the types of solutions required for puzzles and ill-structured problems, assuming that their role in both cases is simply to apply the correct procedure to ensure a valid and accurate solution. Others believe that problems don't always have a correct solution, that knowledge is sometimes influenced by the person's frame of reference, and that reasoning and data are fallible. Therefore, they acknowledge the existence of both puzzles and ill-structured problems and recognize the possibility that different solutions may be constructed (Kitchener, 1983).

According to Chinn et al. (2014), various models of epistemic cognition have been proposed, reflecting differing conceptualizations of how individuals understand knowledge and the process of knowing. These include stage theories of development (e.g., Perry, 1970; King & Kitchener, 1994), which describe series of changes in the sophistication of epistemic cognition over time, and dimensional models (e.g., Schommer, 1990; Hofer & Pintrich, 1997), which conceptualize epistemic cognition as a set of potentially independent dimensions of belief (e.g., Schommer, 1990; Hofer & Pintrich, 1997). Even more models have been developed, such as Basseches's (1984) dialectical schemata framework, which emphasizes the development of more complex, dynamic ways of organizing meaning through the coordination of contradictory perspectives.

The development of epistemic cognition was largely studied by William Perry, whose research on the cognitive and ethical development of university students led to the creation of a scheme (Perry, 1970). Perry's scheme comprises four phases of intellectual and moral development – dualism, multiplicity, relativism, and commitment within relativism – which are divided into nine positions. Individuals progress through these positions at varying rates, moving from simpler to more complex reasoning. At the same moment, individuals can find themselves in different positions on different topics (Perry, 1970). Dualism includes the first two positions of the scheme and is characterized by the belief that there are right and wrong answers, known to the authorities. Multiplicity encompasses positions three and four, and is characterized by an awareness of ambiguity, accompanied by the belief that this is due to a lack of expertise or insufficient research. Individuals tend to believe that, since there are no right answers in a certain area of knowledge, everyone is entitled to their opinion, and none is more valid than another. Relativism encompasses positions five and six, and is characterized by the recognition that ambiguity is inevitable and that knowledge and truth depend on context. Instead of considering all opinions as equally

valid, individuals evaluate them based on evidence, reasoning and context. Commitment within Relativism includes positions seven, eight and nine, and is characterized by a commitment to values, a vocation, a person or an ideal, tied to the understanding that these are made within a context of uncertainty (Perry, 1970).

According to Basseches (1984), the first five positions of Perry's scheme differ in terms of structure, that is, the formal properties of epistemological and meta-ethical assumptions, while positions six to nine differ in terms of the experiences of commitment, which constitutes a more qualitative rather than structural development. As such, in Perry's framework, contextual relativistic reasoning is presented as the most mature form of adult epistemic cognition, within which commitments are made. For Basseches (1984), contextual relativism entails an awareness of the limits of formal thought and the ability to operate between those limits. However, it does not yet reflect the capacity to integrate multiple formal systems into more complex, coordinated and evolving dialectical structures. Additionally, Basseches (1984) argues that Perry's definition of positions seven to nine does not distinguish between those who make commitments based on egocentric or authoritarian grounds and those who make commitments through dialectical processes. While the former ignore or merely tolerate the existence of other points of view, the latter recognize contradiction as an opportunity for development, embracing the commitments of others, as well as the rationales behind them, and allowing them to influence their own commitments (Basseches, 1984).

As such, Basseches (1984) proposed parallels between Perry's scheme and his own model of epistemic cognition development – the dialectical schemata framework. These include correspondences between Perry's relativism positions and forms of partial development of dialectical thinking, as well as a redefinition of Perry's highest positions to reflect the full capacity for dialectical thinking. According to this view, after reaching contextual relativism, individuals may follow one of three developmental trajectories: they may: 1) continue developing epistemically and attain a fully dialectical mode of thinking; 2) regress to pre-relativistic thinking to make commitments; or 3) become stalled in relativism, unable to make meaningful commitments, resulting in stagnation.

Dialectical thinking, as Basseches (1984) proposed, is an advanced form of thought that constitutes a successive level of cognitive organization beyond formal operations and a direction of adult cognitive development. It enables individuals to recognize that things evolve and change, and that contradictions may arise, while providing them flexibility to adjust and find ways to make sense of these complexities (Basseches, 2005). It represents an integrative middle ground between universalistic formal (absolutistic) thinking and relativistic thinking. As such, a commitment made dialectically involves

suffering the tensions that come with acknowledging contradiction, while maintaining responsibility for the possibility of their resolution (Basseches, 1984).

Identity formation may be seen as an ill-structured problem, as it is idiosyncratic and doesn't offer a right or wrong solution. Additionally, it involves confronting different and sometimes contradictory perspectives of reality. Therefore, the way individuals construct their identities may depend on their level of epistemic cognition. For instance, some individuals may assume there is a correct, absolute way to form their own identity and not explore much (e.g., by following their parents' expectations or choosing the best-paying jobs without reflection). In contrast, others may approach identity as a dynamic construction based on weighing up and complementing different possibilities, that is, through active exploration.

Some evidence of the association between Marcia's identity statuses and epistemological beliefs has already been obtained. Berzonsky's (2004) literature review provides some evidence that individuals in the moratorium status or in the identity achievement status prioritize personal attributes, such as their values and goals, and assume an active role in constructing their identity. Individuals in foreclosure status emphasize collective components, such as their family, religion and nationality. They believe that reality is objective and reliable, and see themselves as passive agents whose personalities are determined by social forces. Individuals in the identity diffusion status prioritize social elements, such as their reputation and the impression they leave on others, and tend to have an external locus of control. Although their epistemic position is not yet clear, some studies suggest that these individuals perceive their identity as predetermined by fate or other factors beyond their control. They also seem to believe that there is a very limited basis for making rational judgments, given the multitude of options (Berzonsky, 2004).

Krettenauer (2005) has also studied the relationship between Marcia's identity statuses and epistemic stances, both cross-sectionally and longitudinally. Adolescents were confronted with 14 controversial issues and asked to choose which of three statements better fit their point of view regarding the issue at hand. One sentence reflected absolutism, another reflected multiplism, and the third one reflected evaluativism. They were then assigned to the epistemic stance they answered more frequently. The results suggest that moratorium and identity achievement partly depend on the development of epistemic cognition. However, identity diffusion and foreclosure seem not to be influenced by the development of epistemic cognition (Krettenauer, 2005).

Despite the literature mentioned about the association between epistemic stances and Marcia's statuses, the relationship between epistemic cognition and identity formation remains understudied.

Furthermore, given the criticism Marcia's model received, it appears relevant to use more recent identity models that attempt to explain identity formation as a dynamic process. It would also be relevant to study emerging adults, instead of adolescents, as research has shown that identity development continues through emerging adulthood (Arnett, 2015), as well as the development of post-formal thought.

Therefore, the main aim of this study is to explore the relationship between epistemic cognition and the identity formation processes of university students in the vocational domain. To this end, the study draws on the theoretical frameworks of Perry (1970), focusing on meta-ethical development, and Basseches (1984), focusing on dialectical thinking – two complementary perspectives on epistemic development. Additionally, the study aims to validate the Meta-Ethical Questionnaire (MEQ; Clarkeburn et al., 2003) for use with the Portuguese university population. Our first hypothesis posits that in-depth exploration and reconsideration of commitment are positively associated with more complex forms of epistemic cognition, as reflected in both meta-ethical development and dialectical thinking. Our second hypothesis suggests that individuals classified in the more advanced positions of Perry's scheme (as measured by the MEQ) will exhibit varying levels of dialectical thinking, encompassing both high and low levels.

Method

Participants

The initial sample included 216 participants. Of these, 12 were excluded because they were older than 35 years old, and 16 were excluded because they had started living in Portugal after the age of 10. Therefore, the final sample included 188 participants, aged between 17 and 33 years old ($M = 21.02$; $SD = 2.62$). Of these, 71 % were women. All participants were university students. Regarding the level of education, 51 % were pursuing a bachelor's degree, 38 % were pursuing a master's degree, 3 % were pursuing a PhD, and 8 % were pursuing an integrated master's degree. They were attending various courses, including Psychology, Medicine, Computer Engineering, and Management, among others.

We decided to include people up to 35 years old, because if we were to consider only people aged under 29 years old (emerging adults), our sample would be too small. We chose 35 as the limit, as it represents the end of young adulthood. The decision to select only participants who had started living in Portugal after the age of 10 was based on the need to have participants who identified with Portuguese culture, in order to validate the MEQ.

Measures

Sociodemographic Questionnaire

The sociodemographic questionnaire included questions about age, gender, current degree and year of education, current course attended, country of origin, length of residence in Portugal, and relationship status.

Meta-Ethical Questionnaire (MEQ; Clarkeburn et al., 2003)

This instrument, based on Perry's scheme (1970), aims to assess the meta-ethical development of young adults in relation to: 1) the source and type of moral answers; 2) the role of authority; 3) the nature of multiplicity; 4) personal responsibility and relationship with multiplicity; and 5) the purpose of moral discussions. It consists of 10 statements representing the first three positions (Type A) and 10 statements representing the last three positions of Perry's scheme (Type C), presented on an Osgood scale. The extremes of the scale are identified with *This is definitely my opinion* (A or C) and the center with *None of the statements represent my opinion* (Type B, made up of the three central positions of Perry's model). The positions between the extremes and the center are identified with *It's more or less what I believe* (Ab or Cb). To calculate the score, each type of statement is assigned a different value: A = 1, Ab = 4, B = 9, Cb = 16, and C = 25. In the end, all the values are added up and the total is divided by the number of questions (10), originating the Meta-Ethical Score (MES). The MES allows us to identify the type of ethical knowledge the individual possesses (Type A, 0 – 8.9; Type B, 9 – 15.9; Type C, 16 – 25). This scale contains an internal validity check. Two statements are essentially the same statement with different wording. If there is more than one step difference between the responses to these items, the response must be considered invalid (Clarkeburn et al., 2003). Healy (2014) found acceptable internal consistency ($\alpha = .74$). Since there was no Portuguese version of this questionnaire, we translated and validated it.

Utrecht-Management of Identity Commitments Scale – Portuguese Version (U-MICS; Crocetti et al., 2015)

This is a self-report measure based on the Three Factor Model by Crocetti et al. (2008). In this study, we used the version validated for Portuguese university students (Crocetti et al., 2015). The scale consists of thirteen items, divided into three subscales: commitment (five items), in-depth exploration (five items), and reconsideration of commitment (three items). In each item, the participant must state their degree of agreement with the statement presented, using a Likert scale ranging from 1 (*completely false*) to 5 (*completely true*). This scale can be used to assess different domains of identity. In this study, we

assessed the vocational domain. Scores can be calculated for each of the factors. Additionally, through cluster analysis, identity statuses can be identified. The validation study for the Portuguese population reports good internal consistency for commitment (α = .86) and reconsideration of commitment (α = .89), and acceptable internal consistency for in-depth exploration (α = .76).

Approaches to Contradiction Scale – Version A (ACS; Basseches et al., 2021)

This instrument, developed by Basseches et al. (2021), aims to analyze the type of thought (absolutist, relativistic or dialectical) individuals use when confronted with hypothetical problems in which there is a contradiction between two opposing points of view. As such, it consists of four problems related to four distinct matters: science, justice, politics, and religion. In each one, the participants must answer two yes-or-no questions about whether they think it is possible that both points of view may be correct or that neither of them may be incorrect and about whether they can find an explanation for how the two positions may be correct or compatible. If the participants answer "yes" to this last question, they are requested to write down that explanation. The explanations can be classified as absolutist (one point), relativistic (two points) or dialectical (three points) according to Basseches's (1984) theoretical proposal. Ultimately, a mean score is calculated for each participant. The higher the mean score, the more dialectical answers the participant gave.

Procedure

Firstly, the MEQ was translated into European Portuguese independently by the Adult Development and Aging Investigation Group and another author. The two translations were then compared to achieve a consensual final translation. Then, the participants filled in the informed consent, the MEQ, the U-MICS, and the ACS via the Qualtrics platform. The link was sent via institutional e-mail and social media. U-MICS's affirmations were randomized, using Artificial Intelligence, so that affirmations reflecting the same identity process were not clustered together.

The ACS written answers were analyzed, discussed, and categorized by two authors. When doubts arose, a third author, more experienced in coding dialectical thinking, reviewed the responses and participated in the discussion, ensuring a consensual classification was achieved among all three. The answers were analyzed based on Basseches's (1984) dialectical schemata framework. Each answer was classified as absolutistic (receiving one point), relativistic (receiving two points), dialectical (receiving three points), or unclassifiable (receiving zero points). When participants answered "yes" to the multiple-choice question about whether they had an explanation, but they did not write that explanation down, they also received zero points.

Data Analysis

The collected data were imported into Microsoft Excel, where they were organized, and then into the Statistical Package for the Social Sciences (IBM SPSS, version 28), where they were analyzed. First, normality was tested. Secondly, statistical procedures were employed, including exploratory analysis, descriptive analysis, reliability analysis, Pearson correlations, one-way ANOVA (with Tukey's and LSD's post-hoc tests), and independent samples *t*-tests. We considered statistically significant results that exhibited a *p-value* < .05. We considered marginally significant results that exhibited a *p-value* between .05 and .06.

Twenty-seven responses from the MEQ were disregarded as they did not meet the criteria for the internal validity check. Students enrolled in integrated master's programs were categorized according to their year of study: those in the first, second, or third year were included in the bachelor's degree group, while those in the fourth, fifth, or sixth year were included in the master's degree group. Consequently, the bachelor's group comprised 100 students (53.2 %), the master's group included 82 students (43.6 %), and the PhD group consisted of six students (3.2 %).

Results

Descriptive Analysis

Table 1 presents the descriptive statistics for MES, the ACS, and the three identity processes. The mean ethical score (MES) for the MEQ responses was similar to Healy's (2014) and Clarkeburn et al.'s (2003) findings (means of 16.20 and 16.90, respectively). When considering the meta-ethical development type, nine participants (4.8 %) integrated Type A, 60 participants (31.9 %) integrated Type B, and 92 participants (57.1 %) integrated Type C.

Table 1

Descriptive statistics for MES, the ACS and the three subscales of the U-MICS

Variable	*N*	Min	Max	*M*	*SD*
Mean Ethical Score	161	4.20	25.00	16.24	4.04
Approaches to Contradiction Scale	188	0.00	2.75	1.08	0.48
Utrecht-Management of Identity Commitments Scale					
In-depth Exploration	188	2.20	5.00	3.42	0.60
Commitment	188	1.80	5.00	3.54	0.70
Reconsideration of Commitment	188	1.00	4.67	1.99	0.89

Reliability Analysis

The MEQ demonstrated acceptable internal consistency (α = .79), which aligns with Healy's (2014) findings (α = .74). Regarding item-total correlations, seven out of 10 questions exhibited very good discrimination (r > .40), while the remaining three exhibited good discrimination (r > .20).

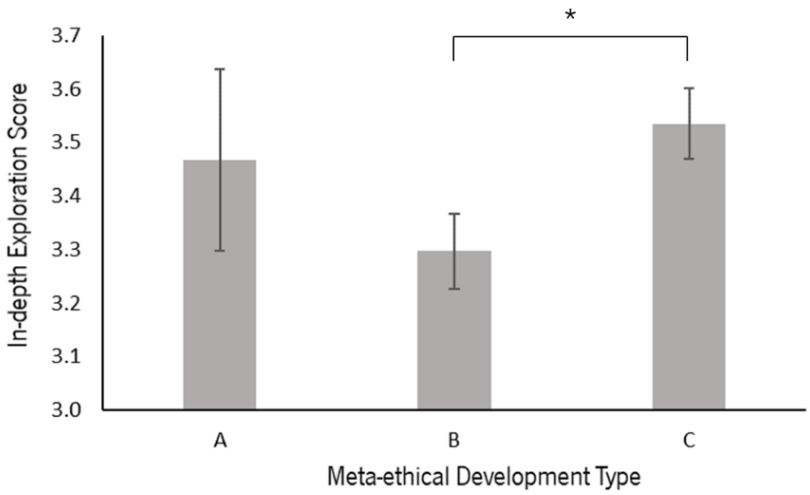
Regarding the U-MICS, the reconsideration of commitment and commitment subscales demonstrated good internal consistency (α = .84 and α = .89, respectively), which aligns with Crocetti et al.'s (2015) findings (α = .89 and α = .86, respectively). The in-depth exploration subscale demonstrated poor internal consistency (α = .59), which does not align with Crocetti et al.'s (2015) findings (α = .76).

Epistemic Cognition and Identity Formation

A one-way ANOVA was conducted to examine the effect of meta-ethical development type (A, B, and C, as classified by the MEQ) on the three identity processes. A marginally significant effect of meta-ethical development type on in-depth exploration was found, F(2, 158) = 2.97, p = .054. Tukey's post-hoc test indicated that individuals classified as Type C exhibited significantly higher in-depth exploration scores than those classified as Type B (p < .05). This result is illustrated in Figure 1. No significant effects were found for commitment, F(2, 158) = 0.05, p = .948, or for reconsideration of commitment, F(2, 158) = 1.67, p = .191.

Figure 1

In-depth exploration score by meta-ethical development type



Note. Bars represent mean values; error bars represent the standard error of the mean; *p < .05.

Given that only nine participants were classified as Type A, Pearson correlation coefficients were calculated to examine the relationship between MES and the identity processes. As shown in Table 2, a significant positive correlation was found between MES and in-depth exploration, $r(161) = .16$, $p < .05$. No significant correlations were observed between MES and commitment, $r(161) = .00$, $p = .96$, or between MES and reconsideration of commitment, $r(161) = -.14$, $p = .09$.

Table 2

Pearson correlation coefficients between MES, the ACS, in-depth exploration, commitment and reconsideration of commitment scores

Variable	1	2
1. Mean Ethical Score	-	
2. Approaches to Contradiction Scale	.22**	-
3. In-depth Exploration	.16*	.09
4. Commitment	.00	.09
5. Reconsideration of Commitment	−.14	.13

Note. *$p < .05$; **$p < .01$.

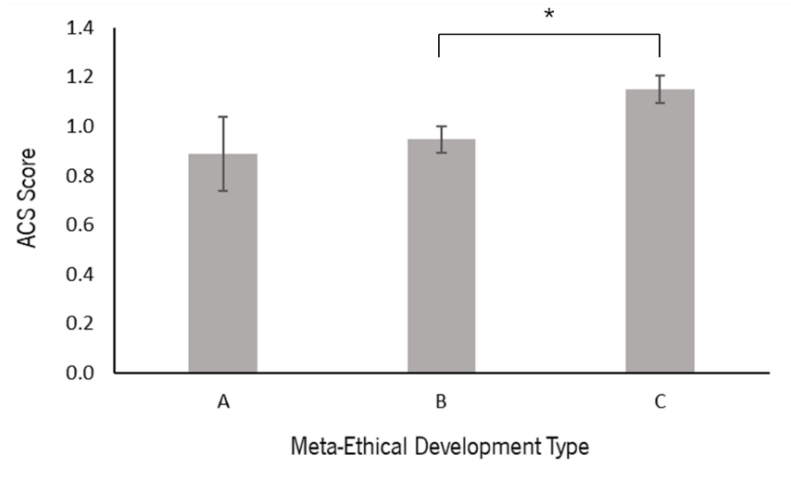
Pearson correlation coefficients were computed to assess the relationship between the ACS and the three identity processes. As shown in Table 2, there were no significant correlations between the ACS and commitment, $r(188) = .09$, $p = .23$, between the ACS and reconsideration of commitment, $r(188) = -.13$, $p = .09$, or between the ACS and in-depth exploration, $r(188) = .09$, $p = .23$.

Meta-Ethical Development and Dialectical Thinking

A one-way ANOVA was conducted to examine the effects of meta-ethical development type on the ACS. A significant effect was found, $F(2, 158) = 3.71$, $p = .027$. Tukey's post-hoc test indicated that participants classified as Type C scored significantly higher on the ACS than those classified as Type B ($p < .05$). This result is illustrated in Figure 2. In line with this finding, and as shown in Table 2, a significant positive correlation was also found between MES and the ACS, $r(161) = .22$, $p < .01$. Within Type C, ACS scores ranged from 0.00 to 2.75, with a variance of 0.28.

Figure 2

ACS score by meta-ethical development type



Note. Bars represent mean values; error bars represent the standard error of the mean; *$p < .05$.

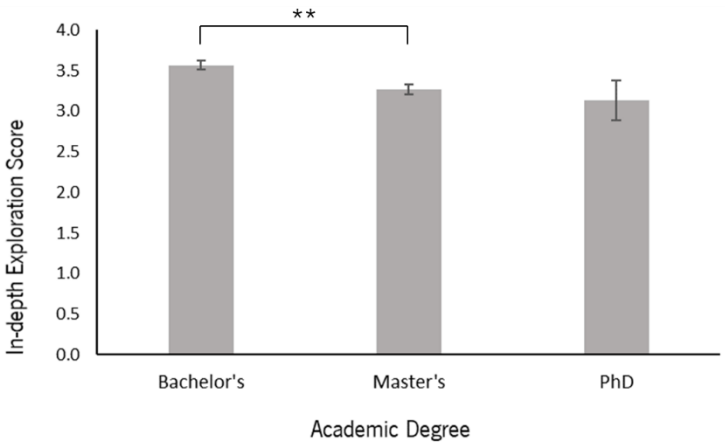
Academic Degree

A one-way ANOVA was conducted to analyze the effects of academic degree (bachelor's, master's and PhD) on MES. No significant differences were reported between the three groups, $F(3, 157) = 0.63$, $p = .596$. Another one-way ANOVA was conducted to examine the effects of academic degree on the three identity processes. A significant effect of academic degree on in-depth exploration was found, $F(2, 185) = 6.69$, $p < .01$. Tukey's post-hoc test revealed that bachelor's students showed significantly higher in-depth exploration scores than master's students ($p < .01$). This result is illustrated in Figure 3. No significant effects of academic degree were found on commitment, $F(2, 185) = 2.01$, $p = .137$, or on reconsideration of commitment, $F(2, 185) = 0.48$, $p = .619$.

An additional one-way ANOVA was conducted to examine the effects of academic degree on the ACS. A significant effect was found, $F(2, 185) = 3.88$, $p = .022$. LSD post-hoc tests indicated that both bachelor's and PhD students scored significantly higher on the ACS than master's students ($p < .05$). These results are illustrated in Figure 4.

Figure 3

In-depth exploration score by academic degree

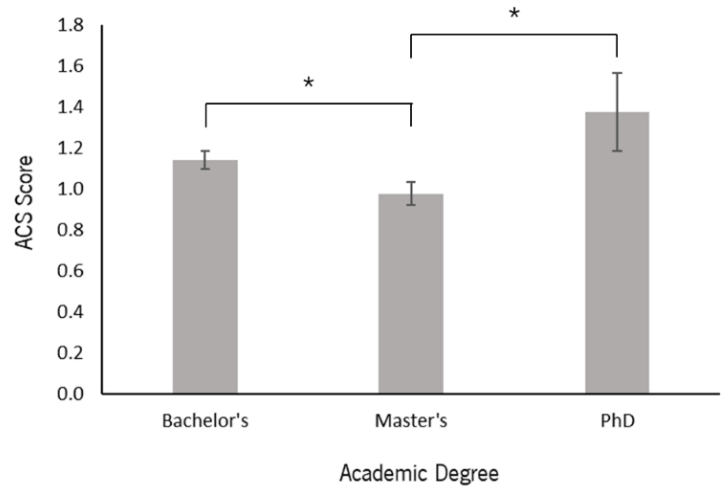


Note. Bars represent mean values; error bars represent the standard error of the mean; $^{**}p < .01$.

A multiple regression analysis was conducted to examine whether academic degree levels significantly predicted participants' ACS scores. Using the master's degree as the reference category, the overall model was significant, $F(2, 185) = 3.88$, $p < .05$, $R^2 = .04$. Further analysis showed that both the bachelor's degree ($\beta = .16$, $p < .05$) and the PhD ($\beta = .40$, $p < .05$) were significant positive predictors. These findings align with the LSD post-hoc test results, confirming that both bachelor's and PhD students scored significantly higher on the ACS than master's students.

Figure 4

ACS score by academic degree



Note. Bars represent mean values; error bars represent the standard error of the mean; $^{*}p < .05$.

Independent-samples *t*-tests were conducted to examine differences in MES and ACS scores between first-year and third-year bachelor's students. No significant differences were found for MES, $t(49) = 0.25$, $p = .801$. However, third-year students exhibited significantly higher ACS scores compared to first-year students, $t(58) = -2.15$, $p < .05$.

Sociodemographic Variables

Pearson correlation coefficients were computed to assess the relationships between age and MES, the ACS, commitment, reconsideration of commitment and in-depth exploration. The results are shown in Table 3. A positive significant correlation was found between age and reconsideration of commitment, $r(188) = .19$, $p < .05$. No other significant correlations were found.

Table 3

Mean, standard deviation and Pearson correlations between age and MES, ACS, commitment, reconsideration of commitment and in-depth exploration scores

Variable	*M*	*SD*	Age
Age	21.02	2.62	-
Mean Ethical Score	16.24	4.04	.02
Approaches to Contradiction Scale	1.08	0.48	.01
In-depth Exploration	3.42	0.60	-.13
Commitment	3.54	0.70	-.09
Reconsideration of Commitment	1.99	0.89	.19*

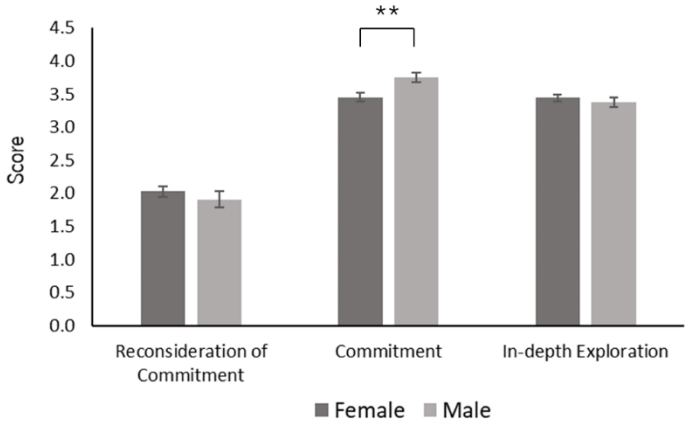
Note. $*p < .05$.

Independent samples *t*-tests were conducted to analyze the differences in MES and in ACS scores between genders. No significant differences were revealed in MES, $t(159) = 1.402$, $p = .16$, or in ACS scores, $t(159) = 1.40$, $p = .16$.

Additional independent samples *t*-tests were conducted to analyze the differences in the three identity processes between genders. Male students showed significantly higher scores of commitment than female students, $t(138{,}471) = 3.11$, $p < .01$. No differences between genders were found regarding reconsideration of commitment, $t(186) = 0.83$, $p = .41$, or in-depth exploration, $t(186) = 0.71$, $p = .48$. These results are illustrated in Figure 5.

Figure 5

Reconsideration of commitment, commitment and in-depth exploration scores by gender



Note. Bars represent mean values; error bars represent the standard error of the mean; $^{**}p < .01$.

Discussion

The present study aimed to explore the relationship between epistemic cognition and the identity processes of university students, in the vocational domain. It also sought to validate the MEQ (Clarkeburn et al., 2003) for use with the Portuguese university population. To this end, we employed two different measures grounded in two distinct theoretical models of epistemic cognition: meta-ethical development, assessed through the MEQ, and dialectical thinking, assessed through the ACS. We also employed an instrument based on Crocetti et al.'s (2008) Three Factor Model, which assesses three processes of identity formation: commitment, in-depth exploration, and reconsideration of commitment.

Firstly, it is noteworthy that only nine participants were classified as Type A in the MEQ. This result was expected, as Type A students are typically rare in higher education populations (Clarkeburn et al., 2003), likely because, by the time they enter university, they have likely been taught to think critically to some degree (Healy, 2014).

Our results suggest that more advanced meta-ethical development is associated with greater in-depth exploration of vocational identity commitments. This aligns with our expectations and the existing literature. According to Muis et al.'s (2021) literature review, individuals who believe that knowledge is complex, actively constructed, and justified through evaluation (i.e., who possess a more complex epistemic cognition) are more likely to exhibit the cognitive skills necessary for critical thinking. Consequently, they are also more inclined to consider multiple perspectives, reassess their own reasoning when forming conclusions, engage in effortful processing, and demonstrate skepticism toward unreliable

sources (Muis et al., 2021). This could mean they don't just accept their current commitments without trying to gather more information about them to justify their own choices, therefore engaging in greater in-depth exploration.

Additionally, in-depth exploration has been found to be positively associated with openness to experience (Crocetti, 2017). Individuals high in this personality trait are typically more receptive to novelty and inclined to engage with new ideas and experiences, often approaching new situations with curiosity. Openness to experience encompasses characteristics such as imagination, aesthetic sensitivity, intellectual curiosity, and a heightened capacity for reflection (Gilhooly & Gilhooly, 2021). Since epistemic cognition involves reflecting on the nature, limits, certainty, and justification for knowledge (Kitchener, 1983), it entails questioning prior assumptions and exploring new ways of viewing the world. As such, it may be associated with higher levels of openness to experience, further reinforcing its connection with various forms of exploration, including exploration related to identity commitments.

These ideas could also imply that a more sophisticated epistemic cognition (here taken as more advanced meta-ethical development) would be associated with greater reconsideration of commitment – an expectation we initially held. However, our results do not support this hypothesis. One possible explanation lies in the developmental pathways of identity formation. In a longitudinal study with Dutch adolescents aged 12 to 20 years-old, Crocetti (2017) found that, over this period, diffusion became less common and achievement became more prevalent. This suggests that, as adolescents grow older, they tend to engage less in reconsideration of commitment, consequently shifting from the identity formation cycle toward the identity maintenance cycle (Crocetti et al., 2008). As identity formation continues into emerging adulthood and adulthood (Crocetti, 2017), we could expect that this pattern persists. This may help explain why we did not find a significant relationship between reconsideration of commitment and meta-ethical development. Moreover, the structure of the Portuguese educational system may limit students' opportunities to reconsider their commitments, particularly due to economic constraints and time-related pressures. These systemic barriers may help explain why fewer students reconsider their vocational or academic paths.

We also tested the hypothesis that there would be a relationship between dialectical thinking and both in-depth exploration and reconsideration of commitment. However, this was not supported by the data. Although meta-ethical development and dialectical thinking are related constructs that share theoretical foundations, as both aim to capture aspects of epistemic cognition, they are not exactly the same. On one hand, the MEQ is based on Perry's (1970) scheme, which emphasizes developmental phases and life events. On the other hand, the ACS is based on Basseches's (1984) dialectical schemata

framework, which focuses on the construction of increasingly complex forms of organization of meaning. As such, it is plausible that each construct contributes differently to identity development. The MEQ's closer alignment with life events may explain its association with in-depth exploration, which is also associated with events in the lives of the participants.

As expected, scores on the MEQ and the ACS were positively correlated, reflecting the fact that both instruments attempt to measure aspects of epistemic cognition. Furthermore, participants classified as Type C scored significantly higher on the ACS than those classified as Type B, while no differences were found between Types A and B. This finding supports the assumption that it is after individuals reach contextual relativism (assumed to be integrated in Type B) that they may continue their epistemic development and reach full capacity for dialectical thinking. Recognizing knowledge as uncertain and context-dependent (contextual relativism) likely precedes the development of the ability to tolerate contradictions and integrate multiple perspectives. However, we might also have expected to find differences between Types A and B. According to Basseches (1984), Perry describes the transition from position three to position four – which roughly corresponds to the shift from Type A to Type B – as stemming from a change in epistemic assumptions. Such a developmental shift would theoretically be reflected in increased dialectical thinking, and therefore in higher ACS scores. This was not observed in our study, likely due to the small number of participants classified as Type A ($N = 9$), which may have limited the statistical power to detect significant differences.

In line with that, it is also noteworthy that, in our study, Type C – which is assumed to correspond to the final three positions of Perry's scheme – included individuals who exhibit both low and high ACS scores, suggesting that some exhibit dialectical thinking while others do not. This finding is consistent with our hypothesis and supports Basseches's (1984) proposal that Perry's positions seven to nine represent divergent developmental paths, ranging from a regress to pre-relativistic thinking to the emergence of full dialectical capacity.

Regarding the effect of higher education, our results suggest that students attending a bachelor's degree exhibit greater in-depth exploration than those enrolled in a master's program. While this may appear counterintuitive, given the notion that identity development is characterized by a shift toward identity maintenance over time (Crocetti, 2017), it is possible that bachelor's students are still in the process of evaluating and confirming their chosen path. As such, they may be more actively engaged in exploring and questioning their commitments. In contrast, master's students are likely to have already engaged in substantial exploration during their undergraduate studies, and have chosen to pursue further

education. As a result, they may feel more confident in their current commitments and not feel as much of a need to engage in in-depth exploration.

It is also worth mentioning that bachelor's students exhibited higher levels of dialectical thinking than master's students. These findings may appear counterintuitive, given that a central aim of higher education is to promote intellectual development and skills associated with complex reasoning (King & Kitchener, 2004). They also contrast with previous research on reflective judgment, a construct related to epistemic cognition that entails recognizing certain problems are marked by uncertainty or controversy and cannot be resolved through formal logic alone. Longitudinal and cross-sectional studies have shown that reflective judgment tends to increase with educational progression, from high school through to advanced doctoral studies (King & Kitchener, 2004). One might question why our results diverge from these. Some hypotheses have been raised. Firstly, it could be that master's students are more focused on the application of knowledge or specialization, becoming more oriented toward results rather than to exploring perspectives. Secondly, while bachelor's programs usually encourage interdisciplinary thinking, master's programs are typically narrower and more discipline-focused, possibly reducing the likelihood of engaging with contradictory or conflicting frameworks. Finally, the discrepancy may be attributable to the characteristics of our sample. If most master's students in our study came from technical fields, and most bachelor's students were enrolled in social sciences or humanities programs, the latter may have been more frequently encouraged to engage in critical reflection and consider multiple perspectives.

PhD students also exhibited higher levels of dialectical thinking than master's students, aligning with previous findings (King & Kitchener, 2004). This may be attributed to the nature of doctoral studies, which often mark a return to a more exploratory phase. Engaging in research typically fosters deeper reflection, critical inquiry, and the consideration of multiple perspectives. Furthermore, PhD students are often more confident in their academic abilities and knowledge base, which may enable them to question assumptions more readily and seek their own answers. Meta-ethical development, however, was not influenced by academic degree.

Another important observation is that, within bachelor's degree, third-year students exhibited higher levels of dialectical thinking than first-year students. This finding may reflect an interaction between students' growing confidence and curricular priorities. In the early stages of their academic journey, students often feel uncertain about their knowledge and rely heavily on instructors as authoritative sources, which can limit their openness to alternative viewpoints. As students progress through their degree, they typically develop a stronger foundational understanding of their field, which may foster

greater intellectual autonomy. This growing confidence can encourage them to engage more deeply with diverse perspectives and to critically reflect on established knowledge.

Age was not correlated with either meta-ethical development or dialectical thinking, suggesting that it is not merely the passage of time that fosters the development of post–formal thought, but rather the nature and quality of individuals' experiences. King and Kitchener's (2004) review supports this idea, showing that non-student adults with college degrees demonstrated higher levels of reflective judgement compared to those without higher education. This implies that individuals of the same age may differ in their epistemic cognition depending on their educational background, with higher education playing a significant role in promoting the development of more complex forms of reasoning. Additionally, age was positively correlated with reconsideration of commitment, which diverges from the findings of Crocetti (2017) discussed earlier. In their longitudinal study, adolescents aged 12 to 20 were found to engage less in reconsideration of commitment as they grew older. However, our sample included older individuals, aged 17 to 35. This discrepancy may indicate that individuals initially focus on maintaining their commitments during late adolescence and early adulthood, but begin to revise them later as they accumulate life experiences and face new challenges.

Furthermore, male students exhibited higher levels of vocational identity commitment than female students. This finding may reflect the influence of gender stereotypes and societal expectations, particularly those related to balancing work and family. For instance, traditional norms often assume that women should prioritize family and caregiving responsibilities, whereas men are expected to focus on professional development and career success (Gender Studies, 2024). As a result, male students may feel greater pressure to commit to a career path early on, while women might be more pressured to adapt to whatever opportunities they can secure, regardless of their career aspirations.

Finally, the MEQ exhibited good internal consistency, item-total correlations ranging from good to very good, and its scores were positively correlated with ACS scores. These results suggest that the original structure, along with our translation, is an appropriate measure for use with the Portuguese population.

Limitations and Future Directions

One of the main limitations of this study is the use of the ACS in written format, as the open-ended written answers leave considerable room for interpretation. Although classifications were based on mutual consensus, it is acknowledged that some responses could be reasonably interpreted in multiple ways. Furthermore, it could be argued that this instrument functions more as a self-report or attitude

measure rather than as a direct assessment of dialectical thinking. This diverges from Basseches et al.'s (2021) original intention of capturing dialectical thinking as a developmental organization of cognitive structures and capacities. One possible way to address this limitation is to explore the relationship between ACS ratings and an interview assessment of dialectical thinking – perhaps even an interview taking ACS responses as a starting point. This approach would enable a more in-depth exploration of participants' responses, potentially leading to a more accurate and reliable understanding of their thought patterns.

Similarly, the MEQ could be understood as a survey of attitudes and self-reports that are assumed to correlate with the use of the cognitive structures that described in Perry's model, which was originally supported through interview-based data. Although the items included in the MEQ were selected based on at least 80 % agreement among external judges regarding their validity in representing the intended Perry type (content validity; Clarkeburn et al., 2003), this does not ensure that the measure accurately or comprehensively captures the broader construct of epistemic cognition (construct validity). Moreover, even if we had more data on the construct validity of this measure, it specifically assesses how individuals reason about moral and ethical issues, rather than knowledge in general. As such, even if it effectively assesses epistemic cognition within the moral domain, it may not generalize to other domains of epistemic reasoning. Therefore, our findings must be interpreted with this limitation in mind: when referring to meta-ethical development, we are not necessarily speaking about epistemic cognition in general, but rather its expression in moral reasoning contexts.

Another limitation concerns the internal consistency of the U-MICS in-depth exploration subscale. While the original validation study (Crocetti et al., 2015) reported an acceptable Cronbach's alpha, our study found a poor internal consistency. This discrepancy may be due to sample differences. For instance, Crocetti et al.'s (2015) sample was larger ($N = 533$) compared to ours ($N = 188$). Additionally, differences in how participants interpreted the items could have contributed to the lower reliability observed in our study. This finding suggests that the results from in-depth exploration should be interpreted with caution.

In future studies, we consider it would be relevant to replicate this study using other domains of identity, such as interpersonal, religious or political identity. Additionally, given the variety of models and instruments related to identity formation and epistemic cognition, it may also be valuable to replicate this study from multiple theoretical and methodological perspectives (e.g., Luyckx et al., 2006; King & Kitchener, 2004). It would also be pertinent to assess the interplay between these variables through a

longitudinal study. Such research would provide insight into how meta-ethical development and dialectical thinking, as well as their relationships with identity processes, develop over the course of higher education. Lastly, conducting interviews would be essential to gain a deeper understanding of how participants think, how their thought processes may relate to their life choices, and how the developmental progression described by Perry (1970) and the increasing complexity of cognitive structures outlined by Basseches (1984) might interact in the process of identity formation.

Conclusion

In conclusion, despite its limitations, this study makes a valuable contribution to the field of vocational identity formation by shedding light on the potential role particular epistemic assumptions play in shaping how individuals reflect on their career choices, their meaning, and their personal alignment. It also highlights the role of higher education in fostering dialectical thinking. These findings suggest that promoting post-formal thought through educational programs that nurture critical thinking and complex reasoning may empower individuals to engage more deeply with their vocational paths and critically evaluate what aligns best with their values and goals.

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