



Universidade do Minho
Escola de Psicologia

Íris Martins Oliveira

**Construction and Validation of the
Childhood Career Exploration Inventory**

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**Construction and Validation of the
Childhood Career Exploration Inventory**

Doctoral Dissertation in Applied Psychology

Work supervised by

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And

Doctor Erik Porfeli

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DECLARATION

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Construction and Validation of the Childhood Career Exploration Inventory

Childhood is a foundational period for career development, during which children are socialized to work, develop conceptions of career choice and attainment, and an emerging sense of self. The research agenda in this field has called for the identification, assessment and research of core constructs of childhood career development as well as for longitudinal studies. Career exploration is a key dimension of childhood career development, which consists of a relational process including both objective and subjective aspects. Career exploration increasingly differentiates and becomes cognitively oriented over childhood and is related to other career and academic variables. Although career exploration is more differentiated in middle school years, the literature often confounds middle school childhood with adolescence and infuses career exploration in the broader study of career adaptability. The use of self-report measures to assess children's career exploration also emerges in middle school years. However, the extant self-report measures of middle school children's career exploration seem not to explicitly refer the career exploration perspective they are grounded in, present curiosity either as an indicator or as a different construct of career exploration, omit the procedures through which they were constructed and validated, as well as lack evidence of temporal and nomological validity. Thus, there is a need to enrich the assessment and scientific knowledge of middle school children's career exploration. This study presents the construction and validation of a new measure to assess middle school children's career exploration – the Childhood Career Exploration Inventory (CCEI). The CCEI relies on an integrative perspective of career exploration and considers curiosity, exploratory resources and the self in life roles as main indicators of the construct. An initial 72-item pool was generated and qualitatively evaluated by four career experts and 11 children in a think-aloud tryout. Evidence of items' judgmental validity based on test content and suggestions to improve the measure's instructions and items were provided. The time needed for administration was also registered. The improved 72-item CCEI Version 1.0 was administered to a sample of 312 children (43.6% girls and 56.1% boys, $M_{age} = 10.80$, $SD = .86$) attending fifth- and sixth-grade. Results from item, reliability, exploratory and confirmatory factor analyses led to the CCEI length reduction for 12 items. These items presented evidence of judgmental validity, an approximate normal distribution of the responses, loaded on a single factor and did not compromise the measure's reliability. The CCEI initial Likert-type response scale (1 "Totally unlike me" to 5 "Totally like me", CCEI Version 2.0) was compared to an alternative one (1 "Strongly disagree" to 5 "Strongly agree", CCEI Version 2.1) with data from another sample of 478 children (45.6% girls and 54.4% boys, $M_{age} = 10.91$, $SD = .88$) attending fifth- and sixth-grade.

Confirmatory multigroup analyses suggested the goodness of fit of a hierarchical measurement model, which was equivalent for the response scales. Evidence also suggested that the CCEI Version 2.1 offered more items presenting an approximately normal distribution of the responses, a better fit and better estimates of internal consistency reliability than the CCEI Version 2.0. Confirmatory multigroup analyses based on the CCEI Version 2.1 suggested the measure's configural and metric equivalence for genders and school levels, although metric non-invariance of the second-order factor was found for school levels. The CCEI Version 2.1 was administered to another sample followed across four occurrences of measurement during fifth- and sixth-grades. The final sample included 429 children (48.3% girls and 51.7% boys, $M_{\text{age at first wave}} = 10.23$, $SD = .50$). Participants completed the CCEI Version 2.1, the subscales of self-efficacy expectations for academic success, self-regulated learning, leisure and extracurricular activities from the Multidimensional Scales of Perceived Self-Efficacy and the subscales of self-concept, locus of control and career planning from the Portuguese version of the Childhood Career Development Scale. The Questionnaire of Identification was also completed based on school records, to collect social demographic and academic information for each participant. Confirmatory results suggested that a hierarchical measurement model yielded a good fit to the data across the four occurrences of measurement, with low to moderate estimates of internal consistency reliability. Confirmatory and longitudinal stability techniques also suggested the configural and metric equivalence of the CCEI first- and second-order factors across the occurrences of measurement and for genders over time. Evidence also pointed to the CCEI configural and metric equivalence for girls and boys presenting different literacy proficiency levels at each occurrence of measurement. Positive and statistically significant correlations between the CCEI total scores, self-efficacy expectations for academic, leisure and extracurricular activities, self-concept, locus of control and career planning were additionally found at each occurrence of measurement. These results are discussed based on analytical, career and human development literatures. Main conclusions from this dissertation are retrieved and implications from this work to future research and early career practices are presented.

Keywords: Career exploration, childhood career development, test construction, test validity.

Construção e Validação do Inventário de Exploração de Carreira na Infância

A infância é um período central para o desenvolvimento de carreira, no qual as crianças são socializadas para o trabalho, desenvolvem concepções de carreira e um sentido emergente de si. A literatura neste tema tem apontado a necessidade de identificar, avaliar e investigar os principais construtos do desenvolvimento de carreira na infância, bem como de conduzir estudos longitudinais. A exploração é uma dimensão-chave do desenvolvimento de carreira na infância, que consiste num processo relacional e inclui aspetos objetivos e subjetivos. A exploração de carreira diferencia-se e torna-se cada vez mais orientada por cognições durante a infância, relacionando-se com outras variáveis de carreira e académicas. Apesar da exploração de carreira ser mais diferenciada no 2.º ciclo do ensino básico, é comum a literatura confundir este período com a adolescência e infundir a exploração no estudo mais alargado da adaptabilidade de carreira. O uso de medidas de autorrelato para avaliar a exploração de carreira na infância emerge ainda naqueles ciclos de estudo. Contudo, as medidas de autorrelato existentes parecem não explicitar a perspetiva de exploração de carreira em que se sustentam, apresentam a curiosidade ora como indicador ora como construto distinto da exploração de carreira, omitem os seus procedimentos de construção e validação, e não apresentam evidência de validade temporal nem nomológica. Assim, importa aprofundar a avaliação e o conhecimento científico da exploração de carreira no 2.º ciclo do ensino básico. Este estudo apresenta a construção e validação de uma medida para avaliar a exploração de carreira no 2.º ciclo – o Inventário de Exploração de Carreira na Infância (IECI). O IECI baseia-se numa perspetiva integradora da exploração de carreira e considera a curiosidade, os recursos exploratórios e o *self* em papéis de vida como indicadores desse construto. Foi elaborado um banco inicial de 72 itens, os quais foram qualitativamente avaliados por quatro peritos e 11 crianças numa reflexão falada. Obteve-se evidência de validade de julgamento e sugestões para melhorar as instruções e os itens, tendo ainda sido possível registar o tempo necessário de administração. A versão melhorada do IECI Versão 1.0 foi administrada a uma amostra de 312 crianças (43.6% raparigas e 56.1% rapazes, $M_{idade} = 10.80$, $DP = .86$) do 5.º e 6.º anos escolares. Os resultados das análises dos itens, fidelidade, fatorial exploratória e confirmatória sustentaram a redução do IECI para 12 itens. Estes itens apresentaram evidência de validade de julgamento, uma distribuição aproximadamente normal das respostas, saturações num único fator e não condicionaram a fidelidade da medida. A escala de resposta inicial do IECI (1 “Totalmente parecido comigo” a 5 “Totalmente diferente de mim”, IECI Versão 2.0) foi comparada a outra alternativa (1 “Discordo fortemente” a 5 “Concordo fortemente”, IECI Versão 2.1), recorrendo a

outra amostra de 478 crianças (45.6% raparigas e 54.4% rapazes, $M_{idade} = 10.91$, $DP = .88$) do 5.º e 6.º anos escolares. As análises confirmatórias multi-grupo sugeriram o bom ajustamento de um modelo hierárquico de medida, o qual se mostrou equivalente para as escalas de resposta. Verificou-se ainda que o IECI Versão 2.1 apresentava mais itens com uma distribuição de respostas aproximadamente normal, melhor ajustamento e melhor consistência interna do que o IECI Versão 2.0. Análises confirmatórias multi-grupo baseadas no IECI Versão 2.1 apontaram para a equivalência configural e métrica da medida para ambos os sexos e anos escolares, embora se constatasse invariância do fator de segunda ordem para os anos escolares. O IECI Versão 2.1 foi administrado a outra amostra, em quatro momentos de avaliação entre o 5.º e 6.º anos escolares. A amostra final incluiu 429 crianças (48.3% raparigas e 51.7% rapazes, $M_{idade\ no\ primeiro\ momento} = 10.23$, $DP = .50$). Os participantes preencheram o IECI Versão 2.1, as subescalas de autoeficácia para o sucesso académico, aprendizagem autorregulada, tempos livres e atividades extracurriculares da Escala Multidimensional de Autoeficácia Percebida e as subescalas de autoconceito, *locus* de controlo e planeamento da versão Portuguesa da *Childhood Career Development Scale*. Preencheu-se ainda o Questionário de Identificação com base nos registos escolares, para recolher informação sociodemográfica e académica dos participantes. Os resultados confirmatórios indicaram que o modelo hierárquico de medida apresentava um bom ajustamento aos dados dos quatro momentos, com baixa e moderada fidelidade. Os resultados sugeriram ainda a equivalência configural e métrica dos fatores de primeira e segunda ordem do IECI para os momentos de avaliação e para ambos os sexos ao longo do tempo. Os resultados indicaram também equivalência configural e métrica do IECI para raparigas e rapazes com diferentes níveis de proficiência literária, em cada momento. Encontraram-se relações positivas estatisticamente significativas entre os *scores* totais do IECI, a autoeficácia para atividades académicas, de tempos livres e extracurriculares, o autoconceito, o *locus* de controlo e o planeamento de carreira, em cada momento de avaliação. Discutem-se os resultados à luz da literatura analítica e de desenvolvimento de carreira e humano. Retiram-se ainda conclusões e apresentam-se implicações deste trabalho para investigação e práticas de carreira futuras.

Palavras-chave: Exploração de carreira; desenvolvimento de carreira na infância; construção de medida; validade de medida.

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INTRODUCTION

Introduction

Career is a lifespan process moving from childhood through adolescence and adulthood (Super, 1994). Still, there is much more attention to career development in adolescence and adulthood than in childhood (Araújo & Taveira, 2009; Hartung, 2015). Such a differentiated attention might be due to a social tendency to protect children from work, although experiences such as play, household chores and school activities contribute for their socialization to work (Goldstein & Oldham, 1979). Thus, the literature has acknowledged the need to advance the scientific knowledge of childhood career development (Patton & McIlveen, 2009). Childhood (0-14 years old; Hartung, Porfeli, & Vondracek, 2005; Super, 1980, 1994) is a foundational period for the socialization to work and career development, during which children explore life roles and develop work habits, an emerging sense of self and conceptions of career choice and attainment, as they engage in family, school and community experiences (Goldstein & Oldham, 1979; Howard & Walsh, 2010; Patton & Porfeli, 2007).

As childhood career development is a growing research domain, a general overview of its literature affords the possibility to acknowledge its particularities, relevance, current state of art and research needs. Despite the lack of an explicit theoretical description of childhood career development (Schultheiss, 2008; Watson & McMahon, 2008), a number of considerations on this process can be retrieved from extant career theories, meta-theories and a proposed integrative framework. Moreover, research has enabled the identification of childhood career development dimensions (e.g., career exploration), the recognition of its personal and contextual influences, the examination of temporal change and the positive impact of early career practices. The agenda of the childhood career development field has credited these efforts and presented suggestions to further advance the topic. Among these suggestions, scholars have called for the identification, assessment and study of core constructs of childhood career development (e.g., Porfeli, Hartung, & Vondracek, 2008; Watson & McMahon, 2008). On the one hand, this would be relevant to advance developmentally-appropriate measures to assess core constructs of childhood career development, thus supporting research and practical purposes (e.g., Porfeli et al., 2008; Watson, Nota, & McMahon, 2015). On the other hand, longitudinally valid and reliable measures to assess core career constructs would sustain developmental studies of individuals' careers, since the childhood period of the lifespan (Vondracek, Ford, & Porfeli, 2014).

Embedded in this general state of art and following such a research agenda, it is possible to identify career exploration as a central construct of childhood career development. While acknowledging the possibility to cover career exploration at any point of the life-course (Jordaan, 1963) and as a dimension of childhood career development (Skorikov & Patton, 2007; Super, 1994),

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children's career exploration can be understood as involving curiosity, the identification and use of exploratory resources and the imagination of the self in future life roles. Career exploration also presents a relational nature (Blustein, 1997) and is believed to shift from in-breadth to in-depth forms since childhood (e.g., Patton & Porfeli, 2007). Thus, it seems reasonable to acknowledge the objective and subjective aspects of career exploration as children age, regarding its behavioral features but also its inherent subjective thoughts and imagination in the future. This is consistent with a more integrative perspective of career exploration as a lifelong and contextual process including attitudes, cognitions, behaviors and affects (Flum & Blustein, 2000; Taveira, 2001; Taveira & Moreno, 2003). Research also supports the importance of investigating children's career exploration. Career exploration sustains the academic adjustment and occupational information during childhood as well as the exploratory process later on in adolescence, which in turn impacts adaptability and identity (e.g., Araújo, 2009; Ferrari et al., 2015; Hartung, Porfeli, & Vondracek, 2008; Savickas, 2002; Super, 1994).

Although in middle school years (10-14 years old), children are expected to systematically and intentionally engage in career exploration (Porfeli et al., 2008), the literature seems to struggle in the chronological definition of childhood and too often overlap middle school childhood with adolescence. This is evident in the assessment and research of career exploration during middle school years, as it often crosses children and adolescents. Although the use of self-report measures emerges in middle school years, possibly due to children's acquired literacy levels (Watson & McMahon, 2008), a number of limitations can be assigned to these measures, regarding the clarification of their theoretical rationale and evidence of construct validity.

Self-report measures directed to middle school children are, therefore, needed to overcome assessment and research limitations on childhood career exploration. Advances in the assessment and scientific knowledge of middle school children's career exploration would additionally be important to inform evidence-based early career practices. Although Portugal does not present systematic and structured efforts to promote career development over the school years, promotional career practices are consistent with Portuguese and international calls to socialize students to work, prevent their academic underachievement and timely prepare them to adapt within unstable educational and working environments (Guichard, 2001; Leão, 2006; Moreno, 2008; Taveira, 1999; Watson et al., 2015). Thus, contributions to assess and investigate middle school children's career exploration could ultimately inform the goals and evaluation of early career practices at this period of the lifespan and stimulate promotional career interventions over the school years. Moreover, a focus on the assessment of middle school children's career exploration would be consistent with previous works conducted by

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the Career Counseling and Development research group at the institution hosting this study. Indeed, as previous works in the research group covered the career development of Portuguese children aged three to six years old and discerned limitations in the assessment of career exploration with middle school children (i.e., Araújo, 2009; B. Araújo, 2002; Oliveira, 2012), it would be reasonable to more deeply cover the assessment of middle school children's career exploration within the research group.

This dissertation intends to contribute for this international and Portuguese state of affairs by presenting the construction and validation of a new self-report measure of middle school children's career exploration – the Childhood Career Exploration Inventory (CCEI). To achieve such a goal, this dissertation is structured in four main chapters.

The first chapter presents a general focus on career development during childhood, acknowledging its relevance, theoretical considerations and research topics. A possible reason for the lack of attention to childhood career development is presented, regarding a paradox from a social protection of children from work versus a socialization of children to work. Theoretical considerations of childhood career development are covered, stating the possibility to address career development during childhood and to identify constructs operating in this process. Particularly, theoretical considerations derived from psychodynamic, correspondence, developmental, social learning, constructivist, developmental-contextual and systems perspectives as well as from our interactive-motivational framework of childhood career development are presented. Research on childhood career development is also offered, acknowledging its dimensionality, personal and contextual influences, temporal change, impact later on in the lifespan and practical initiatives. This general focus on childhood career development sustains the identification of career exploration as a main dimension of this process, as it is theoretically and empirically articulated with other career dimensions, precede later career processes and is covered in early career practices.

The second chapter, therefore, focuses on childhood career exploration. This chapter presents theoretical contributions from both career and human development literatures for the understanding of children's career exploration. Particularly, perspectives of career exploration and works specifically covering this process during childhood contribute for its conceptualization. The assessment of children's career exploration is additionally acknowledged as a relevant step to sustain research and practice in the topic. Thus, techniques and tools to assess career exploration during childhood are identified. Their application in the examination of children's career exploration and main research findings are also presented. Based on these contributions, challenges for the assessment and research

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of childhood career exploration are considered, thus recognizing the need to improve the assessment and scientific knowledge of middle school children's career exploration.

Moving from such a need, the empirical study addressing the construction and validation of the CCEI is presented in the third chapter. Having clarified the purpose, target population, research plan and hypotheses, the procedures inherent to the construction and validation of the CCEI are described. These procedures target the specific goals of yielding complementary types of evidence of construct validity (e.g., Adcock & Collier, 2001; Pais-Ribeiro, 2013; Pedhazur & Schmelkin, 1991), namely judgmental validity focused on test content, internal structure validity, temporal validity and nomological validity. First, the generation of the CCEI item pool and its qualitative evaluation are presented. Second, the procedures and quantitative analyses to sustain the CCEI item selection, response scale piloting and test its internal structure are indicated, based on data collected from a sample of fifth- and sixth-grade children in a cross-sectional design. Third, the test of the CCEI internal structure for response scales, genders and school levels is presented, relying on data from another cross-sectional sample of fifth- and sixth-graders. Fourth, the test of the CCEI internal structure over time as well as for genders, literacy proficiency levels and nomological network across different occurrences of measurement is offered, based on a sample of children followed from fifth- through sixth-grade in a four-wave repeated-measures design.

Finally, the fourth chapter presents the discussion of the results according to relevant analytical, career and human development literatures. Main conclusions as well as implications from this dissertation to future research and early career practices are covered.

CHAPTER 1

Career Development During Childhood

1. A social shield from work vs. socialization to work

Multiple definitions of career can be discerned in different fields of knowledge, such as Sociology, Economy and domains of Psychology, such as Career Psychology, Social Psychology and Personality Psychology (Super, 1979). Despite the diversity of definitions, career is generally defined as a sequence of occupational and non-occupational roles that an individual occupies throughout their life cycle and in different contexts (Super, 1979, 1980, 1994). Such a definition has been associated with the concept of career development and to its related theory, research and practical aspects.

The rapid and global changes in the educational and work environments have stimulated an increased attention to career development. The educational and work environments have shifted from an organizational/external to a personal/internal defined and managed role and from a worker's goal to achieve stability and increasing income to a need for continuous learning and independence (Pinto, 2010). These changes have stimulated the vocational psychology field to address individuals' career learning, behaviors and processes within an increasingly less predictable and more dynamic world. Career theory, research and practice are, therefore, needed to account for people's lifelong and ecological learning, agency and development of main career skills (e.g., career exploration) throughout the life cycle (Taveira, 1999).

As a lifelong and contextual process, it is possible to study career development from childhood through old age and the manifold personal and contextual influences affecting the developmental course of career (Patton & McMahon, 2006, 2014; Super, 1980; Vondracek et al., 2014; Vondracek, Lerner, & Schulenberg, 1986). The field has endeavored to comprehend the lifespan and life course of careers through the scientific study of developmental periods (e.g., childhood, adolescence and adulthood) largely stitched together through theoretical discourse. The field has, however, largely ignored the childhood period spinning until the 14 years of age (Hartung et al., 2005; Super, 1980, 1994) and relied on inferences about childhood career development and developmental processes over this lifespan period and across the transition from childhood to adolescence. Following a developmental view of careers, the scarcity of attention to childhood career development is especially noticeable and calls have been made to enrich the scientific knowledge on this topic (Araújo & Taveira, 2009; Patton & McIlveen, 2009).

A great focus on adolescence and adulthood exists in the career development literature, presumably due to the proximity of these periods of the lifespan to expected school-to-work transitions, career decision-making processes or desired engagement in the work force (Dias & Nascimento,

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2010). However, childhood is a central period for the emergence of conceptions of career choice and attainment, engagement in career exploration and learning of problem solving features (Hartung et al., 2008; Howard & Walsh, 2010; Patton & Porfeli, 2007; Watson & McMahon, 2005, 2008).

Still, we can consider that a social tendency to protect children from work might sustain a resistance to embracing the childhood career development field. While there are movements calling for the promotion of children's work-related experiences at the family, community and school settings, there is also a social tendency to shield children from the deleterious conditions and pressures of work (Cinamon & Dan, 2010; Goldstein & Oldham, 1979; Moreno, 2008). Such a protective tendency might be related to an adult perspective of work and play as separate dimensions of life, with play being associated with childhood and work during this period being considered in relation to negative concepts like "child labor" and "child victimization". Still, a current career perspective pointing to the fusion of work and play throughout the life-cycle (Hartung, 2002) affords the possibility to address the role of play in adolescents' and adults' career development, as well as to identify children's experiences that promote their socialization and emerging orientation to work.

These experiences can be organized around normative and widely accepted childhood concepts such as play, household chores and school activities. Scholars need, therefore, to acknowledge the social bias to protect children from work and to conceive of childhood as a period of play, family and school. This includes accepting that such biases may be contributing to invalid assumptions about the role of work in children's lives. This also includes the recognition that institutions like school and activities such as play, household chores and academic tasks already socialize children to work in a manner that appreciably sets in motion developmental processes leading to lifelong career development.

Play has been perceived as a freely chosen and personally directed activity that benefits children's overall development and experiential learning (Goldstein, 2012; Harkins, 2000). Play can be conceived as a form of children's career exploration, as it affords the possibility for the child to use resources and explore occupational and non-occupational life roles through pretending, symbolic play and interaction with other children and older people. Play presents a key role in the development of children's problem-solving skills, integration of sociocultural rules and perspective taking, as well as abstract reasoning, self-regulation, self-expression and creativity (Bergen, 2002; Papadopoulou, 2012; Smith & Pellegrini, 2008). Children's symbolic play is also relevant for their life role experimentation and perceived mastery, just as children's play with books, letters, computers and numbers are important for the development of language development, school readiness, literacy and numeracy skills

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(Bergen, 2002; Ginzberg, Ginsburg, Axelrad, & Herma, 1951; Goldstein, 2012). Additionally, the shift from a person-centered form of play to an interactional one has been recognized to foster an individual's ego mastery and identity (Erikson, 1963). Differences between girls and boys in play regarding the use of and preference for toys have been found. For example, while girls seem to prefer to play with dolls and to engage in house and family related activities, in which they pretend to perform housework tasks and to take care of others, boys tend to prefer motorized vehicles (B. Araújo, 2002).

Experiences promoting children's orientation to work are also provided at the home setting. Despite a social movement towards the separation of children from work over the past years, children have participated in household chores through recorded history. Children have actively participated in agricultural, family work and contributed to the family income until worldwide social changes such as the Portuguese mandatory school system (e.g., Portuguese Lei número 46/86, 14 outubro). Educational efforts to prevent school dropout and the definition of a chronological high age that presents individuals with the needed skills to perform certain activities have also led to a different perspective of children's work. Nonetheless, there are still worldwide children engaged in or approaching an early transition to the labor market by being employed in illegal activities across a number of countries, doing harmful domestic service or early dropping out of school and engaging in the work force (e.g., Brasted & Wright, 2007; Ferreira, Santos, Fonseca, & Haase, 2007; Gamlin, Camacho, Ong, & Hesketh, 2013; Mortenson, Stocker, & Brunt, 2010; Porfeli et al., 2008). Despite a social tendency to protect children from work experiences that potentially compromise their development, some children are already or about to be engaged in the work force. Moreover, several life settings and institutions generally socialize children to work, under a conception of such practices as being important for their growth and learning (Rodrigues, 2010).

From historical to current times, children continue to perform household chores at the family setting and to be socialized to work. The more common household chores performed by children include washing dishes and caring for younger siblings (Blair, 1992). Motives for children's participation in household chores have been presented both by parents and children, suggesting the positive impact of household chores in children's learning about work and its role in social life. On the one hand, parents have justified the involvement of their offspring in household chores as a socialization strategy to help them develop responsibility, autonomy, pro-social behaviors, task learning and self-worth; as a resource when they have limited time to devote to household duties; and/or as a "domestic democracy", in which the elements of a family split tasks to become more efficient (Blair, 1992; Goodnow, 1988). On the other hand, children's needs for autonomy, responsibility, being helpful

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and reducing parents' burdens sustain their participation in housework (Goodnow, 1988; Russell, Brewer, & Hogben, 1997). Children's positive engagement in household chores might constitute a form of exploration of sex-roles and non-occupational life roles as well as support children's autonomy. Children's engagement in and time devoted to household chores have also been positively related to the development of altruistic values, nurturance towards peers, responsibility, social cognition, pro-social behaviors and orientation to work (Baldwin, 2004; Goodnow, 1988). Following differences for genders in play, also differences for girls and boys have been found in the performed types of household chores. Girls seem to more often present household chores as a leisure activity and to dedicate more time to chores such as cooking, cleaning and laundry than boys (Blair, 1992; Goodnow, 1988; Falusso, 2011). Boys most frequently perform the tasks of taking out the garbage, gardening and outdoor cleaning than girls (Russell et al., 1997). Although gender differences in the children's level of engagement in household chores are less evident, gender stereotypes in household tasks seem to increase over time (Baldwin, 2004), thus suggesting an exploration and learning of sex-roles.

Besides household chores, other experiences at the family setting contribute for the socialization of children to work. Indeed, children and youths perceive parents' work experiences and affectivity, which in turn influence their perceived parental success in work and family, anticipation of one's future work experiences and emotions, disposition to engage in the world of work, motivation for schoolwork, academic engagement and achievement (Lee & Porfeli, 2015; Porfeli, Ferrari, & Nota, 2012; Porfeli, Wang, & Hartung, 2008). Moreover, parents' conversations about work seem to support children's and adolescents' openness to and engagement in career exploration as well as to influence their perceived social support for career choices and life projects (Gonçalves & Coimbra, 2007).

The development of children's orientation to work is also stimulated by academic experiences. Children's academic activities serve their exploration of the educational and working world and are implicated in learning and growth. Academic tasks enable children to develop attitudes towards work, task mastery, perceived competence and problem solving skills (Magnuson & Starr, 2000). Academic experiences are also relevant for the development of children's work habits and routines, awareness of occupations and educational requirements, as well as assignment of meaning to school (Taveira, 1999). Although a scarce attention has been devoted to the links between careers and academics, literature (a) has found positive relations between educational aspirations, career exploration, occupational knowledge, academic achievement and perceived competence in problem solving tasks (e.g., Bandura, Barbanelli, Caprara, & Pastorelli, 2001; Creed, Tilbury, Buys, & Crawford, 2011; Lemos, Almeida, & Primi, 2007; Lopes, 2010; Schmitt-Wilson & Welsh, 2012; Turner et al., 2006), as

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well as (b) has suggested that the general and reading abilities developed during children's academic experiences influence their occupational aspirations and parents' expectations for them (e.g., Creed, Conlon, & Zimmer-Gembeck, 2007). Favorable academic experiences and results lived since the childhood period seem, therefore, important for one to become aware of the importance of the school for the future and influence career outcomes later on in adolescence and adulthood. Among these outcomes, the approach of school tasks and occupational opportunities, being employed, earn a favorable income and present an overall satisfaction with life can be highlighted (Araújo & Almeida, 2014; Gutman & Schoon, 2012; Lewis, Huebner, Malone, & Valois, 2011; Lopes, 2009).

School experiences have also been perceived as the work of children and set the basis for perceived differences among work and play, which emerge as soon as about three years old (Kärby, 1989; Wing, 1995). Children perceive work as mandatory, externally controlled and as a set of cognitive activities that need to be completed (Wing, 1995). Children also assign work to interactions with adults, practicing, books and specific settings (Kärby, 1989). On the other hand, children perceive play as freely chosen, self-directed, internally controlled and involving physical activities that they might decide to do or not to do (Wing, 1995). Children also understand play as a sequence of fantasy and diverse activities (Kärby, 1989). Although children start to differentiate work from play, they seem to assign fun and pleasure to both of them (Kärby, 1989; Wing, 1995). This suggests that a work-play continuum might be predominant in the early years of age, but might become later dichotomized as a product of the children's awareness of others' expectations for them, exploration of life roles, socialization to work and vicarious learning from adults' dichotomized perspective of work and play (Bordin, 1990; Hartung, 2002).

As differences for genders have been found in play and household chores, they have also been reported in children's academic activities. While girls seem to present better results in reading and prefer social, artistic and investigative activities, boys present better results in numeracy and develop preferences towards investigative and enterprising activities (Lerkkanen et al., 2012; Schuette, Ponton, & Charlton, 2012; Watson, McMahon, Foxcroft, & Els, 2010). Moreover, boys often present lower academic achievement and engagement as well as higher classroom disruption, antisocial behaviors and intentions to drop out of school than girls, which makes boys at a higher risk for discontinuities in career paths (Holland, 1998; Ferreira et al., 2007; Spilt, Koomen, & Jak, 2012).

Taking this literature into account, we can acknowledge play, household chores and school activities as integrating career exploration features and serving the socialization of children to work. Thus, the literature suggests something of a paradox. On the one hand, there exists a strong tendency

to shield children from certain forms of work. On the other hand, play, household chores and school experiences already serve as strong socialization agents and positive vehicles of career exploration promoting children's orientation to and learning about work. The next of this paradox is a clear tendency to offer little attention to children's career development in the career literature, although its study is plausible and relevant in current times. Still, while childhood is increasingly acknowledged as a foundational period for career development, growing efforts in the conceptualization and research of childhood career development can be discerned in the literature and are presented next.

2. Theoretical considerations

The literature of childhood career development is dispersed across different journals and disciplines, lacking a framework that explicitly describes its main constructs, inter-relations, procedural and contextual nature (Schultheiss, 2008; Watson & McMahon, 2005). However, there are theoretical and empirical career contributions serving the growing advance of the field (Araújo & Taveira, 2009; Oliveira, Porfeli, & Taveira, in press).

A number of considerations on childhood career development can be retrieved from extant career theories and meta-theories, which implicitly or explicitly refer to the centrality of childhood in career development (Araújo, 2009; Araújo & Taveira, 2009; B. Araújo, 2002). Namely, career considerations on childhood career development can be retrieved from psychodynamic, corresponding, developmental, social learning, constructivist, developmental-contextual and systems career perspectives. Moving from the recognition of these career perspectives (Araújo, 2009; Araújo & Taveira, 2009; B. Araújo, 2002), we herein update their contribution to the understanding of children's career development. We also introduce an example to integrate such theoretical considerations in our interactive-motivational framework of childhood career development (Oliveira & Taveira, 2016).

2.1. Psychodynamic

The psychodynamic (e.g., Erikson, 1963; Roe, 1957) career perspectives implicitly considered childhood career development. Although these perspectives have not been much updated in the childhood career development field, they acknowledge the relevance of children's experiences for career development and inform contemporary constructivist career perspectives.

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Theories such as those of Erikson (1963) and Roe (1957) highlighted the role of children's early experiences in the development of internal working models, ego identity and psychosocial adjustment. These perspectives conceived of children's proximal experiences at the family setting as the bases from which individuals develop a tendency for social integration, openness to exploratory activities, orientation to and adjustment in work. Since childhood and within proximal relations, individuals are expected to develop a sense of trust in one-self and others, autonomy, initiative for one's actions and learning, industry or work effort and identity, incorporating idols and ideals in one's cognitive self-representations (Erikson, 1963). Such personal senses seem to be influenced by children's quality of the relation and identification with parents, parenting styles, exposition to a broad range of career alternatives, awareness of others' expectations for them, cognitive and moral development (Waterman, 1982). Moreover, the developed senses of trust, autonomy, initiative, industry and identity seem to sustain a disposition to explore the environment, which in turn is related to confidence and commitment in career decision-making, career satisfaction, adaptability, adjustment, employment and mental health later on in adolescence and adulthood (Cohen, Chartrand, & Jowdy, 1995; Munley, 1977; Vaillant & Vaillant, 1981).

These perspectives also afford the possibility to acknowledge the impact of attachment experiences in career development (Araújo, 2009). Attachment sustains the development of internal working models, which guide children's social relations with peers and other adults, influence behavioral response patterns as well as shape dispositions to explore and emerging attitudes towards and behaviors in the working world. Individuals who integrate a secure sense of attachment seem to present a positive self-esteem and a high disposition to engage in career exploration, which are associated with favorable career decision-making, career-search self-efficacy expectations, self-knowledge, search for information and career confidence (Emmanuelle, 2011; Ryan, Solberg, & Brown, 1996; Vignoli, Croity-Belz, Chapeland, de Filips, & Garcia, 2005; Wright & Perrone, 2008). The influential role of caregivers' responses to the child's needs in later career decision-making processes has also been considered, as it would be plausible for one to seek for the satisfaction of previously non-responded needs through future career choices (Roe, 1957).

2.2. Correspondence

The correspondence career perspectives also offered implicit considerations to the understanding of childhood career development. Although these perspectives have not been much

updated in this topic, they highly influence Portuguese career practices and have sustained a number of studies on childhood career development.

Correspondence theories, such as Holland's (1985) theory, suggested that career choices and work environments should be aligned with individuals' personalities to favor career satisfaction and success. In this sense, children's experiences would lead to the development of increasingly specific preferences, perceived competences and values, which in turn would be encapsulated in a personality type. Among these experiences, the ones at the family setting seem central. Parents' educational styles and expectations to their offspring are believed to impact the differentiation of children's interests and perceived capabilities (Holland, 1962). Moreover, children are exposed to and learn from their parents' behaviors, work attitudes, affects, tools and activities, thus being socialized to specific environmental types (Holland, 1985; Mullis, Mullis, & Gerwhels, 1998; Williams & Subich, 2006). These perspectives suggest that children would be likely to develop similar personalities and make similar career choices to the ones of their parents. A replication of parents-offspring's occupations was, therefore, hypothesized (e.g., Lee, 2012; Mullis et al., 1998). However, controversial findings have been found and there seems to exist a variation in the types of personality and occupational environments across genders and generations (Helwig, 2008). This might suggest a non-deterministic view of children and their families' environments as well as highlight the possible role of other contexts in the socialization of children to other behavioral and environmental types.

Children may or may not be exposed to other environments besides the ones socialized at the family setting, for example, through additional school, extracurricular and leisure experiences. These multiple experiences contribute for the differentiation of emerging personality features. Thus, children's exposition to and learning from different work environments are implicated in the development of career exploration, preferences, perceived competence and intentions for the future. These career processes may vary across activities within the established Holland's (1985) RIASEC acronym – Realistic (physical and practical activities), Investigative (scientific and analytical activities), Artistic (creative and expressive activities), Social (relational and cooperative activities), Enterprising (management and entrepreneurial activities) and Conventional (concrete and systematic activities).

2.3. Developmental

A different case was made by developmental career perspectives (Ginzberg et al., 1951; Gottfredson, 1981, 1996; Super, 1980, 1994), which presented more explicit considerations on

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childhood career development. These perspectives continue to be acknowledged in current literature and have been frequently cited in journal articles on the topic published over the last eight years (Oliveira et al., in press).

Developmental career perspectives conceived of career development as a process including a sequence of life roles performed across the life cycle – life-span – in a number of contexts or life-theaters – life-space (Super, 1980). Developmental career perspectives were highly informed by human development literature while suggesting expected developmental stages of careers, such as Super's (1980, 1994) life span and life space theory stage of Growth. During the Growth stage, children are expected to become concerned about their future, develop personal control over their actions, become aware of the importance to successfully perform school and work activities, develop adaptive work habits and increase their social participation mostly across the family, school and community life-theaters (Super, 1980; Super, Savickas, & Super, 1996). The Growth stage is also structured across four sub-stages. At the Curiosity sub-stage (0-4 years old), children would be mostly engaged in inquisitive and information-seeking behaviors. Moving towards the Fantasy sub-stage (5-7 years old), children would engage in leisure activities, which would afford the possibility to audition later life roles. At the Interest sub-stage (7-10 years old), children would become aware of their likes and dislikes and would more likely get involved in activities they like and from which they expect to retrieve satisfaction. Finally, the Capability sub-stage (10-14 years old) includes the reality testing of hypotheses about oneself and the environment, based on children's perceived competence in various activities.

Developmental career perspectives also highlighted the role of self-concept in individuals' exploration of activity domains and career decision-making. Super's (1980, 1994) life-span and life-space theory and Gottfredson's (1981, 1996) theory of circumscription and compromise suggested that self-concept develops since the first years of life through processes of exploration, identification with and differentiation from key-figures, role-playing and reality testing (Super, 1963). Self-concept is also believed to include a psychological self, which covers one's values and behavioral patterns, as well as a social self, which derives from children's interpersonal experiences and sustain the acquisition and integration of concepts of gender, prestige and social class (Gottfredson, 1981, 1996).

Cognitive development seems particularly relevant for the coverage of self-concept and its social self, whereby it has been acknowledged both by classical and more recent developmental career contributions. As children become capable of conserving, classifying and seriating objects in a concrete operations stage of cognitive development, they also become oriented to sex roles and start to use concrete clues to assimilate the concept of sex roles, adhere to sex roles, affirm their own sex and

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grasp social class differences. As children move from a concrete operations stage to a formal/hypothetic-deductive one, they get highly sensitive to others' social evaluations and become aware of an implicit social class hierarchy in the educational and working world, developing an orientation to social valuation and perceived capabilities. Thus, children develop increasingly complex and abstract representations of one-self tempered with social concepts such as sex-roles, social valuation and perceived capabilities (Gottfredson, 1981, 1996; Piaget, 1964). Such social concepts are increasingly integrated in children's self-concept and sustain the circumscription of career alternatives, so that these can be personally and socially compatible in terms of representations of tolerable-sex type, social level and effort boundaries in a cognitive map of occupations.

Children's cognitive development and increasingly complex and abstract representations of one-self might also be implicated in shifts (a) from fantasy to realistic conceptions of economic and commercial relations and the working world, (b) from a ludic orientation to activities based on one's satisfaction to a labor orientation sustained by socialization experiences and observation of significant figures, as well as (c) from magical to sequential and interactional approaches to career choice and attainment, balancing perceived personal and environmental features and perspective taking (Dumora, 2004; Ginzberg et al., 1951; Goldstein & Odham, 1979; Howard & Walsh, 2010; Nelson, 1978).

Children's development of cognitive representations of one-self and the working world were also illustrated in Howard and Walsh's (2010) model, which suggested that children progress across three cognitive reasoning approaches to career choice and attainment. We also acknowledge that this model presents similarities to Law and McGowan's (1999) model of career learning. An association approach to career choice and attainment describes children's magical thinking and associations to key-figures, heroes or magical characters. This approach can be tied to a sensing stage of career learning, which challenges children to learn about the work role and its behavioral and affective aspects within social relations with proximal figures and others in extra-familiar settings. Moving to a sequence approach, children are expected to understand that something triggers one's career choice and attainment as well as to be capable of providing concrete spatial/temporal explanations about the relations among these processes. This reasoning approach can be tied to a sifting stage of career learning, during which children organize and communicate information about their preferences and growing knowledge on occupations and the working world. Finally, an interaction approach of career choice and attainment combines personal features and perceived environmental opportunities/barriers, following evidence suggesting that children are able to identify factors influencing their career development, preferences and choices (Howard, Flanagan, Castine, & Walsh, 2015). This career reasoning approach is aligned

with the focusing and understanding stages of career learning, as children develop preferences and construct emerging self-descriptions based on the knowledge of oneself and time perspective, become aware of similarities with and differences from others and progress in career reflexivity. As so, children's conceptions of career choice and attainment seem to parallel career learning and to follow increasingly complex and abstract cognitive representations of one-self and the environment.

Developmental career perspectives have also introduced a dimensional view of children's career development, which we consider in this dissertation. Such a dimensional view was specifically illustrated in Super's (1994) interactive model, which described childhood career development across nine career dimensions – curiosity, exploration, information, key-figures, interests, locus of control, time perspective, self-concept and planning. These dimensions were understood as antecedents of career maturity, later on updated to career adaptability, or one's potential to change and continuously adapt to environmental and organismic challenges and life transitions (Savickas, 1997; Super, 1994). Career adaptability is, therefore, a process developed since childhood and underlying individuals' lives and careers (Hartung et al., 2005, 2008). The interactive model seems to put a special focus on career exploration as a basilar dimension of childhood career development, which is implicated in the child's career growth and learning (Taveira, 1999). Although the interactive model did not thoroughly expand the factors of childhood career development, Super (1980, 1994) acknowledged the importance of personal and social factors of career development. Thus, the interactive model afforded the possibility to conceive of childhood career development as an interactive process, during which children explore, learn and dynamically interact with contexts (Patton & McMahon, 2006, 2014).

2.4. Social learning

Social learning career perspectives also presented more explicit considerations on childhood career development. However, these perspectives still remain more focused on career development in adolescence and adulthood rather than childhood. Calls have, therefore, been made to more deeply apply social learning career perspectives over the lifespan, starting in childhood (Lent & Brown, 2013).

Social learning career perspectives, such as those offered by Mitchell and Krumboltz's (1990) as well as Lent, Brown, and Hackett's (1994) theories, rely on Bandura's (1977) social cognitive theory and focus on the application of social cognitive concepts such as self-efficacy expectations and outcome expectations in the career arena (e.g., Betz, 2000; Lent et al., 1994). Overall, the social learning career perspectives suggested that learning experiences and social cognitive mechanisms

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impact the school-to-work transition, career choices, adjustment and self-management (Lent & Brown, 2013). These perspectives highlighted the person-context interaction in unique learning experiences, which in turn impact career beliefs, behaviors and idiosyncratic career paths.

The unique learning experiences lived since childhood as well as the contexts within which individuals interact and learn from are believed to impact one's career behaviors and beliefs (Mitchell & Krumboltz, 1990). Moreover, as children explore life roles, contexts and the working world, they engage in instrumental, associative, vicarious and social persuasion learning experiences as well as experiment psychophysiological and emotional states, which are implicated in their career behavior and development (Watson & McMahon, 2007). While being engaged in career exploration and inherent learning experiences, children are expected to develop and continuously revise social cognitive mechanisms, which may accordingly influence their approach or avoidance of tasks, sustain the development of provisional academic and occupational preferences, prospects and preparation for the school-to-work transition (Lent, 2004; Lent & Brown, 2013; Lent, Hackett., & Brown, 1999; Lent, Hackett, & Brown, 2004; Oliveira, Taveira, Cadime, & Porfeli, 2016). In addition, the social learning perspectives suggested individuals' agency and interpretative role in career development by shaping and being shaped by environmental challenges. Thus, these perspectives conceive of childhood career development as an interactional process, during which individuals explore a number of activities, develop related social cognitive mechanisms and dispositions to approach/avoid activities.

2.5. Constructivist

The constructivist career perspectives explicitly considered the centrality of childhood in career development and emergence of the bases of career meta-competencies (i.e., adaptability and identity) at this period of the lifespan. Constructivist career perspectives have been mostly applied to the research and practice of adolescents' and adults' careers, but still contributed for the recognition of childhood as an important period in lifelong vocational behavior.

These perspectives expanded the importance of individuals' assignment of meaning to life experiences and construction of a life story since the first years of life. Among constructivist career perspectives, the importance of childhood was specifically addressed in the career construction theory (Savickas, 2002), an update to Super's (1990) career development theory. The career construction theory (Savickas, 2002) presented childhood as a period of orientation to the future. The application of this theory to career counseling additionally suggested the importance of one's childhood experiences

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in the development of themes guiding an autobiographical narrative and intentions to the future (Savickas, 2011). Taking the development of self-concept into account, Savickas (2002) suggested that the children's views of themselves as objects in social situations would enable the creation of a set of self-perceptions, yet disintegrated and incoherent. Experiences at home and other settings (e.g., neighborhood and school) would also sustain the development of children's self-perceptions, social comparison and learning about themselves and the society. From late childhood forward, individuals would become able to generalize self-perceptions and to translate them into a more coherent, integrated and abstract description of themselves. During childhood, individuals would be also increasingly constrained by sociocultural guidelines, from which tensions could be raised and set the basis for the emergence of a theme guiding one's lifelong career story.

Also conceiving childhood as a period of Growth, the development of career concern, control, curiosity and confidence were presented as major tasks for the development of career adapt-abilities grounded on childhood (Hartung et al. 2008; Savickas, 2002). One's career concern about the future as a worker would be developed as a consequence of children's dependence on parents, relying on internal working models and one's trust in others. Career control would emerge from the independence from parents and would be based on proactive behaviors sustaining one's autonomy and personal agency. The development of curiosity would occur in the interdependence with others and include reflective processes and assignment of meaning to oneself and previous experiences in her/his life. Career confidence would emerge from feelings of competence and problem solving experiences in different settings as well as include one's self-efficacy, self-acceptance, self-value and sense of task mastery. According to Savickas (2002), career concern, control, curiosity and confidence are facilitative dispositions for the development of adapt-abilities (i.e., competences) later on in adolescence. Career concern in childhood would sustain the development of the planning competence during adolescence; career control would be the basis for decisional competence; curiosity would generate the knowledge about oneself and the occupations; and career confidence would sustain the development of problem-solving competence.

Moving from this perspective, Hartung (2015) conceived of childhood as a period at which self-construction begins. Based on this conception, children would be expected to attain the life-design goals of activity (i.e., trial of multiple activities and development of related self-representations), adaptability (i.e., adaptation to life transitions and development of exploration and problem-solving skills), narratability (i.e., verbalization of one's experiences and development of an emerging sense of self) and intentionality (i.e., understanding of oneself, circumstances and development of provisional

intentions for the future). Thus, these goals follow children's rehearsal of life-roles, adaptation to developmental tasks, planning for the future, telling of a life-story based on an emerging sense of self and assignment of meaning to lived experiences. The attainment of these life-design goals during childhood are believed, in turn, to facilitate the career meta-competences required to live within unstable environments (Hartung, 2015; Savickas, 2002).

2.6. Developmental-contextual and systems

Developmental-contextual and systems career perspectives highlighted the person-contexts mutual dynamics over the lifespan and the ecology of career development (Patton & McMahon, 2006, 2014; Vondracek et al., 2014; Vondracek et al., 1986). According to the developmental-contextual meta-theory (Vondracek et al., 1986), the living systems theory of vocational behavior and development (Vondracek et al., 2014) or the systems theory (Patton & McMahon, 2006, 2014), a child can be perceived as an open and self-constructing system. Thus, a child combines changeable person-context interactions, affecting and being affected by environmental contingences at different system levels, such as the micro, meso, exo, macro and chronosystems (Araújo & Taveira, 2009; Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998; Taveira, Oliveira, & Araújo, in press; Vondracek, 2004; Vondracek et al., 2014; Vondracek et al., 1986). Following developmental-contextual and systems career perspectives, career development can be understood as a time-related and time-extended changing process, imbued in human development, mutable and interrelated contexts, featuring quantitative and qualitative continuity and discontinuity over the life-course. Career development can also be understood as a process of self-construction, potential for change and intra-/inter-individual variability based on individuals' different intentions, meaning assigned to experiences and responses to lifelong mutable and interrelated contextual dynamics. Based on developmental-contextual and systems career perspectives, one should acknowledge the individuals' characteristics, contextual features and their interaction, thus conducting career assessments from a broad framing of individuals' developmental status in different life areas, to a deeper focus on specific developmental issues (Vondracek, 2004).

Developmental-contextual and systems career perspectives afford the possibility to consider change in children's career development, children as shapers of context and development as well as contextual influences in children's career development (Araújo & Taveira, 2009). Moreover, the child-in-context experiences, such as those lived during career exploration, set the basis for one's learning

about the self and occupations, assignment of meaning to life experiences and development of specific behavior episodes (Patton & McMahon, 2006; Vondracek et al., 2014). Specific behavior episodes emerge since childhood and can be accumulated and generalized to other experiences. Thus, they sustain the development of a vocational behavior episode schema that potentially influences further vocational behaviors in childhood and later on in adolescence and adulthood (Vondracek et al., 2014).

We find the developmental-contextual and systems career perspectives relevant to the general career field and to the specific childhood career development topic. We believe that these perspectives are promising to integrate extant theoretical considerations while (a) addressing vocational behavior and development as a lifelong process, (b) suggesting the mutable, interconnected and systemic nature of career development, (c) highlighting the childhood foundations of vocational behavior, and (d) pointing to the child's active role in the construction of her/his path.

2.7. Interactive-motivational

In an attempt to offer the field a lacking and needed explicit description of childhood career development (Schultheiss, Palma, & Manzi, 2005; Watson & McMahon, 2008), Oliveira and Taveira (2016) rehearsed a combination of the aforementioned career considerations in the interactive-motivational framework. This framework considered that childhood career development (a) is a dimensional process, which can be described according to core developmental-contextual constructs (i.e., career exploration, cognitive-motivational beliefs such as self-efficacy and outcome expectations, information, interests, time perspective, planning, locus of control and self-concept) and their structural inter-relations; (b) is an interactive and systemic process of growth, during which person-in-situation experiences sustain idiosyncrasies in one's career trajectories; and (c) is a constructivist process, in which children play an active role in constructing their own development, shaping contextual influences and coping with expected and non-expected psychosocial challenges.

The interactive-motivational framework flows from a starting point in career exploration to the development of other career dimensions (see Figure 1). This framework conceives of career exploration as a central dimension of childhood career development, in which other career dimensions and processes at this period of the lifespan and later on life rely on.

Our interactive-motivational framework suggests that career exploration offers learning experiences to children, from which they develop related cognitive-motivational beliefs, such as self-efficacy and outcome expectations. In turn, favorable self-efficacy and outcome expectations can

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stimulate one's continuity in career exploration. By the same token, negative self-efficacy and outcome expectations may sustain the children's disengagement from the exploration of certain activities and lead to the exploration of other ones related to the emergence of favorable cognitive-motivational beliefs. Thus, the cognitive-motivational beliefs are informed by career exploration experiences, but their direction and strength may also place continuities and discontinuities in career exploration (Blustein, 1989; Taveira & Moreno, 2003). Children's career exploration is also related to the search for and management of information. Through the acquisition and management of information about the self and the environment, children are provided internal and external feedback about their performance and the utility of their exploratory behaviors.

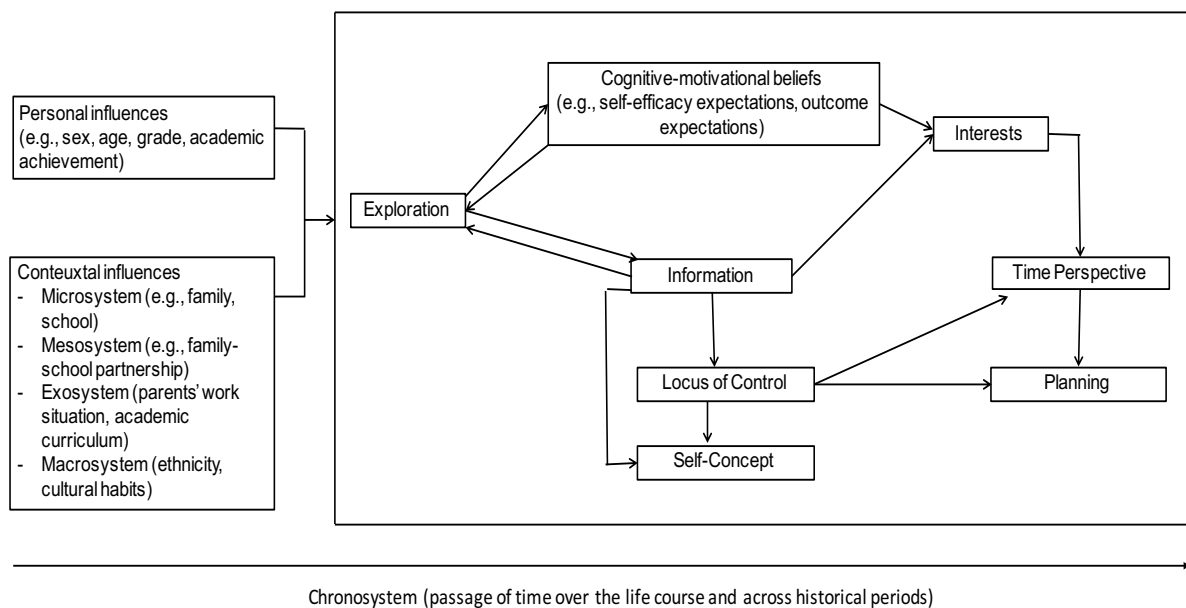


Figure 1.

The interactive-motivational framework of childhood career development.

Moving towards the development of interests, the interactive-motivational framework suggests that as children explore life roles and activities, develop cognitive-motivational beliefs and acquire information, they become aware of personal likes, dislikes and indifferences (Lent, 2004). Being a contextually embedded process, children's preferences can also be shaped by perceived tolerable-sex type and social level alternatives (Gottfredson, 1981).

In addition, children's time perspective is sustained by one's awareness of preferences and by locus of control. On the one hand, children start grasping a chronological temporal continuity and imagining themselves in likeable life roles and occupational activities in the future. On the other hand, locus of control relies on the child's autonomy and confidence required to rehearsal life roles, engage

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in career exploration and develop positive attitudes about the future (Schultheiss et al., 2005; Super, 1994; Taveira & Moreno, 2003). Children's time perspective and favorable generalized expectancies of control are also assumed to sustain career planning, which constitute the basis for career decision-making (Super, 1983; Taveira, 1999).

Regarding the development of self-concept, as children tryout life roles across several contexts, they also develop cognitive representations of themselves. The integration of information about the self and the environment enable children to imagine their role in the future and to develop a more complex, abstract and contextualized constellation of representations of themselves (Taveira, 1999).

Finally, the interactive-motivational framework suggests that children's career development is a systemic process, coupling influences from nested system levels and changing over the lifespan and across generations. Thus, variability in children's career development is plausible based on different child-context dynamics and personal meaning assigned to such experiences.

Although this framework can still be improved according to future advances in the field, it might already present an innovative contribution by highlighting the role of career exploration in childhood career development and accommodating a developmental-contextual and systems perspective of this process. It seems also useful to discern other core constructs of childhood career development that may benefit from more systematic attention in the literature. Indeed, these constructs may be considered in assessments of childhood career development. Advances in the construction or revision of measures to validly and reliably assess each career construct may enable an empirical test of our framework, as well as stimulate the systematic research of each construct and the overall childhood career development process.

In synthesis, different but complementary considerations on childhood career development can be retrieved from extant career theories, meta-theories and our proposed framework. Overall, the conceptualization of childhood career development has progressed from implicit to more explicit considerations (Araújo & Taveira, 2009; Araújo, 2009; B. Araújo, 2002) and towards an integrative position. Such a progress seems consistent with a currently predominant convergent position in the more general career literature (Chen, 2003; Osipow & Fitzgerald, 1996; Patton & McMahon, 2014). It may also stimulate needed advances in the revision of existent theorizations of children's career development and efforts to identify, assess and investigate core constructs, ultimately integrating them in an explicit model of this process (Porfeli et al., 2008; Schultheiss, 2008; Scultheiss et al., 2005; Watson & McMahon, 2008), as rehearsed in our interactive-motivational framework.

Taking these complementary theoretical considerations into account, career exploration emerges as a key-construct of childhood career development, which should be highly valued in the field. On the one hand, career exploration can be conceived of a core construct of childhood career development, which “facilitates socialization and learning” (Porfeli et al., 2008, p. 27) and has been implicitly or explicitly covered across broader theoretical considerations of childhood career development. On the other hand, developmental-contextual and systems career perspectives acknowledge the role of children’s career exploration as operating person-environment dynamics and underlying future vocational behavior (Vondracek et al., 2014).

This dissertation, therefore, recognizes the important role of the presented theoretical considerations on childhood career development and the more implicit or explicit salience of career exploration in these considerations. Following a convergent position in the general career literature and the childhood career development field, we adopt developmental-contextual and systems perspectives of children’s career development and rely on our interactive-motivational framework to focus on children’s career exploration. Research on childhood career development is presented next to yield additional information on what has been covered in the field and to verify the empirical relevance to address children’s career exploration as well.

3. Research

Although most career development research has been conducted with adolescents and adults, the last years have been profitable in the disclosure of studies covering childhood (Oliveira et al., in press). Landmark publications in 2005 and 2008 (e.g., Hartung et al., 2005; Porfeli et al., 2008; Schultheiss, 2008; Watson & McMahon, 2005, 2008) highlighted the importance of childhood in career development, identified main dimensions of such a process (e.g., career exploration) and offered suggestions to advance the field. An additional book (i.e., Skorikov & Patton, 2007) and other empirical works have also been published and sustained progresses in the study of children’s career development (Oliveira et al., in press). Particularly, the international research collaboration and the acknowledgment of its implications for practice have been recently highlighted (Watson et al., 2015).

We next present empirical contributions on children’s career development offered in the last 15 years, based on a continuous searching process performed via Academic Search Complete, Elsevier Eric, PsycARTICLES, PsycInfo, Sage, SCOPUS, Springer and Taylor & Francis, as well as Master thesis and Doctoral dissertations. We can generally organize these empirical contributions in the following

research topics of childhood career development: (a) core constructs and their relationships, (b) personal and contextual influences, (c) temporal progress and consequences in later career processes and results, as well as (d) career interventions.

3.1. Core constructs and their relationships

Scholars in the childhood career development field have recognized the need to identify, assess and investigate the core constructs of the process (Hartung et al., 2005; Watson & McMahon, 2008). Aligned with such a call, Hartung and collaborators' (2005) literature review highly contributed to the field by identifying five main dimensions of children's career development that have been internationally addressed – career exploration, awareness, aspirations/expectations, interests and adaptability. Hartung and collaborators' (2005) review pointed, therefore, to the dimensional nature of childhood career development, thus affording the possibility to cover one or more career dimensions when studying this process, among which career exploration is included. This possibility was also illustrated in Skorikov and Patton's (2007) book, which focused on career development in childhood and adolescence as well as covered dimensions such as career exploration and aspirations in these periods of the lifespan.

Some of these dimensions were consistent with theme categories found in qualitative studies grounded on children's discourses. For example, Schultheiss and collaborators (2005) coded North-American children's narratives in terms of career exploration and information, self-concept, key-figures, locus of control, time perspective and planning, awareness of career decision-making and conceptions of work. In a similar effort in Turkey, Nazli (2007) coded children's discourses in the theme categories of curiosity, exploration and information, key-figures, self-concept, locus of control, time perspective and planning. The categories generated in these qualitative studies were aligned with the ones proposed in Super's (1994) interactive model and our interactive-motivational framework. They additionally supported dimensional assessments of children's career development (e.g., Araújo, 2009; B. Araújo, 2002; Oliveira & Taveira, 2014; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010; Wood & Kaszubowski, 2008).

It is noteworthy that the dimensions identified by Hartung and collaborators (2005) continue to deserve attention in current literature (Oliveira et al., in press). However, the relationships among these dimensions have not been much examined to date. Nonetheless, a number of studies offer some information on the associations of the career dimensions with each other and with other constructs.

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There is evidence indicating positive associations between children's career awareness, occupational aspirations, expectations and academic achievement (Schmitt-Wilson & Welsh, 2012). Moreover, children's career awareness has been related with emerging occupational interests (Rohlfing, Nota, Ferrari, Soresi, & Tracey, 2012). In turn, children's emerging occupational interests have presented associations with interpersonal styles. Social and Conventional preferences seem to be related to affiliative styles, whereas Investigative, Realistic and Enterprising preferences seem to be related to cold styles (Sodano, 2011). Children's career awareness has been also associated with career exploration, contributing to the learning about themselves and the working world. Indeed, evidence has suggested that children's career exploration sustains the acquisition of occupational information (Ferrari et al., 2015). This finding corroborates theoretical considerations derived from Super's (1994) interactive model and our interactive-motivational framework. Moreover, Watson and McMahon (2005) questioned how and what do children learn about the working world and their potential role in it. The former topic led to the recognition of influences such as age and grade interaction as well as family, school, media, ethnical, societal and socioeconomic environments in one's career-related learning. The latter topic identified temperament, locus of control, occupational knowledge, occupational gender stereotypes, gender and self-esteem as intrinsic influences in children's career-related learning. Also in the latter topic, this review suggested that children learn much about sex-roles in occupational and non-occupational life roles, which seems to influence the development of academic and occupational aspirations/expectations, as well as emerging sense of self based on gender and other societal elements (e.g., Araújo, 2009; B. Araújo, 2002; Porfeli et al., 2008; Schuette et al., 2012). In addition, Watson and McMahon (2007) suggested that children experiment instrumental, associative, vicarious and social persuasion learning experiences, such as those afforded by career exploration. These experiences offer children performance feedback and emotional states, which impact their career-related learning and influence the development of time perspective and processes of circumscription and compromise.

In sum, the dimensionality of childhood career development has been empirically illustrated. The scientific knowledge of childhood career development might, therefore, benefit from a complementary attention to each career dimension, regarding its articulations with each other and with other career dimensions, academic processes and results. This research topic seems also to identify career exploration as a core dimension of childhood career development. However, career exploration has been the less frequently and less consistently studied dimension of childhood career development over the last eight years (Oliveira et al., in press). Thus, it seems reasonable to cover career exploration and

bring it to the light of the more systematic study in childhood career development within such a dimensional view and this research topic.

3.2. Personal and contextual influences

The literature has pinpointed the influential role of personal and contextual factors in career development since childhood and through other periods of the lifespan. This is aligned with a developmental-contextual and systems view of childhood career development.

Research on personal factors has found differences for genders in career exploration, awareness, locus of control, aspirations/expectations, academic self-efficacy and outcome expectations, awareness of key-figures, self-knowledge, emergence of career interests, long-term academic, occupational and leisure time perspective as well as career planning (e.g., B. Araújo, 2002; David, Paixão, & Silva, 2015; Howard, Ferrari, Nota, Solberg, & Soresi, 2009; Falusso, 2011; Ferrari et al. 2015; Jorge, 2011; Peetsma & van der Veen, 2011; Schoon, Martin, & Ross, 2007; Schuette et al., 2012; Tracey & Caulum, 2015; Wood & Kaszubowski, 2008).

In addition, differences for school levels in children's career reasoning approaches have been found. Middle school children seem to present more interactive conceptions of careers and perceive more influences to their career preferences than preschool and elementary school children (Howard et al., 2015). Thus, children present more complex career reasoning approaches across the school years, which in turn are related to increasing levels of children's perspective taking (Howard & Walsh, 2010).

The research agenda in this field has also referred the need to expand research on the influence of family and other contexts on children's career development, to comply with a more systemic view of individuals' careers (Schultheiss, 2008). Following such a call, research has identified family influences in children's career development. At the family setting, a secure parental attachment, an authoritative parenting style, parents' positive work experiences and affectivity, parents' high expectations for their offspring and positive parents-children interactions seem to influence children's high levels of career exploration, differentiation of career interests towards the RIASEC structure, orientation to school and work, positive work affectivity, high academic and status occupational aspirations, internal locus of control as well as favorable self-efficacy expectations for certain activity domains (e.g., Bandura et al., 2001; Gonçalves & Coimbra, 2007; Howard et al., 2009; Porfeli et al., 2012; Porfeli et al., 2008; Tenenbaum, Porche, Snow, Tabors, & Ross, 2007; Tracey, Lent, Brown, Soresi, & Nota, 2006; Turner & Lapan, 2002; Wright & Perrone, 2008). Parental influence in children's career development seems

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also to operate in terms of the response to children's career curiosity, time spent with offspring, transmission of gender stereotypes, affirmation of the importance of education, support for independent choices, fostering of career exploration and interests as well as role modeling (Lawson, Crouter, & McHale, 2015; Liu, McMahon, & Watson, 2015).

The literature has additionally suggested that children's career exploration, interest for academic topics, career reflection, forming and networking seem to be influenced by school factors such as an accepting school climate, teachers' encouragement and social support, child-centered teaching practices and teacher's dialogical curriculum applications (Fouad et al., 2010; Lerkkanen et al., 2012; Kuijpers, Meijers, & Gundy, 2011; Noack, Kracke, Gniewosz, & Dietrich, 2010). Moreover, there is evidence suggesting the family and school joint influential role in children's career exploration, agency, perceived social support, acquisition and management of work-related information, development of preferences, conceptions of work and life values (Howard et al., 2009; Nazli, 2007; Noack et al., 2010; Schultheiss et al., 2005). Children's occupational preferences seem also to be influenced by the awareness of jobs performed by key-figures, such as parents, other family members, neighbors and teachers (Falusso, 2011).

A number of studies with children from different social class levels and countries has additionally been conducted. Regarding social class, evidence has suggested that children provenienti from less affluent families are more likely to drop out of school, exhibit lower educational and prestige-based occupational aspirations and an earlier entrance in the labor market and parenting than children from more affluent families (Ferreira et al., 2007; Flouri, Tsivirkos, Akhtar, & Midouhas, 2015; Kendig, Mattingly, & Bianchi, 2014; Oketch, Mutisya, & Sagwe, 2012). Research has also found a positive association between children's occupational aspirations-expectations gap (i.e., the gap between what the child would like to do and what she/he believes would be able to do in the future) and discrimination awareness (Hughes, 2011), which illustrate the possibility for children's circumscription of career options based on perceived societal barriers. Evidence derived from Portuguese children aged eight to 12 from less affluent backgrounds also pointed to their low occupational knowledge, but high prestige occupational aspirations based on a desire to attain a better economic situation (Figueiredo, 2013). Still, less affluent children seem to perceive more financial barriers to attain their career goals than more affluent peers (Falusso, 2011). Moreover, generations living in an economic disadvantage period seem to present lower school motivation and academic achievement than generations living in a period of economic growth (Schoon et al., 2007). Still, academic achievement may constitute a

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protective factor for poorer children's career development, as it is positively related with their career awareness, aspirations and expectations (Schmitt-Wilson & Welsh, 2012).

Following the increased internationalization of the childhood career development field (Watson et al., 2015), a number of studies has covered the occupational aspirations and expectations of children from different countries and continents. For example, in Europe, Portuguese children seem to consider gender and prestige elements in their occupational aspirations (Figueiredo, 2013; Ramos, 2012). As for Africa, South-African girls seem to express aspirations for Social and Artistic domains, whereas boys seem to aspire to Investigative and Enterprising occupational domains (Watson et al., 2010). Additionally, children from Mozambique were mostly shown to aspire to intellectual, scientific and administrative occupations (Falusso, 2011). Moving to Asia, Thai sixth-grade girls develop occupational aspirations for both gender balanced and men-predominated jobs, whereas boys prefer men-predominated occupations, which suggests differences for girls and boys in children's occupational aspirations (Lee, 2012). Looking to America, evidence derived from African-American and Asian-American children suggested that both presented higher educational and occupational aspirations than European-American, Hispanic, or American-Indian peers (Mello, 2009).

In addition, there are works presenting a general description of children's career development in particular contexts. For example, Chinese children seem to be socially stimulated to integrate the role of education for their futures and to pursue occupations aligned with their gender, bringing honor to oneself and to her/his family (Liu, McMahon, & Watson, 2014). Chinese children also seem to present high status occupational aspirations, but limited time perspective and career planning (ibid.). As for Turkey, children demonstrate favorable self-awareness and information about the working world, but limited career planning coupled with limited articulations between academics and careers, and knowledge about lifestyles related to occupations (Nazli, 2014). Similarly, Portuguese children seem to present favorable levels in career development dimensions, showing, however, lower levels in career exploration compared to other career dimensions (Oliveira & Taveira, 2013).

In sum, research has contributed for the identification of personal and contextual factors of childhood career development. These efforts are aligned with a developmental-contextual and systemic view of childhood career development, although a more systematic and ecological study of children's career development is still needed (Oliveira et al., in press). Progresses in the internationalization of the field are also noticeable (Watson et al., 2015), thus affording the possibility to accumulate macro-systemic, national and international scientific knowledge of children's career development. However, there seems to exist an international need to examine other career dimensions besides

aspirations/expectations, such as career exploration. This would be useful to enrich this research topic and to instill a more comprehensive understanding of children's career development.

3.3. Temporal progress and consequences in later career processes and results

Looking to the research agenda in the childhood career development field, scholars have called for longitudinal studies that covered the progress of career development during childhood and articulated it with career processes and results later on in adolescence and adulthood (Hartung et al., 2005; Porfeli et al., 2008; Schultheiss, 2008; Watson & McMahon, 2008). Although longitudinal studies are scarce in this field, presumably due to the demanding human and financial resources implied in such a research design, some contributions to this research topic can be discerned.

Regarding the progress of career dimensions during childhood, there is evidence suggesting that growth in academic and occupational future time perspective parallels growth in students' engagement in learning, from 12 to 13 years old (Peetsma & van der Veen, 2011). These results illustrate the possibility to address time perspective in different life roles, such as the academic and occupational ones, as it can happen with other career dimensions. In addition, longitudinal evidence has suggested a decrease in the vocational aspirations-expectations gap over time (Helwig, 2008). This points to an increased realism of children's aspirations and an awareness of environmental factors, being consistent with theoretical considerations derived from developmental career perspectives (Gottfredson, 1996; Super, 1994). Evidence has also indicated that there exists a developmental continuity between career exploration at age five and six and one year after, with in turn has been shown to predict academic adjustment (Araújo, 2009).

Following articulations between childhood and other periods of the lifespan, a number of studies identified childhood antecedents of later career outcomes. Still acknowledging the relevance of career exploration in lifelong career development, findings have identified children's career exploration at the family, school and out-of-school settings as a facilitative condition for the continuity of career exploration and development of vocational identity later on in adolescence (Schmitt-Rodermund & Vondracek, 1999). By the same token, theoretical comments and cross-sectional studies have acknowledged childhood career exploration as an important process for vocational identity, influencing and being related to an emerging sense of self, self-construction and ego identity (e.g., Porfeli & Lee, 2012; Porfeli, Lee, & Vondracek, 2013; Taveira, 2000). Additional research has suggested that career exploration is related to career adaptability in childhood, adolescence and emerging adulthood (Guan et

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al., 2015; Hartung et al., 2008; Hirschi, 2009). Thus, children's career exploration seems to constitute a central precursor of that same process in adolescence as well as to sustain the development of the career meta-competences adaptability and identity, as postulated by theoretical considerations derived from developmental and constructivist career perspectives (Savickas, 1997, 2002; Super, 1994).

Other childhood processes and experiences have also been shown to precede career processes and results later on in the lifespan. A number of findings yielded emerging information on the articulations from childhood through adolescence. Middle school children's high academic adjustment and family social class seem to be associated with prestigious occupational aspirations, school motivation and academic self-efficacy expectations, which in turn precedes educational enrolment later on in adolescence (Gutman & Schoon, 2012). Moreover, favorable generalized self-efficacy expectations and perceived few barriers during late childhood seem to precede a high career-choice readiness in adolescence (Hirschi, 2011). Increases in the results of career exploration (e.g., information about one-self and occupations) from late childhood through adolescence also follow increases in career-choice readiness (ibid.). Evidence has also indicated that a high socioeconomic status (SES) and parents' high educational levels during childhood sustain high academic and prestigious occupational aspirations in adolescence (Aschby & Schoon, 2010). Moreover, from childhood through adolescence, individuals were found to decrease their engagement in leisure activities, crystalize gender-typified beliefs of the working world and increase the social value of occupational aspirations (Helwig, 2001, 2004).

Research has additionally articulated childhood with adulthood. Particularly, a disinhibited temperament during childhood was shown to precede wellbeing at age 40 and continuous employment at age 50 (Blatný, Millová, Jelinek, & Osecká, 2015). The performance of men-predominated jobs in adulthood seemed to be predicted by the time spent with fathers during childhood, both for girls and boys (Lawson et al., 2015). Antecedents of adult employment have also been identified, such as children's favorable academic achievement, pro-social behaviors, cognitive abilities, psychosocial adjustment, family's medium-high SES, positive parenting, fathers' employment and mother's high educational level and negative dispositions towards social aid (Anyadike-Danes & McVicar, 2005; Ek, Sovio, Remes, & Järvelin, 2005; Wiesner, Vondracek, Capaldi, & Porfeli, 2003).

Synthesizing, there is evidence supporting the relevance of addressing the temporal progress of children's career development dimensions and its (dis)continuities from childhood through later periods of the lifespan. The literature has identified childhood antecedents of career processes and results later on in adolescence and adulthood, thus supporting the centrality of childhood experiences for one's

lifelong careers. However, there seems to exist a lacking attention to the career development processes operating during childhood, whereby additional longitudinal studies during this period of the lifespan would be relevant to better address the temporal progress of career development dimensions during the initial 14 years of life. Among these dimensions, career exploration emerges as a central dimension from which later career processes rely on. Still, the progress of career exploration during childhood and the articulation between middle school years and adolescence needs to be further examined to clarify the role and temporal (dis)continuities of this career dimension over the lifespan.

3.4. Career interventions

Calls have been made to articulate career development theory, research and practice, both at the general career and specific childhood career development literatures (e.g., Patton & McMahon, 2014; Sampson et al., 2014; Schultheiss, 2008; Watson et al., 2015). Specifically, the relevance of promoting children's career competencies (e.g., career exploration), instilling their positive work attitudes and facilitating the development of soft skills to prepare them to cope with instable educational and labor environments later on in life, has been considered (Guichard, 2001; Leão, 2006; Moreno, 2008; Taveira, 1999). Examples of such promotional career practices have been internationally shown to positively impact children's occupational information, future time perspective, academic achievement and engagement (e.g., Porfeli et al., 2008; Schultheiss, 2008; Watson & McMahon, 2005). Other career intervention programs aimed at fostering career development since childhood and over the school years can be discerned in the literature, but still lack evidence of efficacy (e.g., Pinto, 2002). Still, a number of evaluated punctual career interventions in this field can be found. We herein included findings reporting to the impact of international and Portuguese practical trials aimed at fostering career development during childhood.

Araújo, Taveira, and Lemos (2004) offered an example of an early career intervention trial targeting Portuguese children aged three to five attending pre-school, using a strategy of curricular infusion and consultancy with a pre-school teacher. This practical trial intended to promote the career development of children, highlighting the development of career exploration, favorable attitudes towards the self and the environment, autonomy and internal locus of control. To evaluate this intervention, an interview to children and a checklist completed by the preschool teacher were used both before and after the intervention. The results suggested a positive impact of the career intervention, as children's self- and environment-oriented career exploration as well as autonomy, persistence and task

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engagement increased from the pre- to the post-test. This practical trial, therefore, illustrates the possibility to implement early career interventions, which seem to play a positive impact on children's career exploration and other processes.

Targeting Portuguese children aged six to 10 attending the first through fourth grade, Pocinho (2011) implemented an early career intervention using an addition strategy. This career intervention intended to promote the self-awareness, career exploration and career planning of children. The intervention was evaluated with a teachers' appreciation report and a self-report measure assessing children's career development. The efficacy of this practical trial was suggested by teachers' general positive appreciation of the initiative's materials and their perceptions of the students' engagement in and satisfaction with the intervention. It was also suggested by an increase of children's self- and school-related knowledge, concern about the future, internal locus of control, identification of influential key-figures and self-esteem, compared to students who participated for a shorter period of time in the program or who did not attend it at all. Thus, early career practices can be implemented at these school levels and seem to positively impact children's career exploration and other dimensions.

Moving to students aged nine to 15 attending fifth- and sixth-grades, Figueira (2012) implemented another career intervention using an addition strategy. This intervention aimed at promoting children's self- and environment-oriented career exploration and awareness of the importance of school and planning for the future. The evaluation of the intervention relied on a self-report measure assessing children's career development and their impressions about the intervention. The results suggested that children positively appreciated the intervention and students who completed it presented higher levels of career awareness than those who did not. This practical trial also shows the relevance and positive impact of career development initiatives during this period of the lifespan. Still, advances in the assessment of career exploration could be useful to evaluate replications of this career intervention or other similar ones in these school levels.

As an international example with 12-year-old North-American children, Turner and Lapan (2005) offered a career intervention based on a computerized activity to increase students' career awareness, self-efficacy expectations for career exploration and planning, and preferences for occupational domains predominated by the opposite sex. The intervention was evaluated through children's self-reports on occupational preferences and self-efficacy expectations for career exploration and planning, both before and after the intervention. The results suggested that the intervention sustained an increase of children's preferences for occupations predominated by the opposite sex as well as self-efficacy expectations for career exploration and planning. This practical trial illustrates the utility of

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computerized activities in career interventions with children. It also suggests that career exploration can be covered in gender-sensitive early career practices and be tied to social cognitive mechanisms, as our interactive-motivational framework suggested so.

In addition, Turner and Conkel (2010) tested the efficacy of traditional career practices (i.e., focused on the correspondence between personal and occupational features) and contextual-sensitive ones (i.e., focused on career exploration and soft skills) with 13-year old North-American children. Measures of career exploration, goal setting, perceived social support, career self-efficacy expectations, proactivity and self-regulated learning were used. The results pointed to greater benefits of contextual-sensitive career practices than traditional ones or none. Indeed, contextual-sensitive career practices were shown to sustain gains in career self-efficacy expectations, perceived social support and proactivity. This practical trial highlights the benefits of contextual-sensitive career interventions during childhood, which facilitate both career and psychosocial features.

In summary, a number of international and Portuguese practical trials illustrate the relevance and benefits of promoting career development during childhood. Specifically, at the Portuguese setting, the promotion of career development since childhood seems consistent with governmental and educational concerns to foster students' academic success, citizenship and agency (Portuguese Decreto-Lei número 139/2012, 5 julho; Portuguese Lei número 46/86, 14 outubro), whereby it would be important to continue career practices with children.

The aforementioned practices followed theoretical considerations derived from developmental, developmental-contextual and systems career perspectives. Such perspectives support the adequacy of career practices for developmental levels as well as the possibility to implement direct practices with children and indirect practices with key-figures (Turner & Conkel, 2010). Research has also illustrated the positive impact of practices aimed at facilitating children's career development at different ages and school levels. Still, a more systematic and intentional focus on career exploration in early career interventions seems relevant, "facilitating contact with workers, stimulating reflexivity on what children have the opportunity to observe, and providing examples of different activities" (Ferrari et al., 2015, p. 127). The aforementioned practical career trials were also not continued in time. Thus, more systematic career intervention efforts are needed. Moreover, it is central to evaluate the impact of such career interventions and to move towards an articulation between theory, research and practice (Watson et al., 2015). There is still much to do to accomplish this articulated state of affairs, with measurement seemingly being a topic of common concern that might help attain this end.

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Generally, research supports the possibility and relevance to study career development during childhood. Empirical evidence has pointed to the dimensional nature of this process and to its personal and contextual factors. The literature has also suggested the temporal progress of childhood career development, its impact later on in the lifespan and the possibility to promote this process over the school years. Adding to these findings and acknowledging the need for longitudinal studies and valid measures to assess core dimensions of childhood career development in this field (Porfeli et al., 2008; Watson & McMahon, 2008), it seems relevant to go to the basis and establish valid and reliable tools to assess such dimensions in a given occurrence of measurement and over time.

Within this empirical body, career exploration was commonly affirmed as an important dimension of children's career development (e.g., Araújo, 2009; Ferrari et al., 2015; Hartung et al., 2005; Nazli, 2007; Schultheiss et al., 2005; Watson & McMahon, 2005). Thus, career exploration emerges as a relevant construct both in the general theoretical considerations and research of childhood career development. We, therefore, conceive of career exploration as an important dimension of childhood career development, which still needs increased and more systematic attention in the overall literature of the field. Thus, theory, assessment and research on children's career exploration are covered in the next chapter.

CHAPTER 2

The Process of Career Exploration in Childhood

1. Theoretical contributions

Although much more theoretical, empirical and practical attention to career exploration is devoted to the adolescent and adult periods, childhood is a foundational period for the emergence of career exploration attitudes, beliefs, behaviors and affections (Patton & Porfeli, 2007). As the literature of childhood career development has progressed from implicit to explicit conceptualizations, so has the more specific literature of childhood career exploration. Moreover, the human development literature can be coupled with the literature on childhood career development (Patton & McMahon, 2014). This is especially important to address children's career exploration, as the human development literature presents central contributions for the understanding of childhood as a pivotal period for exploration and informs the theory and research of career exploration in this period of the lifespan (Porfeli, 2008).

Theoretical contributions to the understanding of children's career exploration are framed in broader conceptions of career exploration. Four different but complementary conceptions of career exploration have been discerned in the literature (Taveira, 2001; Taveira & Moreno, 2003). A first conception relied on social learning theories and focused on career exploration as a set of information-seeking and problem-solving behaviors (e.g., Krumboltz, 1979). A second conception derived from the career decision-making theories and added to the previous conception the exploratory aspects of identification and evaluation of career alternatives (Tiedman & O'Hara, 1963). A third conception was advanced by developmental career theories, which conceived of career exploration as an attitudinal dimension of career adaptability (e.g., Super, 1990) and as a developmental stage of adolescent career development including the tasks of crystallization, specification and implementation of an occupational choice. Finally, a fourth conception relied on constructivist, developmental-contextual and systems career perspectives to acknowledge the lifelong and contextually embedded nature of career exploration and its implications for individuals' career learning and development (e.g., Flum & Blustein, 2000; Jordaan, 1963; Taveira, 2000).

The conceptualization of career exploration has progressed from a behavioral focus to a cognitive one and from a special attention to adolescence and emerging adulthood to a lifelong perspective covering childhood. The progress of the conceptions of career exploration seems consistent with the progress of more general career theories, moving from personality-based to developmental, constructivist, developmental-contextual and systems perspectives of careers (Chen, 1998). The movement towards an integrative and convergent position in the career literature (Patton & McMahon, 2014) is also illustrated in the fourth conception of career exploration. We assume this conception to

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be the most integrative and comprehensive one, as it considers the lifelong and systemic nature of career exploration as well as its inclusion of attitudes, cognitions, behaviors and affections. Such a conceptualization of career exploration has afforded the possibility to conceive the self- and environment-exploration as two aspects of a single process and to identify different forms of career exploration. It has also enabled the coverage of the relations among career exploration, motivation and emotions, as well as the acknowledgment of the importance of career exploration for career learning and development. Furthermore, such a conceptualization sustained the recognition of the adaptive functions of career exploration in individuals' coping with both expected and non-expected transitions throughout the life-cycle and the possibility to investigate career exploration over the life cycle, from childhood through adulthood (Flum & Blustein, 2000; Porfeli & Skorikov, 2010; Taveira & Moreno, 2003; Zikic & Hall, 2009).

An integrative conceptualization of career exploration is highly sustained by Jordaan's (1963) landmark work on this topic. Based on a review of exploration in the experimental, developmental and career psychology fields, Jordaan (*ibid.*) suggested that career exploration (a) can occur at any point of the life course, (b) includes behaviors (e.g., observation, manipulation and inspection) and reflective processes, (c) shifts from an in-breadth to an in-depth view of the self and the world of work, (d) can be internally or externally stimulated and operationalized in different activities (e.g., play, leisure, work), and (e) enables the tryout of life roles, response to internal conflicts, acquisition of information and overcoming of boredom, curiosity and arousal status.

Jordaan (*ibid.*) also identified the dimensional nature of career exploration by presenting its continua as intended vs. fortuitous, systematic vs. random, recognized vs. not recognized as exploration, self-oriented vs. environment-oriented, self-initiated vs. other-initiated, contemporaneous vs. retrospective, motor vs. mental, intrinsic vs. extrinsic, behavior modifying vs. fruitless, and vocationally relevant vs. irrelevant. These continua illustrated the dimensionality of career exploration as well as can be understood as possible contributions to address the temporal progress of career exploration over time and through periods of the life-course.

Integrating the possibility to address career exploration at any point of the life course, a more comprehensive conception of career exploration afforded the possibility to study this process during childhood. Although Jordaan (*ibid.*) did not focus on childhood, we find that his work can be used to stimulate attention to this period of the lifespan. For example, Jordaan's (*ibid.*) presentation of search, experimentation, investigation and trial as elements of the exploratory process can be readily aligned with the recognition of play, household chores and school tasks as children's exploratory activities.

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Jordaan's (ibid.) proposed correlates of the aforementioned elements of career exploration, namely the development of problem-solving skills, the test of self- and/or environment-related hypotheses, the increase of self-knowledge, the acquisition of and assignment of meaning to information, the set and revision of goals and the engagement in goal-directed behaviors. By the same token, we find these correlates consistent with asserts from the more general career perspectives, suggesting the pivotal and central role of children's career exploration in career development.

The attention to children's career exploration was also stimulated by Super's (1994; Super & Hall, 1978) work. Although the role of career exploration in adolescents' career development and as a dimension of career adaptability was emphasized in his writings, Super and Hall (1978) acknowledged the importance of children's career exploration in their socialization to work, identification of career alternatives and lifelong continuity of career exploration and decidedness. In addition, Super' (1994) interactive model suggested that the underpinnings of career adaptability are developed in childhood. In this model, Super (ibid.) assumed curiosity to be a driving force of children's career exploration. Such an assumption is consistent with the human development theoretical works of children's exploration. These works have suggested that curiosity triggers a sense of insecurity and inner conflict towards the unknown, thus prompting children to engage in exploration (Caruso, 1993; Weisler & McCall, 1976). Exploration can, therefore, be perceived as an adaptive process that enables children to acquire information, continuously learn and develop, as well as integrate into an emerging and developing sense of self (Weisler & McCall, 1976). We acknowledge such a perspective of career exploration, while balancing it with curiosity and suggesting its adaptive features over time.

The human development literature has, therefore, articulated the concept of exploration with the notion of curiosity. Curiosity has been related to inner conflict, emotional unbalance, uncertainty/doubt/ambiguity, stimulus complexity and investigative or exploratory activities such as asking questions and engaging in the symbolic search of the environment (Berlyne, 1960, cit. in Day, 1968). More recent works suggest that curiosity translates an intrinsic motivation, a desire to make sense of things and can be considered as "the threshold of desired uncertainty in the environment which leads to exploratory behavior" (Jirout & Klahr, 2012, p. 150). Focusing on the relation among curiosity and exploration, the differentiation of diversive (i.e., in-breadth) and specific (i.e., in-depth) forms of children's exploration was suggested (ibid.). Porfeli and Skorikov (2010) later on introduced the application of these forms of exploration to the study of career exploration. On the one hand, a diversive/in-breadth form of career exploration would describe a broad self- and environment-exploration, in which new, fantasy and unrealistic career options would be examined. On the other

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hand, a specific/in-depth form of career exploration would describe the in-depth exploration of one's percepts about the self and the environment in an attempt to harmonize them and examine more realistic career options. Both diversive and specific forms of career exploration seem to be positively related with one's personal agency beliefs and positive work valence (Lee, Porfeli, & Hirschi, 2016).

Patton and Porfeli (2007) suggested that around the six years of age, children would shift from exploration to career exploration and from diversive to specific forms of career exploration. The continuous shifts from diversive to specific forms of career exploration during childhood and throughout the life course are also acknowledged as adaptive features and consistent with the human development literature suggesting that career exploration progresses in a U-shaped path. Based on the relations among curiosity and exploration, children would be expected to increase their exploration when faced with situations generating curiosity and an inherent sense of insecurity, and to decrease it after having responded to curiosity and recovered their inner balance (Weisler & McCall, 1976). By the same token, children would move from diversive to specific forms of career exploration according to the situations and own goals, which would support the progress of career exploration in a U-shaped path over time.

The move to identify career exploration as an essential process of the childhood period of the lifespan was also supported by a more refined recognition of its relational nature. Following developmental-contextual and systems career perspectives, we highly acknowledge the relational nature of career exploration and the recognition that children increase their social participation across family and out-of-family settings (Eccles, 1999; Gottfredson, 1996; Seligman, 1994). Also focusing on the relational nature of career exploration, Patton and Porfeli (2007) recognized the influential role of social structures such as the family and school settings in children's career exploration. Recommendations to consider social interactions and institutions as well as to audition life roles have, therefore, emerged in the literature of children's career exploration (Blustein, Prezioso, & Schultheiss, 1995; Patton & Porfeli, 2007).

Based on Super's (1990) Life-Career Rainbow, Blustein (1997) emphasized that career exploration is facilitated by the development of a secure sense of attachment and by parents' emotional and instrumental support in childhood. Focusing on the importance of children's early relational experiences, Blustein and collaborators (1995) indicated that a secure sense of attachment sustains the self- and environment-exploration, testing of and commitment to career decision-making alternatives, work satisfaction and adjustment, construction of adaptive relations at work settings and development of a coherent ego identity. They also described children's career exploration as a set of initiatives to engage in social interactions and to experiment life roles in different contexts, which in turn

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influences one's social competences and approach to the environment. The importance of a secure sense of attachment for children's career exploration was also acknowledged in Wright and Perrone's (2008) theoretical work. These ideas are consistent with the understanding of career exploration as a pivotal skill for career success and for the grounding of positive self-efficacy expectations, self-attribution styles, proactivity in goal-directed behaviors, identity, personality and talents (Lapan, 2004). The literature pointing to the correlates and relational nature of career exploration still informs current works on the topic. Career exploration can, therefore, be considered a process that enables the understanding of oneself and the working world as well as includes contextual interactions influencing individuals' career development and fulfillment of socially desirable career outcomes (Cheung, 2015).

The literature provided additional contributions for the description of children's career exploration. Patton and Porfeli (2007) indicated that children use their cognitive structures to physically and psychologically explore the outer world and organize information. Emotional aspects are also assumed to be involved in children's career exploration, following children's social-emotional development (Oliveira, Taveira, & Porfeli, 2015). One's emotions and emotional regulation might sustain the exploratory behavior, the seeking for and assignment of meaning to information and one's social competence (Fredrickson, 2001; Vondracek et al., 2014). While children's experience of positive emotions, such as excitement or contentment, may sustain their approach and in-depth exploration of given objects/situations, the experience of negative emotions, such as disgust or shame, may lead to an avoidance from objects/situations and in-breath exploration of other objects/situations (Patton & Porfeli, 2007). Still, alternative paths between positive or negative emotions and approach or avoidance of objects/situations are possible (Oliveira et al., 2015).

The interplay between children's cognitions and emotions in career exploration can be articulated with motivation, interests and vocational behavior. First, an approach or avoidant attitude may illustrate the importance of positive or negative performance feedback and resulting emotional states in the sustainment of intrinsic or extrinsic motivation underlying career exploration (Blustein, 1988). Second, the approach or avoidance of given objects/situations based on experienced positive or negative emotions in career exploration sustain individuals' regulation of behaviors and may impact the development of their vocational preferences towards activities encapsulating a positive emotional valence (Krapp, 2007). Third, cognitive evaluations of goal attainment or failure and positive or negative emotions triggered in career exploration experiences can enhance individuals' vocational learning from behavior episodes. In turn, these episodes may be generalized to a vocational behavior

episode schema and impact further vocational behavior and development (Vondracek et al., 2014). Thus, these contributions highlight the emotional aspects of career exploration since childhood.

As a synthesis, an integrative and comprehensive conception of career exploration has highlighted the lifespan and life-space nature of this process, considered its behavioral aspects as well as its internal mechanisms of reflectivity and emotional valences (Oliveira et al., 2015; Taveira, 2001; Taveira & Moreno, 2003). Following such a comprehensive conception of career exploration, the possibility to study this process at any point of the life course was afforded (Jordaan, 1963). Career perspectives have specifically acknowledged the possibility to address career exploration in childhood and in articulation to one's relational experiences (Blustein, 1997; Patton & Porfeli, 2007; Super, 1994; Super and Hall, 1978). The career and human development literatures have both contributed for the description of children's career exploration, focusing on its articulations with curiosity, different forms, temporal shifts and relations to emotional and motivational aspects (Caruso, 1993; Oliveira et al., 2015; Patton & Porfeli, 2007; Super, 1994; Weisler & McCall, 1976). Thus, we can rely on such a comprehensive understanding of children's career exploration to consider it as a dimensional and changeable process. Taking its changeable nature into account, we might stimulate the idea that career exploration can progress and present different forms over childhood. It seems, therefore, relevant to address how career exploration has been assessed and investigated during childhood.

2. Career assessment

The assessment of children's career exploration needs to be considered, as career exploration can be conceived of a core construct of childhood career development (Araújo, 2009; Patton & Porfeli, 2007; Porfeli et al., 2008; Taveira, 1999). Moreover, assessment is an essential building block of the construction of knowledge, facilitating the transition from a field relying mainly on theoretical inferences to a deepen field that rests in conclusions on empirical research and practice. It is, therefore, important to understand how children's career exploration has been assessed and to identify innovative methods that bolster the reliability and validity of current assessment strategies. Tools and techniques that have been used to assess career exploration are presented according to different sub-periods of childhood.

Despite the controversy in the literature about the chronological definition of life periods, many assume that childhood continues until age 14 (Hartung et al., 2005; Super, 1980, 1994), adolescence spans ages 14-18 (Vygotsky, 1998) and emerging adulthood continues from 18 to 25 years old (Arnett, 2000). Childhood can be further divided into sub-periods, which are herein employed to articulate with

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a developmentally-graded educational structure. Particularly, we consider the following sub-periods of childhood: (a) the first three years of life, which are articulated with infancy and early childhood at an international level and include the optional day care in Portugal, (b) from three to 10 years of age, which are aligned with preschool and elementary school years at an international level and cover the optional preschool and the mandatory first four years of school in Portugal, (c) from 10 to 14 years of age, which are tied to middle school years at an international level and include the mandatory grades five, six and seven in Portugal.

These sub-periods of childhood include developmental stability and change, critical periods of possible discontinuity and abrupt changes and moments of potential developmental crises. A number of scholars (e.g., Erikson, 1963; Vygotsky, 1998) have characterized transitions between developmental periods as being prompted by crises, which its more or less successful resolution shaped the developmental course towards more or less adaptive outcomes. Vygotsky (1998) suggested that while the crisis at the age one relies on the emergence/mastery of walk and speech, the crisis at age three is characterized by a higher obstinacy and development of affective and volitional aspects of one's personality. Moving towards the grade school ages, the span between late childhood and early adolescent periods is characterized as early-, young-, or pre-adolescence, the middle school period and the tween period. The crisis of sexual maturation and the establishment of abstract reasoning emerge during this transitional period, which becomes further elaborated during adolescence. This transitional period also involves an emerging self-consciousness, sexual orientation, more realistic perceptions about the difficulty of life tasks and an understanding of social expectations and efforts to comply with them (Apter, 2006). Just as developmental research concentrates on the transition to adulthood, the transition to adolescence is ripe with challenges that justify a focus on childhood and on its (dis)continuities through adolescence.

Given that periods, sub-periods and crisis are cultural constructions (Arnett, 2000), their chronological definition is subject to the individual variability in human and career development. They offer conceptual coherence and practical utility at the expense of technical precision. The chronological definition of the aforementioned life periods, sub-periods and crisis are approximations derived from the human and career development literatures and employed by educational systems to cluster students facing similar developmental challenges. This capacity to identify and cluster students based upon shared challenges permits the educational system to construct environments and curricula to efficiently address the developmental challenges of a large number of students. Still, this efficiency can be limited and sometimes students who are more or less advanced in their development can feel like

misfits in these constructed environments (Lopes, 2009). However, to coherently organize the tools and techniques that have been used to assess children's career exploration, we considered the aforementioned chronological definition of the sub-periods of childhood.

2.1. First three years of age

Qualitative procedures based on human development literature dominate the assessment of exploration during the first three years of age. The assessment of exploration at these ages seems to rely on the presentation of toys to gauge children's exploratory behaviors. As children are presented toys, they are stimulated to engage in exploratory behaviors, which are then registered in checklists and/or recorded and coded. The use of checklists to assess infants' exploration was illustrated in Caruso's (1993) study. While infants were presented new toys in an experimental setting, the presence or absence of exploratory behaviors every 10 seconds was registered in a checklist. The checklist was based on the definition of exploratory behaviors across schemes of exploration, breadth- and depth-exploration and cognitively unsophisticated and sophisticated oriented exploration. The use of the checklist enabled the assessment of both the quality and quantity of infants' exploration. On the other hand, an example of taping and coding infants' exploratory behaviors was presented in Jennings, Harmon, Morgan, Gaiter, and Yarrow (1979) study with one-year olds. Also interacting with new toys at the laboratory or home settings, infants' exploration was taped for 15 minutes and coded every 20 seconds. The coding enabled the assessment of the time infants spent in exploratory activities, their continuity in exploratory behaviors, and their cognitively mature exploration. Notes about the natural environmental conditions that would potentially facilitate or constraint infants' exploration were also taken (i.e., infant-mother interactions in exploration, maternal non-acceptance of exploratory behaviors, struggles with physical barriers and variety of objects offered to explore).

Power, Chapieski, and McGrath (1985) used a similar procedure to assess one- and two-year older children's exploration in a daycare center. Children were presented toys and seven-minute sessions were taped. The coding of records favored the assessment of children's diversity and uniqueness of exploration. Also using toys to stimulate children's exploration at an experimental setting, Olmos, Carranza, and Ato (2000) presented children a doll that would activate lights and music if children pulled a ring with certain strength. Exploration was assessed while noting children's behaviors, strength, precision and time spent in play.

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Hence, the assessment of exploration during the first three years of age is mostly derived from human development literature and relies on qualitative tools such as checklists, coding and notes. Assessments seem to be conducted both at the experimental and proximal home or school settings, which suggest different contexts at which exploration can occur and be assessed. These techniques present the advantage of stimulating children's exploration to enable its assessment. However, time and human resources are demanded to guarantee the quality of assessments, which might be a challenge in current times given the low investment in resources.

2.2. From three to 10 years of age

Adding to the use of observation procedures and checklists during the first three years of age, projective drawings, interviews and guided tasks have also been used with children aged three to 10.

The use of observations procedures was illustrated in Switzki, Haywood, and Isett (1974) study with four- to seven-year olds. After presenting children with increasingly complex polygons at an experimental setting, the time spent in exploration was noted and the exploratory behaviors presented every five seconds were taped and coded. Children's exploratory behaviors were coded as touch, holding and mouthing, slow exploration, fast exploration, looking alone, sensorimotor and symbolic play, and off task. A similar experiment was performed by Henderson's (1984) with three to six-year olds. At the classroom setting, children were presented cards, toys, drawings and puzzles. At home, children were presented bizarre-perceptual, novel problem-solving and conventional toys. Children's exploratory behaviors were registered and coded as questions, comments, manipulations and time spent in the exploration of toys. The parents' behaviors that would potentially facilitate exploration were also registered, namely demonstrations, question asking, information giving, explicit directions, verbal support and acceptance of physical activity. Also relying on observation, van Schijndel, Franse, and Raijmakers (2010) used the Exploratory Behavior Scale. The scale was completed by trained researchers while observing children in a public museum and responding to experimental conditions of adult support for exploration. The scale yielded scores for levels of the observed exploration of the physical environment, namely passive contact, active manipulation and exploratory behavior.

As for the use of checklists, B. Araújo and Taveira (2000a) assessed three- to six-year-olds' career exploration with a checklist to be completed by teachers – the *List of Verification for the Professional of Education*. This checklist included 29 items answered in a five-point Likert-type scale (1 “Not similar to this child at all” to 5 “Completely similar to this child”) and addressed the teachers'

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perceptions about their students' career exploration. The items focused on indicators of career exploration such as curiosity, exploration, initiative, attention and engagement.

The use of projective drawings was illustrated in B. Araújo's (2002) study, in which the *Pictorial Scale of Perceived Competence and Social Acceptance for Young Children, Preschool/Kindergarten version* (PSPCSA; Harter & Pike, 1984) was administered to assess three- to six-year old children's self-exploration. The scale included 32 pictographic items to assess children's perceptions about: (a) the quality of the relation with their mother, based on activities that implicate proximity with and distance from the maternal figure; (b) the quality of the relation with peers, considering a sense of group belongingness and social desirability; and (c) the perceived competence in naturally learned and physical activities and in formally taught activities. Another projective tool assessing children's self-exploration is the *Kinetic Family Drawing* (KFD; Burns & Kaufman, 1970, cit. in Seligman, Weinstock, & Owings 1988). In KFD, the children's drawings of families enable the projective assessment of their perceptions about their family and sense of belonging to it. Despite the utility of these tools and their appropriateness to children, they have been recognized as time-consuming techniques.

Interviews have also served the assessment of self- and/or environment-oriented career exploration. B. Araújo and Taveira (2000b) constructed The *Grid of Interview to the Child* to assess indicators of three- to six-year old children's environment-exploration, such as the knowledge about the world of work, preference for activities and awareness about the importance of school for the future. The grid of interview presented a semi-structured format and included 20 open-ended questions, which were individually answered by the child, taped and coded. The coding of children's answers considered the knowledge of their parents' occupations and out-of-family occupations, the identification of career alternatives and planning, the awareness of one's likes and dislikes, and the sex-role orientation towards activities and places (B. Araújo, 2002). The utility of this grid with children aged five to six and followed over a year has also been demonstrated (Araújo, 2009).

A similar semi-structured interview was presented in Seligman and colleagues' (1988) study to assess both the self- and the environment-exploration. A grid of interview comprising 36 questions was used to assess five-year-olds' future plans, knowledge of parents' occupations, preferred occupations, awareness of abilities, and perceptions about the parents' aspirations for them.

Guided tasks have been also used to assess children's career exploration, consisting of alternatives to time-consuming projective techniques. The *Self-Exploration Guided Task* (Gordon, 1968; cit. in Araújo, Taveira, & Lemos, 2004) was initially developed as a paper and pencil activity, in which five- and six-year old children were asked the question "Who am I". This guided task was then

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expanded to a semi-structured interview focused on the question “How am I” to be more appropriate to the cognitive and linguistic development of children. Araújo and colleagues (2004) presented self-concept as an organizing element of children’s narratives, including their name, height, age, sex, physical appearance, possessions, actions, competences, likes, intentions, causal attributions and sense of belonging to the family, school, peers and community. Suggestions to cover children’s self-exploration according to a public and a private sense of self have been also presented (Araújo, 2009).

Moreover, guided tasks have been useful to assess the cognitive processes involved in children’s exploration. Tytler and Peterson (2004) performed a guided exploration task to examine five-year-old children’s investigative and epistemological reasoning. Children participated in experiments related to the phenomena of the behavior of mealworms, the capacity of objects to float or sink and the flight of paper whirllybirds. During the exploration of these phenomena, children were asked questions which guided their exploration and enabled the assessment of the cognitive beliefs sustaining their exploratory behaviors and explanations for the phenomena. Another example of guided tasks was presented by Bonawitz, van Schijndel, Friel, and Schultz (2012), who used blocks, posts, key rings, magnets, clips and cubes to examine six- and seven-year-old’s attempts to balance tools, cognitive beliefs guiding exploratory behaviors and explanations for their actions.

In sum, the assessment of exploration from three to 10 years old relies on human and career development literatures, whereby a career-oriented exploration emerges. Assessment at these ages presents techniques such as observation, checklists, projective exercises, interviews and guided tasks used in experimental and natural contexts. These assessment techniques range from records externally completed by researchers or teachers, to internal-driven methods based on children’s drawings or verbal answers. The assessment of career exploration at these ages seems advantageous while crediting children’s drawings or discourses, thus affording the possibility to move from a focus on exploratory behaviors to also consider personal percepts and subjective aspects of exploration. Still, there is scarce indication of the researchers’ need for previous training to perform these assessments.

2.3. From 10 to 14 years of age

The assessment of career exploration from 10 to 14 years old includes observation procedures, checklists, projective techniques, interviews, and unlike younger children, also self-report measures.

The application of an observation procedure was illustrated in Vandenberg’s (1984) study. This study used an observation experiment to assess four- to 12-year old children’s orientation towards

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complex objects, in-breadth and in-depth exploration. To assess children's orientation towards complex objects, visual and auditory stimulus of different complexities were presented and participants were required to choose their preferred ones. Through the presentation of new toys, children's in-breadth and in-depth exploration was assessed by calculating the time spent in the exploration of each toy and by registering their search strategies.

Day (1968) presented the use of a checklist employed to assess children's curiosity. This tool was similar to the one of B. Araújo and Taveira (2000a), as it relied on teachers' perspectives and records of students' exploratory behaviors. Teachers rated their students based on the interest pupils revealed towards complex objects, their positive reactions to mysterious objects and their persistence in learning more about them. Day (1968) also used the *Test of Specific Curiosity* (TSC), in which children were presented 28 figures during 15 minutes and their interest in them was noted.

The use of interviews and projective techniques to assess children's self-exploration was illustrated in Seligman, Weinstock, and Heflin (1991) study, in which the interview and the KFD previously applied to five-year-olds has been also used with ten-year-olds. As for the assessment of middle school students' environment-exploration, the utility of the projective technique *Thinking About Careers* (TAC) was demonstrated in Borgen and Young's (1982) study. The TAC presents children with labels of five occupations for them to describe. The coding of children's responses considered the knowledge of occupational-related behaviors, social relevance, career progress, as well as one's interests, focus on the self or the occupation, self-evaluation, misinformation and possibility to be a personal career option for the future.

Moving towards the use of self-report measures, a number of tools have been reported in studies of career exploration and development. Three self-report measures of career exploration have been focused on middle school children's exploratory behaviors. First, the *Career Exploration Scale* was created to assess career exploration with Italian 11-year-olds followed over a year (Tracey et al., 2006) and has been further used with other Italian samples aged nine to 13 (e.g., Ferrari et al., 2015). The measure includes 13 items covering the frequency of children's exploratory behaviors over the last three months and presents a one-factor structure.

Second, the *Childhood Career Development Scale* (CCDS; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010) relied on Super's (1994) interactive model to assess dimensions of childhood career development, among which career exploration. The CCDS was originally constructed for South-African and North-American children aged eight to 13. While the South-African CCDS version included curiosity and exploration as two different factors, the North-American CCDS version combined

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them in a single factor labeled curiosity/exploration. Moderate-low estimates of internal consistency reliability were found in these subscales. The CCDS has been also used in European countries. Ferrari, Nota, and Schultheiss' (2014) poster presentation of a confirmatory study with Italian adolescents suggested that the measurement model yielded a good fit to the data, but presented moderate-low estimates of internal consistency reliability for the curiosity/exploration subscale. On the other hand, an exploratory study of the CCDS in northern Portugal suggested a negative skewness of the items' responses and identified factors labeled curiosity/exploration related to academic activities and curiosity/exploration related to key-figures (Oliveira, 2012). Another exploratory study conducted in southern Portugal and using a different translation defined a factor labeled curiosity/exploration (Ramos, 2012). Both Portuguese versions and solutions pointed to moderate-low estimates of internal consistency reliability for the curiosity/exploration factor(s). A further confirmatory study indicated that the original North-American and Portuguese exploratory measurement models yielded a poor fit to the data and low estimates of internal consistency reliability (Taveira, Oliveira, Araújo, & Pinto, 2012). These results in Portugal were consistent with the moderate-low psychometric results of the curiosity/exploration subscale in the original and Italian CCDS versions. Although the CCDS is a promising theory-based measure to assess childhood career development, the factor instability and moderate-low estimates of internal consistency reliability found for the curiosity/exploration subscale across different countries might limit its use in the assessment of children's career exploration.

Third, career exploration has been also assessed with the *Structured Career Development Inventory* (SCDI; Lapan, 2004; Turner et al., 2006) designed for North-American children of mean age 13. The SCDI assesses children's vocational skills and desired outcomes. Career exploration is assessed with a one-dimensional subscale of seven items related to career exploration experiences.

A different form of assessment was presented in Schmitt-Rodermund and Vondracek's (1999) study with 13- to 19-year old German youths. This study presented career exploration as an expression of one's interests and suggested its retrospective assessment through a self-report measure included in the *National Survey of Shell Youth '92*. This self-report measure includes 12 items referring to the retrospective performance of activities related to creative games, cultural activities and technical games, when individuals were three to 12 years old. Such a different form of assessment of children's career exploration illustrated the possibility to use self-report measures in a retrospective assessment of career constructs.

The use of self-report measures to assess 12- to 14- year olds' career exploration has been additionally reported in studies mainly focused on adolescents' or emerging adults' career exploration

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and development. For example, the Portuguese version of the *Career Exploration Survey* (CES; Stumpf, Colarelli, & Hartman, 1983; adapted by Taveira, 2000) casts the employment outlook, certainty of career exploration outcomes, external and internal search instrumentality and importance of obtaining the preferred position as beliefs pertaining to career exploration; it also incorporates self- and environment-exploration, intended-systematic exploration and the amount of information as key indicators of the career exploration process; and considers the satisfaction with information and exploration and the decisional stress as reactions to exploration. Although the CES was originally designed to support research of adults' career exploration, it has been further adapted to serve adolescents and emerging adults, being also used in the evaluation of career interventions and with specific groups (e.g., Königstedt, 2011; Pinto, Loureiro, & Taveira, 2015; Silva & Marques, 2015). The CES has been used with Portuguese samples from 13 to 25 years old (e.g., Faria, 2013; Faria, Pinto, & Vieira, 2015; Gonçalves, 2013; Königstedt, 2011; Taveira, 2000; Taveira, Silva, Rodríguez, & Maia, 1998; Veiga, Oliveira, & Taveira, 2014). The 53 items of the Portuguese version of the CES are structured in second-order factors of beliefs, process and reactions of the career exploration process. The estimates of internal consistency reliability of these second-order factors have presented moderate-high values (Taveira, 2000). In addition, the CES has been shown to correlate with identity, career decidedness, adaptability, indecision, self-efficacy expectations, achievement motivation, autonomy orientation and social support as well as to be sensitive to differences for genders and school levels in a number of countries (e.g., Blustein, 1988; Cheung & Arnold, 2010; Esters, 2008; Guan et al., 2015; Hellmann, 2014; Taveira, 2000). Still, the CES was not originally designed for children, whereby it might not be well suited for younger students, with the possibility of its length and response options limiting the applicability to middle school children.

Another measure that has served the study of career exploration with samples crossing middle school children and adolescents is the *Occupational Exploration* (Noack et al., 2010). This measure was employed in a longitudinal study of parental and school influences on students' environment-exploration, with German children and adolescents aged 12 to 15 years old. This self-report measure includes six items related to exploratory behaviors, which yield a one-factor solution with good internal consistency reliability checked two moments, one year apart.

Individuals aged 12 to 14 have been also administered measures of career adaptability, in which the assessment of career exploration is included. Savickas (1984) suggested that career adaptability measures assess career tasks, responses or coping behaviors such as career exploration behaviors. Among the measures of career adaptability, the *Career Development Inventory* (CDI; Thompson,

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Lindeman, Super, Jordaan, & Myers, 1981) has been the most popular one. The CDI is specifically focused on the developmental tasks of crystallization and specification of a career choice. Cross-cultural evidence has suggested that attitudes of career adaptability (i.e., career exploration and planning) are positively related to integrated career schemas (Savickas & Hartung, 1996). Janeiro (2010) offered a study in which the Portuguese CDI version (adapted by Marques & Caeiro, 1981) was used with students aged 13 to 17. The Portuguese CDI version enables the assessment of the awareness and use of exploratory resources and provides a subscale of attitudes towards career exploration with moderate-low internal consistency reliability. The CDI has been also widely used in other countries with samples crossing middle school children, adolescents and emerging adults. For example, the Australian CDI version (adapted by Lokan, 1984) has been used with students aged 12 to 19 years old (e.g., Creed et al., 2007; Rogers, Creed, & Glendon, 2008). The Australian CDI version assesses career exploration with 16 items covering the awareness and use of exploratory resources. Career exploration coupled with planning set the Career Development Attitude subscale of the Australian CDI version, which presented very good internal consistency results. Furthermore, Hirschi (2009) used the Swiss CDI version (adapted by Seifert & Eder, 1985) to assess 12- to 16-year olds' career exploration. This measure includes 26 items to assess the use of exploratory resources in information-searching behaviors and the amount of gained information.

Synthesizing, the assessment of career exploration from 10 to 14 years of age presents a broad list of procedures, adding the use of self-report measures to observation, checklists, interviews and projective techniques that have also been used with younger children. The use of self-report measures in middle school years seems consistent with literature suggesting that children at this period already comply with self-report measures and are expected to present the literacy levels required to complete them (Jensen, Fabiano, Lopez-Williams, & Chacko, 2006; Keefer, Holden, & Parker, 2013; Watson & McMahon, 2008). The use of self-report measures seems also advantageous to serve both individual and in-group assessments, thus monetizing limited resources (Hogan, 2003; Taveira, 2004). Still, self-report measures of career exploration seem inconsistent in separately or jointly assessing curiosity and exploration, as well as often present reduced internal consistency reliability estimates. Moreover, the reviewed self-report measures seem to (a) focus on the frequency and variety of exploratory behaviors, identification and use of exploratory resources, as well as previous exploratory experiences, (b) serve the more general assessment of career adaptability, following a conception of career exploration and planning as attitudinal dimensions of such a process, and (c) be administered to confounding samples of children, adolescents and emerging adults. The CES seems to follow a more comprehensive

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perspective of career exploration, while going beyond its behaviors to also consider its beliefs and reactions. Although its use with children seems inappropriate, it might stimulate the elaboration of more comprehensive measures of career exploration for children.

Overall, the assessment of career exploration in childhood has employed qualitative (i.e., observation, checklists, projective drawings, interviews, guided tasks) and quantitative procedures (i.e., self-report measures), ranging from experimental to natural settings and self-percepts. The use of observation procedures and checklists is more frequent during the first three years of life. Moving towards the three to 10 years of age, projective techniques, interviews and guided tasks become more common. Finally, the use of self-report measures becomes noticeable from 10 to 14 years of age. Thus, the assessment of children's career exploration seems to progress from a focus on observable exploratory behaviors to an increased attention to cognitive process and self-reports. The variety of techniques to assess career exploration during childhood seem to articulate with developmental and systems perspectives of careers (Super, 1994; Vondracek et al., 2014), individuals' self-reports, and practical concerns to economize the time and resources needed for career assessments (Hogan, 2003; Taveira, 2004). Such an articulation is illustrated in the use of checklists to be completed by key-figures (e.g., teachers), the development of interviews and guided tasks that consider children's own perspectives, and the use of reduced length self-report measures. This may contribute to the triangulation of methods of assessment and ultimately this triangulation may strengthen the ecological validity of this body of work (Araújo, 2009; Vondracek, 2004; Vondracek et al., 2014).

Adding to the variety of techniques used to assess career exploration during childhood, their content also varies. During the first three years of life, the assessment of exploration relies on physical interactions with objects and the orientation to novel or familiar objects/toys. From three to 10 years of age, children's investigative reasoning, self- and environment-exploration are considered. From 10 to 14 years of age, the assessment of career exploration relies on the frequency of exploratory behaviors, the use of exploratory resources and the occupational exploration. Other measures originally designed to older individuals but used at this sub-period of childhood also consider the beliefs, behaviors and reactions of career exploration and exploratory attitudes linked to career adaptability. The variety of content assessed over childhood is aligned with a shift from exploration to career exploration from three to 10 years of age, as Patton and Porfeli (2007) suggested. Moreover, as the adolescent period is approached, there seems to exist a tendency to assess career exploration as an attitudinal dimension of career adaptability and operationalized in the use of exploratory resources (Super & Hall, 1978).

Thus, the different techniques and targeted contents available to assess career exploration provide researchers and practitioners with several tools from which they can choose the most appropriate one to achieve their goals. However, despite efforts to measure career exploration during childhood, the need to improve the assessment of middle school children's career exploration is noteworthy. The assessment of career exploration with children aged 10 to 14 seems often to rely on self-report measures of career adaptability and to focus on environment-exploratory behaviors and use of exploratory resources. The extant measures seem, therefore, to lack attention to subjective aspects of career exploration and experimentation of life roles. Moreover, the assessment from 10 to 14 years of age often overlap the adolescent and emerging adulthood periods. It is, therefore, important to expand the assessment of middle school children's career exploration, thus enriching the childhood career exploration and development fields. As assessment has implications in research, we next present empirical evidence devoted to career exploration during childhood, checking whether a closer attention to children aged 10 to 14 is also empirically relevant.

3. Empirical evidence

Following theoretical and measurement contributions to the conceptualization and assessment of children's career exploration, career and human development research offer empirical evidence on that process as well (Patton & Porfeli, 2007; Porfeli, 2008). However, as research on children's career exploration is scarce compared to other career dimensions (Oliveira et al., in press), a broader search was herein required. The same databases of the ones considered to search general studies on childhood career development were used. Still, no timeframe was established for the searching process in order to get a broader and more comprehensive overview of the research on children's career exploration. Thus, this section presents both classical and contemporaneous empirical results on children's career exploration, also following the previously presented sub-periods of childhood.

3.1. First three years of age

During the first three years of life, children are curious about new objects/situations and their exploration is mostly operationalized through play. Infants' exploration is also related to their cognitive development. A number of studies have highlighted the important role of play in children's overall development (Bergen, 2002; Smith & Pellegrini, 2008; Goldstein, 2012). It has also been shown that

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during the first two years of age, play enables infants to increase the time devoted to exploration, amplitude/variation of exploratory behaviors, exploratory attention, persistence, cognitive maturity and understanding of the concepts of sampling and generalization (Jennings et al., 1979; Olmos et al., 2000; Schulz, 2012).

At two and three years of age, children increase their relational exploration and orientation to more complex objects/situations (Power et al., 1985). Children also increase the cognitive maturation involved in exploration (ibid.). Evidence has suggested that from two years old forward, there is a differentiation of cognitively unsophisticated and in-breadth/diversive exploration towards cognitively sophisticated and in-depth/specific exploration (Caruso, 1993). In turn, these exploratory and cognitive accomplishments are important for the development of mastery motivation and problem-solving skills (Jennings et al., 1979).

In sum, research inherent to human development literature offered empirical contributions on children's exploration. During the first three years of age, children actively engage in exploration through play, progress in their cognitive development and relational experiences, which sustain a parallel progress towards cognitive-oriented and in-depth forms of exploration. This supports the changeable nature of exploration and its progress towards more relational, focused and increasingly cognitively complex forms during the first three years of life.

3.2. From three to 10 years of age

The differentiation of exploration into manifold forms continues from three to 10 years of age. During this sub-period of childhood, the relational nature of exploration becomes more evident, as children's exploratory behaviors including attention, manipulation, repetition and variation seem to be influenced by explanations of the exploratory situation provided by adults, such as parents (van Schijndel et al., 2010). Children aged three to six years old can also name and describe occupations to which they have had direct contact with or explored at the family setting (B. Araújo, 2002; Seligman et al., 1988). The family setting seems, therefore, to play a key role in children's exploratory activities and resulting occupational knowledge.

Additionally, evidence has suggested that as four- and seven-year old children get involved in exploratory activities and oriented to more complex objects/situations, they gradually engage in investigative and specific forms of exploration (Switzki et al., 1974). Children's orientation to more complex objects/situations seemingly reflects an increased systematic and in-depth exploration

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(Vandenberg, 1984). Moreover, this period marks the dawn on the shift from children's exploration (more random and unsophisticated) to career exploration (more systematic, intentional and career-related), thus supporting the relevance of addressing career exploration early in the lifespan.

Children aged five to 10 have been shown to nominate and describe more occupations as they increase their out-of-family experiences, recognize educational requirements for occupations they aspire to, present a clearer picture of themselves and being aware of the importance of the family and school settings for their occupational knowledge and future (Araújo, 2009; Seligman et al., 1991). Hence, career exploration impacts occupational learning and broadens as children's social relations and contextual experiences increase.

The literature has also investigated the relationship between curiosity and exploration. Six- and seven-year olds seem more curious about complex objects/situations and not so oriented to their novelty than four- and five-year olds (Bonawitz et al., 2012; Switzki et al., 1974). The shift in the orientation toward complexity is consistent with cognitive accomplishments. Three- to six-year-old children have been shown to spend time exploring novel objects/situations through the manipulation and asking of questions (Henderson, 1984). Parents have also been shown to interact more with their daughters/sons when they explore new objects/situations together (ibid.). From four to seven years of age, children's engagement in and assignment of meaning to exploration seem to be guided by cognitive beliefs and trial-and-error experiments (Bonawitz et al., 2012; Schulz, 2012). In this sense, children seem to explore and observe in an attempt to corroborate or falsify cognitive beliefs. When children experience falsification of their cognitive beliefs, they are more likely to explore the familiar object/situation for a longer time, use the exploration of the novelty to increase their understanding of the familiar and present more complex descriptions of the object/situation they have been exploring (ibid.). This different approach to exploration illustrates children's progress in their investigative and epistemological reasoning, which is stimulated at the school setting and involved in exploratory processes (Tytler & Peterson, 2004).

Summarizing, both career and human development research suggest a higher salience of career exploration from three to 10 years of age, with the shift from exploration to career-oriented exploration being noticeable at these ages. Children seem to increase their social participation, engage in relational career exploration as well as progress in related career processes and results. Children also get more disposed to explore novel objects/situations and to accommodate new information in extant one, thus advancing cognitively oriented exploratory behaviors and resources to learn more. Thus, research at this sub-period of childhood supports a systems view of children's career exploration.

3.3. From 10 to 14 years of age

The literature devoted to career exploration from 10 to 14 years of age has mostly derived from studies conducted with broader samples including both children and older individuals in the adolescence and emerging adulthood periods. For this reason, the discerning of results specifically focused on children aged 10 to 14 constitutes a challenge. However, we herein present specific results at this age period. Whenever relevant, we also present findings derived from joint samples of children and older individuals to give a sense of temporal (dis)continuity in career exploration.

The literature has enabled the identification of personal and contextual influences on career exploration. Among the personal influences, a number of studies identified the influential role of gender and school levels in children's career exploration. By age 13, the cognitive representation of the working world seems similar for both girls and boys, with differences only emerging when specific activities are considered and guide representations toward women- and men-predominated tasks (Gottfredson & Lapan, 1997; Wigfield, Battle, Keller, & Eccles, 2002). Among Portuguese children aged nine to 14, girls have been shown to present higher curiosity/exploration related to academic activities than boys (Oliveira & Taveira, 2014). This is consistent with evidence from middle school children in Mozambique, which suggested that girls are more aware of parental and extra-familial occupations than boys (Falusso, 2011). Such a difference seems to continue in time, as cross-sectional and longitudinal evidence from 14 years old through adolescence and emerging adulthood has suggested that girls explore more than boys (e.g., Faria et al., 2015; Königstedt, 2011; Noack et al., 2010; Taveira et al., 1998). These findings call for caution when addressing specific activities in career exploration with both genders as well as suggest variability in the career exploration process of girls and boys during this sub-period of childhood and later on in life.

Mean differences in career exploration for school levels have been found. Indeed, Portuguese fifth-graders seem to present higher levels of curiosity/exploration related to academic activities than sixth-graders (Oliveira & Taveira, 2014). This is consistent with additional findings suggesting higher career exploration levels for Portuguese fourth-graders compared to sixth-graders (Ramos, 2012). These findings suggest that children attending earlier grades present higher career exploration levels than peers attending later grades. Still, variability in career exploration seems to occur when expected moments of career decision-making are approached in adolescence, with high-school students presenting higher career exploration levels than middle school peers (Noack et al., 2010; Taveira et al.,

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1998). Seemingly, comparative results between children and adolescents have been yielded. Evidence has indicated that while middle school children describe occupations mostly based on behaviors, adolescents offer more complex descriptions of occupations based on interests, abilities and possible occupational outcomes, such as income (Borgen & Young, 1982).

Regarding the contextual influences on children's career exploration, evidence at the Chinese setting has suggested that parents stimulate their 11-year-old offspring's career exploration and inherent learning about the working world and the society (Liu et al., 2015). Evidence derived from a Portuguese joint sample of children and adolescents aged 13 to 17 has also suggested that individuals whose parents are employed present higher career exploration levels than peers with unemployed parents (Faria, 2013). Additional evidence at the emerging adulthood period indicated that career exploration is positively related with parental support and negatively related with parental career engagement (Guan et al., 2015). Parents are, therefore, key-figures in offspring's career exploration, impacting such a process in childhood and later on in life.

Research has also examined the relations among curiosity and exploration at this sub-period of childhood. Children's curiosity seems to stimulate exploration while triggering higher levels of flexibility and active engagement in learning and development (Day, 1968). So, articulations between curiosity and career exploration continue to be covered during this sub-period of childhood. Moreover, children's intrinsic mastery motivation, which is related to career exploration, seems to be facilitated by less controlling situations that stimulate autonomy and one's orientation to challenging situations (Boggiano, Main, & Katz, 1991). In addition, children aged 10 have been shown to acknowledge the role of school and extracurricular activities for their learning about careers and occupational future, being able to state preferences, family, educational and occupational aspirations, as well as becoming aware of educational levels required to perform certain occupations (Seligman et al., 1991).

Academic and career correlates of children's career exploration have also been found. Evidence has suggested positive and weak relations between 13-year-old children's career exploration and academic achievement (e.g., Turner et al., 2006). Such relations were also found in a sample coupling children and adolescents aged 12 to 17 (Creed et al., 2011). Moreover, results derived from children aged nine to 13 suggested that career exploration predicts the occupational knowledge of Realistic, Investigative, Artistic and Entrepreneurial activities (Ferrari et al., 2015). Evidence has also supported the relation among career exploration and planning, pointing to positive and moderate correlations around ages eight to 14 (e.g., Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003). This relation was similarly found in a Portuguese sample of children and

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adolescents aged 13 to 17 (Janeiro, 2010). Research has additionally suggested that career exploration at this sub-period of childhood presents positive and weak correlations with self-concept (e.g., Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010). This seems consistent with evidence derived from samples in late childhood and adolescence, suggesting associations among career exploration and vocational identity status (e.g., Ahn et al., 2015). Evidence has also found weak or moderate relations with internal locus of control (Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010) and career self-efficacy expectations (Turner et al., 2006). Weak to moderate relations of career exploration with internal locus of control and career self-efficacy expectations have equally been found in samples joining children, adolescents and emerging adults (e.g., Gonçalves, 2013; Inácio & Gamboa, 2008; Patton, Bartrum, & Creed, 2004; Rogers et al., 2008). The relations among career exploration, academic and career variables support the central role of children's career exploration in academics and careers, with a possible continuity over the lifespan.

In summary, research on career exploration from 10 to 14 years of age has suggested differences for genders and school levels and recognized the key-role of parents in such a process. Research also kept its attention to the articulations between curiosity and career exploration as well as identified academic and career correlates of career exploration at this sub-period of childhood.

Overall, the career and human development literatures offered empirical contributions to enlighten children's career exploration. These contributions generally sustain the possibility to cover career exploration across sub-periods of childhood (see Figure 2).

Based on the overviewed empirical contributions, we find that children's career exploration can be perceived as a process, "or in other words activities, procedures or operations by which some influence or outcome occurs" (Vondracek et al., 2014, p. 15). As a process, children's career exploration is relationally embedded and characterized by development and mutual dynamics of the child and the environment, with increasing social interactions and broad life-spaces (Blustein, 1997; Blustein et al., 1995; Patton & Porfeli, 2007). This perspective is aligned with a more integrative and comprehensive conceptualization of career exploration (Taveira & Moreno, 2003). It is also consistent with developmental-contextual and systems career perspectives as well as with the possible correlates of career exploration established in our interactive-motivational framework.

Still, research on this topic needs to be more systematically considered to address the particularities and temporal progress of career exploration over childhood. Findings derived from children aged 10 to 14 in middle school years are often embedded in broader age range samples

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falling outside the considered childhood sub-period but joining children, adolescents and emerging adults. While this may suggest possible (dis)continuities of career exploration over the lifespan, it may also yield chronological confounding results. A specific empirical attention to the career exploration process of children aged 10 to 14 is, therefore, needed. We next summarize a number of challenges for the assessment and research of children's career exploration, based on the revised contributions.

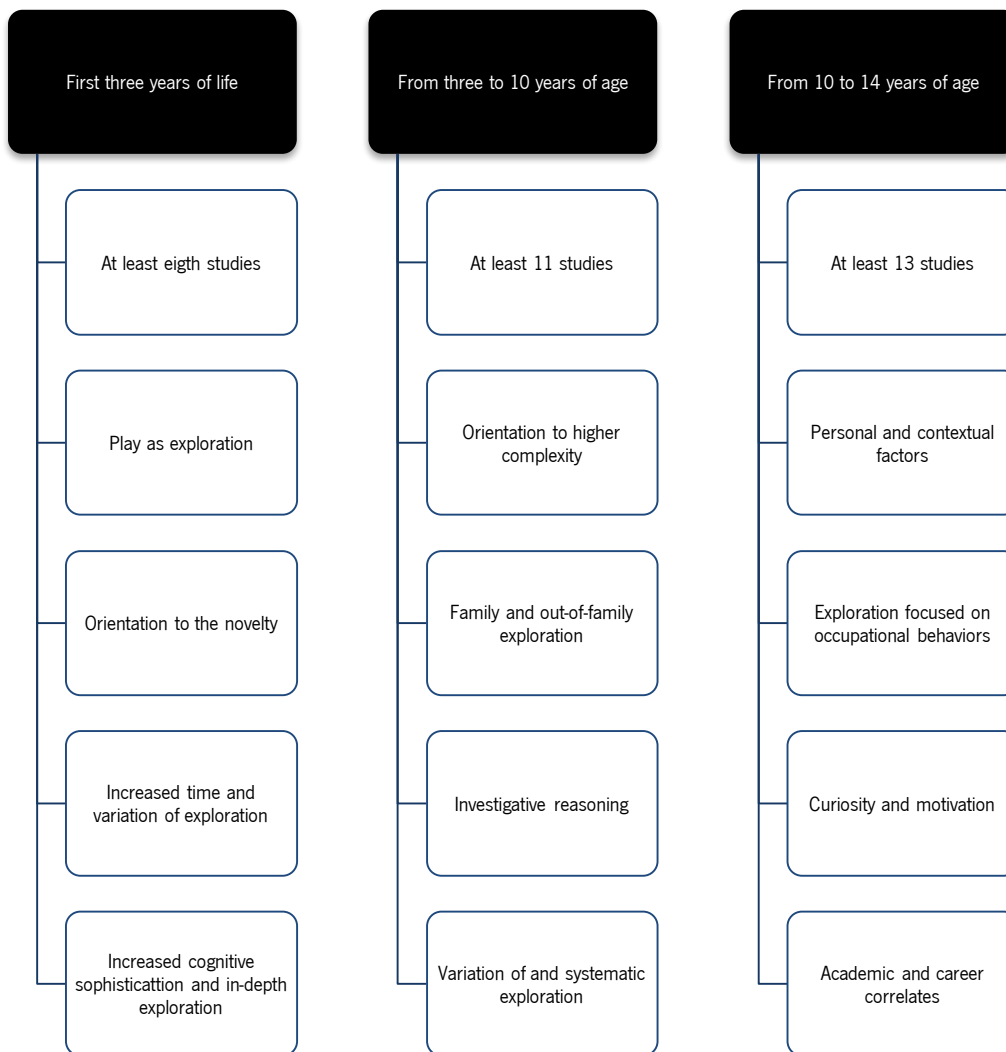


Figure 2.

Summarized research of career exploration during childhood.

4. Challenges for the construct's assessment and study

Based on the theoretical, assessment and empirical contributions offered in this chapter, we can acknowledge that children's career exploration presents particularities that sustain a similar and yet

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different conceptualization than the ones that have been typically considered in adolescence and adulthood (e.g., Jordaan, 1963; Super & Hall, 1978). Taking the overviewed contributions and the more general literature on childhood career development into account, we adopt a conception of childhood career exploration as a relational and contextual process, which becomes increasingly differentiated over time and includes curiosity, objective and subjective aspects such as attitudes, cognitions and behaviors. Particularly, we can conceive of children's career exploration as:

- Consisting of a relational and changeable process coupling personal and environmental factors;
- Being stimulated and stimulating curiosity;
- Presenting increased differentiation over childhood;
- Including the identification and use of exploratory resources as well as the activation of exploratory behaviors such as observing, manipulating, playing, asking questions, engaging in the symbolic search of the environment and being proactive in challenging situations;
- Being cognitively oriented, thus sustaining the imagined tryout of life roles, the more systematic and intentional career exploration behaviors and the construction of representations about oneself and the environment;
- Including emotional aspects that might energize the approach or avoidance of activity domains and exploratory behaviors; and
- Being correlated with career and academic variables during childhood and later on in the lifespan (e.g., occupational information, emerging sense of self, locus of control, career self-efficacy expectations, planning, adaptability, identity and academic achievement).

The assessment and study of children's career exploration is, therefore, important to improve its understanding, address its temporal progress during childhood and articulate it with later periods of the lifespan. Advances in the children's career exploration research topic would also stimulate the progress of the childhood career development field in the operationalization of developmental-contextual and

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systems perspectives of careers (Patton & McMahon, 2006, 2014; Vondracek et al., 2014; Vondracek et al., 1986) and in the understanding of constructs inter-relations, such as those framed in our interactive-motivational framework (Oliveira & Taveira, 2016).

However, the assessment and empirical description of middle school children's career exploration is not yet clear. While there are a few measurement tools and empirical studies discerning results specifically derived from children aged 10 to 14, others combine tools and results from middle school children, adolescents and emerging adults. This sustains a gap in the understanding of career exploration in childhood through adolescence and emerging adulthood (see Figure 3). This is surprising in light of the highest number of references including middle school children, but still sometimes embedded in broader age range samples. This limitation might be due to the chronological definition of ages 10 to 14 years as late childhood, early-, young-, or pre-adolescence or tween crisis. Still, given the importance of children's career exploration (Ferrari et al., 2015; Patton & Porfeli, 2007), the field may benefit from paying more focused attention to the middle school years. Longitudinal studies would be also relevant to overcome the identified near missing link spanning the tween period to the 14 years of age, and to articulate the scientific knowledge of children's career exploration with what is already known about the career development of adolescents and emerging adults.

Considering the literature presented in this chapter, it seems reasonable to cover objective and subjective aspects of middle school children's career exploration. Objective aspects of children's career exploration can be translated in the real tryout of life roles (e.g., student, leisurite) and use of exploratory resources (e.g., books, Internet) (Day, 1968; Super, 1974). Exploratory resources and behaviors enable the search for information and the learning through trial-and-error experiments (Blustein et al., 1995; Jordaan, 1963). Although these objective aspects of career exploration can be directly observed, they can also be addressed based on children's self-reports (e.g., Tracey et al., 2006). On the other hand, the subjective aspects of middle school children's career exploration can be translated in curiosity and cognitive reflection about the self in life roles. Curiosity consists of a driving force for children's proactivity and sustains adaptive functions of overcoming doubt, uncertainty or boredom (Caruso, 1993; Day, 1968; Super & Hall, 1978). Additionally, cognitive reflection about the self in life roles seems to be involved in middle school children's career exploration. Children progress in perspective taking and investigative reasoning as well as acknowledge one's interests, jobs' tasks and their articulation to further sustain a career choice (Caruso, 1993; Gottfredson, 1996; Howard & Walsh, 2010; Nelson, 1978; Tytler & Peterson, 2004). Thus, children's cognitive development suggests that career exploration in middle school years can already include subjective aspects.

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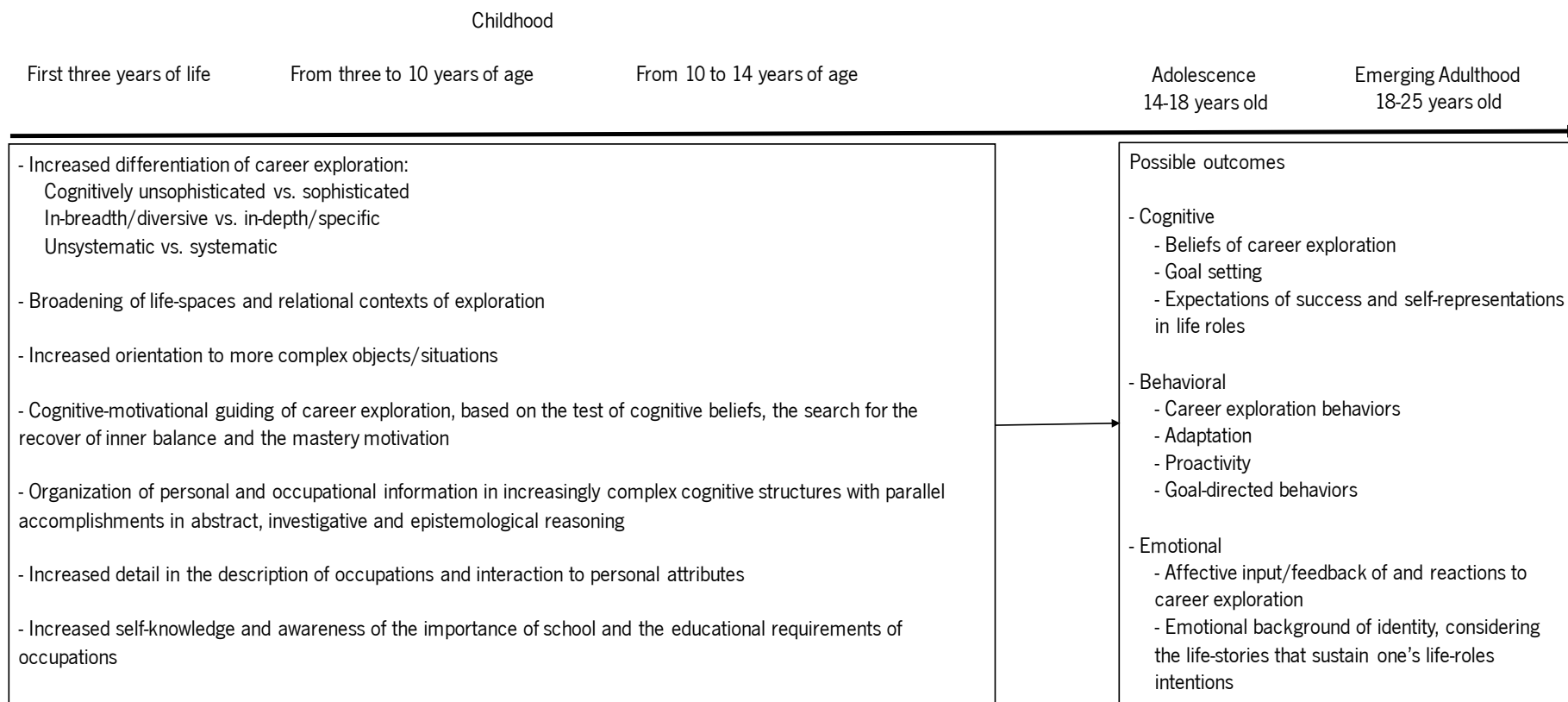


Figure 3.

Children's career exploration: Progress and outcomes.

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The literature has also suggested that middle school children increasingly broaden their social interactions in out-of-family settings and perceive the influence of family, community and school experiences in their career development (Falusso, 2011; Seligman, 1994; Seligman et al., 1991; Super, 1980). Children's increased social interactions may sustain one's engagement in instrumental behaviors and development of capability percepts based on performance feedback across different tasks and settings, such as academics (Gottfredson, 1996). The increase of social interactions is also consistent with an understanding of career exploration as a relational process (Blustein, 1997; Blustein et al., 1995; Patton & Porfeli, 2007; Taveira & Moreno, 2003) that occurs at different contexts (Super, 1980). It is, therefore, reasonable to acknowledge the contexts of middle school children's career exploration and to focus on and instill children's career exploration accordingly. We, therefore, understand middle school children's career exploration as a dimensional process, including curiosity, exploratory resources and projection/trial of the self in life roles. These dimensions can be conceived of indicators of middle school children's career exploration and addressed at different life settings, namely the home, community and school ones.

As research relies on assessment, it is important to first cover such a basilar issue, so that conditions are created to further validly and reliably assess career exploration and study it. Considering that middle school years mark the dawn in the use of self-report measures of career exploration, a closer examination of the measures used in this sub-period of childhood seems useful to advance the field (see Table 1). The self-report measures that have been used with middle school children are generally brief and can be individually or collectively administrated. Although brief measures usually come with a cost of lower reliability estimates (Almeida & Freire, 2003; Marôco & Garcia-Marques, 2006), the short length feature is advantageous for the assessment of middle school children's career exploration and to sustain economized measurements (Chartrand & Walsh, 2001; Hogan, 2003; Taveira, 2004). The self-report measures also present a different number of selected-response options and response labels, presenting either four or five response options and focusing either on perceived agreement with an item, identification with an item, frequency of behaviors or quantity of information.

However, a number of limitations can be assigned to the self-report measures of career exploration used in middle school years. As a first limitation, the measures globally lack an explicit reference to the theoretical rationale or perspective of career exploration supporting the items. This constitutes a glamorous limitation, as a theoretical perspective is required to guide the construction and validation of a measure (Pais-Ribeiro, 2013). An attention to the content of the measures suggest that they mostly follow a conception of career exploration as inquisitive or information-seeking

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behaviors. Still, we believe that measures devoted to this sub-period of childhood could benefit from the inclusion of items sustained by an integrative and comprehensive perspective of career exploration, while highlighting its subjective aspects and contextual nature (Flum & Blustein, 2000; Jordaan, 1963; Taveira & Moreno, 2003). Following such a comprehensive perspective, it would be possible to consider the particularities of middle school years and the life roles and spaces within which children mutually interact (Blustein, 1997; Flum & Blustein, 2000; Patton & Porfeli, 2007; Taveira, 2004).

A second limitation involves a lack of conceptual distinction between curiosity and exploration. This limitation is consistent with some of the assessment techniques used in previous sub-periods of childhood, which conceive of exploratory behaviors as demonstrations of curiosity (e.g., Caruso, 1993; Day, 1968; Jirout & Klahr, 2012). This situation is transferred to middle school years and illustrates the need to clarify whether curiosity and exploration should be separately or jointly assessed. Attempts to separately assess curiosity and exploration pointed to the inclusion of items referring to exploratory behaviors when assessing curiosity, moderate-low estimates of internal consistency reliability and/or conflicting factor loadings in factor solutions (e.g., Schultheiss & Stead, 2004; Stead & Schultheiss, 2003). Thus, curiosity and exploration are difficult to distinguish in terms of their conceptual model and assessment, which seems also consistent with qualitative evidence joining curiosity and exploration in a single theme category grounded on children's discourses (e.g., Nazli, 2007).

A third limitation has to do with the validity of the measures. As the measures have been used for specific studies only, the examination of their psychometric properties has been unsystematically covered. Indeed, the procedures of construction of the measures are often unreported. In addition, mean differences for socio-demographic variables have often been checked, but no evidence of measurement equivalence for groups seems to have been provided. Moreover, the factorial structure of the measures has been asserted in a single occurrence of measurement, lacking evidence of temporal validity. Although temporal validity is not often reported, it is a required procedure to guarantee the applicability of a measure to targeted ages, check the stability of a measurement model over time and sustain further longitudinal analyses (Christensen, 2004; Hirschi, Abessolo, & Foidevaux, 2015; Pedhazur & Schmelkin, 1991; Vandenberg & Lance, 2000; Wang & Netemeyer, 2004; Widaman, Ferrer, & Conger, 2010). Finally, concurrent validity has been reported to some measures (e.g., SCDI) but not all. Adding to this, the measures with published evidence of concurrent validity have relied on the examination of the relations of career exploration with other variables in a single occurrence of measurement, which constraints the understanding of the instruments' nomological validity over time.

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Table 1.

Extant self-report measures used to assess middle-school children's career exploration

| Measure | Applicability | Target population | Properties |
|---|---|---|--|
| Career Exploration Scale (Tracey et al., 2006) | <ul style="list-style-type: none"> - Individual or in-group use - 13 items of exploratory behaviors - 1 "Never" to 5 "Lots of times" | <ul style="list-style-type: none"> - Children aged nine to 13 | <ul style="list-style-type: none"> - Dimensionality: One factor - Reliability: $\alpha = .80$ at age 11 |
| CCDS (Schultheiss & Stead, 2004; see also Stead & Schultheiss, 2003, 2010; adapted in Italy by Ferrari, Nota, & Schultheiss, 2014; adapted in Portugal by Oliveira & Taveira, 2014) | <ul style="list-style-type: none"> - Individual or in-group use - USA Curiosity/Exploration: Seven items of exploratory resources - South-African Curiosity: Eight items of inquisitive behaviors - South-African Exploration: Three items of exploratory resources - Italian Curiosity/Exploration: Eight items of inquisitive behaviors - Portuguese Curiosity/Exploration Related to Academic Activities: Four items of school-related curiosity and use of exploratory resources - Portuguese Curiosity/Exploration Related to Key Figures: Five items of others' opinion on the child's curiosity and exploration of key figures - 1 "Strongly agree" to 5 "Strongly disagree" | <ul style="list-style-type: none"> - USA: Children aged eight to 13 - South-Africa: Children aged eight to 13 - Italy: Children and adolescents of mean age 16 - Portugal: Children aged nine to 14 | <ul style="list-style-type: none"> - Dimensionality: One factor (USA and Italy); two factors (South-Africa and Portugal) - Reliability: $\alpha = .70$ in USA; $\alpha = .69$ and $.54$ in South-Africa; $\alpha = .76$ in Italy; $\alpha = .73$ and $.47$ in Portugal - Concurrent validity: Relations to industry, locus of control, and self-esteem (South-Africa); exploratory behaviors, capacity for success and decision-making self-efficacy (Italy); differences for genders and school levels (USA, South-Africa, Portugal) |

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| Measure | Applicability | Target population | Properties |
|--|---|---|---|
| SCDI (Lapan, 2004) | <ul style="list-style-type: none"> - Individual or in-group use - Seven items of career exploration experiences - 0 “Strongly Disagree” to 4 “Strongly Agree” | <ul style="list-style-type: none"> - Children of mean age 13 | <ul style="list-style-type: none"> - Dimensionality: One factor - Reliability: $\alpha = .88$ - Concurrent validity: Relations to readiness to high-school, perceived barriers, academic and career self-efficacy, identity, interests, positive attributions, proactivity |
| National Survey of Shell Youth '92 (Schmitt-Rodermund & Vondracek, 1999) | <ul style="list-style-type: none"> - Individual or in-group use - Retrospective assessment - 12 items of previous exploratory experiences with creative games, cultural activities and technical games - 1 “Never” to 4 “Very often” | <ul style="list-style-type: none"> - Individuals aged 13 to 19 | <ul style="list-style-type: none"> - Dimensionality: Three factors - Reliability: $.60 < \alpha < .84$ |
| CES (Stumpf et al., 1983; adapted in Portugal by Taveira, 2000) | <ul style="list-style-type: none"> - Individual or in-group use - 54 items of career exploration beliefs, process and reactions - Items 1 to 43: Five-point Likert-type scale related to quantity, satisfaction, frequency, certainty, perceived relevance and expected results - Items 44 to 53: 1 “Minimum” to 7 “A lot of tension” - Item 54: Open-answer | <ul style="list-style-type: none"> - Individuals aged 13 to 22 | <ul style="list-style-type: none"> - Dimensionality: 12 first-order and three high-order factors - Reliability: $.63 < \alpha < .86$ with middle-school children - Concurrent validity: Relations to career indecision and identity; differences for genders, school levels and age |

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| Measure | Applicability | Target population | Properties |
|---|---|--|---|
| Occupational Exploration (Noack et al., 2010) | <ul style="list-style-type: none"> - Individual or in-group use - Six items of environment-exploration - 1 “Does not apply at all” to 4 “Fully applies” | <ul style="list-style-type: none"> - Children and adolescents aged 12 to 16 | <ul style="list-style-type: none"> - Dimensionality: One factor - Reliability: $\alpha = .81$ and $\alpha = .83$ one year apart |
| CDI (Thompson et al., 1981; adapted in Australia by Lokan, 1984; adapted in Portugal by Marques & Caeiro, 1981; adapted in Switzerland by Seifert & Eder, 1985) | <ul style="list-style-type: none"> - Individual or in-group use - Portuguese Career Exploration: 18 items of awareness and use of exploratory resources; 1 “None” to 4 “Very much information” - Australian Career Exploration: Eight items of awareness and use of exploratory resources; 1 “A” to 4 “D” - Swiss Career Exploration: 26 items of the use of exploratory resources; 1 “No information” to 5 “Very much information” | <ul style="list-style-type: none"> - Australia: Children and adolescents aged 12 to 16 - Portugal: Individuals aged 13 to 21 - Switzerland: Children and adolescents 12 to 16 | <ul style="list-style-type: none"> - Dimensionality: One factor (Switzerland); two factors (Australia and Portugal) - Reliability: $\alpha = .72$ in Portugal; $\alpha = .73$ in Australia; $\alpha = .85$ in Switzerland - Concurrent validity: Relations to perceived career barriers, future time perspective and self-esteem (Portugal); relations to career commitment, indecision and self-esteem (Australia); relations to career decidedness and expectations (Switzerland) |

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It is, therefore, noteworthy that self-report measures of middle school children's career exploration might benefit from studies that refer to the processes through which they were constructed, present evidence of factorial equivalence for groups, temporal and nomological validity. Such works seem also important to yield needed psychometric information of a measure (International Test Commission, 2014), which seems to be lacking for extant international self-report measures. As the CCDS has also presented factorial and reliability limitations in the assessment of Portuguese middle-school children's career exploration (Oliveira, 2012; Oliveira & Taveira, 2014; Ramos, 2012), a valid and reliable measure is also needed in the country.

Based on the advantages and limitations of the self-report measures used with middle school children, it is possible to assert that the assessment of career exploration in middle school years through self-report measures might consider: (a) the application of reduced length measures that economize the time and resources implied in career assessment; (b) the presentation of measures that consider an integrative perspective of career exploration and is contextualized within middle school children's main life spaces/theaters; (c) the use of measures that acknowledge the difficulty to separately theorize and assess curiosity and exploration; and (d) the disclosure of measures with psychometric sound properties derived from the examination of factorial equivalence for groups, stability of factorial structure and nomological network over time. Based on the relevance of children's career exploration as well as taking the aforementioned limitations on assessment with middle school children and possibilities to overcome them into account, we next present the empirical study of this dissertation.

CHAPTER 3

Childhood Career Exploration
Inventory (CCEI): Construction,
Internal Structure and
Nomological Network

1. Purpose and target population

The main goal of this empirical study is to construct and validate a new measure to assess Portuguese middle school children's career exploration – the Childhood Career Exploration Inventory (CCEI). Such a measure would be useful to stimulate advances in the research and practice of middle school children's career exploration and development. These advances would also be relevant in light of the current employment challenges confronting young adults in Portugal coupled with a lack of systematic programmatic initiatives in the country to promote career development over the school years. Harmonizing career development programming with Portugal's educational mission to support students' overall development and citizenship (Portuguese Decreto-Lei número 139/2012, 5 julho; Lei número 46/1986, 14 outubro) could yield multiplicative gains for youth and help overcome rates of early school dropout, academic underachievement and retention in the country (Portuguese Conselho Nacional de Educação, 2012; Pereira & Reis, 2014). In addition, this work would better integrate the Portuguese scientific community into the international agenda devoted to childhood career development (Shultheiss, 2008; Watson & McMahon, 2008; Watson et al., 2015), also benefiting Portuguese-speaking nations around the world.

One of the main concerns in this study is to present validity evidence for the CCEI. The psychometric, psychological, educational and economic literatures have suggested different types of validity. For example, the Standards for Educational and Psychological Testing characterize validity evidence based on test content, internal structure and relations to other variables (American Educational Research Association, 2014). In turn, these types of validity are consistent with notions of judgmental validity focused on test content, internal structure validity and nomological validity (Cook & Campbell, 1979; Cronbach & Meehl, 1995; Patten, 2005; Pedhazur & Schmelkin, 1991). Particularly, the coverage of a nomological network has been credited as an essential step to validate a measure (Cronbach & Meehl, 1995; Pais-Ribeiro, 2013). Classical and current literatures have also suggested the importance of temporal validity (e.g., Christensen, 2004; Hirschi et al., 2015; Keefer et al., 2013; Pedhazur & Schmelkin, 1991; Wang & Netemeyer, 2004).

Although different types of validity have been identified in the literature, a number of scholars concluded that they constitute complementary types of evidence of construct validity and need to be thoroughly examined (e.g., Adcock & Collier, 2001; Pais-Ribeiro, 2013; Pedhazur & Schmelkin, 1991). Following such a unified position, this empirical study concentrates on the construct validity of the

CCEI. Thus, the specific goals of this dissertation consist of yielding evidence of the CCEI judgmental validity focused on test content, internal structure validity, temporal validity and nomological validity.

As for the target population, the CCEI was designed within the context of this dissertation for Portuguese fifth- and six-graders. These grades signal the beginning of middle school years in Portugal and were herein selected for three reasons. First, fifth and sixth-grade can stimulate children's career exploration due to its particularities compared to the initial four school levels. While the initial four school levels include four academic subjects lectured by one teacher, the fifth- and sixth-grade include 10 academic subjects and one elective, which are lectured by nine or 10 teachers (Portuguese Decreto-Lei número 139/2012, 5 julho). While transiting to fifth-grade, children may also change schools, peers and communities as well as being offered new extracurricular options. This middle school phase might, therefore, trigger career exploration and sustain increases in children's social participation in out-of-family contexts (e.g., Eccles, 1999; Seligman, 1994; Seligman et al., 1991).

Second, fifth- and sixth-grade offer children performance feedback across academic domains, which can impact their career development. At the time this study was carried out, children had completed and were going to complete local and national tests. On the one hand, these local and national tests offer the opportunity for pupils, teachers and family members to identify students' academic achievement or lack thereof and to mobilize educational efforts to support them (Portuguese Decreto-Lei número 139/2012, 5 julho). On the other hand, the national tests are used to assess the quality of Portuguese schools and educational system by comparing its results to those obtained by other schools and countries. Based on these evaluation experiences during middle school years, children develop perceptions about their capabilities, which may affect their engagement in school and career development tasks (Gottfredson, 1996).

Third, the construction of a measure for Portuguese middle school children is consistent with the work that has been previously developed by the Career Counseling and Development research group at the Portuguese institution hosting this study. The research group has made systematic efforts to study childhood career development, focusing on children aged three to six years old (Araújo, 2009; B. Araújo, 2002). Following this institutional line of inquiry, a previous Master's Degree thesis covered the assessment of career development dimensions with middle school students, but identified limitations in the assessment of career exploration (Oliveira, 2012). Moreover, the research group has been assessing career exploration with observation grids, guided tasks and checklists from three to six years old and with self-report measures during adolescence. The construction of the CCEI for middle school children seemed, therefore, important to offer the group the possibility to overcome the gap in the

assessment and research of career exploration from childhood through adolescence and to broaden the options to choose between qualitative or quantitative techniques according to the targeted period of the lifespan and the conditions available for career assessment.

2. Research methods and plan

This study is a quantitative one, as it relies on quantitative research methods and analyses of data quantified in numerical terms (Almeida & Freire, 2003). It is also a non-experimental study, as it does not include experimental treatments or manipulation of variables, but rather relies on the assessment and description of children's career exploration and development (Patten, 2005).

Seven research phases were followed to fulfill the goals of the empirical study (see Figure 4).

The first phase focused on the substantive analysis of the career exploration construct (Clark & Watson, 1995). Acknowledging the difficulty to achieve a consensual definition of a construct (Cook & Campbel, 1979), the first research phase moved from the broad literature of childhood career development and exploration to an understanding of middle school children's career exploration that would sustain the deductive item generation for the CCEI. It is worth mention that the substantive analysis of the career exploration construct was already introduced in the previous chapters. This research phase included, therefore, the generation of an item pool for the CCEI, also considering the selection of the item format and the response scale piloting.

The second phase included the qualitative evaluation of the CCEI. Such a qualitative evaluation involved judgments from Portuguese experts in the Career Psychology field and think-aloud tryout procedures (Almeida & Freire, 2003). The experts' judgments provided evidence of the CCEI judgmental validity focused on test content (Hinkin, 1995; Patten, 2005). The think-aloud tryout enabled the identification of ambiguous items as well as the adaptation of words and expressions to the target population (Almeida & Freire, 2003). The CCEI Version 1.0 derived from this qualitative evaluation and was used in the following phase.

The third research phase relied on data from a cross-sectional sample of fifth- and sixth-graders with the aim of assessing the CCEI items, reducing the length of the instrument and offer a pilot testing of the response scale. Quantitative analyses of the items, dimensionality and reliability were conducted (Field, 2009), also yielding initial support for the internal structure validity of the CCEI. The CCEI Version 2.0 derived from this phase.

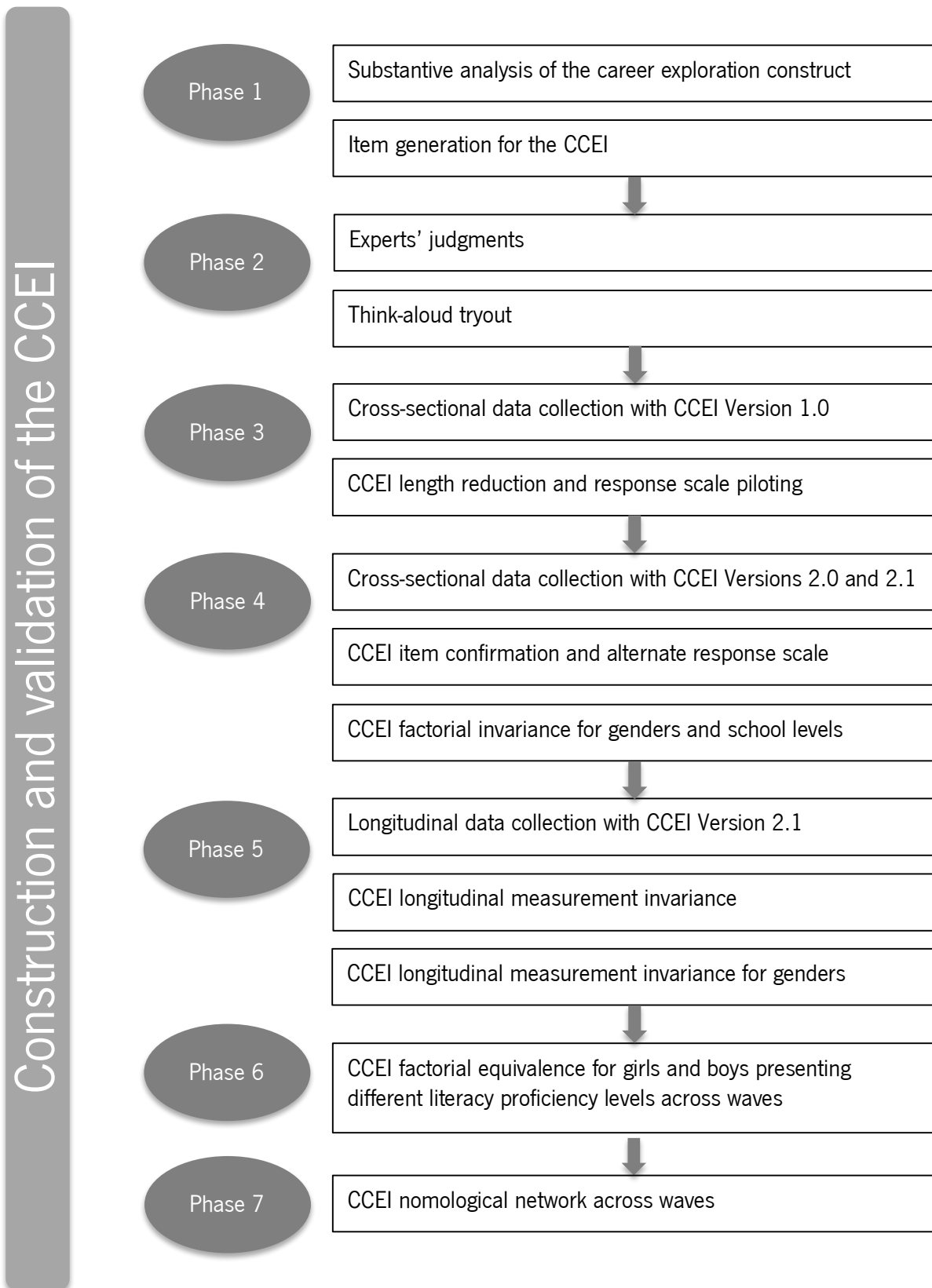


Figure 4.

Construction and validation of the CCEI: Research plan.

The resulting shortened version of the CCEI was administered to another cross-sectional sample of fifth- and sixth-graders. This fourth research phase intended (a) to evaluate the CCEI items selected in the previous phase as one complete measure, (b) to check the appropriateness of the Likert response scale and the initial and alternate set of anchors (CCEI Versions 2.0 and 2.1, respectively), as well as (c) to examine the measure's applicability for genders and school levels. Alternative Likert anchors were developed and tested in this phase to determine if the CCEI response scale could be aligned with that from other childhood career development measures, such as the CCDS. Doing so would be of particular interest in this case due to the CCDS availability in Portugal (Oliveira, 2012; Oliveira & Taveira, 2014) and its familiar item format for Portuguese students. The most efficient response scale was then used to check the applicability of the CCEI for genders and school levels, thus yielding additional evidence of internal structure validity.

A longitudinal dataset with four occurrences of measurement throughout fifth- and sixth-grade was then collected and analyzed. The longitudinal dataset served the fifth, sixth and seventh research phases of this study. The fifth phase examined the stability of the CCEI factor structure and its equivalence for genders over time. These analyses would yield evidence of temporal validity and inform about the possibility of using the CCEI with girls and boys across fifth- and sixth-grades.

The sixth phase checked the factorial invariance of the CCEI for girls and boys with different literacy proficiency levels across occurrences of measurement. These analyses are relevant because the literature has suggested relations among children's literacy proficiency and career variables (e.g., Creed et al., 2007) and have found that the appropriateness of self-report measures with middle school children hinges on their literacy skills (Jensen et al., 2006; Watson & McMahon, 2008).

Finally, the seventh phase examined the relations of the CCEI to other career and academic variables across occurrences of measurement. Evidence of the CCEI nomological validity over time was, therefore, obtained.

3. Research hypotheses

Regarding the goals and research plan of the empirical study, eleven main research hypotheses and five secondary ones (H_x) were tested.

Two research hypotheses were tested up to the third research phase of this study.

- H1. The CCEI Version 1.0 will demonstrate a three-factor structure.

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A three-factor structure was expected based on the indicators acknowledged for middle school children's career exploration (i.e., Curiosity, Exploratory Resources, Self in Life Roles) and which sustained the construction of the CCEI.

- H2. The shortened CCEI Version 2.0 will demonstrate acceptable reliability.

Considering existent international measures of middle school children's career exploration (e.g., Lapan, 2004; Tracey et al., 2006), the CCEI Version 2.0 derived from complementary qualitative and quantitative evaluations was expected to exhibit reliability of .80 or higher for the total scale.

Additional research hypotheses were tested at the fourth research phase of this study.

- H3. The CCEI will exhibit configural, metric, scalar and residual equivalence for Versions 2.0 and 2.1.

The CCEI was expected to present measurement equivalence for the response scales, as literature has suggested no differences in the estimates of students' performance when a response scale changes in anchor points (e.g., Händel & Fritzsche, 2014; Mazaheri & Theuns, 2009). Configural, metric, scalar and residual invariance were expected to hold for the response scales. Configural and metric invariance would assure that the CCEI factor structure and magnitude of measurement weights would be equivalent for the response scales. Scalar invariance would assure that the item intercepts and factor means were equivalent for the response scales. Residual invariance would guarantee that the errors of measurement were equivalent for and not dependent on the response scales.

- H4. The CCEI Version 2.1 will be the most efficient version.

It was anticipated that the CCEI Version 2.1 would be the most efficient one. This hypothesis relied on the possibility of children being more familiar with the alternate response labels of the CCEI Version 2.1 (e.g., Lapan, 2004; Schultheiss & Stead, 2004) than the ones of Version 2.0.

- H5. The CCEI will exhibit configural and metric equivalence for girls and boys.

The CCEI factor structure and measurement weights were expected to be equivalent for girls and boys, thus anticipating configural and metric equivalence for genders. This hypothesis relied on the content of the CCEI items, as they did not cover specific sex-typed items that could lead to

girls' and boys' different endorsement of the items, representation of the construct (e.g., Gottfredson & Lapan, 1997; Tracey & Caulum, 2015; Weigfield et al., 2002), and consequently non-invariance for genders. Scalar invariance for genders was not tested, as it was not expected to hold (Vandenberg & Lance, 2000).¹ Scalar invariance would force girls and boys to present equivalent means in career exploration, which seems inconsistent with literature (e.g., B. Araújo, 2002; Faria et al., 2015; Oliveira & Taveira, 2014). Furthermore, residual invariance is very restrictive (Byrne, 2011; Marôco, 2010) and unnecessary for the purposes of the analysis testing this hypothesis. Hence, it was not tested either.

- H6. The CCEI will exhibit configural and metric equivalence for fifth- and sixth-graders.

Configural and metric equivalence for fifth- and sixth-graders was expected to hold, as cognitive abstraction, perspective taking and career reasoning involved in the cognitive representation of career exploration develop during middle school years and seems similar for proximal school levels (Gottfredson & Lapan, 1997; Howard & Walsh, 2010). Scalar invariance was not tested, as it would force fifth- and sixth-graders to present equivalent means, which is misaligned with previous literature (e.g., Oliveira & Taveira, 2014; Ramos, 2012). Residual invariance was not tested for the purpose of this hypothesis either.

From the fifth to the seventh research phases of the empirical study, five main research hypotheses and five secondary ones were tested.

- H7. The CCEI will exhibit configural and metric stability over time.

Configural and metric stability were expected to hold over time, as the cognitive representation of the career exploration construct was expected to be stable in middle school years. Scalar stability was not tested, as it would force item intercepts and factor means to be stable over time, which would be inconsistent with expected fluctuations of children's responses during monthly intervals across occurrences of measurement. It would also be inconsistent with literature suggesting a U-shaped growth of career exploration (e.g., Patton & Porfeli, 2007; Weisler & McCall, 1976). Residual stability was not tested either.

¹ We herein adopt a position that scalar invariance is not appropriate to be tested when one expects mean differences for groups in specific variables. As Vandenberg and Lance (2000) suggest, testing scalar invariance "is not appropriate because difference in item location parameters would be fully expected. However, these differences are not biases in the sense of being undesirable as in rating source biases, but rather they reflect expected group differences" (p. 38).

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- H8. The CCEI will exhibit configural and metric equivalence for girls and boys over time.

Longitudinal factorial equivalence for girls and boys over time was expected to hold, as the CCEI does not cover specific activities or domains, which could maximize gender different cognitive representations of the working world and the construct under assessment (Gottfredson & Lapan, 1997; Tracey & Caulum, 2015; Weigfield et al., 2002). Scalar equivalence was not tested, as it would be inconsistent with literature suggesting that although girls and boys can present similar changes in career exploration, the factor means for genders differ (e.g., Königstedt, 2011; Noack et al., 2010). Residual stability was also not tested.

- H9: The CCEI will demonstrate acceptable reliability estimates across the four occurrences of measurement.

Estimates of internal consistency reliability equal to or greater than .80 at each occurrence of measurement were expected for the total CCEI. This expectation was supported by evidence suggesting acceptable reliability for existent international measures of middle school children's career exploration (e.g., Lapan, 2004; Tracey et al., 2006) and evidence suggesting stability in the reliability estimates in previous international studies of career exploration with children or adolescents spanning at least two occurrences of measurement (e.g., Noack et al., 2010; Tracey et al., 2006).

- H10. The CCEI will exhibit configural and metric equivalence for girls and boys presenting different literacy proficiency levels across the occurrences of measurement.

Configural and metric equivalence for girls and boys presenting different literacy proficiency levels across occurrences of measurement were expected, as it was considered that students of varying proficiency levels would similarly represent the construct. Scalar equivalence was not tested, as it would be inconsistent with evidence indicating that students' literacy proficiency impact career processes and girls usually are more proficient than boys (e.g., Creed et al., 2007; Lynn & Mikk, 2009). Residual equivalence was not tested either.

- H11: The CCEI will exhibit positive and statistically significant correlations with self-efficacy expectations, self-concept, internal locus of control, career planning and academic achievement across occurrences of measurement.

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- H11.1. The CCEI will be positively related to self-efficacy expectations, presenting weak to moderate magnitude correlations across occurrences of measurement.

Positive, statistically significant and weak to moderate relations between the CCEI scores and self-efficacy expectations for academic, leisure and extracurricular activities were expected. This hypothesis relied on extant literature covering such an association (Gonçalves, 2013; Inácio & Gamboa, 2008; Patton et al., 2004; Rogers et al., 2008; Turner et al., 2006).

- H11.2. The CCEI will be positively related to self-concept, presenting weak correlations across occurrences of measurement.

Positive, statistically significant and weak relations between the CCEI scores and self-concept were expected. This hypothesis relied on results from previous studies (e.g., Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010) and on literature suggesting that career exploration promotes the development of an emerging sense of self and vocational identity (e.g., Ahn et al., 2015; Porfeli et al., 2008; Porfeli et al., 2013; Schmitt-Rodermund & Vondracek, 1999; Super, 1963; Taveira, 2000).

- H11.3. The CCEI will be positively related to internal locus of control, presenting moderate correlations across occurrences of measurement.

Positive, statistically significant and moderate relations between the CCEI scores and internal locus of control were expected. This hypothesis was based on previous research (e.g., Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010) and on literature indicating that individuals' engagement in career exploration is related to internal generalized expectancies of control over one's actions and future (e.g., Schultheiss et al., 2005; Super, 1994; Taveira & Moreno, 2003).

- H11.4. The CCEI will be positively related to career planning, presenting moderate correlations across occurrences of measurement.

Positive, statistically significant and moderate relations between the CCEI scores and career planning were expected. This hypothesis relied on literature suggesting associations between career exploration and planning (e.g., Super, 1994) and on previous empirical findings (e.g., Janeiro, 2010; Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010).

- H11.5. The CCEI will be positively related to academic achievement, presenting weak correlations across occurrences of measurement.

Positive, statistically significant and weak correlations between the CCEI scores and academic achievement were expected. This hypothesis considered previous findings associating career exploration and academic achievement (Creed et al., 2011; Turner et al., 2006).

Before moving to the construction and validation of the CCEI and test of these research hypotheses, four general aspects of the empirical study are worth clarification. First, it is noteworthy that the Portuguese General Direction of Education approved the collection of data at the school setting for the purposes of this doctoral project and dissertation (see Appendix 1), as it is legally required (Portuguese Despacho número 15 847/2007, 23 julho). Confidentiality was maintained throughout this study and ethical procedures inherent to the use of measures and assessments were followed (International Test Commission, 2014). For example, main results and possible practical implications from this empirical study were shared with schools, thus offering feedback to the research intervenient (International Test Commission, 2014).

Second, participants in the three data sets were recruited with a non-probabilistic intentional sampling method (Gravetter & Wallnau, 2007). Children derived from schools, which were selected due to the heterogeneity of students, staff's interest to collaborate in research projects and availability to comply with the proposed research designs and methods. All the schools' principals, teachers and psychologists granted consent for their institutions to be part of the study. The schools' principals and psychologists selected the classroom groups to collaborate in the study. All the students from the selected classroom groups were invited. Written consent forms from the students' caregivers were obtained and children also consented their voluntary participation in the study. After meeting these ethical procedures, the timeframes for data collections were all negotiated with the schools' principals, teachers and psychologists to avoid disruption of academic activities. Data collections took place at the classroom setting. Whenever possible, data collections were performed in the absence of the classroom teacher to control for teachers and students interacting and ultimately contaminating the children's responses. Data was collected from January 2013 to June 2014 by the Doctoral student with the collaboration of school psychologists, a Doctoral colleague and Psychology interns. The study personnel were previously trained to become familiar with the measures, clarify the data collection procedures and manage protocols with standard instructions. Study personnel always read the

instructions and response scales aloud to the students. These instructions clarified the inexistence of (in)correct answers and the importance of each student to sincerely and individually complete the items based on her/his personal experiences. Children were asked to select a single response category per item and to ensure that all the items had been completed at the end of the task. If the students had any questions, they were instructed to ask the study personnel. As teachers had previously identified students presenting reading and/or learning difficulties compared to their peers, study personnel were available to assist these students in the completion of the measures by reading them some items or allowing them to use additional time to complete the task.

Third, the description of the samples followed in cross-sectional and longitudinal designs included evidence of the children's family SES. Children's family SES was coded according to the parents' educational level and occupational category as stated by the Portuguese Classification of Occupations (Portuguese Instituto Nacional de Estatística, 2011; see Tables A1 and A2). A low SES was considered when both parents did not complete compulsory education and performed low-skilled occupations. A medium-low SES was assigned to participants with at least one parent completing compulsory education and/or performing administrative or technical occupations. A medium-high SES was assigned when at least one parent held a college degree and performed an intellectual or managerial occupation. The two medium SES were motivated by the recent Portuguese socioeconomic crisis, which has been leading to the gradual elimination of the middle-class status, with families in this class splitting toward the lower or higher SES (Cantante, 2010).

Fourth, data was analyzed with the Statistical Package for the Social Sciences (IBM SPSS) and the add-on module Analysis of Moment Structures (AMOS), version 22 for Windows. The three data sets were submitted to data preparation. Missing value analyses using the Little Missing Completely at Random (MCAR) test were conducted to check for missing data (Tabachnick & Fidell, 2013). In the sample followed over time, item nonresponses at each and across occurrences of measurement were examined (Jeličić, Phelps, & Lerner, 2009). Moreover, multivariate outliers were investigated in all data sets, using the Mahalanobis Distance statistics (Marôco, 2010; Tabachnick & Fidell, 2013). While applying confirmatory statistical techniques, the normality of sampling distribution was checked by calculating Mardia's coefficient of multivariate kurtosis, with values higher than 3 indicating multivariate non-normality (Garson, 2012). As parametric correlational analyses, such as those computed to assert the CCEI nomological validity, require the normality assumption, the Kolmogorov-Smirnov and the Shapiro-Wilk tests were also computed to check the normality of sampling distribution of interval scale variables (Field, 2009) at each occurrence of measurement.

4. CCEI item generation and qualitative evaluation

The CCEI was designed to cover the three main indicators of middle school children's career exploration, contextualizing them at the home, community and school settings. *Curiosity* was herein perceived as the gap between what the child already knows and is familiar with, to what she/he does not yet know and strives to know. *Exploratory Resources* are those assets children use to engage in career exploration behaviors at the family, community and school settings. The *Self in Life Roles* focuses on the child's imagined tryout of occupational and non-occupational life roles that may sustain her/his career conceptions and aspirations in the future and her/his understanding about how context and social interactions contribute to establishing life roles.

4.1. CCEI item generation

The CCEI was designed as a self-report paper and pencil measure for two main reasons. First, self-report measures have been used to assess career exploration in middle school years across many different countries (e.g., Lapan, 2004; Noack et al., 2010; Schultheiss & Stead, 2004; Tracey et al., 2006). However, these measures present a number of limitations and there is no validated measure of this kind in the Portuguese context for children attending fifth- and sixth-grades. Second, the literature suggests that from eight years old forward, children appropriately respond to self-report measures and their pattern of responses reflect dimensional construct representations (e.g., Keefer et al., 2013). Students are also expected to have developed literacy skills during the elementary school years, which potentiate their completion of self-report measures (Jensen et al., 2006; Watson & McMahon, 2008).

Taking the assumed understanding of career exploration and measurement format into account, items were generated for the CCEI in a deductive manner (Clark & Watson, 1995). Recommendations to develop an initial broad item pool to cover the central indicators of a construct and to be further selected based on qualitative and quantitative evaluations were followed (e.g., Clark & Watson, 1995; Field, 2009; Hogan, 2003). Twenty-four items were designed to assess each of the three indicators of career exploration. These items were contextualized within the home, community and school settings, including eight items per setting for each construct. These procedures yielded a pool of 72 items (see Table 2). During the item generation process, double-barreled, ambiguous and negatively formulated items were avoided and the independence and simplicity of the item content was maximized (Field, 2009; Hogan, 2003; Johns, 2010). Items were also formulated in a general way to avoid specifying

activities, which could be perceived by children as predominated by women or men and thus potentially lead to a gender bias in the responses and inadequacy of the items for both genders (Gottfredson & Lapan, 1997; Tracey & Caulum, 2015).

Table 2.

CCEI 72-item pool content

| Item | Content |
|------|--|
| | Curiosity |
| 1 | I like to ask my parents about their jobs. |
| 2 | Sometimes, I think how it would be like to work as a school principal. |
| 3 | I feel good when I talk to my friends about their daily activities. |
| 4 | I am curious about my neighbors' occupations. |
| 5 | Sometimes I wonder how my parents manage their jobs with household chores. |
| 6 | I would like to learn more about the life style of a teacher I admire. |
| 7 | I feel happy when I learn new things with my friends. |
| 8 | I like to learn more about other people's occupations during my leisure time. |
| 9 | I am curious about my parents' daily work activities. |
| 10 | I am curious about my teachers' daily work activities. |
| 11 | Sometimes, I talk with my friends about the future. |
| 12 | I like to learn more about my neighbors' life styles. |
| 13 | I learned from my family that work is important in life. |
| 14 | I like to learn new things from my teachers. |
| 15 | I like to visit my friends' homes and meet other life styles. |
| 16 | I am curious about how it is to work in an extracurricular setting (for example, being an assistant in a tutoring center). |
| 17 | I learned from my family that it is possible to manage work, friends and household chores. |
| 18 | I am stimulated by some teachers to be interested in academic contents. |
| 19 | I ask my older friends about their daily activities. |
| 20 | I attend community initiatives that prepare me for the future (for example, scouts and student associations). |
| 21 | I am happy when my parents share stories about their past with me. |
| 22 | I learned from my teachers about the world of work. |

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| Item | Content |
|-----------------------|---|
| 23 | I like to learn more about the occupations performed by my friends' parents. |
| 24 | I like to hear my older neighbors' stories about their experiences as students. |
| Exploratory Resources | |
| 25 | I like to read books or guides to learn more about occupations, when I am at home. |
| 26 | I like to search occupational information using the school's Internet. |
| 27 | I talk to my friends between classes and learn more about their daily activities. |
| 28 | I like to watch the TV newscast to find out what is happening in the world. |
| 29 | I like to see my parents' old pictures to learn more about their lives. |
| 30 | I find interesting to learn more about the lives of my school maintenance workers. |
| 31 | I wonder if my friends' daily activities are similar to mines. |
| 32 | I think about the information I obtained through the news. |
| 33 | I feel happy when my family tell stories about their past. |
| 34 | I read books at the school library to learn new things. |
| 35 | I like to learn how other families operate, when I visit my friends' homes. |
| 36 | I like to hear my parents' friends talk about their lives. |
| 37 | I am curious about what my parents did when they were my age. |
| 38 | I know which school services or people I can ask for help in case I have questions. |
| 39 | I feel alike my friends in many aspects. |
| 40 | I believe leisure activities will help me develop important skills for the future. |
| 41 | Sometimes I think about what I have learned with my family. |
| 42 | I imagine myself creating opinions about what people from my school talk about. |
| 43 | Sometimes my friends and I think about what we would do in the future. |
| 44 | I feel happy when I engage in leisure activities. |
| 45 | After my family members help me with homework, I think about what they taught me. |
| 46 | I understand better a subject when different people at school talk me about it. |
| 47 | Sometimes I think about things that my older friends told me about them. |
| 48 | I acknowledge my older neighbors' advice for the future. |
| Self in Life Roles | |
| 49 | I wonder how my family would react if I were to perform a job tied to a leisure setting. |
| 50 | I like to learn more about occupations related to school courses at which I have good grades. |
| 51 | Sometimes I think how it would be like if I were to perform a friend's job. |

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| Item | Content |
|------|--|
| 52 | I imagine myself performing an occupation related to leisure activities at which I am good at. |
| 53 | I imagine myself performing my mother's or father's occupation. |
| 54 | I learned from school that the society needs me to be competent at my future work. |
| 55 | I think I will make new friends when I get a job in the future. |
| 56 | I engage in activities at which I am good at, during my free time. |
| 57 | I wonder about how would I contribute for the society, if I were similar to my mother or father. |
| 58 | I wonder how my parents would react if I were to perform the occupations they hold. |
| 59 | I learned from my family that girls and boys perform different household chores. |
| 60 | Sometimes I wonder if I will have little free time if I become a teacher. |
| 61 | I think I will be able to manage work and household chores, as many adults do. |
| 62 | I think the school prepares me to be a good citizen in the future. |
| 63 | I wonder how my friends would react if I were to perform a job they found inappropriate for me. |
| 64 | I think about leisure activities that could become my future job. |
| 65 | I imagine myself performing certain household chores, being a girl or a boy. |
| 66 | I learned from school that there are women- or men-predominated jobs. |
| 67 | I think my friends and I will contribute to a better future. |
| 68 | I engage in activities I find appropriate for me, being a girl or a boy. |
| 69 | I wonder how others would react if I were to perform an occupation tied to a leisure activity. |
| 70 | I imagine myself performing a certain job, based on what I learned from school. |
| 71 | I think how my colleagues and I could construct a fair society for girls and boys. |
| 72 | I wonder how it would be like if I were to perform leisure activities I find inadequate for me, being a girl or a boy. |

Note. A direct translation of the items from European-Portuguese to English is presented.

A selected-response Likert-type scale was chosen for the CCEI item format. The format was selected to conform with existing self-report measures and to capitalize on the practical advantages of selected-response scales to facilitate group administrations and maximize time efficiency in psychological assessments (Hogan, 2003; Taveira, 2004). The Likert-type scale included five response categories. Despite the controversy in the literature about the number of response categories to include in a selected-response scale, five points have been suggested to: (a) maximize the respondents' choices within an item; (b) maximize the participants' consistency in their responses; (c) enable the

use of correlation-based analyses and model testing; and (d) be consistent with career assessment recommendations for younger participants (Johns, 2010; Lent & Brown, 2006; Weijters, Cabooter, & Schillewaert, 2010). To be consistent with the items' content, the response categories were labeled in terms of participants' degree of perceived similarity with an item. The five-point Likert-type scale ranged from 1 "Totally unlike me" to 5 "Totally like me", also including a neutral point 3 "Not unlike me nor like me". It was expected that such response anchors would enable the differentiation of children, as they would be required to think about themselves when endorsing an item.

As a synthesis of the first research phase, we moved from an integrative perspective of career exploration to the consideration of dimensions and contexts of middle school children's career exploration. A total of 72 items was designed for the CCEI item pool. A five-point Likert-type scale was selected for the item format. The resulting 72-item pool was used in the next research phase.

4.2. CCEI expert judgments and think-aloud tryout

The CCEI item-pool was submitted to a qualitative evaluation including experts' judgments and think-aloud tryout procedures (Almeida & Freire, 2003). Four experts were invited to assess the CCEI over a five-week period. The experts were asked to share their general impressions of the item pool and to assign each item the indicator they thought was being assessed. The group included four Portuguese-speaking experts in the Career Psychology field, three women and one man. At the time of this study, three experts were assistant professors at different public and private universities from central and southern Portugal and one expert was a Post-Doctoral research fellow in a public university from northern Portugal. After favorably replying to the invitation, the experts were sent the 72-item pool and a brief description of middle school children's career exploration and the presumed indicators.

The experts generally suggested that the CCEI was a comprehensive measure of middle school children's career exploration but would benefit from a reduction in the number of items. Based on the judgments for each item and indicator, the percentages of the experts' agreement and of the experts and scale constructors' agreement were calculated (see Table 3). Most of the items presented a 100% ($n = 31$) or 75% ($n = 32$) of experts' agreement. Twenty-three items presented 50% or lower percentages of experts and scale constructors' agreement. A total of 43 items presented a 100% ($n = 24$) or 75% ($n = 19$) of experts and scale constructors' agreement. These items simultaneously presented a 100% or 75% of experts' agreement. Forty-three items were, therefore, judgmentally valid. These results also suggested the need to reduce the length of the CCEI. Although only items with

favorable evidence of content validity should be retained in a measure (Hinkin, 1995), no item was deleted in this phase to further test the items with quantitative methods.

Table 3.

CCEI 72-item pool: Experts' judgment results

| Agreement | % | <i>n</i> items | Order in the item pool |
|---|-----|----------------|---|
| Experts' agreement | 100 | 31 | 2, 3, 4, 5, 8, 11, 22, 26, 27, 29, 33, 34, 36, 40, 47, 48, 49, 51, 52, 53, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 70 |
| | 75 | 32 | 1, 6, 9, 10, 12, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 28, 30, 31, 35, 37, 38, 39, 42, 43, 45, 50, 55, 67, 68, 69, 71, 72 |
| | 50 | 9 | 7, 13, 14, 32, 41, 44, 46, 54, 56 |
| Experts and scale constructors' agreement | 100 | 24 | 4, 8, 26, 27, 29, 34, 36, 40, 47, 49, 51, 52, 53, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 70 |
| | 75 | 19 | 1, 6, 9, 10, 12, 16, 23, 24, 25, 28, 30, 31, 35, 55, 67, 68, 69, 71, 72 |
| | 50 | 8 | 7, 14, 32, 41, 44, 46, 54, 56 |
| | 25 | 8 | 15, 18, 19, 21, 37, 38, 42, 45 |
| | 0 | 13 | 2, 3, 5, 11, 13, 17, 20, 22, 33, 39, 43, 48, 50 |

The think-aloud tryout was individually conducted with 11 middle school children, five (45.5%) girls and six (54.5%) boys, aged 10 to 13 years old ($M = 10.55$, $SD = 1.04$), attending fifth- and sixth-grade at three public schools in northern Portugal.

Children were presented the 72-CCEI item pool and a heading with written instructions guiding their completion of the survey. The students were asked to orally share their thinking about the instructions, items and response scale, while completing the measure. Children spent an average of 35 minutes in the completion and think-aloud tryout of the CCEI. During the completion of the measure, children presented general favorable reactions to the CCEI and perceived it as meaningful for them to think about career issues.

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Children also provided relevant suggestions to improve the CCEI. First, children suggested that the instructions could be improved by clarifying that if an item presented unfamiliar experiences for children, the option 1 “Totally unlike me” should be selected. Second, children demonstrated fatigue from item 47 forward and recommended a reduction in the length of the CCEI. Third, children suggested clarifications of six items to improve their comprehensibility. Specifically, children recommended that examples were added to items 13, 40 and 64 to better illustrate and clarify them. Children also suggested the replacement of expressions in items 42, 44 and 57 for others more familiar to their age group. Alternatives to improve these items were negotiated and included in an improved version of the 72-item pool (see Table 4). A resulting 72-item CCEI Version 1.0 was obtained.

Table 4.

CCEI 72-item pool: Items improved based on think-aloud tryout

| Item | Original item | Negotiated and improved alternative |
|------|--|--|
| 13 | I learned with my family that work is important in life. | I learned with my family that work (as studying or having a job) is important in life. |
| 40 | I believe leisure activities will help me develop important skills for the future. | I believe leisure activities (such as sports or scouts) will help me develop important skills for the future. |
| 42 | I imagine myself creating opinions about what people from my school talk about. | I imagine myself formulating opinions about what people from my school talk about. |
| 44 | I feel happy when I engage in leisure activities. | Nowadays, I feel happy when I engage in leisure activities. |
| 57 | I wonder about how would I contribute for the society, if I were similar to my mother or father. | I wonder about how I would contribute for the society if I had similar characteristics to my mother or father. |
| 64 | I think about leisure activities that could become my future job. | I think about leisure activities that could become my future job (such as being an scout leader or a catechist). |

As a synthesis of the second research phase, four Portuguese career experts judged the CCEI and 11 children participated in a think-aloud tryout. Acceptable evidence of judgmental validity was found for 43 items. The think-aloud tryout enabled an estimation of approximately 35 minutes to

administrate the CCEI and the improvement of the CCEI instructions and items. The resulting CCEI Version 1.0 was used in the next research phase.

5. Testing the CCEI items, response scale piloting and internal structure

The CCEI Version 1.0 was tested in terms of univariate statistics of the items, factors/dimensionality and reliability. The derived quantitative results were coupled with previous qualitative evaluations of the CCEI to further reduce the length of the measure. It was intended for the CCEI to be reduced to a maximum of 13 items to be consistent with the maximum length of existent international measures of children's career exploration (e.g., Lapan, 2004; Noack et al., 2010; Schultheiss & Stead, 2004; Tracey et al., 2006).

5.1. Participants

A public urban school at the Northwest of Portugal was contacted and available to collaborate in the study. Following recommendations for a first administration of a measure under construction (e.g., Clark & Watson, 1995; Field, 2009), a goal of 300 participants was set by the researcher. The school's principal and psychologist selected six fifth-grade and seven sixth-grade classroom groups to collaborate in the study, from which invitations were made and written consent forms were obtained.

The sample included 313 students, 137 (43.8%) girls and 176 (56.2%) boys, aged nine to 14 years old ($M = 10.80$, $SD = .86$). At the time of this study, 151 (48.2%) students were attending fifth-grade and 162 (51.8%) were attending sixth-grade. Most of the participants were Portuguese-native students (97.2%), followed by Brazilian- (1.9%), French- (.3%), German- (.3%) and Venezuelan-native (.3%) participants.

The majority of the children's mothers and fathers were employed (73.7% and 81.1%, respectively). Mothers frequently performed occupations in the domains of executive services, administration and technical occupations (49.8%). Fathers frequently performed occupations in the domains of trades and security, intellectual and scientific activities, qualified work in industry and construction as well as non-qualified jobs (42%). As for the educational level, 17.8% of the mothers and 22.1% of the fathers completed the first three periods of education, 20.8% of the mothers and 18.3% of the fathers completed high school as well as 29.5% of the mothers and 25.3% of the fathers earned a

college degree (see Table A1). While 50% of the children were from families of medium-low SES, 23.1% derived from low and 25.3% from medium-high SES.

5.2. Procedures

The paper-based 72-item CCEI Version 1.0 was administrated in a 50-minute class period with the entire group of students.² Data collection was planned according to the estimated time needed for the completion of the CCEI and allowed by the school's principal, psychologist and teachers to collect data from each classroom group. Children presented favorable reactions to the CCEI, but some did demonstrate fatigue as they approached the end of the survey.

5.3. Data analyses

The CCEI item selection, length reduction and response scale piloting relied on quantitative analyses of the items, dimensionality and reliability. For the item analyses, the dispersion analyses and the discrimination index were computed. The dispersion analyses focused on the minimum and maximum values, the appropriate descriptive measures of central tendency and dispersion for ordinal variables (i.e., median and interquartile range) and the skewness and kurtosis values, which suggested an approximately normal distribution when ranging from -1 to 1 (Martins, 2011). The dispersion analyses enabled the identification of items presenting an unbalanced distribution of responses (Clark & Watson, 1995). The discrimination index was calculated through the corrected item and total scale correlation coefficient. The index was calculated for the total CCEI and for each indicator, with values higher than .20 being acceptable (Kline, 1993). The discrimination index identified items that offered a similar level of discrimination to the degree of discrimination offered by the total CCEI and each indicator (Hogan, 2003).

The dimensionality of the CCEI was examined with exploratory and confirmatory factor analyses (EFA and CFA), thus contributing "for a more comprehensive assessment of the instrument's properties" (Oliveira, Melo-Silva, Taveira, & Grace, 2015, p. 91). The EFA was used to identify underlying dimensions of the CCEI based on the items' common variance. The principal factors method, specifically the principal axis factoring, was used (Tabachnick & Fidell, 2013). The factorability

² The Portuguese Multidimensional Scales of Perceived Self-Efficacy version (Bandura, 1990; adapted by Teixeira & Carmo, 2004) was also administrated to this sample for pilot testing in fifth- and sixth-grade. However, such data was not used for the purposes of this research phase. More information on the self-efficacy measure is provided in section 7 of the current chapter.

of the correlation matrix was previously examined with the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and the Bartlett's test of sphericity. Values of KMO higher than .70 were deemed favorable, suggesting that different factors could be obtained from the matrix (Field, 2009). Statistically significant results from the Bartlett's test were indicative of the correlation matrix being different from an identity matrix. As one correlation matrix can yield different factor solutions (Field, 2009), possible solutions were examined based on the specified and non-specified number of factors to extract, using oblique (i.e., direct oblimin) and orthogonal (i.e., varimax) rotations.

CFA was herein used to provide results that could be directly comparable to other CFA's that were conducted in later phases of the research plan in this dissertation. CFA was also used to support the CCEI item selection with an eye toward reducing the length of the survey. Possible measurement models were specified and tested. The evaluation of model fit relied on the chi-square goodness-of-fit test (χ^2), with a p value higher than .05 indicating a good fit (Jackson et al., 2009). However, as the chi-square statistics can be influenced by sample size (Marôco, 2010), additional fit statistics were considered, namely the chi-square to degrees of freedom ratio (χ^2/df), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) with its 90% confidence intervals (CI), and the Akaike Information Criterion (AIC). These estimates were selected due to their frequent use in CFA articles and utility when comparing measurement models (Jackson, Gillaspay, & Purc-Stephenson, 2009; Marôco, 2010). Values of χ^2/df lower than 3 or 2 respectively suggested an acceptable or good fit (Blunch, 2008; Kline, 2011). Values of CFI and TLI ranging from .90 to .95 were deemed acceptable and values above .95 were indicative of good fit (Hu & Bentler, 1999). Values of RMSEA ranging from .05 to .08 were acceptable and values below .05 were considered to be good (Browne & Cudeck, 1993, cit. in Jackson et al., 2009). No cut-off values have been recommended for the AIC, but the model presenting the lowest value is assumed to yield the better fit (Marôco, 2010). Correlated errors were not permitted in these models, since they may mask underlying unrecognized factors.

Reliability was addressed with the internal consistency method. Cronbach's Alpha (α) is the most commonly used estimate, which can be influenced by the length of a scale and variance of each item and total scale (Almeida & Freire, 2003; Marôco & Garcia-Marques, 2006). Cronbach's Alpha values lower than .60 can be interpreted as unacceptable, between .60 and .65 as undesirable, between .65 and .70 as minimally acceptable, between .70 and .80 as respectable, and between .80 and .90 as very good (DeVellis, 1991).

5.4. Results

5.4.1. Data preparation

The frequency of missing values ranged from zero to six (1.9%) across the 72-item CCEI Version 1.0. The Little's MCAR test suggested a non-random distribution of missing data, $\chi^2(3627) = 4431.22$, $p < .001$. One student presented 24 non-responses from item 41 through 64. As these missing values would be overestimated, this participant's data were filtered from further analyses. After filtering this data, the number of missing values maintained its range. The Little's MCAR test continued to suggest a non-random pattern of missing values, $\chi^2(3579) = 4408.38$, $p < .001$. This might be due to a high frequency of missing values from item 32 forward for less than 5% of participants, with only the items 37, 55, 57, 58, 60 and 63 presenting no missing values. Still, as the frequencies of missing values were lower than 5% and no association with demographic variables (i.e., gender, grade) were found, the missing values were considered negligible. The mean replacement method was used to resolve missing values, as this is a conservative and acceptable procedure when a low frequency of missing values exists (Tabachnick & Fidell, 2013). The Mahalanobis Distance statistics identified no outliers.

5.4.2. CCEI item selection, response scale piloting and internal structure

The dispersion analysis suggested that all five points of the response scale were used by participants across the 72 items. The skewness and the kurtosis values suggested that 35 items presented an approximated normal distribution (see Table 5). The remaining 37 items were removed due to evidence of non-normality (e.g., Clark & Watson, 1995; Hogan, 2003; Field, 2009). Among the removed items, six items did simultaneously present less than 75% of experts' agreement (i.e., items 7, 13, 14, 41, 44 and 56) and 12 items presented less than 75% of experts and scale constructors' agreement (i.e., items 2, 3, 5, 15, 18, 20, 21, 33, 37, 38, 43, 50).

The discrimination indexes presented favorable results for the 72 items. The corrected item and total of the CCEI correlation coefficient ranged from .38 to .66, with an average of .53 for the total scale. The discrimination index ranged from .40 to .65 with an average of .52 for Curiosity (items 1 through 24), from .39 to .65 with an average of .55 for Exploratory Resources (items 25 through 48), and from .42 to .62 with an average of .53 for Self in Life Roles (items 49 through 72). Each item

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discriminated participants in the same direction as the total CCEI and each indicator. No item was removed based on discrimination indexes results.

Table 5.

CCEI Version 1.0: Item analyses

| Item | Min.-Max. | Median | IQR | Skewness | Kurtosis | <i>D</i> (indicator) | <i>D</i> (CCEI) |
|------|-----------|--------|-----|----------|----------|-------------------------|-----------------|
| 1 | 1-5 | 4 | 2 | -.95 | .34 | .50 | .50 |
| 2 | 1-5 | 3 | 2 | -.19 | -1.08 | .47 | .47 |
| 3 | 1-5 | 4 | 1 | -1.37 | 1.32 | .50 | .51 |
| 4 | 1-5 | 2 | 2 | .56 | -.88 | .53 | .47 |
| 5 | 1-5 | 4 | 1 | -1.05 | .61 | .60 | .60 |
| 6 | 1-5 | 4 | 2 | -.64 | -.62 | .58 | .55 |
| 7 | 1-5 | 5 | 1 | -1.62 | 2.55 | .49 | .52 |
| 8 | 1-5 | 3 | 2 | -.32 | -.91 | .61 | .58 |
| 9 | 1-5 | 4 | 2 | -1.01 | .26 | .46 | .44 |
| 10 | 1-5 | 3 | 2 | -.15 | -1.02 | .59 | .55 |
| 11 | 1-5 | 4 | 2 | -.99 | .02 | .51 | .51 |
| 12 | 1-5 | 2 | 2 | .45 | -.87 | .51 | .48 |
| 13 | 1-5 | 5 | 1 | -1.90 | 3.80 | .44 | .46 |
| 14 | 1-5 | 4 | 1 | -1.23 | 1.66 | .55 | .56 |
| 15 | 1-5 | 5 | 1 | -1.53 | 1.81 | .46 | .47 |
| 16 | 1-5 | 3 | 1 | -.41 | -.80 | .50 | .50 |
| 17 | 1-5 | 4 | 2 | -.99 | .39 | .65 | .66 |
| 18 | 1-5 | 4 | 1 | -1.03 | 1.04 | .48 | .48 |
| 19 | 1-5 | 3 | 2 | -.30 | -.98 | .60 | .59 |
| 20 | 1-5 | 3 | 2 | .30 | -1.06 | .43 | .42 |
| 21 | 1-5 | 5 | 1 | -1.87 | 3.01 | .40 | .44 |
| 22 | 1-5 | 4 | 2 | -.91 | .47 | .55 | .58 |
| 23 | 1-5 | 4 | 2 | -.78 | -.43 | .57 | .62 |
| 24 | 1-5 | 3 | 2 | -.02 | -1.45 | .46 | .47 |
| 25 | 1-5 | 3 | 1 | -.47 | -.52 | .53 | .53 |
| 26 | 1-5 | 4 | 1 | -.50 | -.61 | .54 | .54 |
| 27 | 1-5 | 4 | 1 | -1.19 | .76 | .54 | .53 |
| 28 | 1-5 | 4 | 1 | -1.17 | .84 | .43 | .42 |
| 29 | 1-5 | 5 | 1 | -1.86 | 3.79 | .57 | .57 |
| 30 | 1-5 | 3 | 2 | .01 | -1.16 | .51 | .52 |
| 31 | 1-5 | 4 | 2 | -1.03 | .35 | .62 | .62 |
| 32 | 1-5 | 4 | 2 | -.86 | .11 | .62 | .62 |
| 33 | 1-5 | 4 | 1 | -1.67 | 2.53 | .56 | .56 |
| 34 | 1-5 | 3 | 1 | -.41 | -.79 | .56 | .56 |
| 35 | 1-5 | 4 | 2 | -.70 | .55 | .60 | .60 |
| 36 | 1-5 | 4 | 2 | -.46 | -.80 | .53 | .54 |
| 37 | 1-5 | 5 | 1 | -1.74 | 2.77 | .54 | .54 |
| 38 | 1-5 | 4 | 1 | -1.10 | .86 | .56 | .55 |

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| Item | Min.-Max. | Median | IQR | Skewness | Kurtosis | <i>D</i> (indicator) | <i>D</i> (CCEI) |
|------|-----------|--------|-----|----------|----------|-------------------------|-----------------|
| 39 | 1-5 | 4 | 2 | -.93 | .45 | .56 | .55 |
| 40 | 1-5 | 4 | 2 | -1.22 | .53 | .39 | .38 |
| 41 | 1-5 | 4 | 1 | -1.25 | 1.13 | .63 | .63 |
| 42 | 1-5 | 4 | 2 | -.68 | -.09 | .58 | .59 |
| 43 | 1-5 | 5 | 1 | -1.43 | 1.33 | .58 | .57 |
| 44 | 1-5 | 5 | 1 | -1.43 | 1.85 | .42 | .59 |
| 45 | 1-5 | 4 | 2 | -.81 | .15 | .59 | .55 |
| 46 | 1-5 | 4 | 2 | -.79 | .02 | .55 | .55 |
| 47 | 1-5 | 4 | 2 | -.89 | .17 | .65 | .66 |
| 48 | 1-5 | 4 | 1 | -.49 | -.88 | .47 | .47 |
| 49 | 1-5 | 3 | 3 | -.41 | -1.04 | .44 | .41 |
| 50 | 1-5 | 5 | 1 | -1.82 | 2.98 | .51 | .56 |
| 51 | 1-5 | 4 | 1 | -1.22 | 1.24 | .52 | .56 |
| 52 | 1-5 | 4 | 2 | -.98 | .36 | .50 | .58 |
| 53 | 1-5 | 4 | 2 | -.89 | .09 | .62 | .59 |
| 54 | 1-5 | 4 | 2 | -.85 | .46 | .60 | .45 |
| 55 | 1-5 | 5 | 1 | -1.99 | 4.37 | .45 | .46 |
| 56 | 1-5 | 4 | 1 | -1.30 | 1.36 | .42 | .52 |
| 57 | 1-5 | 4 | 2 | -.94 | .38 | .58 | .54 |
| 58 | 1-5 | 4 | 2 | -.62 | -.68 | .51 | .54 |
| 59 | 1-5 | 4 | 2 | -.79 | -.17 | .58 | .59 |
| 60 | 1-5 | 4 | 2 | -.92 | -.21 | .44 | .47 |
| 61 | 1-5 | 4 | 1 | -1.19 | 1.14 | .57 | .51 |
| 62 | 1-5 | 4 | 1 | -1.34 | 1.86 | .62 | .61 |
| 63 | 1-5 | 4 | 2 | -.58 | -.54 | .56 | .49 |
| 64 | 1-5 | 4 | 1 | -.71 | -.27 | .50 | .57 |
| 65 | 1-5 | 4 | 1 | -1.44 | 2.09 | .44 | .45 |
| 66 | 1-5 | 4 | 2 | -1.18 | .63 | .51 | .57 |
| 67 | 1-5 | 4 | 1 | -1.51 | 2.42 | .65 | .45 |
| 68 | 1-5 | 4 | 1 | -1.28 | 1.80 | .53 | .46 |
| 69 | 1-5 | 4 | 2 | -.99 | .29 | .49 | .62 |
| 70 | 1-5 | 4 | 1 | -1.18 | 1.28 | .51 | .49 |
| 71 | 1-5 | 4 | 2 | -.77 | -.29 | .62 | .60 |
| 72 | 1-5 | 4 | 2 | -.64 | -.39 | .53 | .49 |

Note. *N* = 312. Min.-Max. = Minimum-Maximum. IQR = Interquartile range. *D* = discrimination index, based on each indicator or the total CCEI.

The retained 35 items were included in the next EFA. The factorability of the correlation matrix was supported on the basis that the KMO value of .93 and the Bartlett's test result, $\chi^2(595) = 4855.86, p < .001$.

The EFA with no previous specifications suggested the extraction of seven factors with eigenvalues higher than Kaiser's criterion of 1. The seven-factor solution accounted for 47.72% of the variance. Still, the scree plot highlighted a one-factor solution, with one factor accounting for 33.38% of

the variance and presenting an eigenvalue of 12.19, against six factors with eigenvalues from 1.01 to 1.74. The 35 items presented acceptable factor loadings ranging from .48 to .72 in the first factor. Fourteen items loaded higher than -.25 or .25 in other factors (i.e., items 4, 12, 22, 23, 32, 35, 36, 39, 45, 46, 52, 57, 59 and 63).

A specified three-factor solution was examined next and accounted for 39.56% of the variance. The first factor accounted for 33.14% of the variance and presented an eigenvalue of 12.19. The remaining factors presented eigenvalues of 1.74 and 1.44 and only added 3.55% and 2.87% of explained variance respectively. Factor solutions with both oblique and orthogonal rotations were investigated. On the one hand, the results from an oblique rotation suggested that the items 39, 52, 59, 63 and 64 offered loadings larger than .30 in more than one factor. On the other hand, the results from an orthogonal rotation identified 20 items with factor loadings larger than .25 in more than one factor (i.e., items 4, 6, 8, 12, 16, 22, 23, 32, 35, 36, 42, 45, 46, 47, 54, 57, 58, 59, 60, 69).

Overall, this three-factor solution indicated that 14 items demonstrated appreciable cross loadings in more than one factor (i.e., items 4, 12, 22, 23, 32, 35, 36, 39, 45, 46, 52, 57, 59, 63). For that reason, these 14 items were removed from the CCEI (e.g., Clark & Watson, 1995; Mansoer & Oei, 1999). Among these items, item 32 presented 50% of experts' agreement. Additionally, items 22 and 39 presented 0%, the item 45 presented 25% and the items 32 and 46 presented 50% of experts and scale constructors' agreement. These findings suggested that items with poor judgmental validity (i.e., less than 75% of experts' or experts and scale constructors' agreement) could negatively influence the CCEI at the item and factor levels. So, six additional items presenting 50% (i.e., item 54), 25% (i.e., items 19 and 42) or 0% (i.e., items 11, 17 and 48) of experts and scale constructors' agreement were eliminated from the CCEI.

The retained 15 items were included in another EFA. A non-specified solution suggested the extraction of two factors accounting for 37.46% of the variance. Still, a one-factor solution continued to be highlighted, as the first factor explained 33.10% of the variance and presented an eigenvalue of 5.58 against the second factor, which accounted for 4.36% of the variance and presented an eigenvalue of 1.22. The factor loadings ranged from .42 to .67 for the first factor whereas items 25 and 34 presented factor loadings higher than .35 for the second factor.

A specified three-factor solution was also tested and accounted for 40.79% of the variance. The first factor remained strong, as it explained 33.37% of the variance and presented an eigenvalue of 5.58, against the eigenvalues of 1.22 and .94 of the other two factors. The results from both orthogonal and oblique rotations suggested that a three-factor solution was unclear. The results derived

from an oblique rotation suggested that the items 16 and 47 presented factor loadings higher than .25 in more than one factor. Moreover, only one item loaded in the third factor, which is not consistent with recommendations to operationalize a factor with at least three items (Marôco, 2010).

These results suggested that the extraction of three factors would increase the complexity of the factor solution and yield an unbalanced distribution of items per factor. A two-factor solution seemed also to provide an unbalanced distribution of items per factor and to present high loadings in more than one factor. Taking these results into account, a one-factor solution was preferred. A one-factor solution has been highlighted throughout the exploratory analyses and would maximize the desired simplicity of the factor solution (Cureton & D'Agostino, 1983). The CCEI one-factor solution based on the retained 15 items presented a very good estimate of internal consistency reliability ($\alpha = .88$).

Based on existent international measures of middle school children's career exploration and career assessment recommendations, the possibility of reducing the CCEI length to a maximum of 13 items was considered. After revising the content of the retained 15 items, items 6, 47 and 72 were assumed dispensable from the CCEI due to their extended text length and content redundancy. The deletion of these items yielded a 12-item CCEI version with a balanced distribution of items per context: items 1, 25, 53 and 58 focused on the home setting; items 8, 16, 64 and 69 attended to the community setting; and the items 26, 34, 60 and 71 were devoted to the school setting.

An EFA with the retained 12 items was conducted (see Table 6). A non-specified solution suggested the extraction of two factors accounting for 37.57% of the variance. However, the first factor continued to explain a majority of the variance (32.82%) and presented an eigenvalue of 4.55, whereas the second factor only accounted for 4.75% of the variance and presented an eigenvalue of 1.12. These results supported a one-factor solution, that accounted for 32.35% of the variance and presented an eigenvalue of 4.55. The factor loadings ranged from .51 to .62. The estimate of internal consistency reliability was classified as very good ($\alpha = .85$).

CFA was next conducted, enabling the direct comparison of model fit for the 12-item version relative to the previous 15-item version of the CCEI. Three measurement models were tested (see Figure 5). Model 1 relied on the exploratory results to include a latent variable labeled Career Exploration and the items as observed variables. Model 2 relied on the theoretical grounding of the CCEI and distributed the observed variables across three correlated latent factors – Curiosity, Exploratory Resources, and Self in Life Roles. Model 3 balanced the CCEI theoretical grounding with the exploratory results by specifying a hierarchical model. This model simultaneously treated Curiosity, Exploratory Resources, and Self in Life Roles as first-order factors indicated by the CCEI items, and the

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three constructs served as indicators for a second-order factor labeled Career Exploration. Model 3 was tested with the marker variable strategy, fixing one of the second-order factor loadings to 1 (Chen, Sousa, & West, 2005).

Table 6.

CCEI Version 1.0: Exploratory one-factor solution with 12 items

| Item | Synthesized content | Context | Factor loading | Cronbach's Alpha if item deleted |
|------|---|-----------|----------------|----------------------------------|
| 1 | Be curious about the parents' occupations. | Home | .51 | .84 |
| 8 | Be curious about other people's occupations. | Community | .65 | .83 |
| 16 | Be curious about working in an extracurricular setting. | Community | .55 | .84 |
| 25 | Read home-accessible books to learn about occupations. | Home | .57 | .84 |
| 26 | Use the school's Internet to learn about occupations. | School | .62 | .83 |
| 34 | Read school-accessible books to learn new things. | School | .58 | .84 |
| 53 | Imagine to perform the mother's or the father's occupation. | Home | .61 | .84 |
| 58 | Think about the parents' reactions if the child performed their occupations. | Home | .57 | .84 |
| 60 | Think about the free time one would have if he/she became a teacher. | School | .42 | .85 |
| 64 | Think about leisure activities that could become a future occupation. | Community | .59 | .84 |
| 69 | Think about others' reactions if the child performed an occupation related to leisure activities. | Community | .53 | .84 |
| 71 | Think about the role of the child and of his/her peers for a gender-fair society. | School | .59 | .84 |

The normalized estimate of Mardia's multivariate kurtosis presented a value of 87.81 based on 15 items and of 54.31 based on 12 items, thus suggesting the violation of the assumption of multivariate non-normality required for CFA. To control for biases derived from the multivariate non-normality of sampling distribution, the Maximum Likelihood (ML) estimation method based on the variance-covariance matrix using bootstrapping was selected. Bootstrapping is a non-parametric procedure that does not depend on normality and that provides robust statistics and an empirical sampling distribution based on the construction of randomized samples derived from the original one (Kline, 2004; Nevitt & Hancock, 2001). The Bollen-Stine bootstrap χ^2 test statistic with 500 bootstrap samples was considered (e.g., Gilson et al., 2013). A significance value higher than .05 for the Bollen-Stine bootstrap χ^2 test statistic is also recommended for good fit. The Bollen-Stine bootstrap has been suggested to better control the Type I error than the ML estimation method under conditions of non-normality. It has also been suggested to yield more accurate results than the Asymptotic Distribution Free (ADF) estimation method in samples with less than 1500 participants (Nevitt & Hancock, 2001).

The results suggested that, regardless of the number of items, Models 2 and 3 yielded a better fit to the data than Model 1 (see Table 7). As no differences in the fit results were found for Models 2 and 3, Model 3 was preferred. Three main reasons sustained the preference for Model 3: (a) it balanced the theoretical grounding of the CCEI with the EFA results; (b) it was more parsimonious in explaining the covariances between the first-order factors; and (c) it could maximize the analytical flexibility of the CCEI in further analyses as a tool yielding one higher-order construct or three more specific lower-order factors to facilitate the interpretation of its results (e.g., Chen et al., 2005).

Table 7.

CCEI Version 1.0: Confirmatory factor models' results with 15 versus 12 items

| Model | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC |
|--------------------------------|--------------------|-------------|-----|-----|-------------------|--------|
| CCEI Version 1.0 with 15 items | | | | | | |
| Model 1 | .004 | 2.67 | .88 | .87 | .07 (.06-.09) | 300.03 |
| Model 2 | .01 | 2.18 | .92 | .91 | .06 (.05-.07) | 255.25 |
| Model 3 | .01 | 2.18 | .92 | .91 | .06 (.05-.07) | 255.25 |
| CCEI Version 1.0 with 12 items | | | | | | |
| Model 1 | .004 | 2.75 | .90 | .88 | .08 (.07-.09) | 197.01 |
| Model 2 | .20 | 1.58 | .97 | .96 | .05 (.03-.06) | 137.81 |
| Model 3 | .20 | 1.64 | .97 | .96 | .05 (.03-.06) | 137.81 |

Note. $N = 312$.

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Model 3 yielded a better fit to the data collected with 12 items than with 15 items. All standardized regression weights derived from the 15 or the 12 items were statistically significant ($p \leq .001$) and no major changes were found between them. Reliability estimates were also very similar among the CCEI versions with 15 or 12 items (see Figure 6).

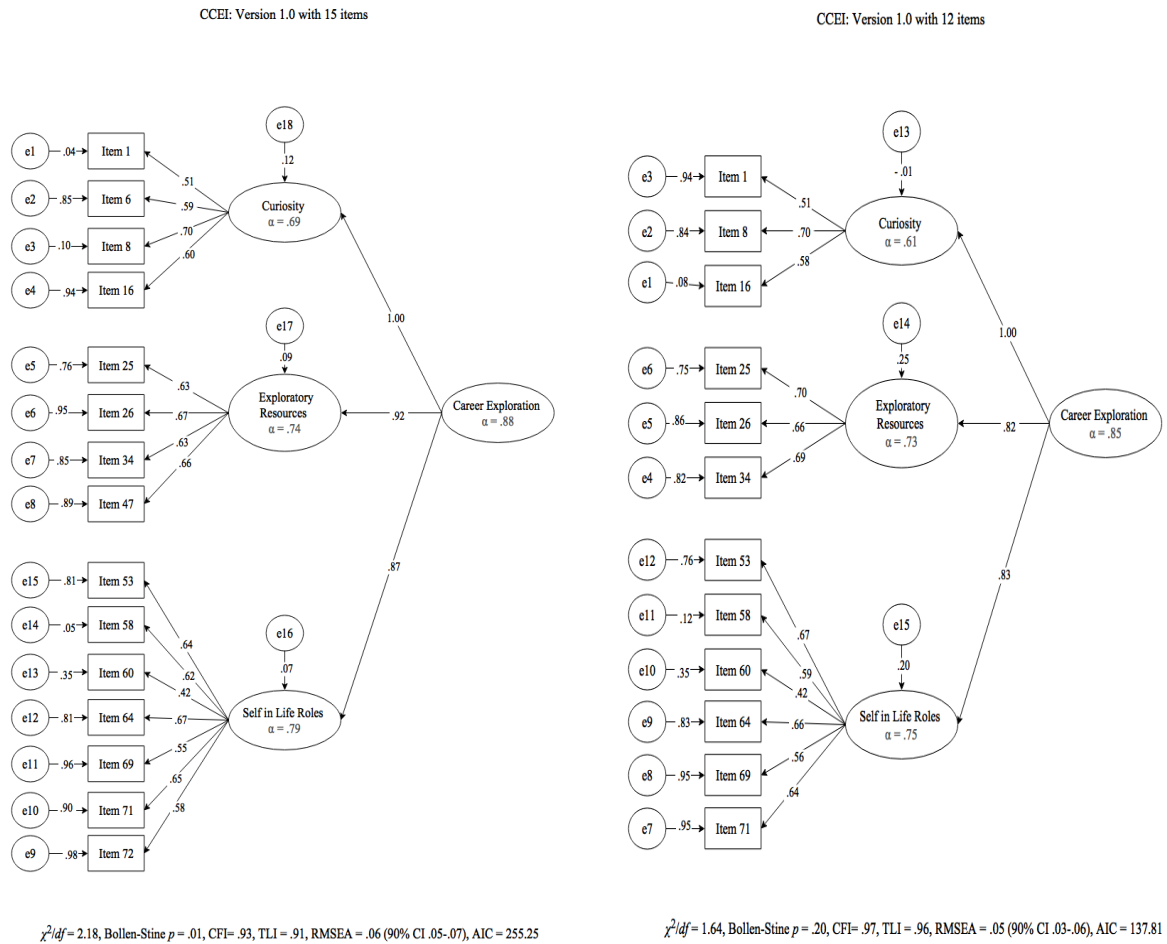


Figure 6.

CCEI Version 1.0: Results of the hierarchical confirmatory model with 15 vs. 12 items.

Note. Standardized regression weights are presented; α = Cronbach's alpha; e = residual variance.

These results suggested that the efficiency of the CCEI was not compromised when the items 6, 47 and 72 were removed from the measure. Model fit was better with 12 items and no major changes in the standardized regression weights and in the estimates of internal consistency reliability for the versions with 12 versus 15 items were found. Only the internal consistency results for Curiosity seemed to shift from minimally acceptable in the 15-item version to undesirable in the 12-item version. Still, the reliability for the total CCEI remained very good. Thus, the resulting 12-item CCEI Version 2.0 was

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developed on the basis of this robust set of analyses that were guided by a balance of theoretical, analytical and practical considerations (see Figure 7).

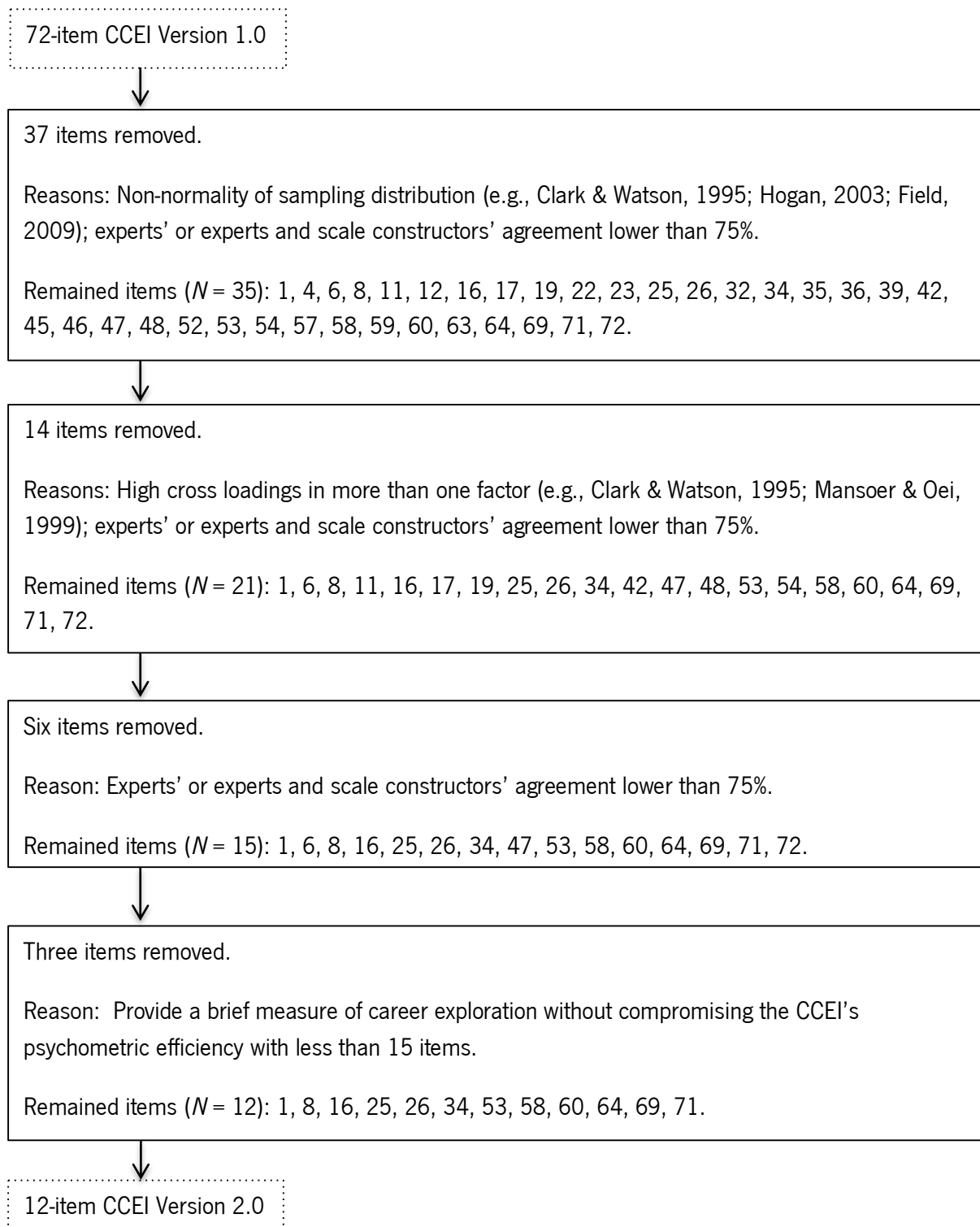


Figure 7.

CCEI item selection process.

As a synthesis of the third research phase, an iterative process combining experts' judgments and quantitative analyses of the CCEI Version 1.0 guided item selection with the goal of yielding a parsimonious set of items assessing the target career exploration indicators. Fifteen items with favorable judgmental validity, an approximate normal distribution of the responses and factor loadings on a single factor were identified. The CCEI was additionally reduced to 12 items, with no meaningful empirical compromise of its efficiency. The item analyses suggested that all five response categories were consistently endorsed in a manner approximating a normal distribution with items. The items and the total CCEI were consistent in the differentiation of the participants. The EFA and CFA results both aligned with a hierarchical factor structure. While EFA affirmed a strong factor labeled Career Exploration, CFA confirmed the goodness of fit of lower-level constructs of career exploration, thus partially supporting H1. H2 was supported, as the total CCEI exhibited a very good reliability. Still, its first-order factors presented undesirable or respectable reliability. The resulting 12-item CCEI Version 2.0 was used in the next research phase.

6. Testing the CCEI internal structure for response scales, genders and school levels

The 12-item CCEI Version 2.0 was administered to another cross-sectional sample of fifth- and sixth-graders. This dataset was employed to assess the psychometrics of the CCEI Version 2.0 with an alternative response scale within a sample of students and across genders and school levels. The CCEI response scale was tested against an alternate one ranging from 1 "Strongly disagree" to 5 "Strongly agree". Two CCEI versions were, therefore, considered – Versions 2.0 and 2.1 – and reflective of the original and alternate/new response scales, respectively. The test of the response scales would enable the identification of the most efficient one. It would also offer indications on whether the CCEI could be further combined with other measures of children's career development employing a different response scale (e.g., CCDS). Although procedures exist to work with assessments derived from different response numbers and/or anchors (e.g., standardization in Z-scores), the literature has suggested the possibility of comparing the functioning of different response scales using multigroup analyses (e.g., Händel & Fritzsche, 2014). Such a possibility was preferred and used in this study.

6.1. Participants

Two public schools and a cooperative one from rural and urban areas of Northwest Portugal

were contacted and agreed to collaborate in the study. The schools' principals and psychologists selected a total of 11 fifth- and 10 sixth-grade classroom groups to participate in the study, from which participants were recruited.

Two groups were derived from this sample. One group completed the CCEI Version 2.0 and another group completed the CCEI Version 2.1. It was intended that each group presented a balanced distribution of approximately 100 students for genders and school levels, due to the utility of such a balanced distribution and absolute frequency for confirmatory multigroup analyses (Harrington, 2009).

The sample included 478 students, 218 (45.6%) girls and 260 (54.4%) boys, aged 10 to 14 years old ($M = 10.91$, $SD = .88$). While 248 (51.9%) children attended fifth-grade, 230 (48.1%) attended sixth-grade. Two hundred and thirty-six (49.4%) children completed the CCEI Version 2.0 and 242 (50.6%) children completed the CCEI Version 2.1 (see Table 8).

Table 8.

Distribution of children completing the CCEI Versions 2.0 and 2.1

| CCEI Version Gender | Age Mean (<i>SD</i>) | School level | | Social economic status | | |
|----------------------------------|---------------------------|-------------------|-------------------|------------------------|--------------------------|---------------------------|
| | | 5 <i>n</i> (%) | 6 <i>n</i> (%) | Low <i>n</i> (%) | Med.-low <i>n</i> (%) | Med.-high <i>n</i> (%) |
| Version 2.0 (<i>n</i> = 236) | 10.92 (.94) | 130 (55.1) | 106 (44.9) | 137 (58.1) | 73 (30.9) | 24 (10.2) |
| Girls (<i>n</i> = 115) | 10.90 (.94) | 65 (56.5) | 50 (43.5) | 62 (53.0) | 35 (30.4) | 17 (14.8) |
| Boys (<i>n</i> = 121) | 10.95 (.94) | 65 (53.7) | 56 (46.3) | 75 (62.0) | 38 (31.4) | 7 (5.8) |
| Version 2.1 (<i>n</i> = 242) | 10.90 (.82) | 118 (48.8) | 124 (51.2) | 37 (15.3) | 120 (49.6) | 76 (31.4) |
| Girls (<i>n</i> = 103) | 10.84 (.82) | 52 (50.5) | 50 (48.5) | 18 (17.5) | 47 (45.6) | 35 (34) |
| Boys (<i>n</i> = 139) | 10.94 (.82) | 65 (46.8) | 74 (53.2) | 19 (13.7) | 73 (52.5) | 41 (29.5) |

Note. $N = 478$. SD = Standard Deviation. Med.-low = Medium-low. Med.-high = Medium-high.

Most of the participants' mothers (78.5%) and fathers (82.6%) were employed at the time of this study. Mothers frequently performed occupations in the domains of industry and construction, installing operators, administrative services and inter-medium or technical occupations (40.6%). Fathers frequently performed occupations in the domains of industry and construction, trades and security,

inter-medium and technical occupations, and installing operators (43.4%). As for the educational level, .6% of the mothers and .8% of the fathers had no educational level, 16.6% of the mothers and 17.3% of the fathers completed the first three periods of education, 17.6% of the mothers and 13.4% of the fathers completed high school, and 22.6% of the mothers and 18.2% of the fathers earned a college degree (see Table A2). While 40.4% of the children sourced from a medium-low family SES, 36.4% derived from a low SES and 20.9% from a medium-high SES.

6.2. Procedures

The 12-item paper-based CCEI Versions 2.0 and 2.1 were administered to the participants. Data was collected in a 45- or 50-minute class, depending on the school. Students presented favorable reactions to the CCEI versions.

6.3. Data analyses

A baseline model was identified through the separate test of models 1, 2 and 3 with data from each CCEI version. Multigroup analyses were computed to test the CCEI measurement equivalence for the response scales of Versions 2.0 and 2.1 (Model 4). Increasing levels of constraints were imposed in a forward multigroup procedure (Byrne, 2011; Marôco, 2010). First, the fit of measurement models to the data collected with each CCEI version was separately examined to establish a baseline model. Second, configural equivalence was tested by estimating the baseline model for the response scales, imposing no constraints. Third, metric equivalence was addressed by constraining the magnitude of the measurement weights to be equivalent for the response scales. Fourth, scalar equivalence was examined by constraining the item intercepts and factor means to be equivalent for the response scales. Fifth, residual invariance was investigated by constraining the measurement residuals to be equivalent for the response scales. If Model 3 was identified as the baseline model and presented configural equivalence for the response scales, then metric, scalar and residual constraints would be examined in two levels to examine the first- and second-order factors (e.g., Dimitrov, 2010; Keith, Low, Reynolds, Patel, & Ridley, 2010). Equivalence was evaluated by comparing the CFI and RMSEA values of the unconstrained and metric models, the metric and scalar models, and the scalar and residual models. Equivalence was indicated based on the following CFI and RMSEA differences (Δ): Δ CFI \leq |.01| and Δ RMSEA $<$.05 (Cheung & Rensvold, 2002).

The most efficient response scale identified during the previous procedure was used to examine the CCEI factor equivalence for girls, boys (Model 5), fifth and sixth-graders (Model 6) through a similar multigroup strategy focused on configural and metric equivalence.

6.4. Results

6.4.1. Data preparation

The frequency of missing values in the data collected with the CCEI Version 2.0 ranged from zero to two (0.8%) across the 12 items. Missing values were found in the Self in Life Roles items G and I with a MCAR pattern, $\chi^2(10) = 12.71, p = .24$. While the missing value in item G was presented by a sixth-grade boy, the two missing values in item I were presented by two fifth-grade girls. As for the CCEI Version 2.1, the frequency of missing values ranged from zero to one (0.4%) across the 12 items. Missing values were found in the Self in Life Roles items I and L with a MCAR pattern, $\chi^2(10) = 9.47, p = .49$. Whereas a sixth-grade boy missed item I, a fifth-grade girl missed item L. The frequency of missing values was reduced for both versions and did not rely on children's gender or school level. Imputation procedures based on Expectation Maximization (EM) method were used, as they are consistent with a MCAR pattern and consider standard errors in confirmatory techniques (Tabachnick & Fidell, 2013).

The item skewness values ranged from -.92 to -.11 and the item kurtosis values ranged from -1.49 to -.06 in the data collected with the CCEI Version 2.0. A normalized estimate of Mardia's multivariate kurtosis of 13.64 was obtained, thus indicating a multivariate non-normal sampling distribution. The Mahalanobis Distance statistics found no outliers in the data collected with the CCEI Version 2.0. On the other hand, the item skewness values ranged from -.18 to 1.07 and the item kurtosis values ranged from -1.14 to -.34 in the data collected with the CCEI Version 2.1. A multivariate non-normal sampling distribution was suggested by a normalized estimate of Mardia's multivariate kurtosis of 33.64. The Mahalanobis Distance statistics found two multivariate outliers in the data collected with the CCEI Version 2.1 – a fifth-grade boy and a sixth-grade girl – who presented lower item values than the other students completing the CCEI Version 2.1. After filtering the outliers, the CCEI Version 2.1 skewness values ranged from -1.08 to -.18 and the kurtosis values ranged from -1.14 to .86. A multivariate non-normal sampling distribution remained, as an estimate of Mardia's multivariate kurtosis of 31.87 was obtained. The items in either the Versions 2.0 and 2.1 discriminated

participants in the same direction as each CCEI indicator and total scale. Although the data collected with both versions presented a multivariate non-normality of sampling distribution, the CCEI Version 2.0 presented six univariate items with a non-normal distribution (i.e., items C, D, F, G, I and L) against only one item in such a situation (i.e., item G) in the CCEI Version 2.1 without outliers (see Table 9).

Table 9.

CCEI Version 2.0 and 2.1: Item analyses

| Item | Min.-Max. | Median | IQR | Skewness | Kurtosis | <i>D</i> (indicator) | <i>D</i> (CCEI) |
|------------------------------------|-----------|--------|-----|----------|----------|----------------------|-----------------|
| CCEI Version 2.0 (<i>N</i> = 236) | | | | | | | |
| A | 1-5 | 4 | 1 | -.92 | -.06 | .40 | .49 |
| B | 1-5 | 3 | 2 | -.19 | -.80 | .50 | .55 |
| C | 1-5 | 3 | 1 | -.29 | -1.15 | .42 | .51 |
| D | 1-5 | 3 | 1 | -.11 | -1.10 | .63 | .55 |
| E | 1-5 | 4 | 1 | -.37 | -.86 | .55 | .55 |
| F | 1-5 | 3 | 2 | -.15 | -1.02 | .53 | .44 |
| G | 1-5 | 3 | 3 | .11 | -1.49 | .32 | .27 |
| H | 1-5 | 4 | 1 | -.51 | -.85 | .48 | .45 |
| I | 1-5 | 4 | 3 | -.42 | -1.02 | .27 | .29 |
| J | 1-5 | 4 | 2 | -.73 | -.67 | .22 | .24 |
| K | 1-5 | 3 | 2 | -.30 | -.95 | .45 | .53 |
| L | 1-5 | 3 | 2 | -.11 | -1.19 | .36 | .50 |
| CCEI Version 2.1 (<i>N</i> = 240) | | | | | | | |
| A | 1-5 | 4 | 1 | -1.08 | .86 | .55 | .56 |
| B | 1-5 | 4 | 1 | -.53 | -.30 | .62 | .62 |
| C | 1-5 | 4 | 1 | -.65 | -.37 | .54 | .50 |
| D | 1-5 | 3 | 2 | -.29 | -.79 | .56 | .57 |
| E | 1-5 | 3 | 2 | -.34 | -.79 | .59 | .53 |
| F | 1-5 | 3 | 1 | -.45 | -.59 | .66 | .49 |
| G | 1-5 | 3 | 1 | -.18 | -1.14 | .43 | .45 |
| H | 1-5 | 4 | 1 | -.48 | -.71 | .57 | .62 |
| I | 1-5 | 4 | 1 | -.70 | -.54 | .39 | .39 |
| J | 1-5 | 4 | 1 | -.85 | -.07 | .35 | .31 |
| K | 1-5 | 4 | 1 | -.45 | -.57 | .60 | .47 |
| L | 1-5 | 3 | 1 | -.44 | .73 | .50 | .56 |

Note. Results for the CCEI Version 2.1 presented without outliers. Min.-Max. = Minimum-Maximum IQR = Interquartile range. *D* = discrimination index, based on each indicator and the total CCEI.

Due to the multivariate non-normal sampling distribution, bootstrapping was performed and the

Bollen-Stine bootstrap χ^2 test statistic results were considered. Moreover, having identified two multivariate outliers in data collected with the CCEI Version 2.1, the analyses with the data collected using this CCEI version were performed with and without outliers to control for their biases (e.g., Pinto, Taveira, Candeias, & Araújo, 2013).

6.4.2. CCEI internal structure for response scales

Regardless the response scale, Models 2 and 3 yielded a similar model fit to the data and better results than Model 1. The results derived from the CCEI Version 2.1 data with and without outliers were also consistent in reaching these conclusions (see Table 10). The hierarchical Model 3 was, therefore, preferred and assumed as a baseline model. All standardized measurement weights were statistically significant ($p < .001$) in the data collected with either response scale (see Figure 8).

Table 10.

Model fit to the data collected with the CCEI Versions 2.0 and 2.1

| Model | B-S p value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC |
|--|---------------|-------------|-----|-----|-------------------|--------|
| CCEI Version 2.0 ($n = 236$) | | | | | | |
| Model 1 | .002 | 2.82 | .84 | .80 | .09 (.07-.11) | 278.60 |
| Model 2 | .002 | 2.11 | .91 | .88 | .07 (.05-.09) | 169.20 |
| Model 3 | .002 | 2.11 | .91 | .88 | .07 (.05-.09) | 169.20 |
| CCEI Version 2.1 with outliers ($n = 242$) | | | | | | |
| Model 1 | .002 | 3.89 | .81 | .77 | .11 (.09-.13) | 258.21 |
| Model 2 | .03 | 1.97 | .94 | .92 | .06 (.05-.08) | 154.65 |
| Model 3 | .03 | 1.97 | .94 | .92 | .06 (.05-.08) | 154.65 |
| CCEI Version 2.1. without outliers ($n = 240$) | | | | | | |
| Model 1 | .002 | 4.27 | .79 | .74 | .12 (.10-.13) | 215.20 |
| Model 2 | .006 | 2.26 | .92 | .90 | .07 (.06-.09) | 161.99 |
| Model 3 | .006 | 2.26 | .92 | .90 | .07 (.06-.09) | 161.99 |

Still, the measurement model generally presented a better fit to the data collected with the CCEI Version 2.1 than with the CCEI Version 2.0. A 21.63 modification index could be obtained for the CCEI Version 2.0 if the errors 11 and 12, inherent to the observed variables G and H, were correlated. As these items referred to the child's imagined tryout of her/his parents' occupations and anticipation of

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their parents' reactions to it, it would be plausible that the answers to these items could be related and would eventually be influenced by the child's experiences and level of familiarity with such a career exploration trial. However, the most parsimonious initial model was preferred, as correlating errors could suggest a secondary variable that was not theoretically considered in the original specification of the model (Harrington, 2009).

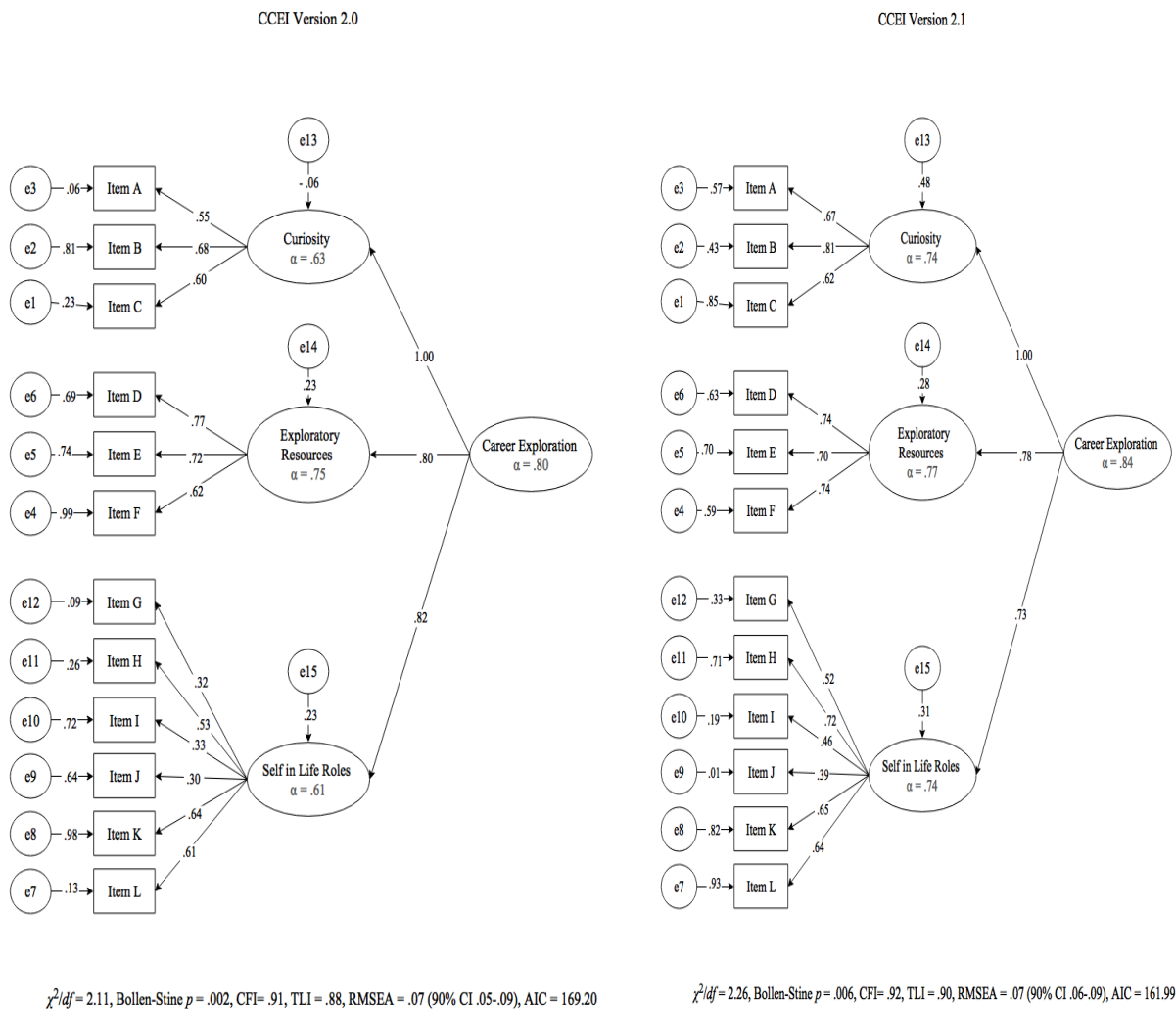


Figure 8.

CCEI Versions 2.0 and 2.1: Hierarchical confirmatory model results.

Note. Standardized regression weights are presented. Estimated parameters for CCEI Version 2.2 are presented without outliers. α = Cronbach's alpha. e = residual variance.

Models 4a through 4g tested the CCEI equivalence for the response scales. The results derived from the CCEI Version 2.1 with and without outliers consistently suggested the CCEI configural, metric, scalar and residual equivalence for the response scales (see Table 11). Despite the CCEI measurement

equivalence for the response scales, the CCEI Version 2.1 provided a general better fit to the data and better reliability estimates for first- and second-order factors than the CCEI Version 2.0.

Table 11.

Measurement equivalence for the response scales

| Models | B-S p value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|--|---------------|-------------|-----|-----|-------------------|--------|--------------|----------------|
| Model 4 with outliers ($N = 478$) | | | | | | | | |
| a. Configural | .002 | 2.04 | .93 | .90 | .04 (.04-.06) | 364.48 | — | — |
| b. Metric _{L1} | .002 | 1.94 | .93 | .91 | .04 (.04-.05) | 353.30 | -.001 | .003 |
| c. Metric _{L1&2} | .002 | 2.02 | .91 | .91 | .05 (.04-.06) | 362.58 | .014 | -.001 |
| d. Scalar _{L1} | .002 | 2.05 | .91 | .90 | .05 (.04-.06) | 366.55 | .002 | -.003 |
| e. Scalar _{L1&2} | .002 | 2.01 | .91 | .91 | .05 (.04-.05) | 360.90 | .000 | .000 |
| f. Residuals _{L1} | .002 | 2.37 | .81 | .90 | .05 (.05-.06) | 412.87 | .01 | -.007 |
| g. Residuals _{L1&2} | .002 | 1.99 | .91 | .91 | .05 (.04-.05) | 358.90 | .000 | .000 |
| Model 4 without outliers ($n = 476$) | | | | | | | | |
| a. Configural | .002 | 2.19 | .92 | .89 | .05 (.04-.06) | 379.03 | — | — |
| b. Metric _{L1} | .002 | 2.07 | .92 | .90 | .05 (.04-.06) | 367.84 | -.002 | .001 |
| c. Metric _{L1&2} | .002 | 2.13 | .90 | .90 | .05 (.04-.06) | 376.70 | .014 | .001 |
| d. Scalar _{L1} | .002 | 2.17 | .90 | .89 | .05 (.04-.06) | 380.60 | .001 | .010 |
| e. Scalar _{L1&2} | .002 | 2.12 | .90 | .90 | .05 (.04-.06) | 375.27 | .001 | .001 |
| f. Residuals _{L1} | .002 | 2.53 | .80 | .89 | .06 (.05-.06) | 434.68 | .01 | -.01 |
| g. Residuals _{L1&2} | .002 | 2.11 | .90 | .90 | .05 (.04-.06) | 373.63 | .000 | .001 |

Note. L1 = First-order factor. L1&2 = First and second-order factors; Δ = difference.

Based on these results for the response scales, the tests of the CCEI applicability to girls, boys, fifth- and sixth-graders were performed using the data collected with the CCEI Version 2.1.

6.4.3. CCEI internal structure for genders and school levels

The results with and without outliers consistently indicated that Models 2 and 3 provided a better

fit to the data separately for girls, boys, fifth- and sixth-graders than Model 1 (see Table 12). The standardized measurement weights were all statistically significant ($p \leq .01$).

Due to the similar fit between Models 2 and 3 and the advantages of a hierarchical model, Model 3 was assumed as the baseline to further test the CCEI configural and metric equivalence for genders and school levels.

Models 5a through 5c and Models 6a through 6c tested the CCEI configural and metric equivalence for girls and boys and for fifth- and sixth-graders, respectively. The results with and without outliers supported the same conclusions (see Table 13).

Configural and metric equivalence of the first- and second-order factors for girls and boys were found. Configural and metric equivalence of the first-order factors for fifth- and sixth-graders were also obtained. Still, there was metric non-invariance of the second-order factor for school levels.

Fifth-graders presented a higher standardized measurement weight of Exploratory Resources than sixth-graders (i.e., .83 with outliers and .82 without outliers for fifth-graders versus .66 with outliers and .65 without outliers for sixth-graders). In turn, sixth-graders presented a higher measurement weight of Self in Life Roles than fifth-graders (i.e., .80 with outliers and .82 without outliers for sixth-graders versus .59 with and without outliers for fifth-graders). Fifth-graders also presented a slight higher average standardized measurement weights than sixth-graders (i.e., .81 with outliers and .80 without outliers for fifth-graders versus .79 with and without outliers for sixth-graders).³

Additional evidence of reliability and bivariate correlation coefficients further affirmed the CCEI metric non-invariance for school levels in the second-order factor. Fifth-graders presented higher estimates of internal consistency reliability in the CCEI first- and second-order factors than sixth-graders (i.e., $\alpha = .75$ versus .71 in Curiosity, .76 versus .73 in Exploratory Resources, .77 versus .66 in Self in Life Roles, and .84 versus .81 in Career Exploration, for fifth- and sixth-graders respectively).

Fifth-graders also presented higher average correlation coefficient values (i.e., .48) than sixth-graders (i.e., .46). Still, the correlation coefficient values between the Self in Life Roles with Exploratory Resources and with Curiosity were higher for sixth-graders than fifth-graders (i.e., .41 versus .37, and .52 versus .48 for fifth- and sixth-graders respectively). Oppositely, fifth-graders presented a higher correlation value (i.e., .61) between Curiosity and Exploratory Resources than sixth graders (i.e., .44).

³ Although partial models can be tested when evidence of non-invariance is found, this procedure is often used in an exploratory fashion. Such an exploratory use is inconsistent with the confirmatory nature of multigroup analyses and care should be taken to adequate this strategy to the literature (Vandenberg & Lance, 2000). Taking these reasons into account, partial models were not tested in this dissertation.

Table 12.

CCEI Version 2.1: Model fit to the data of girls, boys, fifth- and sixth-graders

| Model | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC |
|--|--------------------|-------------|-----|-----|-------------------|--------|
| Girls with outliers (<i>n</i> = 103) | | | | | | |
| Model 1 | .000 | 2.58 | .73 | .67 | .12 (.09-.15) | 187.27 |
| Model 2 | .04 | 1.37 | .94 | .92 | .06 (.01-.09) | 123.63 |
| Model 3 | .04 | 1.37 | .94 | .92 | .06 (.01-.09) | 123.63 |
| Girls without outliers (<i>n</i> = 102) | | | | | | |
| Model 1 | .000 | 2.63 | .71 | .65 | .13 (.10-.15) | 190.24 |
| Model 2 | .019 | 1.45 | .93 | .90 | .06 (.03-.09) | 127.97 |
| Model 3 | .019 | 1.45 | .93 | .90 | .07 (.03-.09) | 127.97 |
| Boys with outliers (<i>n</i> = 139) | | | | | | |
| Model 1 | .000 | 2.74 | .81 | .77 | .11 (.09-.13) | 196.21 |
| Model 2 | .000 | 1.95 | .90 | .88 | .08 (.06-.11) | 153.41 |
| Model 3 | .000 | 1.95 | .90 | .88 | .08 (.06-.11) | 153.41 |
| Boys without outliers (<i>n</i> = 138) | | | | | | |
| Model 1 | .000 | 2.98 | .79 | .75 | .12 (.09-.14) | 208.80 |
| Model 2 | .000 | 2.09 | .89 | .86 | .09 (.07-.11) | 160.59 |
| Model 3 | .000 | 2.09 | .89 | .86 | .09 (.07-.11) | 160.59 |
| Fifth-graders with outliers (<i>n</i> = 117) | | | | | | |
| Model 1 | .000 | 2.62 | .78 | .74 | .12 (.09-.14) | 189.44 |
| Model 2 | .08 | 1.29 | .96 | .95 | .05 (.00-.08) | 119.54 |
| Model 3 | .08 | 1.29 | .96 | .95 | .05 (.00-.08) | 119.54 |
| Fifth-graders without outliers (<i>n</i> = 116) | | | | | | |
| Model 1 | .000 | 2.66 | .78 | .73 | .12 (.09-.14) | 191.78 |
| Model 2 | .11 | 1.25 | .97 | .96 | .05 (.00-.08) | 117.52 |
| Model 3 | .11 | 1.25 | .97 | .96 | .05 (.00-.08) | 117.52 |
| Sixth-graders with outliers (<i>n</i> = 124) | | | | | | |
| Model 1 | .000 | 2.56 | .76 | .71 | .11 (.10-.14) | 186.32 |
| Model 2 | .000 | 1.82 | .88 | .85 | .08 (.06-.11) | 147.02 |
| Model 3 | .000 | 1.82 | .88 | .85 | .08 (.06-.11) | 147.02 |
| Sixth-graders without outliers (<i>n</i> = 123) | | | | | | |
| Model 1 | .000 | 2.69 | .74 | .69 | .12 (.09-.14) | 193.05 |
| Model 2 | .000 | 1.96 | .86 | .82 | .09 (.06-.11) | 153.77 |
| Model 3 | .000 | 1.96 | .86 | .82 | .09 (.06-.11) | 153.77 |

Table 13.

CCEI Version 2.1: Configural and metric equivalence for genders and school levels

| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|--|--------------------|-------------|-----|-----|-------------------|--------|--------------|----------------|
| Model 5 with outliers (<i>N</i> = 242) | | | | | | | | |
| a. Configural | .07 | 1.66 | .92 | .89 | .05 (.04-.07) | 325.04 | — | — |
| b. Metric _{L1} | .08 | 1.62 | .92 | .90 | .05 (.04-.06) | 317.36 | .002 | .001 |
| c. Metric _{L1&2} | .11 | 1.59 | .92 | .91 | .05 (.04-.06) | 313.50 | -.001 | .002 |
| Model 5 without outliers (<i>n</i> = 240) | | | | | | | | |
| a. Configural | .03 | 1.77 | .90 | .88 | .06 (.04-.07) | 335.56 | — | — |
| b. Metric _{L1} | .04 | 1.71 | .90 | .88 | .06 (.04-.07) | 327.51 | .000 | .002 |
| c. Metric _{L1&2} | .02 | 1.72 | .89 | .89 | .06 (.04-.07) | 324.71 | .013 | .002 |
| Model 6 with outliers (<i>N</i> = 242) | | | | | | | | |
| a. Configural | .16 | 1.56 | .93 | .90 | .05 (.03-.06) | 315.49 | — | — |
| b. Metric _{L1} | .19 | 1.53 | .92 | .91 | .05 (.03-.06) | 307.57 | .002 | .001 |
| c. Metric _{L1&2} | .04 | 1.69 | .89 | .88 | .05 (.04-.07) | 321.43 | .034 | -.006 |
| Model 6 without outliers (<i>n</i> = 240) | | | | | | | | |
| a. Configural | .09 | 1.63 | .92 | .89 | .05 (.04-.07) | 322.36 | — | — |
| b. Metric _{L1} | .10 | 1.59 | .92 | .90 | .05 (.04-.06) | 324.58 | .002 | .001 |
| c. Metric _{L1&2} | .02 | 1.76 | .87 | .87 | .06 (.04-.07) | 329.64 | .046 | -.006 |

Note. Model 5 = Factor equivalence for girls and boys. Model 6 = Factor equivalence for fifth- and sixth-graders. L1 = First-order factor. L1&2 = First and second-order factors. Δ = difference.

As a synthesis of the fourth research phase, the hierarchical measurement model yielded a good fit to the data with either Versions 2.0 or 2.1. The CCEI demonstrated measurement equivalence for the response scales, thus supporting H3. Still, the CCEI Version 2.1 presented more favorable results of univariate item normality, model fit and reliability than Version 2.0, thus supporting H4. For these reasons, the CCEI Version 2.1 was used to test the factorial equivalence for genders and school levels. Configural and metric equivalence of the CCEI first- and second-order factors for girls and boys were found, thus supporting H5. As equivalence for genders was indicated, the use of the CCEI Version 2.1 with girls and boys in the following longitudinal study was supported. On the other hand, H6 was

partially supported, as configural and metric equivalence of the CCEI first-order factors for school levels were found, but not metric equivalence of the second-order factor. Despite evidence of non-invariance of the second-order factor for school levels, the CCEI Version 2.1 was still used in the next research phases, regarding its potential to check the measurement temporal invariance.

7. Testing the CCEI internal structure and nomological network over time

The CCEI Version 2.1 and other measures assessing additional career and academic variables were administrated to another sample of middle school children followed across four occurrences of measurement during fifth- and sixth-grade.

7.1. Participants

Portuguese northern and central geographical areas were selected for data collection to represent the main area of influence of the hosting institution and to expand the areas that have been examined by the research group. The northern and central areas of Portugal were also selected because they are more similar to each other when contrasted with the southern area, but still heterogeneous in terms of employment levels, population density and average annual family income (Rosa, 2004). After contacting a number of schools in the targeted areas, three public schools and a cooperative school from urban and rural locations agreed to collaborate in this study.

The schools' principals and psychologists selected a total of 22 fifth-grade classroom groups to collaborate in the study, from which children were recruited. Although the initial plan was to collect data across three occurrences of measurement, the possibility of conducting a fourth wave of data collection was later discussed with the schools' principals, psychologists and teachers. This additional measurement occasion was motivated by a need to balance the number of occurrences of measurement for both school years. An additional occurrence of measurement would also yield a more comprehensive feedback to the schools and enrich the longitudinal design, as a minimum of three or four occurrences of measurement are recommended for longitudinal studies (Swason & Miller, 2008). Additional written consent forms from the students' caregivers inherent to the fourth occurrence of measurement were obtained.

A total of 446 students participated in the first occurrence of measurement. The initial sample included 213 (47.8%) girls and 233 (52.2%) boys, aged nine to 13 years old ($M = 10.23$, $SD = .50$),

314 (70.4%) from northern Portugal and 132 (29.6%) from central Portugal. Most of the children were Portuguese-native (99.4%), followed by Portuguese-German (.2%), Brazilian (.2%) and Chinese (.2%) students. The majority of the participants (92.8%) presented no previous retention in their academic path, while the remaining children failed once (6.5%) or twice (.7%) during elementary or middle school years. Still, these students remained in the study, as Portuguese fifth-grade classroom groups usually include students that have previously failed in their academic path, with retention being a common educational practice in Portugal (Pereira & Reis, 2014).

Most of the children's mothers (73.5%) and fathers (83.2%) were employed at the first occurrence of measurement. Regarding parents' educational status, one mother (.22) and two fathers (.45) had no educational level, 251 mothers (56.3%) and 276 fathers (61.9%) completed fourth, sixth or ninth grades, 101 mothers (22.7%) and 87 fathers (19.5%) completed high school and 71 mothers (15.9%) and 44 fathers (9.9%) earned a college degree, respectively. Mothers most frequently performed occupations in the domains of trades and security, intellectual and scientific activities, qualified work of industry and construction, and administrative personnel (68.6%). Fathers' most frequent occupations were grouped in the domains of qualified work in industry and construction, trades and security, and installing machinery operators (69.3%). Most children (53.8%) sourced from medium-low SES (53.6%), followed by 26.7% children from low and 19.3% from medium-high SES.

Attrition in longitudinal designs occurs when participants are not available to collaborate in the study from one occurrence of measurement forward (Jeličić et al., 2009). Attrition was found for nine cases: one girl did not participate in the second occurrence of measurement forward due to health issues that compromised her return to school; another girl and one boy did not complete the third occurrence of measurement forward due to family emigration and nonresponse to contacts from the Doctoral student, teachers and colleagues asking them to continue their participation at distance; six boys did not complete the fourth occurrence of measurement, as their caregivers did not consent to do so. Additional analyses suggested that attrition was random (Swason & Miller, 2008), since no statistically significant associations among attrition, gender, geographical areas, academic achievement and the scores in the assessed variables were found. As no biases seemed to be introduced by attrition and these cases constituted only 2% of the initial sample, they were filtered from the longitudinal analyses. This option presents advantages in longitudinal designs by enabling a more accurate estimation of the stability of a measurement model over time (Keefer et al., 2013).

The resulting sample included 437 students, 211 (48.3%) girls and 226 (51.7%) boys, 305 (69.8%) from northern and 132 (30.2%) from central Portugal. Although students' family and academic

information varied across occurrences of measurement, the distribution and descriptive results generally remained stable across assessments (see Table 14).

However, as eight students failed fifth-grade while transiting from the second to the third occurrences of measurement, they were only included in analyses that separately covered the first and second occurrences of measurement, but filtered from the remaining ones. The option to filter cases who failed fifth-grade throughout this study relied on the intention to perform two occurrences of measurement at each grade and to examine both the stability of the CCEI factorial structure from fifth-through sixth-grade.

The longitudinal analyses springing from the first to the fourth occurrences of measurement were, therefore, conducted with 429 students, 207 (48.3%) girls and 222 (51.7%) boys, 298 (69.5%) from northern and 131 (30.5%) from central Portugal ($M_{\text{age at first wave}} = 10.23$, $SD = .50$) (see Figure 9).

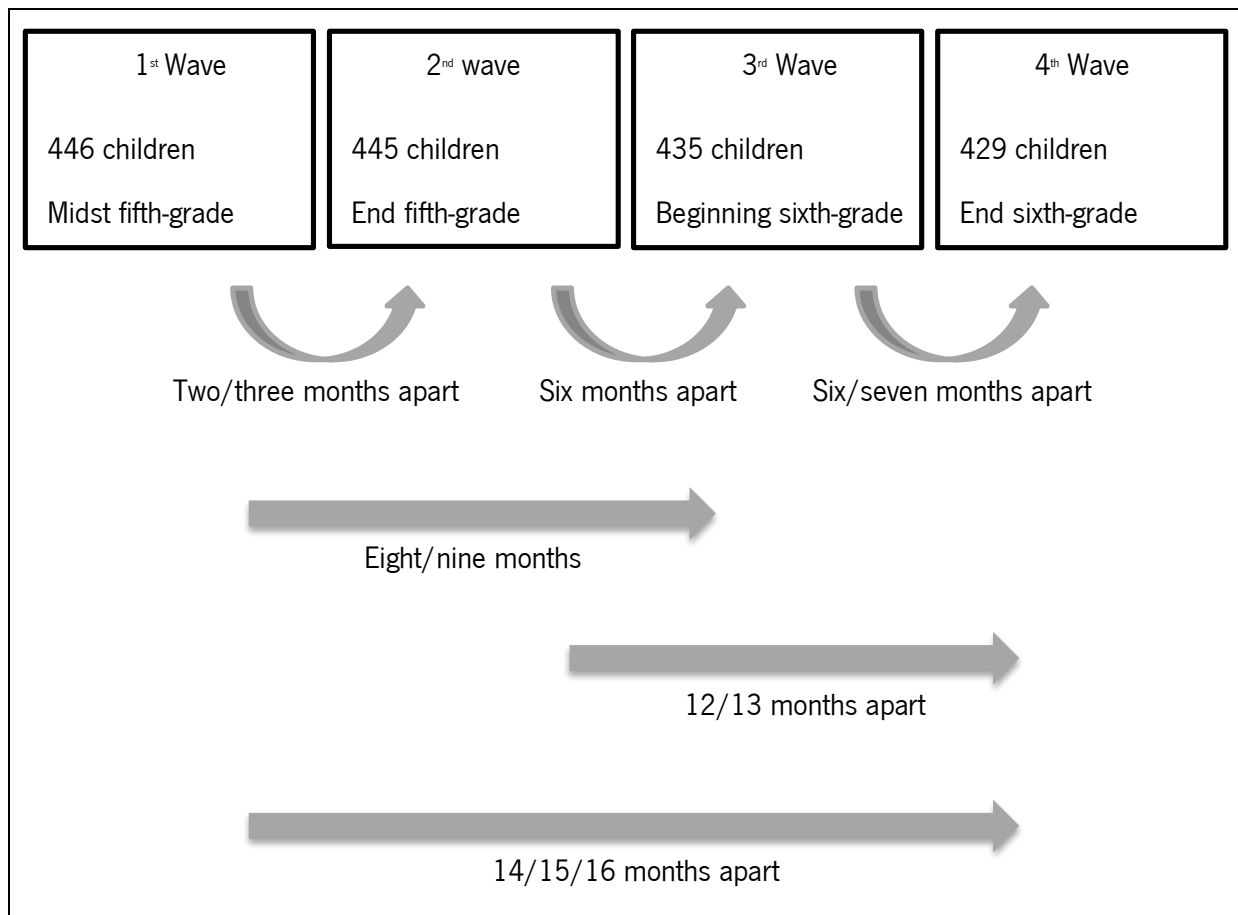


Figure 9.

Longitudinal data collection planning.

Table 14.

Characterization of the sample across waves

| Social-demographic or academic descriptor | Categories | Waves | | | |
|---|-------------------|---|---|---|---|
| | | 1 st Wave (<i>N</i> = 446) | 2 nd Wave (<i>N</i> = 445) | 3 rd Wave (<i>N</i> = 443) | 4 th Wave (<i>N</i> = 437) |
| | | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) |
| Gender | Girls | 213 (47.8) | 212 (47.6) | 211 (47.6) | 211 (48.3) |
| | Boys | 233 (52.2) | 233 (52.4) | 232 (52.4) | 226 (51.7) |
| Geographical area | Northern Portugal | 314 (70.4) | 313 (70.3) | 312 (70.4) | 305 (69.8) |
| | Central Portugal | 132 (29.6) | 132 (29.7) | 131 (29.6) | 132 (30.2) |
| Nationality | Portuguese-native | 443 (99.4) | 442 (99.3) | 441 (99.6) | 435 (99.5) |
| | Portuguese-German | 1 (.22) | 1 (.22) | 0 (0) | 0 (0) |
| | Brazilian | 1 (.22) | 1 (.22) | 1 (.22) | 1 (.22) |
| | Chinese | 1 (.22) | 1 (.22) | 1 (.22) | 1 (.22) |
| Socioeconomic status | Low | 119 (26.7) | — | 115 (26.2) | 114 (26.1) |
| | Medium-low | 239 (53.6) | — | 240 (54.2) | 237 (54.2) |
| | Medium-high | 86 (19.3) | — | 86 (19.4) | 84 (3.7) |
| Fathers' occupational situation | Employed | 371 (83.2) | — | 399 (90.1) | 393 (89.9) |
| | Inactive | 52 (11.7) | — | 37 (8.4) | 37 (8.5) |
| Mothers' occupational situation | Employed | 328 (73.5) | — | 340 (76.8) | 341 (78.0) |
| | Inactive | 114 (25.6) | — | 101 (22.8) | 95 (21.7) |

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| Social-demographic or academic descriptor | Categories | Waves | | | |
|---|--|----------------------|----------------------|----------------------|----------------------|
| | | 1 st Wave | 2 nd Wave | 3 rd Wave | 4 th Wave |
| | | (<i>N</i> = 446) | (<i>N</i> = 445) | (<i>N</i> = 443) | (<i>N</i> = 437) |
| | | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) |
| Fathers' educational level | No educational level | 2 (.45) | — | 2 (.45) | 1 (.22) |
| | 1 st cycle | 52 (11.7) | — | 42 (9.5) | 40 (9.2) |
| | 2 nd cycle | 122 (27.4) | — | 126 (28.4) | 126 (28.8) |
| | 3 rd cycle | 102 (22.9) | — | 96 (21.7) | 96 (21.9) |
| | High school | 87 (19.5) | — | 99 (22.4) | 98 (22.4) |
| | College | 44 (9.9) | — | 45 (10.2) | 43 (9.8) |
| Mothers' educational level | No educational level | 1 (.22) | — | 1 (.22) | 1 (.22) |
| | 1 st cycle | 39 (8.7) | — | 33 (7.5) | 32 (7.3) |
| | 2 nd cycle | 91 (20.0) | — | 91 (20.5) | 91 (20.8) |
| | 3 rd cycle | 121 (2.7) | — | 120 (27.1) | 119 (27.2) |
| | High school | 101 (22.7) | — | 102 (23.0) | 101 (23.1) |
| | College | 71 (15.9) | — | 75 (16.9) | 72 (16.5) |
| Fathers' occupation | Military occupations | 1 (.22) | — | 1 (.22) | 1 (.22) |
| | Executive services representatives | 6 (1.4) | — | 6 (1.4) | 5 (1.1) |
| | Intellectual and scientific occupations | 44 (9.9) | — | 44 (9.9) | 43 (9.8) |
| | Inter-medium technicians and occupations | 31 (6.9) | — | 31 (6.9) | 31 (7.0) |
| | Administrative personnel | 24 (5.4) | — | 24 (5.4) | 24 (5.5) |
| | Personnel of services, trades and security | 104 (23.3) | — | 101 (22.8) | 99 (22.7) |
| | Qualified workers of farms, fishing and forest | 2 (.45) | — | 2 (.45) | 2 (.46) |
| | Qualified workers of industry and construction | 142 (31.8) | — | 140 (31.6) | 138 (31.6) |

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| Social-demographic or academic descriptor | Categories | Waves | | | |
|---|--|---|---|---|---|
| | | 1 st Wave (<i>N</i> = 446) | 2 nd Wave (<i>N</i> = 445) | 3 rd Wave (<i>N</i> = 443) | 4 th Wave (<i>N</i> = 437) |
| | | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) |
| | Non-qualified workers | 9 (2.0) | — | 9 (2.0) | 9 (2.1) |
| Mothers' occupation | Military occupations | 0 (0) | — | 0 (0) | 0 (0) |
| | Executive services representatives | 4 (.89) | — | 3 (.68) | 3 (.69) |
| | Intellectual and scientific occupations | 67 (15.0) | — | 69 (15.6) | 66 (15.1) |
| | Inter-medium technicians and occupations | 18 (4.0) | — | 19 (4.3) | 19 (.43) |
| | Administrative personnel | 48 (10.8) | — | 47 (10.6) | 47 (10.8) |
| | Personnel of services, trades and security | 133 (29.8) | — | 132 (29.8) | 131 (29.9) |
| | Qualified workers of farms, fishing and forest | 0 (0) | — | 0 (0) | 0 (0) |
| | Qualified workers of industry and construction | 58 (13.0) | — | 57 (12.9) | 56 (12.8) |
| | Installing operators | 42 (9.4) | — | 43 (9.7) | 43 (9.8) |
| | Non-qualified workers | 35 (7.9) | — | 31 (6.9) | 30 (6.9) |
| Retentions | None | 413 (92.6) | — | 312 (70.4) | — |
| | One | 30 (6.7) | — | 28 (6.3) | — |
| | Two | 3 (.68) | — | 2 (.45) | — |
| | Three | 0 (0) | — | 1 (0) | — |

Note. Data from all children participating across the four occurrences of measurement was considered (including data from students who failed the transition from the fifth- to sixth-grade (i.e., from the second to the third waves). Parents' work situation includes an inactive category to aggregate unemployed, retired or died parents. Family information varies between occurrences of measurement due to attrition and changes in parents' work situation, educational level and occupation. Although family information was not collected at the fourth occurrence of measurement, it is presented in the table to describe the final sample.

7.2. Measures

7.2.1. Questionnaire of Identification

The Questionnaire of Identification (QID; Araújo, 2009) was adapted in two sections to collect social demographic and academic information. The first section kept the original QID version, which enabled the collection of children's social demographical information such as sex, age, ethnicity, school, geographical area, mothers' and fathers' age, work situation, occupation and school level.

The second section was added in this study to collect children's academic information such as records of previous retentions as well as academic achievement based on average school grades and grades at each course. We initially intended to assess children's reading comprehension, acknowledging the efforts that have been made to assess this process during the school years (e.g., Viana, Pereira, & Teixeira, 2003). Still, while valid instruments to assess reading comprehension in Portuguese elementary school years are being actively developed (e.g., Cadime, Ribeiro, Viana, Santos, & Prieto, 2014), the assessment of middle school students is limited. Due to these limitations, the students' grades at the Portuguese course were used (Ribeiro et al., 2010) and assumed as indicators of literacy proficiency. Grades in the Portuguese course ranging from 1 "Very weak" to 5 "Very good" were registered at each occurrence of measurement, based on the teachers' evaluation of each student in reading, writing, grammar and knowledge/interpretation of classical Portuguese texts.

7.2.2. Multidimensional Scales of Perceived Self-Efficacy

The Multidimensional Scales of Perceived Self-Efficacy (MSPSE; Bandura, 1990) is a self-report measure of students' confidence in academic and social tasks. The MSPSE was adapted and validated for the Portuguese population by Teixeira and Carmo (2004) and has been used with Portuguese middle school, high school and college students ever since. Research with the Portuguese MSPSE version has confirmed its dimensional structure, acceptable reliability and demonstrated associations with career and academic constructs (e.g., Lobo, 2011; Lopes, 2010; Teixeira, 2009; Teixeira & Carmo, 2004). The Portuguese MSPSE version includes 57 items grouped in nine scales and employing a five-point Likert type scale ranging from 1 "Not easy at all" to 5 "Very easy". Scores for each scale and the total MSPSE can be computed.

With consent of the main author of the Portuguese MSPSE version, the scales self-efficacy

expectations for academic success (e.g., “Is it easy for you to learn math”; nine items), self-regulated learning (e.g., “Is it easy for you to focus on academic subjects”; 11 items), leisure and extracurricular activities (e.g., “Is it easy for you to learn music”; eight items) were used in this study. These scales were selected due to their coverage of academic, leisure and extracurricular domains, which aligns with the contexts of middle school children’s career exploration (e.g., Seligman, 1994; Super, 1980). Although the Portuguese MSPSE version has been used in middle school years, it has only been administrated from seventh-grade forward (Lopes & Teixeira, 2012). The items of the selected scales were, therefore, revised according to the Portuguese fifth- and sixth-grade curriculum.

A CFA was conducted from a pilot administration of the MSPSE to fifth- and sixth-graders. Confirmatory results suggested that a three-factor model (i.e., factors aligned with each MSPSE scale) and a hierarchical model (i.e., three first-order factors and a second-order factor labelled self-efficacy expectations for academic, leisure and extracurricular activities) yielded a similar and acceptable fit to the data. However, the CFI and TLI values were below the recommended criteria. After dropping off items 21 and 28 (i.e., 25 and 32 in the original Portuguese version), which were highly negatively skewed compared to the remaining ones, the fit statistics reached the cutoff criteria and the standardized regression weights improved. The reliability estimates were also very good absent these items (i.e., .85 for self-efficacy expectations for academic success, .93 for self-regulated learning, .80 for leisure and extra-curricular activities, and .95 for the second-order factor). The MSPSE was, therefore, used in this study absent items 21 and 28. As both measurement models yielded a similar fit to the data, the hierarchical model was preferred (see Chen et al., 2005). A composite score was computed by averaging the scores of the MSPSE items at each occurrence of measurement. Higher composite scores indicated higher self-efficacy expectations for academics and leisure activities.

7.2.3. Childhood Career Development Scale

The Childhood Career Development Scale (CCDS; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003) is a self-report measure of childhood career development. The authors of the CCDS authorized the adaption and validation of the North American version (Schultheiss & Stead, 2004) to the Portuguese context and language. The North American CCDS version includes 52 items answered in a five-point Likert-type scale ranging from SD “Strongly Disagree” to SA “Strongly Agree”.

Oliveira (2012; Oliveira & Taveira, 2014) adapted the CCDS to northern Portuguese middle school children. Exploratory results were consistent with the North American version while suggesting

the extraction of eight factors. However, confirmatory results derived from another dataset indicated that both the original North American and the Portuguese exploratory measurement model yielded a poor fit to the data and presented low estimates of internal consistency reliability for some scales. Following these results, another EFA was run to reduce the CCDS measurement model to a more parsimonious and psychometrically acceptable structure. Results suggested the extraction of three factors (i.e., locus of control, career planning and self-concept), which were consistent with the first three factors extracted in the first EFA. Another CFA was run and indicated that the three-factor model yielded a good fit to the data and presented very good estimates of reliability. In addition, the CCDS authors consented to its different adaptation for use with southern Portuguese children (Ramos, 2012). Similar exploratory and confirmatory results were found. Although exploratory results suggested the extraction of eight factors, confirmatory results suggested that both the original North American and southern Portuguese exploratory measurement models yielded a poor fit to the data and presented low estimates of internal consistency reliability in some scales. On the other hand, our alternative three-factor model yielded a good fit to the data and was consistent with the first three factors extracted in the southern Portuguese EFA. Thus, the poor fit of the original CCDS measurement model seemed not to be a limitation of translation and the alternative three-factor model yielded a good fit to the northern and southern Portuguese data, regardless of the adapted version.

The CCDS northern Portuguese version was used in this study. It includes 19 items grouped in the scales of self-concept (four items, $\alpha = .87$; e.g., “I know what kind of friend I am”), locus of control (seven items, $\alpha = .83$; e.g., “I have control over the things I do”) and career planning (eight items, $\alpha = .86$; e.g., “It is important for me to have a plan when I do a project”). A score for each scale was calculated by averaging the items’ scores at each occurrence of measurement. Higher scores were interpreted as higher levels of self-knowledge, internal locus of control and career planning.

7.3. Procedures

The engagement of the schools collaborating in this longitudinal data collection was maintained between occurrences of measurement. From the first to the second occurrences of measurement, a brief report presenting the sample main descriptive results and practical suggestions was shared with the schools’ principals, psychologists and teachers. From the second to the third occurrences of measurement, an informative text presenting inferential statistical results at the sample level and practical suggestions for the children’s caregivers was offered to the school psychologists with the prior

consent of the schools' principals. From the third to the fourth occurrences of measurement, holiday postcards were sent to the schools. Personal, phone and email contacts were also provided over time.

Study personnel completed the QID for each student, as the required social demographic and academic information were available in individual school records stored in the school administrative offices or the teachers' classroom folders. Whenever students did not live with their parents due to death, they were individually approached to determine whether they would be available and comfortable providing information about their parents' last educational status and occupation. Whenever students were living with people other than their parents due to parents' emigration or other reasons, they were personally asked if they were aware of the parents' educational status, work situation and occupation. The first section of the QID was completed at the first and third occurrences of measurement, as the schools also updated such information in those moments. The second section of the QID was updated at each occurrence of measurement.

Different orders of administration of the paper-based measures were randomly used for each classroom group. The different work rhythms of the students were respected and, as they completed the first measure, the next one was individually introduced. Students took an average of 40 minutes to complete the measures. Whenever a child missed the class scheduled for data collection, a new timeframe to individually meet her/him was negotiated with the schools' psychologists, teachers and caregivers in order to prevent wave nonresponse. Each student was assigned a code in the longitudinal study, thus assuring confidentiality and protection of individual data.

7.4. Data analyses

The CCEI model fit to the data collected at each occurrence of measurement was verified. A baseline model was identified by testing the fit of models 1, 2 and 3 to the data collected at each occurrence of measurement. The same model fit statistics previously reported in this dissertation were considered in the modeling phase. Estimates of internal consistency reliability and mean inter-item correlations were also calculated for each occurrence of measurement.

In case the hierarchical model was selected as the baseline model, the stability of the CCEI first- (i.e., Curiosity, Exploratory Resources, Self in Life Roles) and second-order factors (i.e., Career Exploration) (Models 7, 8, 9 and 10) were longitudinally and separately examined to control for model complexity (e.g., Keefer et al., 2013). An analytical strategy similar to the one of multigroup analyses was used to check the stability of the CCEI internal structure over time. Configural stability was tested

by simultaneously fitting the unconstrained baseline model to the data from the four occurrences of measurement. Metric stability was examined by constraining the measurement weights to be equivalent across occurrences of measurement. The CFI and RMSEA criteria (Cheung & Rensvold, 2002) served the evaluation of the equivalence of the CCEI factor structure over time. The stability of the CCEI was additionally expanded by computing the constructs autocorrelations/time stability coefficients, which yield complementary results on the stability of the measurement model and illustrate the CCEI detection of construct (in)stability over time (e.g., Keefer et al., 2013).

To examine the equivalence of the CCEI measurement model for girls and boys over time, longitudinal configural and metric equivalence for genders were tested both in the first- and second-order factors (Models 7.1, 8.1, 9.1 and 10.1). Adding to the configural and metric constraints previously used to check the CCEI longitudinal measurement invariance, the factorial structure and measurement weights were also constrained to be equivalent for genders over time. The potential effect of the literacy proficiency levels on the CCEI measurement model for girls and boys at each occurrence of measurement was also examined (Models 11.1, 11.2, 11.3 and 11.4). Groups of children were created based on their grades in the Portuguese course. A balanced distribution was achieved by distributing children graded as weak or average (grades 2 and 3), and as good or very good (grades 4 and 5). No student was graded as 1. Four groups were, therefore, considered: (i) girls presenting weak or average literacy proficiency, (ii) girls presenting good or very good proficiency, (iii) boys presenting weak or average proficiency and (iv) boys presenting good or very good proficiency.

Correlation coefficients were computed to examine the CCEI nomological network of theoretically predicted relations to other variables at each occurrence of measurement. Parametric Pearson correlation coefficients were computed to correlate the CCEI with the MSPSE and CCDS scores, as these were interval scale variables. Given that academic achievement was collected as an ordinal variable, non-parametric Spearman correlation coefficients were computed (Martins, 2011). Cohen's (1988) classification of the magnitudes of correlation coefficient values was considered, assuming correlations between .10 and .29 as weak, .30 and .49 as moderate, and .50 or higher as strong.

7.5. Results

7.5.1. Data preparation

The number of item nonresponses was negligible, as it generally ranged from zero to 10 (1.4%)

across all the items of the measures. A MCAR pattern was found across the four occurrences of measurement. The only exceptions were found in the self-concept items at the first occurrence of measurement, and in the planning items at the third occurrence of measurement (see Table 15). These exceptions might be due to one participant that did not complete any of the self-concept items at the first occurrence of measurement and to another case that did the same for the planning items at the third occurrence of measurement. These cases were filtered from the analyses covering such career variables. No relations were found between the missing values and the variable scores obtained in previous occurrences of measurement. There were also no relations between the missing values, gender, geographical area and the variables' scores across the occurrences of measurement.

The EM method was used to deal with item nonresponses. The EM method yields full information maximum likelihood estimates recommended for longitudinal designs (Jeličić et al., 2009) and has been used in other longitudinal career studies (e.g., Weisner et al., 2003). There were no missing values for academic achievement, as the children's records were checked at the schools.

Table 15.

Missing values in career variables across waves

| | Waves | | | | | | | |
|---------------|----------------------|-------------------------|----------------------|-------------------------|----------------------|-------------------------|----------------------|-------------------------|
| | 1 st Wave | | 2 nd Wave | | 3 rd Wave | | 4 th Wave | |
| | Max. <i>n</i> (%) | Little MCAR <i>p</i> | Max. <i>n</i> (%) | Little MCAR <i>p</i> | Max. <i>n</i> (%) | Little MCAR <i>p</i> | Max. <i>n</i> (%) | Little MCAR <i>p</i> |
| Exploration | 2 (.5) | .09 | 1 (.2) | .96 | 1 (.2) | .10 | 2 (.5) | .09 |
| LOC | 2 (.5) | .83 | 2 (.5) | .11 | 1 (.2) | .26 | 2 (.5) | .08 |
| Self-Concept | 2 (.5) | .02 | 1 (.2) | .30 | 1 (.2) | .47 | 0 (0) | — |
| Planning | 3 (.7) | .32 | 2 (.5) | .41 | 3 (.7) | .02 | 5 (1.1) | .54 |
| Self-efficacy | 10 (1.4) | .16 | 3 (.6) | .70 | 4 (.9) | .99 | 10 (1.4) | .13 |

Note. *N* = 429. Cases who failed the transition from fifth- to sixth-grade (i.e., from the second to the third occurrences of measurement) were filtered from these analyses. Max. = Maximum number of item nonresponse per item. Little MCAR *p* = statistical significance of the Little MCAR test, with results above .05 suggesting a missing completely at random pattern.

As for the assumptions required to test the stability of the CCEI factor structure, the normality of sampling distribution and the absence of multivariate outliers were checked. The item skewness and

kurtosis values respectively ranged from -1.30 to -.50 and from -.94 to 1.54 at the first occurrence of measurement; from -1.21 to -.57 and from -.85 to 1.04 at the second occurrence of measurement; from -1.14 to -.54 and from -.92 to 1.20 at the third occurrence of measurement; and from -1.30 to -.50 and from -.09 to 1.58 at the fourth occurrence of measurement. Normalized estimates of Mardia's multivariate kurtosis of 54.06, 58.60, 56.97 and 54.06 were respectively obtained for each occurrence of measurement, thus suggesting a multivariate non-normal sampling distribution over time.

Outliers at each and across occurrences of measurement for each CCEI indicator and total scale were identified (see Table 16). At the first occurrence of measurement, the multivariate outliers across the CCEI items were boys who presented a weak or average literacy proficiency. At the second occurrence of measurement, outliers were three girls and one boy presenting a weak or average literacy proficiency as well as one girl and one boy presenting a good or very good proficiency. At the third occurrence of measurement, outliers were a girl and two boys presenting weak or average literacy proficiency. At the fourth occasion of measurement, outliers were a girl and a boy presenting weak or average literacy proficiency and a girl demonstrating a good or very good proficiency. It seems, therefore, that there was no systematic bias in outliers based on literacy proficiency levels. Common outliers in the maximum of two occurrences of measurement were also identified.

Table 16.

CCEI Version 2.1: Multivariate outliers across waves

| | Waves | | | | Common outliers across waves | Total across waves |
|-----------------------|----------------------|----------------------|----------------------|----------------------|---------------------------------|-----------------------|
| | 1 st Wave | 2 nd Wave | 3 rd Wave | 4 th Wave | | |
| | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | <i>N</i> (%) | <i>N</i> (%) |
| Curiosity | 4 (.92) | 3 (.70) | 2 (.47) | 4 (.92) | 2 (.47) | 13 (3.03) |
| Exploratory Resources | 1 (.23) | 2 (.47) | 0 (0) | 1 (.23) | 0 (0) | 4 (.92) |
| Self in Life Roles | 3 (.70) | 2 (.47) | 3 (.70) | 6 (1.40) | 0 (0) | 14 (3.26) |
| Exploration | 3 (.70) | 6 (1.39) | 3 (.70) | 3 (.70) | 2 (.47) | 15 (3.50) |

Note. *N* = 429.

The non-normal sampling distribution remained after filtering the outliers. Using this procedure, the item skewness and kurtosis values ranged from -1.20 to -.54 and from -.96 to 1.33, with a normalized estimate of Mardia's multivariate kurtosis of 41.19 at the first occurrence of measurement; from -1.21 to .61 and from -.76 to 1.04, with a Mardia's multivariate kurtosis of 45.98 at the second

occurrence of measurement; from -1.06 to -.48 and from -.85 to 1.19, with a Mardia's multivariate kurtosis of 41.48 at the third occurrence of measurement; and from -1.29 to -.49 and from -.95 to 1.44, with a Mardia's multivariate kurtosis of 43.32 at the fourth occurrence of measurement.

Having verified the violation of the statistical assumptions of normality of sampling distribution and nonexistence of outliers, additional analytical options were considered. Due to the non-normality of sampling distribution, the structural equation modeling analyses were run with bootstrapping (Gilson et al., 2013; Kline, 2004; Nevitt & Hancock, 2001). To control for the outliers' biases, the analyses were run with and without outliers (e.g., Pinto et al., 2013), namely:

- To test of the baseline measurement model and the CCEI factorial equivalence for girls and boys presenting different literacy proficiency levels at each occurrence of measurement, analyses were performed with and without the outliers identified at the targeted wave.
- To test the stability of the CCEI factorial structure and equivalence for both genders over time, the analyses were performed (a) with all the outliers identified across the occurrences of measurement, (b) without common outliers found in two occurrences of measurement, (c) without cases that contributed for the highest frequency of outliers in specific occurrence(s) of measurement, and (d) without all the outliers across all occurrences of measurement.

The normality of sampling distribution required for correlational analyses was also examined in the assessed career variables at each occurrence of measurement. The Kolmogorov-Smirnov and the Shapiro-Wilk tests suggested the violation of the normality assumption in the assessed career variables, at each occurrence of measurement. To deal with such a violation, both parametric Pearson and non-parametric Spearman correlation tests were computed while examining the relations between the CCEI scores, self-efficacy expectations, self-concept, locus of control and career planning. When the conclusions from both sets of tests were consistent to retain/reject the null hypothesis, parametric results were presented; otherwise, non-parametric results were reported (Fife-Schaw, 2006).

7.5.2. CCEI internal structure for genders over time

The results with and without outliers consistently suggested that Models 2 and 3 yielded a better fit than Model 1 to the data collected at each occurrence of measurement (see Table 17). Based on the

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TLI and AIC estimates without outliers, Model 3 presented a slightly better fit than Model 2 to the data of the first and fourth occurrences of measurement. Hence, Model 3 was assumed as the baseline.

Table 17.

CCEI Version 2.1: Confirmatory factor model at each wave

| Model | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC |
|---------------------------------------|--------------------|-------------|-----|-----|-------------------|--------|
| 1 st Wave with outliers | | | | | | |
| Model 1 | .002 | 3.92 | .83 | .79 | .08 (.07-.09) | 259.60 |
| Model 2 | .004 | 2.67 | .91 | .88 | .06 (.05-.08) | 190.33 |
| Model 3 | .004 | 2.67 | .91 | .88 | .06 (.05-.08) | 190.33 |
| 1 st Wave without outliers | | | | | | |
| Model 1 | .002 | 3.78 | .84 | .81 | .08 (.06-.09) | 276.26 |
| Model 2 | .002 | 2.90 | .90 | .87 | .07 (.05-.08) | 225.70 |
| Model 3 | .002 | 2.90 | .90 | .87 | .07 (.05-.08) | 201.70 |
| 2 nd Wave with outliers | | | | | | |
| Model 1 | .002 | 3.70 | .90 | .88 | .08 (.07-.09) | 248.04 |
| Model 2 | .006 | 2.81 | .94 | .92 | .06 (.05-.07) | 197.27 |
| Model 3 | .006 | 2.81 | .94 | .92 | .06 (.05-.07) | 197.27 |
| 2 nd Wave without outliers | | | | | | |
| Model 1 | .002 | 3.64 | .91 | .89 | .08 (.07-.09) | 244.82 |
| Model 2 | .002 | 2.82 | .94 | .92 | .07 (.05-.08) | 197.50 |
| Model 3 | .002 | 2.82 | .94 | .92 | .07 (.05-.08) | 197.59 |
| 3 rd Wave with outliers | | | | | | |
| Model 1 | .002 | 4.82 | .87 | .84 | .09 (.08-.11) | 308.50 |
| Model 2 | .002 | 3.23 | .93 | .91 | .07 (.06-.08) | 218.61 |
| Model 3 | .002 | 3.23 | .93 | .91 | .07 (.06-.08) | 218.61 |
| 3 rd Wave without outliers | | | | | | |
| Model 1 | .002 | 4.02 | .90 | .87 | .09 (.07-.10) | 265.33 |
| Model 2 | .002 | 2.82 | .94 | .93 | .07 (.05-.08) | 198.02 |
| Model 3 | .002 | 2.82 | .94 | .93 | .07 (.05-.08) | 198.02 |
| 4 th Wave with outliers | | | | | | |
| Model 1 | .002 | 3.88 | .83 | .79 | .08 (.07-.09) | 257.70 |
| Model 2 | .002 | 2.60 | .91 | .88 | .06 (.04-.07) | 186.58 |
| Model 3 | .002 | 2.60 | .91 | .88 | .06 (.05-.07) | 186.58 |
| 4 th Wave without outliers | | | | | | |
| Model 1 | .002 | 3.90 | .84 | .80 | .08 (.07-.10) | 258.68 |
| Model 2 | .004 | 2.82 | .90 | .87 | .07 (.05-.08) | 197.50 |
| Model 3 | .004 | 2.81 | .90 | .88 | .07 (.05-.08) | 197.50 |

Note. The participants and the outliers at each occurrence of measurement were considered.

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Model 3 generally yielded a good fit to the data collected at each occurrence of measurement. Model 3 presented a particular good fit to the data collected at the second and third occurrences of measurement. A slight lower fit to the data collected at the first and fourth occurrences of measurement was found. The standardized measurement weights were all statistically significant ($p < .001$) across the four occurrences of measurement. Respectively at the first, second, third and fourth occurrences of measurement, the standardized regression weights ranged from .44 to .59, .65 to .70, .67 to .71, and .45 to .60 in Curiosity; from .58 to .67, .61 to .70, .56 to .76, and .60 to .64 in Exploratory Resources; from .34 to .65, .39 to .71, .38 to .75, and .33 to .65 in Self in Life Roles; as well as presented a minimum of .79, .86, .88 and .75 in Career Exploration (see Table 18).

Overall, acceptable reliability estimates were found for the high-order factor and marginal estimates for the first-order factors. The CCEI first- and second-order factors presented higher estimates of internal consistency reliability at the second and third occurrences of measurement compared to the first and fourth ones. More specifically, at the second and third occurrences of measurement, the CCEI first- and second-order factors respectively exhibited respectable and very good estimates of internal consistency reliability. At the first and fourth occurrences of measurement, the CCEI second-order factor presented a respectable estimate of reliability, whereas the first-order factors exhibited unacceptable, undesired or minimally acceptable estimates of internal consistency reliability (see Table 19).

Having identified the hierarchical measurement model as the baseline model, the stability of the first- and second-order factors over time was separately examined (see Figure 10). The longitudinal factorial equivalence of the first- and second-order factors for girls and boys over time was then investigated (e.g., Keefer et al., 2013).

The configural invariance results with and without outliers consistently suggested that the measurement model for the first- (i.e., Curiosity, Exploratory Resources, Self in Life Roles, Models 7, 8 and 9 respectively) and second-order factors (i.e., Career Exploration, Model 10) yielded a good fit to the data from the four occurrences of measurement, simultaneously considered. A particularly good fit was found for Curiosity, Exploratory Resources and Career Exploration, as the fit indexes values were all above the cutoff criteria. A lower fit was found for Self in Life Roles, in which the CFI and TLI estimates without outliers were slightly below the cutoff criteria. Still, no modification indexes would improve these estimates. Additionally, the results with and without outliers consistently indicated the CCEI configural and metric equivalence of Curiosity (Model 7), Exploratory Resources (Model 8), Self in Life Roles (Model 9) and Career Exploration (Model 10) across fifth- and sixth-grade (see Table 20).

Table 18.

CCEI Version 2.1: Standardized regression weights at each wave

| Item/ 1 st order factor | Waves | | | | | | | | | | | | | | | |
|--|----------------------|-------|-----|------|----------------------|-------|-----|------|----------------------|-------|-----|------|----------------------|-------|-----|------|
| | 1 st Wave | | | | 2 nd Wave | | | | 3 rd Wave | | | | 4 th Wave | | | |
| | Cur. | ExpR. | SLR | Exp. | Cur. | ExpR. | SLR | Exp. | Cur. | ExpR. | SLR | Exp. | Cur. | ExpR. | SLR | Exp. |
| Item A | .53 | | | | .66 | | | | .69 | | | | .55 | | | |
| Item B | .59 | | | | .70 | | | | .71 | | | | .60 | | | |
| Item C | .44 | | | | .65 | | | | .67 | | | | .45 | | | |
| Item D | | .67 | | | | .70 | | | | .76 | | | | .64 | | |
| Item E | | .60 | | | | .69 | | | | .72 | | | | .63 | | |
| Item F | | .58 | | | | .61 | | | | .56 | | | | .60 | | |
| Item G | | | .59 | | | | .50 | | | | .62 | | | | .60 | |
| Item H | | | .65 | | | | .69 | | | | .73 | | | | .65 | |
| Item I | | | .34 | | | | .39 | | | | .38 | | | | .35 | |
| Item J | | | .34 | | | | .47 | | | | .40 | | | | .33 | |
| Item K | | | .49 | | | | .71 | | | | .75 | | | | .48 | |
| Item L | | | .48 | | | | .66 | | | | .64 | | | | .47 | |
| Cur. | | | | 1.00 | | | | 1.00 | | | | | 1.00 | | | 1.00 |
| ExpR. | | | | .80 | | | | .89 | | | | | .88 | | | .81 |
| SLR | | | | .79 | | | | .86 | | | | | .90 | | | .75 |

Note. Cur. = Curiosity; ExpR. = Exploratory Resources; SLR = Self in Life Roles; Exp. = Career Exploration. Standardized regression weights are presented without the outliers identified at each occurrence of measurement for the first- and second-order factors. All standardized regression weights statistically significant at $p < .001$.

Table 19.

CCEI Version 2.1: Reliability at each wave

| CCEI first- and second-order factors | Waves | | | | | | | |
|--------------------------------------|----------------------|-----|----------------------|-----|----------------------|-----|----------------------|-----|
| | 1 st Wave | | 2 nd Wave | | 3 rd Wave | | 4 th Wave | |
| | α | MIC | α | MIC | α | MIC | α | MIC |
| Curiosity | .52 | .27 | .71 | .45 | .73 | .47 | .54 | .29 |
| Exploratory Resources | .65 | .38 | .71 | .45 | .73 | .47 | .66 | .39 |
| Self in Life Roles | .64 | .23 | .74 | .33 | .75 | .34 | .64 | .23 |
| Career Exploration | .79 | .24 | .86 | .34 | .86 | .35 | .79 | .24 |

Note. α = Cronbach's alpha. MIC = Mean inter-item correlation. Estimates are presented without the outliers identified at each occurrence of measurement for the first- and second-order factors.

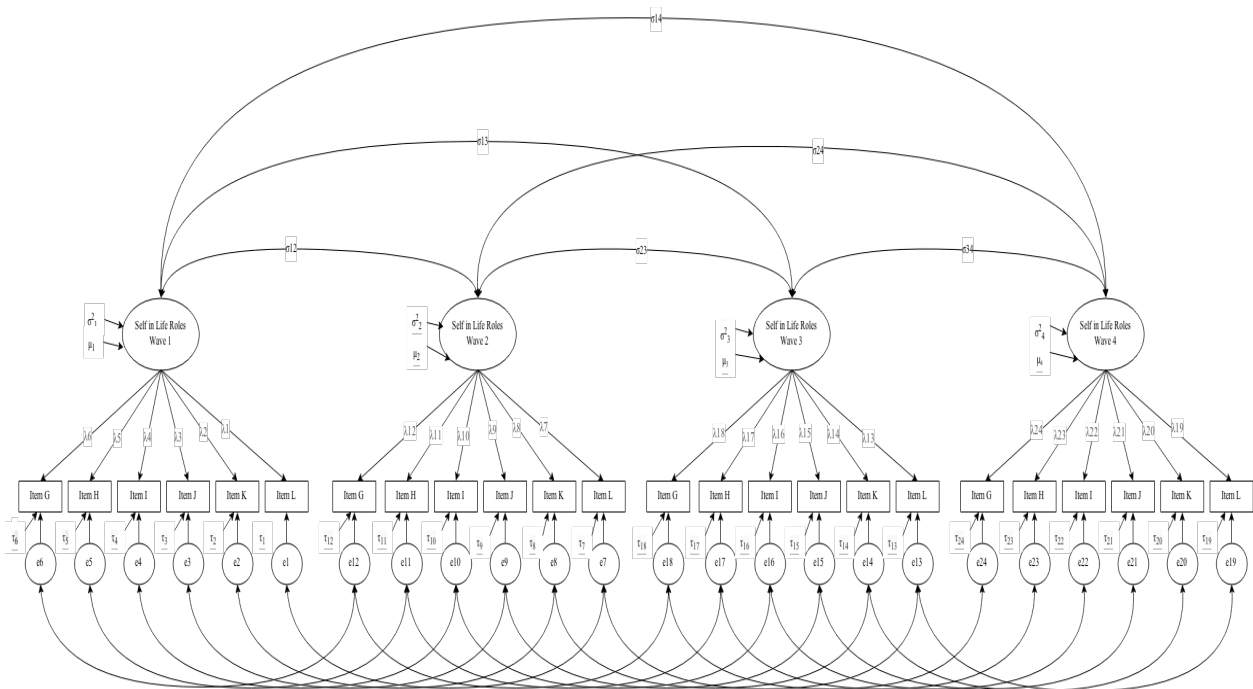


Figure 10.

CCEI Version 2.1: Parameterization of one factor longitudinal measurement invariance.

Note. The depicted parameterization is a prototype of the others designed for the remaining first- and second-order factors, which were adjusted according to the inherent number of observed variables. As the variances of identical observed and latent variables were not independent over time, residual and factor covariances were freely estimated. Estimated parameters: e = residual variance, λ = measurement weights, σ = freely estimated factor covariances. Only measurement weights were constrained to be equivalent over time, while checking the stability of the CCEI factor structure.

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Table 20.

CCEI Version 2.1: Longitudinal configural and metric equivalence

| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|---|--------------------|-------------|-----|-----|----------------|--------|--------------|----------------|
| Model 7 with outliers | | | | | | | | |
| a. Configural | .012 | 2.11 | .96 | .94 | .05 (.04-.07) | 184.23 | — | — |
| b. Metric | .030 | 1.87 | .97 | .97 | .05 (.03-.06) | 174.13 | -.003 | .006 |
| Model 7 without common outliers waves 1 & 2 | | | | | | | | |
| a. Configural | .010 | 1.99 | .97 | .94 | .05 (.03-.06) | 179.91 | — | — |
| b. Metric | .026 | 1.78 | .97 | .94 | .04 (.03-.06) | 170.31 | -.003 | .005 |
| Model 7 without outliers wave 1 | | | | | | | | |
| a. Configural | .008 | 2.13 | .96 | .93 | .05 (.04-.07) | 185.25 | — | — |
| b. Metric | .020 | 1.91 | .96 | .95 | .05 (.03-.06) | 175.93 | -.003 | .006 |
| Model 7 without all outliers | | | | | | | | |
| a. Configural | .008 | 2.01 | .97 | .94 | .05 (.03-.07) | 180.46 | — | — |
| b. Metric | .012 | 1.88 | .97 | .95 | .05 (.03-.06) | 174.50 | .001 | .003 |
| Model 8 with outliers | | | | | | | | |
| a. Configural | .19 | 1.43 | .99 | .98 | .03 (.01-.05) | 157.96 | — | — |
| b. Metric | .28 | 1.35 | .99 | .98 | .03 (.00-.05) | 150.62 | -.001 | .004 |
| Model 8 without outliers wave 2 | | | | | | | | |
| a. Configural | .16 | 1.45 | .99 | .98 | .03 (.01-.05) | 158.37 | — | — |
| b. Metric | .25 | 1.36 | .99 | .98 | .03 (.00-.05) | 151.09 | -.001 | -.01 |
| Model 8 without all outliers | | | | | | | | |
| a. Configural | .10 | 1.54 | .98 | .97 | .04 (.02-.05) | 162.19 | — | — |
| b. Metric | .18 | 1.42 | .99 | .98 | .03 (.01-.05) | 154.01 | -.001 | .004 |

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| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|--|--------------------|-------------|-----|-----|----------------|--------|--------------|----------------|
| Model 9 with outliers | | | | | | | | |
| a. Configural | .002 | 2.11 | .90 | .88 | .050 (.04-.06) | 672.64 | — | — |
| b. Metric | .002 | 2.02 | .90 | .89 | .05 (.04-.06) | 653.11 | -.001 | .002 |
| Model 9 without outliers wave 4 | | | | | | | | |
| a. Configural | .002 | 2.18 | .89 | .87 | .05 (.05-.06) | 687.92 | — | — |
| b. Metric | .002 | 2.10 | .89 | .88 | .05 (.05-.06) | 671.72 | -.001 | .002 |
| Model 9 without all outliers | | | | | | | | |
| a. Configural | .002 | 2.22 | .88 | .86 | .05 (.05-.06) | 697.45 | — | — |
| b. Metric | .002 | 2.13 | .89 | .87 | .05 (.05-.06) | 679.67 | -.002 | .002 |
| Model 10 with outliers | | | | | | | | |
| a. Configural | .002 | 4.08 | .95 | .91 | .08 (.07-.10) | 261.18 | — | — |
| b. Metric | .002 | 3.82 | .94 | .92 | .08 (.07-.09) | 261.97 | .003 | .004 |
| Model 10 without common outliers waves 2 & 3 | | | | | | | | |
| a. Configural | .002 | 3.86 | .95 | .92 | .08 (.07-.10) | 252.43 | — | — |
| b. Metric | .002 | 3.66 | .95 | .92 | .08 (.07-.09) | 254.89 | .003 | .003 |
| Model 10 without outliers wave 2 | | | | | | | | |
| a. Configural | .002 | 3.65 | .96 | .92 | .08 (.07-.09) | 244.53 | — | — |
| b. Metric | .002 | 3.48 | .95 | .93 | .08 (.06-.09) | 246.72 | .004 | .002 |
| Model 10 without all outliers | | | | | | | | |
| a. Configural | .002 | 3.54 | .96 | .93 | .08 (.06-.09) | 239.91 | — | — |
| b. Metric | .002 | 3.26 | .96 | .94 | .07 (.06-.09) | 236.50 | .001 | .007 |

Note. *N* with outliers = 429. The outliers found for each first- and second-order factors were considered in these analyses. Models 7, 8, 9 and 10 = Longitudinal measurement invariance of Curiosity, Exploratory Resources, Self in Life Roles, and Career Exploration respectively. CI = confidence interval. Δ = difference.

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Similar patterns of temporal stability coefficients were found for the CCEI first- and second-order factors. These results yielded complementary evidence of overall relative stability in the measurement model. Temporal stability coefficients also suggested relative stability of the first- and second-order factors until the third occurrence of measurement. However, there was relative instability from the third to the fourth occurrences of measurement. This was especially noticeable for the Self in Life Roles indicator, which presented a non-statistically significant temporal stability coefficient between the third and fourth occurrences of measurement (see Table 21).

Table 21.

CCEI Version 2.1 scores: Temporal stability coefficients

| Occurrences of measurement | Stability coefficient |
|---|-----------------------|
| Curiosity | |
| 1 st wave – 2 nd wave | .51*** |
| 2 nd wave – 3 rd wave | .55*** |
| 3 rd wave – 4 th wave | .18*** |
| Exploratory Resources | |
| 1 st wave – 2 nd wave | .53*** |
| 2 nd wave – 3 rd wave | .61** |
| 3 rd wave – 4 th wave | .14* |
| Self in Life Roles | |
| 1 st wave – 2 nd wave | .53*** |
| 2 nd wave – 3 rd wave | .65** |
| 3 rd wave – 4 th wave | .05 |
| Career Exploration | |
| 1 st wave – 2 nd wave | .59*** |
| 2 nd wave – 3 rd wave | .71** |
| 3 rd wave – 4 th wave | .17** |

Note. $N = 429$.

* $p < .05$. * $p < .01$. *** $p < .001$.

Configural and metric equivalence for genders over time was also verified for Curiosity (Model 7.1), Exploratory Resources (Model 8.1), Self in Life Roles (Model 9.1), and Career Exploration (Model

10.1) (see Table 22).

As a synthesis of the fifth research phase, confirmatory and longitudinal stability techniques indicated that the CCEI hierarchical measurement model generally yielded a good fit to the data collected across fifth-and sixth-grades. Model fit was better in the second and third occasions of measurement than in the first and fourth ones. Configural and metric equivalence of the first- and second-order factors across all occasions of measurement and both genders were found, thus supporting H7 and H8. The CCEI first- and second-order factors demonstrated relative construct stability up to the third occurrence of measurement, but relative instability from the third to the fourth occurrences of measurement. In addition, the second-order factor presented respectable and very good estimates of internal consistency reliability across occurrences of measurement, thus yielding partial support to H9. However, the first-order factors presented respectable reliability at the second and third occurrences of measurement, but lower estimates at the first and fourth occurrences of measurement.

7.5.3. CCEI internal structure for genders of different literacy proficiency levels at each occurrence of measurement

Regardless of gender, the frequency of students presenting weak or average literacy proficiency levels was higher than the frequency of students presenting good or very good levels (see Table 23).

The results with and without outliers consistently suggested the equivalence of the CCEI hierarchical structure for girls and boys presenting weak or average and good or very good literacy proficiency levels at each occurrence of measurement (see Table 24).

In a synthesis of the sixth research phase, the CCEI hierarchical factor structure was equivalent for girls and boys presenting weak or average and good or very good literacy proficiency levels over time, thus supporting H11.

7.5.4. CCEI nomological network at each occurrence of measurement

The conclusions derived from parametric and non-parametric tests relating the CCEI scores with career variables were similar, whereby parametric tests results were reported. The results suggested positive and statistically significant correlations between career exploration, self-efficacy expectations, self-concept, locus of control and career planning at each occurrence of measurement.

Table 22.

CCEI Version 2.1: Longitudinal configural and metric equivalence for genders

| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|---|--------------------|-------------|-----|-----|----------------|--------|--------------|----------------|
| Model 7.1 with outliers | | | | | | | | |
| a. Configural | .02 | 1.75 | .95 | .92 | .04 (.03-.05) | 340.40 | — | — |
| b. Metric | .04 | 1.67 | .95 | .92 | .04 (.03-.05) | 330.23 | .002 | .002 |
| Model 7.1 without common outliers waves 1 & 2 | | | | | | | | |
| a. Configural | .03 | 1.67 | .96 | .92 | .04 (.03-.05) | 334.53 | — | — |
| b. Metric | .05 | 1.59 | .96 | .93 | .04 (.03-.05) | 322.80 | .000 | .003 |
| Model 7.1 without outliers wave 1 | | | | | | | | |
| a. Configural | .002 | 1.92 | .94 | .89 | .05 (.04-.06) | 353.61 | — | — |
| b. Metric | .004 | 1.86 | .93 | .90 | .05 (.03-.06) | 347.84 | .005 | .002 |
| Model 7.1 without all outliers | | | | | | | | |
| a. Configural | .014 | 1.75 | .95 | .92 | .04 (.03-.05) | 340.75 | — | — |
| b. Metric | .012 | 1.70 | .95 | .92 | .04 (.03-.05) | 332.66 | .004 | .002 |
| Model 8.1 with outliers | | | | | | | | |
| a. Configural | .16 | 1.39 | .98 | .96 | .03 (.01-.04) | 312.28 | — | — |
| b. Metric | .18 | 1.37 | .98 | .96 | .03 (.01-.04) | 303.11 | .002 | .001 |
| Model 8.1 without outliers wave 2 | | | | | | | | |
| a. Configural | .14 | 1.37 | .98 | .96 | .03 (.01-.04) | 311.18 | — | — |
| b. Metric | .12 | 1.39 | .98 | .96 | .03 (.02-.05) | 309.18 | .003 | .000 |
| Model 8.1 without all outliers | | | | | | | | |
| a. Configural | .09 | 1.43 | .98 | .96 | .03 (.02-.05) | 315.62 | — | — |
| b. Metric | .09 | 1.45 | .97 | .96 | .03 (.02-.05) | 313.56 | .003 | -.001 |

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| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|--|--------------------|-------------|-----|-----|----------------|---------|--------------|----------------|
| Model 9.1 with outliers | | | | | | | | |
| a. Configural | .002 | 1.72 | .87 | .85 | .04 (.04-.05) | 1167.91 | — | — |
| b. Metric | .002 | 1.66 | .87 | .86 | .04 (.04-.04) | 1131.38 | -.002 | .002 |
| Model 9.1 without outliers wave 4 | | | | | | | | |
| a. Configural | .002 | 1.73 | .87 | .84 | .04 (.04-.05) | 1174.03 | — | — |
| b. Metric | .002 | 1.69 | .87 | .85 | .04 (.04-.05) | 1143.95 | .000 | -.005 |
| Model 9.1 without all outliers | | | | | | | | |
| a. Configural | .002 | 1.76 | .86 | .83 | .04 (.04-.05) | 1184.35 | — | — |
| b. Metric | .002 | 1.70 | .86 | .84 | .04 (.04-.05) | 1149.29 | -.002 | .002 |
| Model 10.1 with outliers | | | | | | | | |
| a. Configural | .002 | 2.93 | .94 | .89 | .07 (.06-.08) | 426.81 | — | — |
| b. Metric | .002 | 2.69 | .93 | .90 | .06 (.05-.07) | 422.51 | .003 | .003 |
| Model 10.1 without common outliers waves 2 & 3 | | | | | | | | |
| a. Configural | .002 | 2.76 | .94 | .90 | .06 (.05-.08) | 419.66 | — | — |
| b. Metric | .002 | 2.61 | .94 | .91 | .06 (.05-.07) | 415.17 | .003 | .002 |
| Model 10.1 without outliers wave 2 | | | | | | | | |
| a. Configural | .002 | 2.64 | .95 | .91 | .06 (.05-.07) | 410.19 | — | — |
| b. Metric | .002 | 2.51 | .94 | .91 | .06 (.05-.07) | 405.95 | .003 | .002 |
| Model 10.1 without all outliers | | | | | | | | |
| a. Configural | .002 | 2.40 | .95 | .92 | .06 (.05-.07) | 391.54 | — | — |
| b. Metric | .002 | 2.26 | .95 | .93 | .06 (.05-.07) | 383.13 | .002 | .003 |

Note. *N* with outliers = 429. The outliers found for the first- and second-order factors were considered in these analyses. Models 7.1, 8.1, 9.1 and 10.1 = Longitudinal measurement invariance of Curiosity, Exploratory Resources, Self in Life Roles, and Career Exploration for gender, respectively. Δ = difference.

Table 23.

Distribution of children per gender and literacy proficiency levels

| Literacy proficiency levels <i>n</i> (%) | Gender | |
|--|--------------------|-------------------|
| | Girls <i>n</i> (%) | Boys <i>n</i> (%) |
| 1 st Wave | | |
| Weak or average 308 (71.8) | 137 (44.5) | 171 (55.5) |
| Good or very good 121 (28.2) | 70 (57.9) | 51 (42.1) |
| 2 nd Wave | | |
| Weak or average 282 (65.7) | 127 (45.0) | 155 (55.0) |
| Good or very good 147 (34.3) | 80 (54.4) | 67 (45.6) |
| 3 rd Wave | | |
| Weak or average 262 (61.1) | 117 (44.7) | 145 (55.3) |
| Good or very good 167 (38.9) | 90 (53.9) | 77 (46.1) |
| 4 th Wave | | |
| Weak or average 275 (64.1) | 116 (42.2) | 90 (58.8) |
| Good or very good 154 (35.8) | 159 (57.8) | 63 (41.2) |

Table 24.

CCEI Version 2.1: Configural and metric invariance for girls and boys presenting different literacy proficiency levels at each wave

| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|-------------------------------|--------------------|-------------|-----|-----|----------------|--------|--------------|----------------|
| Model 11.1 with outliers | | | | | | | | |
| a. Configural | .05 | 1.75 | .85 | .80 | .04 (.04-.05) | 573.49 | — | — |
| b. Metric _{L1} | .09 | 1.67 | .85 | .82 | .04 (.03-.05) | 546.64 | -.000 | .002 |
| c. Metric _{L1&2} | .04 | 1.74 | .83 | .80 | .04 (.04-.05) | 562.79 | .01 | -.002 |
| Model 11.1 without outliers | | | | | | | | |
| a. Configural | .05 | 1.76 | .84 | .77 | .042 (.04-.05) | 574.96 | — | — |
| b. Metric _{L1} | .10 | 1.67 | .84 | .88 | .040 (.03-.05) | 548.79 | .001 | .002 |
| c. Metric _{L1&2} | .07 | 1.72 | .83 | .90 | .041 (.03-.05) | 556.53 | .01 | -.001 |
| Model 11.2 with outliers | | | | | | | | |
| a. Configural | .02 | 1.93 | .88 | .85 | .05 (.04-.05) | 610.65 | — | — |
| b. Metric _{L1} | .01 | 1.89 | .87 | .86 | .05 (.04-.05) | 599.18 | .009 | .001 |
| c. Metric _{L1&2} | .01 | 1.86 | .88 | .86 | .05 (.04-.05) | 591.53 | -.001 | .001 |

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| Models | B-S <i>p</i> value | χ^2/df | CFI | TLI | RMSEA (90% CI) | AIC | Δ CFI | Δ RMSEA |
|-------------------------------|--------------------|-------------|-----|-----|----------------|--------|--------------|----------------|
| Model 11.2 without outliers | | | | | | | | |
| a. Configural | .01 | 1.91 | .89 | .85 | .05 (.04-.05) | 606.53 | — | — |
| b. Metric _{L1} | .01 | 1.86 | .88 | .86 | .05 (.04-.05) | 592.06 | .007 | .002 |
| c. Metric _{L1&2} | .01 | 1.83 | .88 | .87 | .04 (.04-.05) | 583.44 | -.001 | .001 |
| Model 11.3 with outliers | | | | | | | | |
| a. Configural | .008 | 1.98 | .88 | .84 | .05 (.04-.06) | 620.67 | — | — |
| b. Metric _{L1} | .006 | 1.95 | .87 | .85 | .05 (.04-.05) | 611.21 | .01 | .001 |
| c. Metric _{L1&2} | .01 | 1.90 | .87 | .85 | .05 (.04-.05) | 600.73 | -.003 | .001 |
| Model 11.3 without outliers | | | | | | | | |
| a. Configural | .006 | 2.00 | .87 | .84 | .05 (.04-.06) | 624.99 | — | — |
| b. Metric _{L1} | .004 | 1.96 | .86 | .84 | .05 (.04-.05) | 614.89 | .01 | .001 |
| c. Metric _{L1&2} | .006 | 1.92 | .87 | .85 | .05 (.04-.05) | 604.45 | -.002 | .001 |
| Model 11.4 with outliers | | | | | | | | |
| a. Configural | .06 | 1.62 | .87 | .83 | .04 (.03-.05) | 546.04 | — | — |
| b. Metric _{L1} | .11 | 1.54 | .87 | .85 | .04 (.03-.04) | 517.45 | -.001 | .002 |
| c. Metric _{L1&2} | .12 | 1.55 | .87 | .85 | .04 (.03-.04) | 514.98 | .003 | .000 |
| Model 11.4 without outliers | | | | | | | | |
| a. Configural | .03 | 1.67 | .86 | .82 | .04 (.03-.05) | 556.22 | — | — |
| b. Metric _{L1} | .10 | 1.59 | .86 | .84 | .04 (.03-.04) | 527.98 | -.001 | .003 |
| c. Metric _{L1&2} | .11 | 1.58 | .86 | .84 | .04 (.03-.04) | 522.70 | .001 | .000 |

Note. Models 11.1, 11.2, 11.3 and 11.4 = Equivalence for girls and boys presenting different literacy proficiency levels at the first, second, third and fourth occurrences of measurement. Participants and the outliers at each occurrence of measurement were considered.

Career exploration presented weak correlations with self-concept across occurrences of measurement and with self-efficacy expectations for academic, leisure and extracurricular activities at the fourth occurrence of measurement. The magnitude of the correlations between career exploration and self-efficacy expectations was moderate during the remaining occurrences of measurement.

Career exploration also presented moderate magnitude correlations with locus of control and career planning across waves.

No relations were found between career exploration and academic achievement throughout the occurrences of measurement (see Table 25).

Table 25.

CCEI Version 2.1 scores: Associations with other variables at each wave

| Exploration at each wave | Correlation | | | | |
|--------------------------|---------------|--------------|------------------|----------|----------------------|
| | Self-efficacy | Self-concept | Locus of control | Planning | Academic achievement |
| 1 st wave | .30** | .22*** | .45*** | .45*** | .01 |
| 2 nd wave | .36** | .19*** | .46*** | .43*** | -.07 |
| 3 rd wave | .34** | .29*** | .43*** | .45*** | -.08 |
| 4 th wave | .29** | .21*** | .44*** | .45*** | .01 |
| Mean correlation | .32 | .23 | .45 | .45 | -.13 |

Note. $N = 429$. Pearson coefficient results are presented for the correlations among career variables. Spearman correlation results are presented for the correlations between the CCEI scores and academic achievement.

** $p < .01$. *** $p < .001$

As a synthesis of the sixth research phase, the CCEI total scores were positively and statistically significantly associated with career variables. H12.1 was empirically supported, as weak to moderate correlations between the CCEI and self-efficacy expectations were found across the occasions of measurement, respectively. Empirical support for H12.2, H12.3 and H12.4 was also found, as the CCEI presented weak correlations with self-concept and moderate correlations with the locus of control and career planning throughout fifth- and sixth-grades. Still, no relations were found between the CCEI and academic achievement, whereby H12.5 was not empirically supported.

CHAPTER 4

Discussion

This study intended to construct and validate a new self-report measure of Portuguese middle school children's career exploration – the CCEI. To attain such a goal, we assumed a position that the construct validity of a measure relies on complementary types of evidence (Adcock & Collier, 2001; Pais-Ribeiro, 2013; Pedhazur & Schmelkin, 1991). Thus, the specific goals of offering evidence of judgmental validity focused on test content, internal structure validity, temporal validity and nomological validity were set. These goals were fulfilled and the results informing these types of validity evidence are next discussed, according to four main topics: (a) the CCEI rationale and format; (b) the CCEI internal structure, (c) the CCEI internal structure for groups, and (d) the CCEI nomological network.

1. CCEI rationale and format

The CCEI was constructed as a dimensional self-report measure of middle school children's career exploration, contextualizing items at the home, community and school settings. On the one hand, the Curiosity, Exploratory Resources, and Self in Life Roles indicators seemed consistent with a comprehensive perspective of career exploration and the recognition of its objective and subjective aspects (Flum & Blustein, 2000; Taveira & Moreno, 2003). On the other hand, the settings considered in the CCEI have been highlighted in middle school years (e.g., Eccles, 1999; Falusso, 2011; Gottfredson, 1996; Seligman et al., 1991; Super, 1980, 1994) and were aligned with the understanding of play, household chores and school activities as experiences triggering the socialization of children to work (Goldstein & Oldham, 1979).

The experts' judgments supported the rationale of the CCEI, as experts were able to assign items to career exploration dimensions. This was important for the construction of the CCEI, as it sustained item selection. Thus, these findings supported recommendations to “make experts judgments of the appropriateness of the contents” (Patten, 2005; p. 68) while constructing and validating a measure.

The CCEI item format was also supported by middle school children in the think-aloud tryout and in the three data sets, who offered favorable reactions to it. Such a qualitative appreciation seemed consistent with the progress of tools to assess career exploration during childhood, which increasingly acknowledge children's self-percepts (e.g., Lapan, 2004; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010; Tracey et al., 2006). It is also noteworthy that children in the think-aloud tryout perceived the CCEI as meaningful for them. This might be due to the lack of systematic and structured opportunities in Portugal for children to discuss career issues and advance career exploration over the school years (Leão, 2006; Taveira, 1999). Still, further studies coupling the CCEI

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with qualitative evaluations and analyses of children's discourses about their career exploration experiences might help advance qualitative and mixed-research design methods in this field (Liu et al., 2014, 2015; Schultheiss, 2008; Watson et al., 2015) as well as contribute to better understand the children's appreciations reported in this study.

Considering the CCEI item format, two Likert-type scales with different labels were tested and offered empirical support to H3 and H4. Findings suggesting the CCEI measurement invariance for the response scales were aligned with the psychometric literature (e.g., Händel & Fritzsche, 2014). Additionally, the results supporting the use of the CCEI alternate scale could be illustrative of children's familiarity with perceived-agreement response labels. This might be due to the frequent use of such labels during the middle school years (e.g., Lapan, 2004; Oliveira & Taveira, 2014; Schultheiss & Stead, 2004). Taking these results into account, further research could examine the possibility of coupling the CCEI Version 2.1 with extant measures of childhood career development employing a perceived-agreement response scale. For example, it could be useful to couple the CCEI with the Portuguese CCDS version and check its impact on the factorial structures. If no major changes occur to the factorial structures, then it might be reasonable to infuse the CCEI in the CCDS, thus presenting complementary items to children and broadening the assessment of children's career development.

Despite caution in the analyses and selection of the CCEI response scale, evidence of multivariate non-normality of sampling distribution was consistently found. Although multivariate non-normality of sampling distribution has been verified in other career development studies with Portuguese children (e.g., Oliveira & Taveira, 2014; Oliveira et al., 2016), this finding presents two main limitations of this study. A first limitation has to do with the lack of a social desirability measure. This would have been useful to control for an eventual social desirability bias. Thus, further studies should overcome such a limitation and clarify this possibility. A second limitation considers the lack of assessments of cognitive development. This would be relevant, as human and career development literatures bring complementary knowledge on career exploration (Patton & Porfeli, 2007; Porfeli, 2008). Moreover, by middle school years, children are expected to present more realistic, abstract and interactive conceptions of occupations as well as to more intentionally engage in career exploration based on investigative reasoning and more sophisticated representations of themselves and the working world (Bonawitz et al., 2012; Dumora, 2004; Gottfredson, 1996; Howard et al., 2015; Nelson, 1978; Tytler & Peterson, 2004; Schulz, 2012). Following theoretical and empirical articulations between children's cognitive and career development (Howard & Walsh, 2010; Law & McGowan, 1999), it would have been relevant to check whether variability in cognitive development influenced

children's comprehension of the CCEI items. Variability in cognitive development could have helped understand the multivariate non-normality results, as if students were grasping abstract reasoning, they could more likely fail to understand the items and endorse extremer response categories than their peers who were more developed in abstract reasoning (Oliveira et al., 2016). Thus, further research might enrich the study of the CCEI by coupling it with assessments of cognitive development.

2. CCEI internal structure

Exploratory and confirmatory results in cross-sectional and longitudinal designs yielded empirical support to H1 and H7. These findings were consistent with the dimensional understanding of middle school children's career exploration and affirmed the CCEI internal structure validity. These results were also aligned with a position that the application of exploratory and confirmatory techniques is important to attest the psychometric properties of a measure (Oliveira et al., 2015).

Focusing on H7, evidence of the CCEI temporal validity was obtained. This type of evidence has been rarely reported in the literature (Christensen, 2004; Hirschi et al., 2015; Keefer et al., 2013; Pedhazur & Schmelkin, 1991; Wang & Netemeyer, 2004), but its relevance seemed to be herein reinforced. Indeed, these findings suggested that children's representation of the career exploration construct seems to be stable from fifth- through sixth-grades. Additional studies using the CCEI with other samples of Portuguese fifth- and sixth-graders could test whether these results would be replicated and thus contribute for their generalization. Still, having supported the temporal stability of the CCEI measurement model, future studies may now rely on it to investigate developmental trajectories and patterns of growth of Portuguese middle-school children's career exploration. This would be of particular relevance for the field at an international level, as calls have been made to longitudinally investigate childhood career development (Porfeli et al., 2008; Watson & McMahon, 2008) and a need to address temporal (dis)continuities of career exploration during middle school years has been identified in this dissertation. This would also be fruitful for the Portuguese institution hosting this study, as it would expand the scientific knowledge of Portuguese middle school children.

Evidence from the present study also suggested a relative instability of the career exploration construct from the third to the fourth occurrences of measurement. Two possible reasons for these findings can be discussed. First, the relative instability of the career exploration construct from the beginning to the end of sixth-grade could be tied to the approach of a developmental crisis of sexual maturation and the adolescent period (Apter, 2006; Erikson, 1963; Vygotsky, 1998). Not only does this

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developmental crisis trigger change, but also adolescence marks the dawn for the development of vocational identity grounded on previous career exploration (Flum & Blustein, 2000; Porfeli & Lee, 2012; Porfeli et al., 2013; Schmitt-Rodermund & Vondracek, 1999; Taveira, 2000). This developmental phase could, therefore, influence students' career reasoning and sense of self as well as trigger doubt and confusion, impacting career exploration (Caruso, 1993; Day, 1968; Super & Hall, 1978). Taking this possible explanation into account, future efforts could instill the multidisciplinary collaboration and acknowledge articulations among career and human development (Araújo, 2009; Porfeli, 2008; Schultheiss, 2008) to deepen these findings.

Second, the relative instability could be illustrative of the career exploration progress in a U-shaped path (Patton & Porfeli, 2007; Weisler & McCall, 1976). Taking the Portuguese setting into account, it might be plausible that relative stability would be found across fifth- and sixth-grade, but instability would emerge as children approached the end of sixth-grade. Indeed, despite possible changes in their teachers, most children usually find similar circumstances from fifth- to sixth-grade. Children could, therefore, present greater career exploration stability as they recovered their inner balance after having transited to fifth-grade. However, by the end of sixth-grade, children could present relative instability due to an approach of final evaluation exams and a new cycle of study in Portugal. This educational phase presents children with new teachers and social expectations for students to make formal academic choices leading into the high school years. It might be possible that at the end of sixth-grade children already foresee these challenges and thus present different career exploration levels. Further research assessing career exploration and employing complementary qualitative methods, such as interviews to Portuguese middle school children targeting their meanings assigned to school and motives to engage in career exploration, could help examine this possible explanation.

Adding to these results, evidence also indicated that the CCEI estimates of internal consistency reliability were higher at the second and third occurrences of measurement than at the first and fourth ones. This internal consistency variability could derive from multiple factors (e.g., children's personal disposition, contextual conditions during data collection), but seemed consistent with the aforementioned findings on the relative career exploration construct instability.

Findings also supported H2 and offered partial support to H9. Respectable and very good reliability estimates were found for the total CCEI, which supported its validity. However, a tradeoff between the number of items and reliability estimates was empirically verified for the first-order factors. This seemed to be aligned with psychometric literature (Almeida & Freire, 2003; Marôco & Garcia-Marques, 2006). Analyses into a measure with fewer items were explored, but the reliability estimates

were reduced for the CCEI subscales. Future discussions with career development researchers and practitioners on whether the practical advantages of a measure with fewer items might compensate for the reliability tradeoff could be conducted.

3. CCEI internal structure across groups

Results on the CCEI factorial equivalence for groups were obtained and yielded additional evidence on the CCEI internal structure validity. Evidence pointed to the CCEI configural and metric equivalence for girls and boys in cross-sectional and longitudinal designs, thus supporting H5 and H8. These findings indicated that although mean differences for genders in career exploration have been often found (e.g., Faria et al., 2015; Königstedt, 2011; Oliveira & Taveira, 2014; Ramos, 2012; Taveira et al., 1998), girls and boys seem to similarly represent the career exploration construct, resembling the CCEI dimensional structure. These findings could be aligned with literature suggesting a similar cognitive representation of the working world for girls and boys, with differences in such a representation being stimulated when women- and men-predominated activities are covered (Gottfredson & Lapan, 1997; Tracey & Caulum, 2015; Weigfield et al., 2002). These results could, therefore, have relied on the presentation of the CCEI as a general measure of children's career exploration, with no items covering female or male dominated activities.

As for school levels, cross-sectional findings partially supported H6 and longitudinal evidence supported H7. These findings seemed to bring the statistical value of the results into question (Kline, 2004). Although findings point toward metric non-invariance of the high-order factor for fifth- and sixth-graders in the cross-sectional design, differences in the standardized measurement weights, reliability estimates and correlation coefficients for school levels were small in magnitude. These cross-sectional results seemed even more questionable when facing longitudinal evidence suggesting the CCEI configural and metric equivalence of the first- and second-order factors over time. Still, further research could replicate cross-sectional and longitudinal data collections to clarify these results.

Factorial equivalence for girls and boys presenting weak or average and good or very good literacy proficiency levels was found, thus supporting H10. These findings could have been fostered by concerns in the construction of the CCEI, such as maximizing the items' simplicity and avoiding double-barreled formulations (Field, 2009; Hogan, 2003; Johns, 2010). If such concerns had not been realized, then children could have experienced difficulties in the understanding of the items' content. While these concerns did not manifest themselves in the results, study personnel supported students

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who presented reading and/or learning difficulties during the administrations of the CCEI. Hence, a question remains on whether invariance was influenced by the study personnel's support to those students experiencing reading challenges during the survey. Future research could test the CCEI factorial invariance for groups of children presenting weak or average literacy proficiency levels, benefiting and not benefiting from study personnel's support in data collection.

It is also worth comment that the literacy proficiency levels relied on children's course grades. Literacy proficiency was assessed in this manner because it is currently not possible to validly and reliably assess the reading comprehension of Portuguese fifth- and sixth-grade children (Ribeiro et al., 2010). Still, the CCEI's applicability to Portuguese fifth- and sixth-graders presenting different reading comprehension levels could be further examined following advances in such an assessment. In addition, current advances in the assessment of reading comprehension during elementary school years (e.g., Cadime et al., 2014) could serve future studies with the CCEI. For example, emerging reading comprehension measures could be used to identify students' readability levels at the end of elementary school and determine which readability levels are required for children to complete the CCEI at the beginning of middle school. This would be important as children's literacy skills are usually assumed but rarely examined when using self-report measures (Jensen et al., 2006; Watson & McMahon, 2008). Moreover, these sorts of studies could be important to stimulate research focused on the articulations among students' careers and academics, which have been theoretically and empirically suggested (e.g., Araújo, 2009; Creed et al., 2007; Fouad et al., 2010; Noack et al., 2010).

Although no other sub-groups of participants were analyzed, the applicability of the CCEI can continue to be examined. In consonance with calls to study the career development of specific groups (e.g., Faria, 2013; Gonçalves & Coimbra, 2007; Oliveira et al., in press; Silva & Marques, 2015), the use of the CCEI with, for example, children living with birth families or foster care institutions, children of immigrant or native families, and those living with employed or unemployed parents could be compared. Following the international collaboration in the childhood career development field (Watson et al., 2015), the CCEI could also be adapted and tested in other countries, thus contributing to broaden the study of children's career exploration in different cultures. These efforts would be equally useful to move forward in developmental-contextual and systems perspectives of children's career development (Araújo & Taveira, 2009; Vondracek et al., 2014) as well as to acknowledge macro-systemic variables impacting such a process (Oliveira & Taveira, 2016; Taveira et al., in press).

However, regarding the application of the CCEI to groups, a limitation can be identified. Although data on children's SES, academic achievement and location on northern or central Portugal were

collected, the CCEI factorial invariance for these groups was not examined due to an unbalanced number of participants across groups (Harrington, 2009). Still, future studies could recruit broader samples of Portuguese fifth- and sixth-graders and offer this currently missing information.

4. CCEI nomological network

Evidence on the CCEI nomological network was provided while testing relations among the CCEI, career and academic variables. Empirical support for H11.1, H11.2, H11.3 and H11.4 was found.

The positive associations among the CCEI scores and self-efficacy expectations for academic, leisure and extracurricular activities seemed consistent with literature indicating that children are likely to engage in activities they successfully expect to perform (Bandura et al., 2001; Lent, 2004; Lent et al., 1999, 2004). These findings seemed also aligned with our interactive-motivational framework (Oliveira & Taveira, 2016) and affirmed the need to cover social cognitive career mechanisms since childhood (Lent & Brown, 2013; Turner & Lapan, 2005). In this sense, further research could examine (a) the role of children's career exploration in the development and revision of self-efficacy expectations, (b) the influence of self-efficacy expectations in children's (dis)continuities in career exploration, as well as (c) their joint impact in the development of career preferences and intentions (Bandura et al., 2001; Blustein, 1989; Lent, 2004; Lent et al., 1994, 1999). Still, the magnitude of the correlations among these variables decreased from the third to the fourth occurrences of measurement. This might be consistent with results from other studies covering such an association with children and adolescents (e.g., Betz, 2000; Gonçalves, 2013; Inácio & Gamboa, 2008; Patton et al., 2004; Rogers et al., 2008; Turner et al., 2006). These findings could also be linked to children's shifts from in-breadth to in-depth forms of career exploration (Patton & Porfeli, 2007; Porfeli & Skorikov, 2010). During the first three occurrences of measurement, children could have been engaged in an in-breadth form of career exploration, coupling general career exploration with general self-efficacy expectations for academic, leisure and extracurricular activities. However, children could have started to engage in an in-depth form of career exploration, relying on self-efficacy expectations for specific activities, while preparing a transition for a new educational phase. Thus, future studies discerning in-breadth and in-depth forms of career exploration could help understand such a variability in the magnitude of the correlations among career exploration and self-efficacy expectations over time.

The relations between the CCEI scores and self-concept were also aligned with extant literature (e.g., Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003,

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2010). These results seemed to support the theoretical and empirical assumption that children's career exploration is coupled with an emerging sense of self (Porfeli et al., 2008; Porfeli & Lee, 2012; Porfeli et al., 2013; Taveira, 2000). As weak correlations were found during fifth- and sixth-grades, it would be useful to further check whether such a magnitude remains later on in the lifespan. Moreover, future longitudinal studies spinning childhood through adolescence and adulthood could investigate the factors facilitating career exploration and favorable self-concept in childhood. Such studies could also investigate the ways through which career exploration and self-concept in childhood may jointly impact self-construction and vocational identity later on in life (Ahn et al., 2015; Flum & Blustein, 2000; Hartung, 2015; Schmitt-Rodermund & Vondracek, 1999; Super, 1963; Taveira, 1999, 2000).

Also consistent with previous literature were the relations among the CCEI scores and locus of control (Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010). These relations seemed illustrative of the importance of career exploration for generalized internal expectancies of one's behaviors and outcomes (Schultheiss et al., 2005; Super, 1994). These results could also indicate that as career exploration relies on children's autonomy (Blustein, 1988; Blustein et al., 1995; Savickas, 2002), so does internal locus of control (Boggiano et al., 1991). As evidence has additionally shown that both career exploration and internal locus of control can be influenced by school experiences (Magnuson & Starr, 2000; Nazli, 2007; Schultheiss et al., 2005; Taveira, 1999), future studies could investigate the features of learning environments and school interactions that facilitate children's career exploration and internal locus of control. This scientific knowledge would sustain advances in the field and early career practices, which seem to positively impact children's career exploration and locus of control (e.g., Araújo et al., 2004; Pocinho, 2011).

The correlations between the CCEI scores and career planning were also consistent with the literature (e.g., Janeiro, 2010; Oliveira & Taveira, 2014; Ramos, 2012; Schultheiss & Stead, 2004; Stead & Schultheiss, 2003, 2010). These correlations could illustrate one's increased intentionality while engaging in career exploration (Blustein, 1988; Jordaan, 1963). Moreover, as career planning has been linked to career decision-making (Nazli, 2007; Schultheiss et al., 2005) and relies on career exploration experiences (Oliveira & Taveira, 2016; Super, 1994; Super & Hall, 1974; Taveira, 1999), these findings might support such an articulation and importance of children's career exploration and planning for the future. As children's career exploration and planning also set the bases for future career adaptability (Hartung, 2015; Hartung et al., 2008; Savickas, 1997, 2002, 2011; Super, 1994), further studies could identify factors and practical strategies to nurture these processes over childhood.

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Still, the correlations between the CCEI scores and academic achievement were not aligned with expectations, as no empirical support to H11.5 was found. This could be due to other variables such as vocational knowledge and achievement orientation (Schmitt-Rodermund & Vondracek, 1999; Schmitt-Wilson & Welsh, 2012), which perhaps play a mediator role in the association among career exploration and academic achievement. It might also be the case that career exploration is directly related to academic processes, experiences and figures rather than academic results. Such a possibility would be consistent with evidence highlighting the important role of teachers and academic environments in career exploration (e.g., Dias & Nascimento, 2010; Flouri et al., 2015; Nazli, 2007; Noack et al., 2010; Schultheiss et al., 2005) as well as the impact of career exploration in academic processes (e.g., Araújo, 2009). Thus, additional studies articulating career exploration with academic processes and contexts could be enriching for this line of research (Oliveira et al., in press).

Evidence on the CCEI nomological validity can still be further expanded. The relations among career exploration and other career dimensions, such as career awareness (Hartung et al., 2005; Ferrari et al., 2015) could be further examined. Moreover, the CCEI predictive validity could be investigated. For example, it would be useful to check the predictive role of the CCEI scores during fifth- and sixth-grade in vocational identity, career adaptability and career decision-making later on in the lifespan. This would expand the CCEI nomological validity as well as confirm/infirm theoretical and empirical considerations suggesting that career meta-competences (i.e., identity and adaptability) are preceded by the career exploration experiences previously lived in childhood (e.g., Hartung, 2015; Hartung et al., 2008; Hirschi, 2009; Porfeli & Lee, 2012; Porfeli et al., 2013; Savickas, 2002; Schmitt-Rodermund & Vondracek, 1999). Our interactive-motivational framework could also be revised and tested according to findings derived from further examinations of the CCEI nomological network.

However, one limitation can be assigned to this section of our empirical study. Indeed, evidence on the CCEI nomological network was obtain only considering the career exploration total scores. This was due to the fact that the literature supported such a nomological test, based on theoretical and empirical assumptions focused on children's career exploration. Given the scarce systematic research on children's career exploration and its lower attention compared to adolescence and adulthood, specific assumptions for each CCEI's indicator nomological network were not established nor tested. Still, advances in the childhood career exploration and development research domain could help deepen the scientific knowledge of middle school children's curiosity, exploratory resources and self in life roles, thus enabling a test of nomological networks of these CCEI's indicators in the future.

CONCLUSION

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The literature has increasingly affirmed childhood as a foundational period for career development, during which children are socialized to work and interact with multiple figures and contexts (Araújo & Taveira, 2009; Hartung et al., 2005; Magnuson & Starr, 2000; Schultheiss, 2008; Watson et al., 2015). One of the main topics highlighted in the childhood career development research agenda has been the need to discern, assess and investigate its core constructs (Porfeli et al., 2008). This would be relevant to sustain the reinvigoration of theory and research in this field as well as the evaluation of early career interventions (Hartung et al., 2005; Schultheiss, 2008; Watson et al., 2015). This would also be aligned with a general need in the career literature for core career constructs to be targeted and psychometric sound measures to be disclosure in order to advance developmental and systemic studies of career development over the lifespan (Vondracek et al., 2014).

Moving from the general literature of childhood career development, this dissertation identified career exploration as a central dimension of such process. However, career exploration has been lacking systematic attention in the childhood career development field (Oliveira et al., in press; Patton & Porfeli, 2007). Throughout this dissertation, middle school childhood was additionally highlighted as an important period of the lifespan (Porfeli et al., 2008), casting “the dawn of vocational development” (Porfeli et al., 2008, p. 26) and impacting career processes and results later on in life (e.g., Lawson et al., 2015). However, limitations in the coverage and scientific knowledge of career exploration and development in middle school childhood seemingly exist. Moreover, limitations in self-report measures used to assess middle school children’s career exploration can be identified, lacking the psychometric information required to guarantee the quality of a measure (International Test Commission, 2014). This study, therefore, introduced a new measure to assess middle school children’s career exploration, hoping it would help advance the field and overcome these limitations. Six main conclusions can be retrieved from the overall work underlying this dissertation and are next expanded.

First, this dissertation identified a paradox from a social tendency of protecting children from work to the socialization of children to work across accepted settings and activities (e.g., Goldstein & Odham, 1979). The recognition of this paradox seemed an important contribution of this dissertation to sensitize readers to the centrality of childhood career development and to stimulate advances in this field (Cinamon & Dan, 2010). Indeed, advancing the field’s scientific knowledge could help protect children from harmful types of work that put their human, career development and wellbeing at great risk. Alternatively, it could stimulate systematic age-appropriate interventions to foster career development over the school years. These practices seem to positively impact children’s human and career development (Araújo et al., 2004; Figueira, 2012; Pocinho, 2011; Turner & Conkel, 2010;

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Turner & Lapan, 2005). They seem also to hold the potential to prepare children to make future academic and career decisions, become active citizens and adaptable within unstable educational and work environments (Day, 1968; Lei número 46/86, 14 outubro; Guichard, 2001; Leão, 2006; Moreno, 2008; Savickas, 2002; Taveira, 1999; Watson et al., 2015). Thus, while acknowledging such a paradox, this dissertation might stimulate advances in the field and early career practices aligned with Portuguese governmental and educational missions.

Second, this dissertation moved from the general childhood career development literature to the presentation of a specific focus on children's career exploration. This constitutes an important contribution of this dissertation, as such a theoretical organization led to conclusion that children's career exploration is a core construct that can be framed in the general childhood career development literature, but also specifically addressed. This dissertation could, therefore, stimulate a more systematic attention to children's career exploration (Oliveira et al., in press; Patton & Porfeli, 2007; Taveira, 1999) within a broader lens of childhood career development.

Third, this dissertation identified challenges in the chronological definition of childhood. The childhood career development field has adopted a chronological definition of childhood spinning until the 14 years of age (e.g., Hartung et al., 2005; Super, 1980, 1994). However, such a chronological definition might not be consistent with the one adopted in career development research with adolescents or in other fields. This seems to be translated in career exploration measures and empirical results overlapping children and adolescents. Following developmental-contextual and systemic career perspectives as well as recognizing that life periods are cultural constructions (Arnett, 2000), this dissertation could help acknowledge that chronological definitions may vary for each person and her/his contexts and cultures. Thus, the increased international collaboration (Watson et al., 2015) could contribute to discuss the adequacy of the childhood chronological definition across cultures and sensitize the scientific and practical communities for the culturally-grounded nature of such definitions.

Fourth, this dissertation highlighted developmental-contextual and systems career perspectives (Vondracek et al., 2014; Vondracek et al., 1986). This perspective was most noticeable while considering the main settings of middle school children's career development (Eccles, 1999; Seligman et al., 1991; Super, 1980, 1994) in the contextualization of the CCEI items. Although the CCEI is a self-report measure to be completed by children, it offers a contextual and relational awareness to career exploration, which is aligned with a more integrative and comprehensive perspective of the construct (Blustein, 1997; Cheung, 2015; Flum & Blustein, 2000; Taveira & Moreno, 2003). This feature might stimulate (a) the use of the CCEI in systemic assessment protocols (Vondracek, 2004;

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Vondracek et al., 2014), (b) the combination of the CCEI with other tools, techniques and key-figures' reports on children's career exploration (e.g., parents, teachers, peers), adding evidence about the CCEI convergent and ecological validity (Araújo, 2009; B. Araújo, 2002; Vondracek, 2004; Vondracek et al., 2014), and (c) the middle school children's reflection on the life roles they currently perform and imagine themselves performing in the future. The contextualization of the CCEI items across the home, community and school settings constitutes, therefore, an innovative feature and is illustrative of a developmental-contextual and systems perspective of children's career exploration and development.

Fifth, this dissertation affirmed the possibility of assessing subjective aspects of career exploration with middle school children. Particularly, the self in life roles indicator can be deemed as another innovative feature of the CCEI, as it enables the coverage of children's imagined tryout of life roles in the future and anticipation of internal and external reactions to such a performance. This CCEI feature might, therefore, stimulate children's projection in the future, reflection on career issues and sensitize career researchers and practitioners to the subjective aspects of career exploration (Cheung, 2015; Flum & Blustein, 2000; Jordaan, 1963; Taveira & Moreno, 2003).

Sixth, this dissertation illustrated the complexity and thoroughness of constructing and validating a measure. Qualitative appreciations, cross-sectional and longitudinal designs, quantitative factor, multigroup, longitudinal invariance and correlational analyses were employed throughout this study. Experts, children and different data analyses were, therefore, relevant to yield complementary types of evidence of the CCEI construct validity (e.g., Adcock & Collier, 2001; Pedhazur & Schmelkin, 1991). Thus, it is possible to conclude that the construction and validation of a measure is an iterative and continuous process involving a number of procedures through which a measure is investigated. These thorough procedures are required to assure the quality of a measure (Cronbach & Meehl, 1995; Pais-Ribeiro, 2013) and seemed to have been illustrated here.

The overall evidence offered in this dissertation affords the possibility to present major guidelines for further administrations of the CCEI serving career research and/or practical purposes. Particularly:

- The CCEI provides a flexible, economically viable and contextual-sensitive assessment of Portuguese fifth- and sixth-grade children's career exploration due to its brief length, hierarchical structure and contextualization of items across the home, community and school settings;
- The CCEI yields scores for Curiosity, Exploratory Resources and Self in Life Roles subscales and total Career Exploration scale;

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- The CCEI scores are illustrative of middle school children's high/low curiosity, high/low use of exploratory resources, high/low reflection about themselves in future life roles and high/low levels of career exploration;
- The CCEI can be used in individual and in-group administrations;
- School/educational psychologists and career counselors further using the CCEI need training in the scientific knowledge of childhood career development and exploration as well as in the CCEI theoretical rationale, standard administration protocol and data interpretation;
- The CCEI can be used in cross-sectional and longitudinal designs covering Portuguese fifth- and sixth-grade children of both genders and presenting different literacy proficiency levels;
- The CCEI total scores sustain inferences on parallel high/low self-efficacy expectations for academic, leisure and extracurricular activities, self-concept, internal locus of control and career planning.

Words of caution while using the CCEI should, however, be noticed. As the CCEI is a general measure of middle school children's career exploration, it does not address specific tasks or activity domains. Thus, if a user intends to obtain a more specific activity-based assessment of career exploration, the CCEI would need to be coupled with other more specific measures of career exploration. Another word of caution has to do with the CCEI reliability. The CCEI total scale consistently offered good internal consistency reliability in this study, whereas the CCEI indicators may present low reliability estimates. Thus, future users are advised to consider this reliability issue, as they may prefer to use the CCEI total scale for this reason.

Main implications for future career research and practice can also be derived from this dissertation. Regarding future research, the CCEI's properties can continue to be addressed with other Portuguese and international samples in order to get additional evidence on its applicability to different groups of children and expand evidence of its nomological network. The use of the CCEI at an international level and/or its eventual role stimulating attention to children's career exploration could be relevant to the field's growing international collaboration (Watson et al., 2015) and to cross-cultural

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studies. In addition, the CCEI can be employed in cross-sectional and longitudinal studies with Portuguese fifth- and sixth-graders, expanding the scientific knowledge of middle school children's career exploration features, temporal dynamics and factors. Finally, the CCEI can be employed to assess the engagement of children in early career interventions (Porfeli et al., 2008). Indeed, a further normative study of the CCEI with a representative sample from urban and rural areas of northern, central, southern and isles of Portugal could yield CCEI norms for the Portuguese population. These norms would afford the possibility to identify children whose scores would be located in percentiles within, below or above average scores of Portuguese middle school children. This could be useful for career researchers and practitioners to identify middle school children who could benefit the most from early career interventions aimed at facilitating career exploration, preventing an early career exploration foreclosure and promoting a positive orientation to work (Ferrari et al., 2015; Patton & Porfeli, 2007; Porfeli et al., 2008; Taveira, 1999).

As for career practices, the CCEI can be used in the evaluation of early career practices' results (Porfeli et al., 2008). Indeed, the CCEI favors the evaluation of the efficacy of early career interventions. As tools to evaluate the efficacy of early career interventions are scarce and there is an increasing need to articulate research and practice in this field (Patton & McMahon, 2014; Schultheiss, 2008; Watson et al., 2015), the CCEI could be used in quasi-experimental designs evaluating control and experimental groups of middle school children assessed in pretest, posttest and follow-up moments. As the goals of early career practices often include career exploration (e.g., Araújo et al., 2004; Figueira, 2012; Pinto, 2002; Pocinho, 2011), the CCEI could, therefore, be useful to address the results of such practices and yield empirical evidence to the social and scientific communities on their relevance.

In addition, practices aimed at promoting career exploration over the school years should be sensitive to a developmentally-graded structure (Apter, 2006; Erikson, 1963; Vygotsky, 1998) and to the ecology of childhood career development and exploration (Araújo & Taveira, 2009; B. Araújo, 2002; Oliveira & Taveira, 2016; Taveira et al., in press). Taking the particularities of middle school children's career exploration into account (e.g., Borgen & Young, 1982; Falusso, 2011; Gottfredson, 1996; Howard et al., 2015; Pinto, 2002; Oliveira & Taveira, 2014; Ramos, 2012; Seligman et al., 1991; Turner & Lapan, 2005), career practices could foster girls' and boys' engagement in career exploration activities, such as (a) visiting community workplaces, (b) asking questions to familiar and extra-familiar people holding different jobs, (c) identifying behaviors, educational requirements and community concerns inherent to different occupations and workplaces, (d) contacting with women and men performing jobs socially predominated by the opposite sex, (e) observing and asking questions to

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professionals working in settings at which children often engage in leisure and extracurricular activities, (f) identifying current life roles, rehearsing time management skills and integrative narratives about the self, as well as (g) playing computerized career exploration games and activities.

Based on developmental-contextual and systems career perspectives, school/educational psychologists and career counselors could also involve parents, teachers, school leaders, community professionals and policy stakeholders in direct and indirect early career interventions. For example, consultancy with parents and teachers could include formal sessions to raise awareness on their impact on children's career exploration and development (Araújo et al., 2004). It could also stimulate educational practices at the family and school settings to support children's autonomy, reflection on their lived experiences and on the role of school for their future and societal contribution (Boggiano et al., 1991; Day, 1968; Guan et al., 2015; Liu et al., 2015; Taveira, 1999). In turn, community professionals could be invited to discuss their career experiences with children, present similarities with and differences from other jobs as well as collaborate in structured and career development oriented field trips (Law & McGowan, 1999). Finally, school leaders and policy stakeholders could establish partnerships with career researchers, practitioners and organizations, so that emotionally supportive and dialogical learning environments would be instilled as well evidence-based early career interventions would be systematically implemented and evaluated (Fouad et al., 2010; Kuijpers et al., 2011; Oliveira et al., 2015; Watson et al., 2015).

Concluding, the contributions of this dissertation advanced the international and Portuguese science devoted to childhood career development and exploration. The contributions also affirmed the growing trend for earlier interventions devoted to career and academic progress as well as enduring family, school, and community goals aimed at supporting students of all ages to make sound academic and career decisions in the future (Ferrari et al., 2015; Guichard, 2001; Oliveira et al., 2015; Patton & Porfeli, 2007; Schultheiss, 2008; Moreno, 2008; Taveira, 1999; Watson et al., 2015). Systematic interventions could help students to adaptively cope with challenging environments and socio-economic situations, improve their academic achievement and advance their overall development and citizenship (Portuguese Conselho Nacional de Educação, 2012; Portuguese Decreto-Lei número 139/2012, 5 julho; Portuguese Lei número 46/86, 14 outubro).

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APPENDIX

1. Notification of approval from the Portuguese General Direction of Education

de: mime-noreply@gepe.min-edu.pt
para: oliveira.iris.m@gmail.com

data: 11 de Janeiro de 2013 às 11:57
assunto: Monotorização de Inquéritos em Meio Escolar: Inquérito n° 0355100001

enviado por: gepe.min-edu.pt

Exmo(a) Senhor(a) Dr(a) Íris Martins Oliveira

Venho por este meio informar que o pedido de realização de inquérito em meio escolar n.º 0355100001 é autorizado uma vez que, submetido a análise, cumpre os requisitos, devendo atender-se às observações aduzidas.

Com os melhores cumprimentos

José Vitor Pedroso

Diretor de Serviços de Projetos Educativos

DGE (gepe.min-edu.pt)

Observações:

- a) A realização do Inquérito fica sujeita a autorização prévia das Direções dos Agrupamentos de Escolas.
- b) Dado que na investigação se obtêm dados pessoais para uso e tratamento em trabalho académico, exige-se a garantia de anonimato, confidencialidade e proteção dos mesmos. Deverá ser obtido o consentimento informado e a respetiva autorização dos inquiridos para realização do estudo e bem assim dos próprios alunos pelos seus representantes legais (menos de 18 anos). As autorizações assinadas pelos EE devem ficar em poder da Escola à qual pertencem os alunos.

Appendix

Table A1.

First sample: Parents' educational level and occupational category

| Occupational category | | Educational level <i>n</i> | | | | | Total <i>n</i> (%) |
|-----------------------|---------|----------------------------|-----------------------|-----------------------|-------------|-----------|--------------------|
| | | 1 st cycle | 2 nd cycle | 3 rd cycle | High school | College | |
| 0 | Mothers | 0 | 0 | 0 | 0 | 4 | 4 (1.3) |
| | Fathers | 0 | 0 | 1 | 1 | 0 | 2 (.6) |
| 1 | Mothers | 0 | 0 | 0 | 1 | 63 | 64 (20.4) |
| | Fathers | 0 | 1 | 3 | 5 | 6 | 15 (4.8) |
| 2 | Mothers | 1 | 0 | 5 | 9 | 4 | 19 (6.1) |
| | Fathers | 0 | 0 | 0 | 0 | 46 | 46 (14.7) |
| 3 | Mothers | 1 | 2 | 5 | 17 | 6 | 31 (9.9) |
| | Fathers | 2 | 1 | 2 | 12 | 2 | 19 (8.6) |
| 4 | Mothers | 9 | 10 | 21 | 17 | 4 | 61 (19.5) |
| | Fathers | 0 | 1 | 1 | 6 | 3 | 11 (3.5) |
| 5 | Mothers | 0 | 2 | 2 | 1 | 0 | 5 (1.6) |
| | Fathers | 6 | 8 | 11 | 18 | 12 | 55 (18.3) |
| 6 | Mothers | 1 | 1 | 0 | 0 | 0 | 2 (.6) |
| | Fathers | 3 | 1 | 2 | 0 | 1 | 7 (2.2) |
| 7 | Mothers | 4 | 6 | 5 | 1 | 0 | 16 (5.1) |
| | Fathers | 5 | 10 | 15 | 2 | 3 | 35 (11.2) |
| 8 | Mothers | 0 | 1 | 0 | 0 | 0 | 1 (.3) |
| | Fathers | 0 | 3 | 6 | 4 | 0 | 13 (4.2) |
| 9 | Mothers | 4 | 6 | 5 | 1 | 0 | 16 (5.1) |
| | Fathers | 4 | 2 | 4 | 3 | 2 | 15 (4.8) |
| 10 | Mothers | 11 | 12 | 5 | 16 | 6 | 50 (15.9) |
| | Fathers | 6 | 5 | 7 | 3 | 1 | 22 (7.03) |
| Total <i>n</i> (%) | Mothers | 31 (9.9) | 40 (12.8) | 48 (15.3) | 63 (20.1) | 87 (27.8) | |
| | Fathers | 26 (8.3) | 32 (10.3) | 52 (16.6) | 54 (17.3) | 76 (24.3) | |

Note. 0 = Military occupations. 1 = Executive services representatives. 2 = Intellectual and scientific occupations. 3 = Inter-medium technicians and occupations. 4 = Administrative personnel. 5 = Personnel of services, trades and security. 6 = Qualified workers of farms, fishing and forest. 7 = Qualified workers of industry and construction. 8 = Installing operators. 9 = Non-qualified workers. 10 = Inactive population, such as unemployed, retired or died parents.

Appendix

Table A2.

Second sample: Parents' educational level and occupational category

| Occupational category | Educational level <i>n</i> | | | | | | Total <i>n</i> (%) | |
|-----------------------|----------------------------|-----------------------|-----------------------|-----------------------|-------------|-----------|--------------------|-----------|
| | None | 1 st cycle | 2 nd cycle | 3 rd cycle | High school | College | | |
| 0 | Mothers | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0) |
| | Fathers | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0) |
| 1 | Mothers | 0 | 0 | 0 | 0 | 0 | 7 | 7 (1.5) |
| | Fathers | 0 | 0 | 0 | 3 | 1 | 9 | 13 (2.7) |
| 2 | Mothers | 0 | 0 | 0 | 0 | 0 | 3 | 3 (.6) |
| | Fathers | 0 | 0 | 0 | 0 | 0 | 64 | 64 (13.4) |
| 3 | Mothers | 0 | 4 | 2 | 10 | 19 | 4 | 39 (8.2) |
| | Fathers | 0 | 1 | 0 | 9 | 14 | 0 | 24 (5.0) |
| 4 | Mothers | 0 | 0 | 1 | 4 | 15 | 1 | 21 (4.4) |
| | Fathers | 0 | 0 | 1 | 3 | 9 | 1 | 14 (2.9) |
| 5 | Mothers | 0 | 0 | 8 | 14 | 12 | 7 | 41 (8.6) |
| | Fathers | 0 | 3 | 12 | 18 | 17 | 8 | 48 (10.0) |
| 6 | Mothers | 0 | 2 | 0 | 1 | 0 | 0 | 3 (.6) |
| | Fathers | 0 | 4 | 1 | 1 | 0 | 0 | 6 (1.3) |
| 7 | Mothers | 1 | 13 | 27 | 10 | 5 | 1 | 57 (11.9) |
| | Fathers | 3 | 26 | 41 | 14 | 8 | 3 | 95 (19.9) |
| 8 | Mothers | 0 | 2 | 6 | 4 | 3 | 2 | 17 (3.5) |
| | Fathers | 0 | 5 | 14 | 10 | 3 | 0 | 32 (6.7) |
| 9 | Mothers | 1 | 13 | 27 | 10 | 5 | 1 | 57 (11.9) |
| | Fathers | 0 | 3 | 2 | 2 | 1 | 0 | 8 (1.7) |
| 10 | Mothers | 0 | 9 | 13 | 11 | 7 | 0 | 40 (8.4) |
| | Fathers | 1 | 16 | 10 | 6 | 7 | 4 | 44 (9.2) |
| Total <i>n</i> (%) | Mothers | 2 (.4) | 43 (8.9) | 84 (17.6) | 64 (13.4) | 66 (13.8) | 27 (5.6) | |
| | Fathers | 4 (.8) | 58 (12.1) | 81 (16.9) | 66 (13.8) | 60 (12.6) | 89 (18.6) | |

Note. 0 = Military occupations. 1 = Executive services representatives. 2 = Intellectual and scientific occupations. 3 = Inter-medium technicians and occupations. 4 = Administrative personnel. 5 = Personnel of services, trades and security. 6 = Qualified workers of farms, fishing and forest. 7 = Qualified workers of industry and construction. 8 = Installing operators. 9 = Non-qualified workers. 10 = Inactive population, such as unemployed, retired or died parents.