Pedro Miguel Gomes Cordeiro

COGNITIVE-MOTIVATIONAL DETERMINANTS OF CAREER DECISION-MAKING PROCESSES: VALIDATION OF A CONCPEPTUAL MODEL

A Dissertation submitted in partial fulfillment of the requirements for the Degree of Doctor of Psychology (Specialty area of Educational Psychology) at the University of Coimbra and the University of Lisbon, under the supervision of Doctor Maria Paula Paixão, PHD, and co-supervision of Doctor Marlies Lacante, PHD.

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Doctoral Dissertation

Title: Cognitive-Motivational Determinants of Career Decision-Making Processes: Validation of a Conceptual Model

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Cover illustration:

Vestígios Atávicos Depois da Chuva

Salvador Dali, 1934

Resumo

No 12.º ano os adolescentes são chamados a tomar uma decisão acerca da sua intenção de seguir para o ensino superior ou entrar no mercado de trabalho. A concretização desta tarefa mobiliza processos psicológicos múltiplos que nem sempre se traduzem em escolhas de carreira alinhadas com os verdadeiros interesses, valores e objetivos do indivíduo, e não poucas vezes são acompanhados de sentimentos de alienação e mal-estar. No entanto, a investigação tem sido pouco consensual relativamente aos processos e dinâmicas que subjazem à escolha de percursos de carreira mais ou menos autodeterminados, bem como à forma como estes processos facilitam ou colocam obstáculos à resolução bem-sucedida das tarefas de transição de carreira (Waterman, 1990). Por outro lado, as explicações fornecidas refletem uma análise independente dos determinantes cognitivos, motivacionais ou sociais dos processos de tomada de decisão de carreira, centrados em investigação transversal, e fundamentalmente focados em construtos de natureza estritamente vocacional. Importa, assim desenvolver modelos concetualmente mais integradores acerca dos processos de tomada de decisão de carreira (Super, Savickas & Super, 1996). Nesta dissertação apresentamos um estudo compreensivo acerca da forma como as variáveis contextuais, cognitivas e motivacionais se articulam para predizer trajetórias de decisão de carreira e ajustamento em adolescentes que estão a fazer a transição do ensino secundário para ensino superior/mercado de trabalho. Neste sentido, testámos um modelo concetual integrador destes diferentes processos, cujos construtos são obtidos a partir de modelos motivacionais, sociocognitivos e clínicos da Psicologia. O estudo apresentado tem um *design* longitudinal com dois momentos de medida: um o primeiro período do ano letivo 2012-20113, e o segundo no terceiro período do ano letivo de 2013-2014. Neste estudo participaram estudantes do 12.º ano, matriculados em escolas de Ensino secundário Português. Os alunos foram avaliados em vários construtos, incluindo a perceção dos pais, as necessidades psicológicas, crenças de autoeficácia de carreira, o processamento esquemático, os processos de exploração e tomada de decisão de carreira, a regulação do compromisso de carreira e o bem/mal-estar psicológico. Os dados apontam para que as experiências de suporte parental das necessidades parecem associar-se, nos adolescentes, a um sentimento de maior satisfação das necessidades e ao aumento da confiança na capacidade de tomar uma decisão de carreira, o que, por sua vez, conduz à exploração proactiva as opções de carreira, a escolhas mais autodeterminadas e a sentimentos de maior bem-estar. Em termos gerais, estas associações parecem indicar a existência de trajetórias de desenvolvimento da identidade de carreira e ajustamento substantivamente distintas. Uma primeira essencialmente autodeterminada e uma segunda mais controlada e disfuncional. Este argumento, apesar de relativamente especulativo, estende a distinção feita pela SDT acerca da existência de trajetórias "bright" e "dark" de desenvolvimento, para o domínio do desenvolvimento de carreira. Sugere igualmente a necessidade de diferenciar intervenções de natureza promocional e remediativa, em função do grau de autodeterminação dos processos de exploração e tomada de decisão vocacional. Esperamos que com esta investigação tenhamos inspirado o desenvolvimento de intervenções de carreira mais integradas, centradas no desenvolvimento de processos psicológicos mais autodeterminados.

Palavras-chave: Transições de carreira, parentalidade percebida, necessidades psicológicas básicas, autoeficácia, funcionamento esquemático disfuncional, desenvolvimento da identidade, motivos de tomada de decisão de carreira, ajustamento, intervenções de carreira.

Abstract

In the 12th grade, students are called to make a decision about their intention to proceed for higher education or to entering the job market. The accomplishment of this task mobilizes multiple psychological processes that not always translate into career choices aligned with the individual´s true interests, values and career goals, and quite often are accompanied by feelings of alienation and ill-being. However, research has gathered little consensus about the processes and dynamics that determine the selection of more, or less, self-determined career pathways, as well as the way in which these processes facilitate or hinder the successful resolution of career transition tasks (Waterman, 1990). On the other hand, the explanations provided often reflect the independent exam of the cognitive, motivational and social determinants of the career decision-making processes, rooted in cross-sectional research studies and are essentially focused on constructs which bear a strict vocational nature. Thus, it seems important to develop more integrative conceptual models about the processes involved in career decision-making (Super, Savickas & Super, 1996). In this dissertation we present a comprehensive study of the way as several contextual, cognitive and motivational variables combine to predict differentiated trajectories of career decision-making and adjustment in adolescents who are making the transition from high school to higher education/job market. With this purpose in mind, we developed and tested an integrative conceptual model, which includes constructs obtained from motivational, social cognitive and clinical models. The study presented has a longitudinal research design with two measurement waves: the first was carried out in the first term of the 2012-2013 school year and a second in the third term of the 2013-2014 school year. In this study participated 12th grade students enrolled in Portuguese secondary schools. Students were assessed in several constructs, including perceived parenting, psychological needs, career self-efficacy beliefs, dysfunctional schematic functioning, career exploration and commitment-making processes, regulation of career commitments and psychological well/ill-being. Findings suggest that experiences of parental need-support seem to associate to the adolescents´ feelings of higher need satisfaction and to an increased self-confidence in career decision-making, what, in turn, leads to the proactive exploration of career options, to more self-determined career choices and to feelings of higher well-being. On the other hand, they suggest that active parental need-thwarting experiences associate to the adolescents´ to an increase in feelings of psychological need frustration, which, in turn, lead to exploration and career choice processes based on dysfunctional schematic functioning, namely to ruminative exploration an exploration of career options, controlled choices and to the experience of higher ill-being. Overall, these associations seem to indicate the existence of substantively distinct pathways of career identity development and adjustment, one essentially self-determined and adaptive, and a second one more controlled and dysfunctional. This argument, despite somehow speculative, extends the SDT-based distinction between bright" and "dark" pathways of development, to the field of career development. It also suggests the need to differentiate career interventions of a promotional and remediate nature, in function of the degree of self-determination that is associated to the processes of exploration and commitment-making. We hope that with this research we have inspired the development of more integrated career interventions focused on building more self-determined psychological processes.

Keywords: Career transitions, perceived parenting, basic psychological needs, self-efficacy, dysfunctional schematic processing, identity development, career decision-making self-efficacy, motives for career decision-making, adjustment, career interventions.

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Acknowledgements

To my wife and to my parents

To my daughter,

My dream, my joy, my pride.

Subtitle

Character 1

I know what I am going to do when I grow up

Character 2

Well, I don´t

Illustration:

Career Identity Development From the Eyes of a Child

Maria Leonor, 2015

Esta dissertação dá corpo a um percurso feito de paixão e trabalho árduo, de esperança e otimismo, de espírito crítico e compromisso pessoal. Foi desafio e estímulo, frustração e reconquista. Foi estrada, foi caminho e, se Deus quiser, percurso. Devo-o a muitos, por tanto e tão bom apoio que tenho recebido.

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humildade, bem como a consciência de que a investigação é, também ser-se pessoa, ser-se família. Nunca vou esquecer a forma como me, e nos, recebeu em sua casa, me/nos apresentou aos seus familiares, com quem partilhámos momentos únicos. Foi a nossa família, em Lovaina, o sentimento de estar em casa, de ser bem-vindo, e a vontade de voltar. Willy, tenho saudades suas. Vou tê-las para o resto da minha vida. Até sempre, meu amigo… (Falecido a 27 de Agosto de 2014).

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1

This Dissertation in the Context of Motivational and Cognitive Research

The aim of this dissertation was to test an integrated model of the cognitive-motivational antecedents of adjustment and career identity development during the transition from high school to higher education/job market. A sample of 755 Portuguese high school students was followed during 9 months. Students were assessed in a two-wave longitudinal research design for various constructs, including perceived parenting, psychological needs, self-efficacy beliefs, schematic functioning, identity dimensions and regulations and well/ill-being. Before we proceed to the presentation of the empirical studies included in this dissertation, we first provide a general overview of the self-determination perspective on parenting, psychological needs, identity development and regulation of career commitment-making (Deci & Ryan, 1985; 2000). We give special attention to their multivariate relations and intrinsic dynamics and in the prediction of the quality of career decision-making and adjustment processes. Next, we propose an integrated conceptual model of the contextual, and cognitive-motivational antecedents of career identity and adjustment, rooted on the convergence of Self-Determination Theory, Schema Model (Young & Kolsko, 1994), Social-cognitive career theory (Lent, Brown & Hacket, 1994) and Identity Theory (Luyckx, Vansteenkiste, Goossens & Duriez, 2009). We establish the groundings for conceptual convergence, assuming that the influence of parenting on adolescents´ career exploration, commitment-making and well/ill-being, is mediated by a combination of cognitive and motivational subjective experiences, in distinct mediational pathways. Across the introductory chapter we also explain the relevance of targeting 12th grade students for the processes examined, and the relevance of capturing their dynamics through a longitudinal research design. Finally, a short overview is presented of the empirical studies comprised in this dissertation.

Perspectives on Parenting

For many decades the dimensional and typological approaches to parenting have mapped out the key components of parenting and explored their relations to predict unique variance using developmental criteria (Bean, Barber, & Crane, 2006).In general, both approaches essentially agreed that the quality of parent-child interactions would be adequately captured in a set of three interrelated dimensions, featuring parental support, behaviour control and psychological control (Barber & Xia, 2013). *Parental support* describes the parental attitudes of autonomy-support, that promote self-initiation, freedom of expression and intrinsic motivation (Barber, 1996; Deci & Ryan, 1985), and responsiveness-warmth, related to the affective and involved ways through which parents interact with their children (Barber, Stolz, & Olsen, 1995; Soenens, Duriez, Vansteenkiste, & Goossens, 2007). *Behaviour control* features the positive and active parental efforts intended to regulate or provide structure for the children's behaviour (Barber, 1996; Steinberg, 1990, 2005). Finally, *psychological control* characterizes the manipulative and autonomy-inhibiting parental attitudes of guilt-induction, shaming, love withdrawal and invalidation of the child's perspective which impairs the child's individuality (Barber, 1996; 2002; Barber & Harmon, 2002). Yet, the broad consensus gained in the identification of the parenting dimensions contrasts with the diverse modelling approaches that have been used to examine their dimensionality. On the one hand, the research conducted on the dimensional approach to parenting (e.g., Gray & Steinberg, 1999) modelled one or two of the three parental dimensions at a time, at the risk of exaggerating or misinterpreting the effect of specific dimensions, when other dimensions were not considered. On the other hand, the research based on the typological approach to parenting (e.g., Baumrind, 1966) usually aggregated specific dimensions to form different parenting styles or clusters, making it impossible to isolate and to examine

the unique or joint effects of specific parental dimensions on motivational outcomes (Bean, Barber & Crane, 2006).

Over time, the diversity of the modeling approaches adopted has subsidized the persistence of ambiguities at both the conceptual and operational levels (Bean, Barber & Crane, 2006), making findings less cumulative. For instance, despite the broad consensus obtained for the linear positive effects of supportive/nurturing parenting based on developmental criteria (for a review see Ryan & La Guardia, 2000), there is still some confusion regarding the linear, piecewise or even non-linear effects of behaviour control on motivational outcomes (Soenens & Byers, 2012; Soenens & Vansteenkiste, 2010). Likewise, despite the consistent support obtained for the effects of parental psychological control on maladjustment (e.g., Barber, 1996; Wang, Pomerantz, & Chen, 2007), it is still not absolutely clear how other dimensions of parental psychological control relate to ill-being and maladjustment (e.g., rejection, chaos; for a review, see Soenens & Vansteenkiste, 2010).

To this ambiguous findings contributed the fact that the parenting dimensions/typologies have been identified from predominantly inductive approach (e.g., psychological control; Schaefer, 1965), with parenting dimensions being inferred from the results of empirical research. Despite having produced important insights on the characteristics and dimensionality of the parenting dimensions, this approach has recently given place to more top-down or theory driven studies (Steinberg, 2005) that attempted to provide more conceptual and operational unity to the findings. For the purpose of this dissertation, we will pay special attention to the parenting research conducted from the edge of Self-determination theory (Deci & Ryan, 1985; 2000).

A SDT Perspective on Parenting, Psychological Needs and Adjustment

In Self-Determination Theory (Deci & Ryan, 2000, 2008), human motivation and personality develop via a continual dialectical interplay between organismic tendencies towards psychological development and integrity (Ryan, 1995) and the way primary social contexts either support, deprive or actively thwart those universal tendencies (Deci & Ryan, 1985; Vansteenkiste & Ryan, 2013). This process is assumed to be driven by innate dispositions that guide individuals towards growth and to become more integrated in their functioning, founded on the complementary processes of activating intrinsic motivations, and internalizing non-intrinsic motivations (Deci & Ryan, 2000)[1].

According to SDT, for intrinsic motivation and internalization to manifest to the fullest extent, significant social contexts (e.g., family or school) must support the child´s autonomy, competence, and relatedness needs. Parents support the child's needs satisfaction when they allow for volitional functioning (*PVF*; Deci & Ryan, 1985, 2000; Reeve & Jang, 2006; Deci & Ryan, 1985, 1987), provide structure for behaviour **(**Barber, 1996; Barber, Olson, & Shaggle, 1994; Grolnick & Ryan, 1989) and interact with the child in warm, involved and responsive ways (Baumeister & Leary, 1995; Ryan, 1995; Deci & Ryan, 2000). Allow for volitional functioning supports the child´s need for autonomy. Autonomy-supportive parents provide an optimal amount of choice for their actions, or an adequate rationale when choice is constrained, and refrain from using insidious, manipulative and invasive practices (Deci & Ryan, 1985, 2000). In addition, provide structure for behaviour is assumed to support the need for competence. Competence supportive parents make positive efforts to regulate and structure the child's behavior (e.g., manners, study activities, and involvement with peers) through provision

[1] Intrinsic motivation refers to a natural desire of individuals to engage in interesting and stimulating activities. Internalization describes natural inclination to integrate extrinsic aspects of the social environment in the self (Deci & Ryan, 1985, 2000).

of clear expectations/rules, active monitoring of behavior and positive informative feedback for the child´s accomplishments (e.g., Barber, 2002; Farkas & Grolnick, 2010). Finally, warm-responsive interactions to primarily support the child´s need for relatedness. Parents support relatedness whenever they attune and empathize with their child´s experiences and feelings and relate to them in warm and accepting ways (Soenens, Vansteenkiste, Duriez & Goossens, 2006). In sum, for SDT, when parents support the three needs they make children more prone to develop feelings of autonomy, competence and relatedness need satisfaction (Deci & Ryan, 2000; Ryan & Deci, 2000). Autonomy satisfaction relates to the experience of self-endorsement, volition and choice in the initiation and regulation of behavior (e.g., deCharms, 1968; Deci & Ryan, 1985, 1987). Competence satisfaction corresponds to feelings of effectiveness and self-efficacy related to the achievement of desired outcomes (e.g., Deci & Ryan, 1985; Schunk & Zimmerman, 2007; White, 1959). Finally, relatedness satisfaction is expressed in the feelings of being genuinely connected, appreciated and accepted by others, and to be part of warm, supportive and caring interpersonal relationships (Baumeister & Leary, 1995; Ryan, 1995).

For SDT, when individuals feel that their three psychological needs are satisfied (BPNT; Deci & Ryan, 2000), the integrative process energizes them towards greater psychological integrity, optimal integrated functioning and well-being in ways consistent with the self (e.g., Deci & Ryan, 2000; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Ryan & Deci, 2000; Sheldon & Niemiec, 2006; Sheldon, Ryan & Reis, 1996; Vansteenkiste & Ryan, 2013). However, parents vary considerably in the way as they support the child´s needs. Some parents may even behaving in such a way that actively thwarts the satisfaction of the psychological needs, particularly when they use controlling and pressuring socialization techniques to regulate their child´s behavior. To explain these

behaviors, SDT makes a distinction between external and internal forms of parental control. *External control* refers to the parental attitudes that regulate the child's behavior through reward contingencies, such as punishments (e.g., coercion; Skinner, Johnson & Snyder, 2005) or rewards (e.g., prizes for achievement; Soenens & Vansteenkiste, 2010). On the other hand, *psychological control* characterizes the internally controlling and insidious manipulative techniques aimed at controlling the psychological world and behaviour of the child (Deci & Ryan, 2000; Soenens, Park, Vasteenkiste & Mouratidis, 2012; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012; Soenens & Vansteenkiste, 2010). These messages may be accompanied by attitudes of derision, criticism or emotional outbursts that give a negative emotional tone to the interactions with the child. Psychological control, expressed in attitudes of guilt-induction, shaming and love withdrawal used when students fail to comply with parental expectations, primarily thwarts the child´s need for autonomy. External control, expressed in attitudes of rejection, criticism, neglect (Skinner, Johnson & Snyder, 2005) primarily thwart the child´s need for relatedness. Beyond the external-internal distinction SDT posits also that parents who provide negative corrective feedback to performance and compare the child´s unfavorably to colleagues actively thwart the child´s need for competence (Mouratidis, Lens & Vansteenkiste, 2010). SDT argues that the chronic exposure to parental need-thwarting practices make the child more vulnerable to develop the subjective experiences of autonomy, competence and relatedness need frustration (Vansteenkiste & Ryan, 2013). *Autonomy frustration* refers to the perceptions of being controlled through externally enforced or self-imposed pressures (e.g., perception of pressure from parents, or from self-imposed high standards for achievement), *competence frustration* describes feelings of being incompetent or a failure to accomplish achievement-related goals (e.g., perception of not having the necessary skills to succeed in school) and *relatedness*

frustration conveys feelings of being apart from others or alone (e.g., perception of being different or excluded from the peer group). Once formed, these subjective experiences disrupt the integrative process, and contribute to the development of compensatory, or less adaptive motivations that are alien to the self and that have serious maladaptive effects on mental health and well-being (Deci & Ryan, 2000). Consistent with this claim several studies have consistently demonstrated that the subjective appraisals of need frustration associate to diminished well-being and to high levels of ill-being and psychopathology (e.g., Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Costa, Ntoumanis & Bartholomew, 2015; Vansteenkiste, Lens; Soenens, & Luyckx, 2006; Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013).

Overall, to the SDT conception of "needs as experiences" (Sheldon, 2011) is implicit the assumption that need-*supportive* parental behaviors relate to well-being and thriving via the child´s subjective feelings of need satisfaction whereas actively need-*thwarting* parenting relates to ill-being and psychopathology via appraisals of need frustration (Deci & Ryan, 2000; Sheldon, 2011; Vansteenkiste & Ryan, 2013). Support for this claim has been obtained in recent SDT-based research (e.g., Bartholomew et al., 2011b) in a variety of contexts, including parenting (Cordeiro, Paixão, Lens, Lacante & Sheldon, 2015), sports (Haerens et al., 2015; Gunnell, Crocker, Wilson, Mack, & Zumbo, 2013), work (e.g., Gillet, Fouquereau, Forest, Brunault, & Colombat, 2011) and interpersonal relations (Costa, Ntoumanis & Bartholomew, 2015)[2]. In this dissertation we extend these mediational hypothesis for a theory-based model of adjustment and career identity developed for adolescents that are undergoing critical career transitions. This research is relevant because it targets a domain of psychosocial functioning that has been overlooked

[2] For construct clarification, need-satisfaction and need-frustration are the psychological processes that result from a history of parental support or thwarting of basic needs over time (Vansteenkiste & Ryan, 2013).

both by SDT-based and identity development research (Luyckx, 2006). A general description of the models of (career) identity development is below provided.

Perspectives on Identity and Career Development

For Erikson (1968) the formation of an integrated sense of personal identity is a primary developmental task in adolescence. According to this scholar, identity describes personal feelings, interests and needs that remain relatively constant across time and situations, and give individuals a sense of wholeness, self-sameness and continuity. Adolescent identity develops in a single bipolar continuum of identity confusion, situated on the negative (or ego-dystonic) pole and identity synthesis, lying on the positive (or ego syntonic) pole. *Identity synthesis* describes the process of reworking the childhood identifications into a larger and self-determined set of ideals, values or goals. On the contrary, *identity confusion* refers to the inability to develop a manageable set of ideals that form the basis of adult identity. The resolution of the identity crisis through identity synthesis would allow individuals to be more conscious of their personal profile of strengths and weaknesses, whereas managing this crisis through identity confusion would leave adolescents to feel more confused about their commitments in identity-relevant issues (Erikson, 1968; Soenens, Berzonsky, Dunkel, Papini, & Vansteenkiste, 2011). This process develops in a continual interaction with the social environment in which individuals explore different options, social roles, and experiment various behavioral and ideological patterns and convictions (Luyckx, 2006).

One of the most remarkable neo-Eriksonian theorization on identity development is Marcia´s Identity Status Model (Marcia, 1980). Marcia´s model focused on the intra-individual behavioral components exploration and commitment as the basic processes of identity development (e.g., Luyckx, Goossens, & Soenens, 2006; Luyckx, Goossens, Soenens & Beyers, 2006). *Identity exploration* describes as the degree of exploration of

various social alternatives and self-appraisal about personal goals, values, and beliefs prior to making commitments and *identity commitment* relates to the ability to make firm choices on identity-relevant domains. Marcia (1980) crossed the two identity dimensions in order to form four identity statuses: *achievement* (high commitment following high exploration), *foreclosure* (high commitment not followed by prior exploration), *moratorium* (high exploration but very low commitment), and *diffusion* (low commitment and low systematic exploration). From the achievement towards diffusion identity statuses, adolescents move from more autonomous to more controlled behavior in exploration and commitment-making, from feelings of energy and agency to apathy and dependent decision-making, from personal self-integrative continuity to situation/others contingency in decision-making, from flexible to rigid cognitive functioning, and from the experience of well-being to anxiety and low self-esteem (Luyckx, 2006).

In one of the recent extensions of the identity status model, Luyckx and colleagues (Luyckx, Vansteenkistee, Goossens & Duriez, 2009; Luyckx, Goossens, & Soenens 2006; Luyckx, Goossens, Soenens & Byers, 2006; Luyckx, Soenens, Goossens, Beckx, & Wouters, 2008b) proposed a more dynamic view of identity formation, by unpacking the dimensions of exploration and commitment, and examined whether the model of identity development is rooted in experiences of psychological need satisfaction, by unpacking the dimensions of exploration and commitment. A model of identity development is proposed with five central dimensions. The first, *identity exploration* encompasses the dimensions of exploration in breadth, i.e., the degree to which adolescents search for different alternatives with respect to goals, beliefs, and values before making commitments. The second dimension, of *exploration in depth*, features the in-depth evaluation of commitments, choices, and plans already made and their convergence with

internal standards. The third dimension, of *ruminative exploration*, characterizes the pattern of indecisiveness, hesitation, worry, and flawed decision-making (Luyckx et al., 2008a). The fourth dimension, of *commitment-making*, taps into the degree to which the individuals make firm identity choices. Finally, a fifth dimension, of *identification with commitment* describes the degree to which adolescents feel certain about and can identify with their identity commitments. The five-component model has the advantage of capturing both the adaptive and maladaptive aspects of identity formation (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009).

In addition this model provides important cues about how the dimensions of identity exploration and commitment are rooted in developmental experiences of psychological need satisfaction, as conceptualized in by self-determination theory (Deci & Ryan, 2000). Luyckx and colleagues (2009) found that total need satisfaction experienced in daily life energizes positive identity-related investments that are associated to the proactive exploration of different identity issues (exploration in breadth and exploration in depth), as well as to the commitment to, and endorsement of specific identity options (dimensions of commitment-making; identification with commitment). In opposition, the experience of low need satisfaction was associated to endless worries and self-doubts about the identity options that best-fit the individuals´ interests and experience (dimension of ruminative exploration). Studies on identity dimensions (Luyckx et al., 2010; Luyckx, Soenens, Goossens, & Vansteenkiste, 2007) also suggest that autonomy-supportive parenting predicts the adolescents´ pursuit of career goals, exploration behaviour, and decision-making in identity-relevant domains, whereas psychologically controlling parenting relates to the development of an indecisive vocational orientation and to low commitment-making. Despite these pioneering findings little agreement has been reached about the role played by psychological needs in the

determination of individual differences in identity-related behavior and adjustment (Waterman, 1990) and in no case the unique effects of need frustration on career adjustment were examined.

A Self-determination Theory on Career Identity Development

The influence of basic need satisfaction and need frustration is at the core of the SDT perspectives on identity development and adjustment. For SDT, *identity integration* and organization is energized from experiences of need satisfaction, once these are aligned with the individuals' self-actualizing growth tendency, whereas *identity diffusion*, arises from inner feelings of need frustration that are alien to the self, and that undermine the individuals´ growth tendencies (Soenens & Vansteenkiste, 2010).

From SDT one could also examine the contextual and motivational underpinnings of the *quality* of the motivation (motives or reasons) underlying career commitment-making. This topic is of capital importance for this dissertation, as we target students that must commit, until the beginning of the third term of the 12th grade, to a specific career path: enter higher education (and a specific major within higher education) or join the labor force. According to SDT, more than examining the content of this decision it matters to investigate the *level* of internalization, or the degree of relative autonomy with which adolescents make these identity-related commitments (Deci & Ryan, 1985, 2000; Ryan & Connell, 1989). Much like in Waterman´s model (1984), SDT posits the existence of innate propensities – the *self,* motivating identity-related pursuits towards growth and optimal functioning. For SDT, an important instantiation of this growth tendency is the *level* of internalization or the continuum of autonomous *versus* controlled reasons that underlie the exploration and commitment to specific career pathways (Soenens & Vansteenkiste, 2011). Within this continuum, *autonomous motivation* (Deci, 1980, 1985; Ryan, Connell, & Deci, 1985) reflects the innate tendency for organisms to function in

self-integrated, authentic and unified ways (Deci & Ryan, 2000). It comprises career commitments regulated from self-endorsed interests and goals and that are fully consistent with the self (*intrinsic motivation*) but also commitments regulated by well-internalized forms of extrinsic motivation. Among the latter we have the career commitments that have been harmoniously integrated with other self-endorsed values and goals (*integrated regulation*), and the commitments that are perceived as instrumental to accomplish personal and occupational meaningful goals (*identified regulation*). Commitments may be also regulated by *controlled motivation,* particularly when they are pursued for poorly internalized forms of extrinsic motivation (La Guardia, 2009; Ryan & Deci, 2003). In this case individuals may adopt career commitments to avoid internal pressures or controls/increase feelings of self-worth and pride (*internalized regulation;* e.g., shame guilt, disappointment) or to pursue rewards/avoid punishment (*external regulation*), contingencies that are wholly external to the self.

SDT posits that identity career commitments enacted from autonomous motives are more likely related to well-being and adjustment (e.g., Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Sheldon & Kasser, 1995), because they relate to the satisfaction of the three psychological needs, whereas the career commitments adopted for controlled reasons would more likely relate to ill-being and maladjustment (Deci & Ryan, 2000; Soenens & Vansteenkiste, 2011), because they are rooted in experiences of need frustration.

Gaps in Career Identity Research and Rationale for the Present Dissertation

SDT provides a sound approach for the study of the universal contextual and motivational processes implied in normative trajectories of career identity development and adjustment, relegating to the background the role of cognitive processes implied in integrated (e.g., career decision—making self-efficacy; Betz, 2001; Lent & Brown, 2006)

versus derailed (e.g., early maladaptive schemas; Young & Kolsko, 1994) pathways of identity development and adjustment. Nonetheless, the role of cognitions and their relations to psychological needs is not left unnoticed in SDT. For Deci and Ryan (2000) experiences of need satisfaction relate to the formation of *self-determined*, positive and flexible cognitions (*self-schemas*) that are aligned with *autonomous* trajectories of growth and thriving. Conversely, experiences of need frustration prone the child to develop negative and rigid cognitions and emotions that are not well assimilated into the self. The scholars further consider that the positive cognitions form the basis for self-determined behaviors and relate to well-being, whereas negative cognitions are associated to *controlled* behaviors and adjustment difficulties (Deci & Ryan, 2000). Despite this rationale, the elaboration of positive and flexible versus maladaptive cognitions was overlooked in SDT and their relation to controlled behavior and adjustment was not examined.

In this dissertation we attempt to shed further light on this subject. Converging the constructs of self-determination theory (Deci & Ryan, 2000) schema theory (e.g., Young, Klosko & Weishaar, 2003) and socio-cognitive career theory (Lent, Brown & Hacket, 1994), we specifically examined how perceived parenting and psychological needs relate to career decision-making self-efficacy beliefs (Betz, 2001) and early maladaptive schemas (Young & Kolsko, 1994; Young, Klosko & Weishaar, 2003) in order to predict individual differences in trajectories of career identity development and adjustment. From this broad conceptual model we expect to provide extended evidence for the conceptualization of career decision-making and adjustment in possible "bright" and "dark" pathways (Deci & Ryan, 2000).

"Bright" Pathways: The Role of Career Decision-making Self-efficacy

From a SDT perspective, *autonomous* career commitment-making and well-being

would be expected from career pathways that are rooted in *self-determined* cognitions because these experiences are energized by feelings of need satisfaction that are aligned with the individual´s innate propensity for growth and thriving. Therefore, autonomous, or "bright" career pathways are associated to positive cognitive functioning. In parallel, Social-Cognitive Career Theory (Lent, Brown, & Hackett, 1994; Lent & Brown, 2006), claims that more than from broad, complex judgements about the subjective experiences of basic need-satisfaction, career identity development and positive adjustment would be determined by task-specific appraisals of *self-efficacy* (Bandura, 1977; Ford & Smith, 2007), and, particularly, by career decision-making self-efficacy beliefs (CDMSE; Betz, 2001; Lent & Brown, 2006; Ezeofor & Lent, 2014; Guay, 2005; Lent, 2004) expressing the confidence that adolescents have about their competence to accomplish career-related goals and choices. In support of this view SCCT-based research has successfully demonstrated that career decision-making self-efficacy is an important predictor of high commitment-making (e.g., Ezeofor & Lent, 2014; Ford & Smith, 2007; Lent, 2004; Lent & Brown, 2006), autonomous motivation for exploration behavior (e.g., Guay, 2005; Lent, 2004) and experienced well-being Ezeofor & Lent, 2014; Lent, 2004) during critical career transitions (e.g., Germeijs & Verschueren, 2007; Lent, Paixão, Silva, & Leitão, 2010; Luyckx, Vansteenkiste, Goossens & Duriez, 2009). From a Self-determination perspective, positive career decision-making self-efficacy beliefs would be anchored in experiences of need satisfaction and help the adolescents move towards *autonomous* trajectories of career decision-making and well-being because they are aligned with trajectories of growth and thriving in identity-related pursuits (SDT; Deci & Ryan 2000). In support of this view research has suggested that psychological need satisfaction would energize an autonomous motivation for career decision-making and well-being, in part because feelings of needs satisfaction raise decision-making self-efficacy for career

commitment-making (e.g., Guay, 2005). These findings suggest that CDMSE partially mediates the effects of need satisfaction over the quality of motivation for career commitment-making, providing initial evidence for the cognitive-motivational determinants of the "bright" pathways of career identity development.

"Dark" Pathways: The Role of Dysfunctional Schematic Functioning

SDT also conceptualizes that *rigid and self-invalidating* cognitions, primarily predict "dark" pathways of career development and maladjustment, because they develop from experiences of need frustration that alienate the self from dynamics of growth and self-integrated functioning and energize controlled or pressured modes of functioning (Erikson, 1968; Soenens & Vansteenkiste, 2010). Yet, SDT does not present a taxonomy of self-alienated cognitions. Hence, to investigate this premise we felt it was necessary to integrate self-determination theory into models of cognitive self-schemata (see Bober & Grolnick, 1995 for a similar approach). We selected Schema Model (ST; Young & Kolsko, 1994; Young & Kolsko, 1994; Young, Klosko & Weishaar, 2003), because it provides a widely-validated taxonomy of Early Maladaptive Schemas (EMSs) that are associated to maladjustment and psychopathology (e.g., Beck, Freeman & Associates., 1990; Rafaeli, Bernstein & Young, 2011; Safran & Segal, 1990). EMSs are defined as "Broad and pervasive themes or pattern regarding oneself and one´s relations with others, developed during childhood or adolescence and elaborated through one´s lifetime" (Young & Kolsko, 1994, p.9).

In schema model, a structure of eighteen early maladaptive schemas is organized in five higher-order domains of unmet emotional needs. The first domain - disconnection and rejection, covers the EMSs of defectiveness/shame, social isolation/alienation, abandonment/instability, mistrust/abuse and emotional deprivation. The second domain - impaired autonomy/performance comprises the EMSs of vulnerability to harm and

illness, dependence/incompetence, enmeshment/undeveloped self and failure. The third domain - impaired limits encompasses the EMSs of entitlement/grandiosity, insufficient self-control/self-discipline. Further, the fourth domain - other-directness includes the EMSs of self-sacrifice, subjugation, and approval-seeking/recognition-seeking, and finally, the fifth domain - overvigilance and inhibition – involves the EMSs of emotional inhibition, unrelenting standards/ hypercriticalness and punitiveness (for a taxonomy of the 18 EMSs see Young. 1990; Young, Klosko & Weishaar, 2003; Theiler, 2005).

Thirteen of the 18 EMSs are considered unconditional (Young, Klosko & Weishaar, 2003). They are formed earlier in life, involve core unconditional beliefs about the self and others and are more rigid and resistant to change. The remaining five EMSs represent conditional or "secondary schemas" (Young, Klosko & Weishaar, 2003) that develop later in life to compensate for the unconditional schemas[3]. For schema model, the EMSs are progressively structured from the chronic exposure of the child to dysfunctional family environments that systematically frustrate the child´s core emotional needs of (a) secure attachment to others; (2) autonomy, competence and sense of identity; (3) freedom to express valid needs and emotions; (4) spontaneity and play, and (5) realistic limits and self-control (Young, Klosko & Weishaar, 2003). Once triggered, EMSs become dysfunctional to a significant degree. They are capable of generating high levels of disruptive affect, selective memory retrieval and intense physiological activation, as well as anxiety, depression and somatization symptoms (e.g., Welburn, Coristine, Dagg, Pontefract, & Jordan, 2002).

Implicit to both SDT and schema model is the view that there is a functional antecedence of psychological need frustration over schematic functioning (here measured

[3] For parsimony, the unconditional EMSs are represented by the self-schemas of abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness-shame, social isolation/alienation, vulnerability to harm or illness, enmeshment/undeveloped self, failure to achieve, entitlement/grandiosity, insufficient self-control/self-discipline, punitiveness and negativity/pessimism. The conditional schemas include EMSs of subjugation, self-sacrifice, approval-seeking/recognition-seeking, emotional inhibition and unrelenting standards/hypercriticalness (Young, Klosko & Weishaar, 2003).

as an averaged score of the 13 unconditional schemas), suggesting that schematic functioning mediates the effects of need frustration on "dark" or derailed trajectories of identity career development and adjustment. However, to date, this hypothesis was left untested as both models have remained, for the most part, independent from each other.

Aims of the Present Dissertation

The goals of the present dissertation are manifold. First, we will develop a broader framework for career identity research and adjustment by integrating existing theories into a comprehensive conceptual model that focuses on the contextual and cognitive-motivational building blocks (i.e., parenting, psychological needs, schematic functioning and career decision-making self-efficacy) of identity formation and well/ill-being. Second, the external validity of this model will be tested for a variety of outcomes, bearing a cognitive-behavioral, motivational and/or emotional nature (e.g., career commitment-making, career exploration, regulation of the career decision-making, well-being). Third, we will examine whether specific combinations of cognitive-motivational and contextual variables predict distinct developmental trajectories of career identity research and adjustment across the transition from high school to higher education/job market. Fourth, the diversity of the trajectories found will be explored and interpreted from the light of a self-determination theory perspective. Finally we will discuss the practical implications of the developmental trajectories found for the design of career counselling programmes.

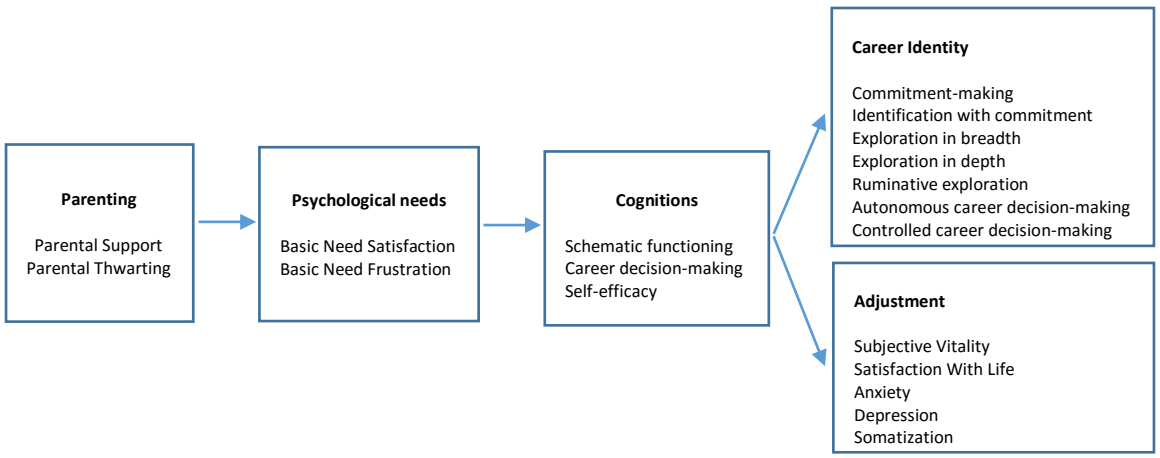
Proposal of an Integrated Conceptual Model

The theoretical model we tested on the present dissertation is depicted in figure 1. In this model the parenting dimensions, placed on the left side of Figure 1, the psychological needs, and the cognitions, placed in the centre of Figure 1 are assumed as predictors. Career identity and adjustment, situated on the right side of Figure 1 represent possible outcomes in the model. The causal order proposed in the model is based upon

the mainstream theorization in motivation, cognition and career identity development above described.

Figure 1.1

Conceptual Model Proposed for test in this Dissertation



For links not addressed in theory, the causal ordering derived from theory-based prospective hypotheses. The longitudinal nature of the study conducted in this dissertation allowed us also to examine possible bidirectional or reciprocal effects between the variables, and, thus, test further specifications of the linear causal main-effects derived from theory. This possibility follows from previous studies on identity development showing that the relations between identity dimensions and need satisfaction are reciprocal in nature (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009).

General Hypotheses

The primary aim of this study was to test an integrated model of the antecedents of identity development and experiences of well/ill-being for 12th grade students involved in the transition to higher education/job market. We followed a process-based approach to examine how parenting styles associate to the adolescent´s cognitive-motivational functioning in order to predict the quality of their career identity development and adjustment across the school-to-work/higher education transition. Overall we

investigated whether our data are capable of differentiating two distinct theory-based pathways of career identity development and adjustment. A "bright" trajectory of proactive career exploration, (Luyckx, Vansteenkiste, Goossens & Duriez, 2009), autonomous commitment-making (Bandura, 1977) and well-being (Ryan & Frederick, 1997) would be instigated by parents that support the child's psychological needs satisfaction and is energized by inner feelings of need satisfaction (Deci & Ryan, 2000) and career decision-making self-efficacy beliefs (Betz, 2001). This pathway is aligned with trajectories of personal growth and thriving (Deci & Ryan, 2000). In addition, a "dark" pathway of indecisiveness/rumination about career pathways (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009), emotional maladjustment (La Guardia, 2009; Ryan & Deci, 2003) and controlled commitment-making (Deci & Ryan, 2000) would be predicted by the chronic exposure to parental need-thwarting via the adolescents´ subjective experiences of need frustration (Ryan & Deci, 2000) and self-invalidating schematic functioning (Young, Klosko & Weishaar, 2003). This path is alien to self-integration trajectories (Deci & Ryan, 2000), representing controlled career identity development and increased ill-being over time.

Longitudinal Data Collection and Waves of Measurement

The data were collected in five Portuguese secondary schools in two waves of measurement. Convenience sampling was used to select the schools. Yet, in the final sample schools from urban and rural territories, interior and coastline regions, as well as from the north, centre and south regions of Portugal were represented. The first wave took place at the beginning of the first term (Time 1: October, 2013). A sample of 755 12th grade students (455 girls [60.3%], mean age of 17, 36 years [SD = 0, 89]), completed the questionnaires. The second wave of measurement took place nine months later (Time 2: July, 2014) after the exams required to enter higher education were completed and their

choice concerning their future career path was made. A subsample of Sample 1, consisting of 462 Portuguese students (278 girls [60.2%] and 184 boys [39.8%], aged between 16 and 22 years, with a mean age of 17.12 years (SD= 0.92), completed the questionnaires. At both waves, students were assessed for all the model constructs, except for career decision-making self-efficacy, that, logically, was only measured at time 2. Questionnaires were administered during regular class hours, after approval from the ethical committee of the University of Coimbra and once informed consent was obtained from students or from parents of underage students. Participation was voluntary, anonymity guaranteed and no credits were granted for participation in the study. In both measurement waves, students took no longer than 30 min to complete the questionnaires.

At this point, two considerations must be made. Firstly, the high attrition rate (38%) from T1 to T2. Missing students at T2 were randomly absent from classes or from school, either because they were involved in scheduled curricular activities (e.g., apprenticeship experiences in work settings) or in extra-curricular activities, (e.g., sports competitions). However, students at T2 do not differ in gender, age or on any psychological dimension assessed at T1. Further, missing data analysis showed that individual missing values were randomly observed at both T1 and T2. Mean replacement was used to deal with missing data. Secondly, we examined the longitudinal associations between the variables in a short-time interval period, of about 9 months, making it difficult to detect significant developmental changes in the psychological variables assessed. However, from the first to the second waves of measurement students evolved from a situation where they only had commitment intentions (Time 1) to the effective implementation of that decision (Time 2), once they have already completed the exams that gave them access to higher education, if that was the case. Thus it is expected that major processes associated to career commitment-making become activated during this

period, and, once activated, determine psychological changes in career identity development.

Sample Choice

In general research on identity formation has focused on university students (Schwartz, Côté & Arnett, 2005), assuming that most gains in identity are expected to occur especially during the college years (Waterman, 1993). Therefore, the transition to college represents a major step towards achieving an adult identity (Montgomery & Coté, 2003). During this period, adolescents face the daunting challenge of compromising to a particular career pathway, i.e., to decide whether entering higher education or to join the labour force. The successful choice of a career path and the feelings that arise throughout this process are critical building blocks for the future occupational life and functioning (Luyckx, 2006). Thus, it matters to examine the psychological processes involved in career decision-making that are relevant for this career transition, and acknowledge their influence on the quality of adjustment and career identity development trajectories. We must emphasize that our data must be only generalized for 12th grade students and not for younger age cohorts, since the career challenges and contextual pressures for career commitment-making are quite different in early stages of development.

Structure of the Present Dissertation

This doctoral dissertation is a collection of eight papers that I have written over the past years on the topics of career identity development and adjustment, in close collaboration with my supervisors, Paula Paixão, Willy Lens, and Marlies Lacante, Portuguese researcher, Daniel Rijo and João Marôco, and from foreign researchers that kindly accepted to be part of this project, Kennon Sheldon, Koen Luyckx. The status of these articles varies from “published” over “in press” to “”under review or “second review”. Each article corresponds to a chapter of the empirical section of the present

dissertation. The articles do not represent disperse or isolated research efforts. On the contrary, they build on one another, in the sense that they test specific associations between the variables of the model earlier described. This procedure was followed because the model includes a number of processes tied up in a network of complex and intricate associations that made it necessary to segment the analyses. In the remainder of the current chapter I will briefly describe each of the eight empirical chapters, highlighting the objective and place they take in the overall model proposed. Table 1.1 presents a general overview of the empirical studies comprised in the empirical section of the dissertation. Nine empirical papers were produced.

Chapter 2 conveys a systematic approach on how to read and interpret a scientific article. It provides a set of guidelines and orienting questions about how to interpret the content and structure of research papers, and provide straightforward suggestions about the mistakes in content and writing style. With this article we intended to create a resource to help undergraduate students on the task of making critical reviews of research literature. For this dissertation it not only represented a product that resulted from the teaching experience of the researcher, but also introduced him to the structure and form of research articles. In chapter 3 we adapted the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2014) for the Portuguese population and examined the construct validity of the scales. In particular, we tested the robustness of the SDT-based 6-factor model proposed in the original studies that distinguishes the components of satisfaction and frustration of psychological needs. Unfortunately we were later informed that it would not be possible to publish with this scale. To overcome this limitation translated and validated the Portuguese version of the Balanced Measure of Psychological Needs Scale (BMPN; Sheldon & Hilpert, 2012). These procedures are reported in chapter 4. Later on this chapter we provide evidence for the internal structure

and construct validity of its scales and concluded for the substantive distinctiveness between the components of satisfaction and frustration of the three needs. Next, in chapter 5 we report the procedures followed to develop and validate the Parental Need Support and Thwarting Scale (PNSTS; Cordeiro, Paixão, Lens, Lacante & Sheldon, 2015), a SDT-based questionnaire designed to assess behavioral styles of parents vis-à-vis both the supporting and the thwarting of the autonomy, competence and relatedness needs. In this analyses we describe analytic techniques used to examine the dimensionality of selected items and their external validity to predict experiences of psychological need satisfaction and adjustment. In chapter 6 we examined the dimensionality and psychometric properties of the Parenting Questionnaire Scales (PQS; Soenens, Vansteenkiste, Duriez & Goossens, 2006), to provide evidence for their dimensionality and construct validity. We concluded about the relevance of the parenting dimensions to predict experiences of psychological need satisfaction and frustration. Having obtained robust measures of the constructs, we moved to the exam of the integrated conceptual model proposed. Three studies were conducted with this purpose. In chapter 7 we examined how experiences psychological needs (need satisfaction; need frustration) and career-specific self-efficacy beliefs (CDSE) predict identity development (exploration in breadth, exploration in depth, ruminative exploration and commitment-making) and psychosocial adjustment (well-being, ill-being) across the career transition from high school to higher education/job market. Further, in chapter 8 we examined whether psychological need satisfaction and frustration mediated the impact of parenting styles on adolescents´ identity development and adjustment. Finally, in chapter 9 we inspected how the experiences of psychological need satisfaction and frustration relate to schematic functioning to predict the quality of the motivation for career commitment-making, as well as the experiences of (mal) adjustment across this career transition. In chapter 10 we

end this dissertation with the discussion of the implications of findings. Across this chapter we attempted to merge findings into a coherent set of guidelines that hopefully enrich career counselling programs and interventions.

Table 1.1

Present Dissertation: Empirical Chapters, Type of Article, Datasets and Status

Chapter	Type of Article					Status
	Longitudinal		Cross-sectional		Review	
	Dataset 1 (N = 755)	Dataset 2 (N = 462)	Dataset 3 (N = 371)	Dataset 4 (N = 417)		
Chapter 2. Reading scientific papers					√	**In press** Psychology, Community and Health
Chapter 3. Scale validation.	√		√			**Second Review*** Psychologica Belgica
Chapter 4. Scale validation.		√		√		**Second Review*** Learning and Individual Differences
Chapter 5. Scale development.	√	√				**Under Review** Motivation & Emotion
Chapter 6. Parenting; Needs.			√			**Published** Spanish Journal of Psychology
Chapter 7. Needs, CDMSE; Career Identity.	√	√				**Published** Journal of Vocational Behavior
Chapter 8. Parenting, Needs, Identity; Adjustment.		√				**Under Review** Journal of Career development.
Chapter 9. Needs, Schematic Functioning, Career Identity; Motives; Adjustment	√	√				**Submitted** Journal of Counseling Psychology.
Chapter 10. Overall model.	√	√				**Conclusion** This Dissertation

Dataset ½: 12th grade students; Dataset 3: high (10-12th grade) grade students; Dataset 4: undergraduate students.
Second review. *This process is close to the acceptance phase.

proposed for this dissertation, in an attempt to integrate the empirical chapters into a general model of career identity development and adjustment for the post-secondary school transition. This dissertation ends with chapter 11 where we attempt to provide useful implications and guidelines for the development of more integrated interventions in career counselling. Limitations of our findings are discussed an avenues for possible future studies are presented.

2

Reading a Scientific Paper for Psychology and the Social Sciences: A Critical Guide

Pedro Cordeiro, Victor E. C. Ortuño, Paula Paixão & João Marôco (2015, *In press*)

Psychology, Community and Health

Abstract

A critical review of a journal article is a comprehensive evaluation of the article content, formal structure and methodological approach. Success in this task, requires students to develop analytic and reflexive skills as pre-requisites to identify the article´s key research question(s), relevant findings and main conclusions reached. Critical skills are also an important aspect of a student's academic and future professional lives, yet this has been a largely overlooked component of academic training. This paper aims to provide undergraduate students with a simple and straightforward set of guidelines that allow to develop a more complete understanding of research articles. The content, structure and common mistakes of research papers are addressed, along with the most relevant standards for review. With this structure, we hope students will be able to more thoroughly analyze and critically discuss the strengths and weaknesses of a research article.

Introduction

It is easy to find good (but dense) books on how to write, read and review scientific papers. However this literature has not been particularly useful to aid students in the task of critically reviewing research articles. In addition there is also a lack, if not total absence of published papers on the topic of review of scientific manuscripts (e.g., McKenzie, 1995). This topic is essentially covered in the Instructions for Authors section of Scientific Journals, and guidelines for structure and content of the manuscripts are suggested according to the specifications of each Journal. Moreover, despite students are required to review scientific literature in their majors, little training and resources are allocated to this academic task. Yet, we assume that this is a useful resource to introduce scientific research to undergraduate students. It requires not only that students develop objective and mature reading and comprehension skills, but also the ability to identify the core aspects of an article, namely key research questions and hypothesis, relevant findings and main conclusions. This article conveys a systematic approach for manuscript review. In each section, content, writing style and common flaws will be addressed. In complement, an exhaustive set of open-ended orienting questions are provided to guide the efforts of evaluating the quality of the article (see Table 2.1 at the end of the article).

Conceptualization and Characteristics

A critical review is an integrated evaluation of what one has learned from reading a scientific article. It conveys an assessment of the article's value, through explanation, interpretation and analysis, and provides a balanced perspective on the article's strengths, weaknesses and validity of conclusions. A good critical review (a) frames the content of the article in the context of the problem under discussion, (b) clarifies the study aims and tested hypotheses, (c) evaluates how replicable is the methodology used to test hypotheses and (d) assesses whether the conclusions are in line with the main findings (internal

critique). In addition, the article must provide readers with information about the work's contribution to research in a particular scientific domain (external critique).

Structure of an Article

Research articles present original findings based on rigorous empirical research. They vary in content or structural order, depending on the type of journal to which they are intended to be submitted. In general, the structure follows a typical Introduction, Methods, Results and Analysis, and Discussion (IMRaD) structure (e.g., Saracho, 2013). For didactic purposes we add considerations about title, author affiliations and abstract, as they are essential to capture the attention of the reader for the paper.

The Title makes it clear of what the paper is about. It is the first thing that will be read and sometimes the last, being determinant to continue the reading. A well-written title is accurate, clear, concise, revealing and provocative. In 10 to 15 words, it provides the reader, in a timesaving but informative way, the general field of the paper, objectives and/or main results. Titles can be worded in different ways, including a) general versus specific, b) declarative versus interrogative, c) with or without subtitles and d) short indicative versus long informative. The option for a particular type of title is in accordance to the style of the author and the requirements of the scientific journal. Titles that are long, grandiose or promise too much are to be avoided.

The Authors and Affiliations section, present the authors of the manuscript by order of importance, i.e, based on the relevance and nature of their contribution for the article. Depending on personal preferences and the requirements of the journal, authors and co-authors are either referenced by their name and surname, or by the first name abbreviated to its initials. In the authors' list, the institutional affiliation, academic degree and area of expertise are presented. The section ends with the identification of the e-mail and full address of the author to whom correspondence should be addressed.

The Abstract, is the "hall of entrance" of the article. It summarizes the most important features of the manuscript (Provenzale & Stanley, 2006), providing the reader, and the editor, with a global first impression on the paper (Hartley & Betts, 2009). In general, the Abstract must answer the questions: or "What should be learned in this article?", "Is it worth reading the paper further on?" The Abstract is a synopsis of the whole paper. In 150 to 250 words it provides a succinct, clear, and comprehensive summary of the main sections of the paper. A well-structured abstract follows a standard back-bone structure of Problem - Purpose of the Study - Method - Results - Conclusion (Hartley, 2012). The Problem sums up the reason(s) and purpose of the study, research questions, hypotheses being tested and their relative contribution to the field. The Method section covers the methodologies used to investigate the problem, including the identification of target participants, statistical analyses and programs used. Finally, the Results section presents key findings of the research, including reference to indicators of statistical significance of the coefficients. Abstract ends with authors' interpretations of the findings, considerations about the novelty of the study, and relevance of implications for theory and practice. In terms of writing style, a good abstract should be self-contained. It should be written in a concise and clear fashion to provide a summary of key aspects of research without need to consult the full paper. Sentences are usually worded in an active style and exclude personal pronouns. Verbs are conjugated in the past tense, when they describe procedures followed, and in the present tense when they report the results. Digits can be used to present figures, except when these are placed in the beginning of the phrase. Acronyms, if used, must be defined. Aspects to avoid include mention references, tables and figures, provide statements not supported by data, lengthy or omitted background information and reference to footnotes, equations, symbols and abbreviations. Most scientific journals require also that authors provide, just after the

abstract, 3 to 10 index terms, keywords or short phrases for cross-indexing purposes. Keywords should clearly indicate the field of study and main concepts targeted in the paper.

The paper proceeds with the introduction. Crafting a convincing Introduction is a formidable challenge for authors (Drotar, 2009). Indeed, in just a few pages, researchers need to set the conceptual framework of the paper, address the problem under investigation and state the novelty and relevance of the current research to answer specific questions. To make this task easier, the introduction follows a commonly agreed format. In the first paragraph, authors specify the broad research topic, main issues and questions left open and the research question under study (Drotar, 2009).

From the second to the penultimate paragraph, the article reviews the literature relevant to understand the state of the art of knowledge in the subject area. In general, this section starts with an historic overview of the topic covered and most relevant conceptual frameworks. It follows a description of the conceptual framework adopted in terms of key constructs and operational definitions. Specific linkages are then made between previous research and the work addressed in the current paper, paying particular attention to research questions left unanswered. Theory-based research is next presented. Authors generally convey a broad perspective on the findings, including both confirmatory and contradicting evidence to the hypotheses of the current study.

The purpose and specific contribution(s) of the present study to the field are treated in a subsection of the Introduction usually entitled “The Present Study”. In this section authors clearly state the study objectives and hypotheses being tested. The focus is putted on new research questions, or innovative ways to address them (in terms of methods, theory, and/or findings; Drotar, 2008; Sternberg & Gordeeva, 1996). The translation of research questions into hypotheses aims to help readers to understand the

logic of the study and give focus to the procedures of data analyses, thus reducing the likelihood to report spurious findings. Common flaws in the introduction include (a) insufficient background information, or limited to a unique conceptual framework, (b) unclear coverage of the subject matter and/or deficit of comprehensive information (c) confusing operationalization of constructs, research questions and hypothesis and (d) dated or excessively detailed previous research. Most importantly, introduction should not promise results and implications that the data does not support.

The Method section provides a description of how the study was conducted, and should be sufficiently detailed to allow interested readers to replicate it (Baker, 2012; Olson & Meyersburg, 2008). Traditionally, this section is subdivided in the subsections of "Participants and Procedures" and "Measures". The Participants and Procedures subsection details the sampling methodology (probabilistic versus non-probabilistic; independent versus paired samples) and sociodemographic characteristics of participants' (e.g., sex, age, ethnicity, educational level), along with a justification for the choice of the sample. Information should be sufficient for readers to reach an informed conclusion about what generalization are possible. The Procedure describes the waves of measurement defined for the study, pilot studies performed, and the time, place and duration of data collection. Information about the ethical aspects is also be conveyed, including the procedures followed to recruit the participants, and permissions from the institution(s) and informed consent from the participants (or parents of underage participants). Procedures followed to ensure anonymity are made explicit, and when applicable, authors declare any possible conflicts of interest that might influence the results of the study, including information about incentives for study participation (monetary, academic credits, prize draws, etc.).

In the Measures subsection the variables and instruments used to collect the data are described. Information usually specifies the type of instruments (e.g., self-report questionnaires) and materials (e.g., computer programs and apparatus) employed, a reference to authorship and publication, and a justification of their appropriateness. When scales are developed or validated for different cultures this section also describes the steps involved in the transcultural adaptation/validation of instruments, the changes made to the original scale and the psychometric properties of the instruments in the original and current samples. Sources of measurement error should be also conveyed, as well as the steps taken to minimize them.

The Results section present the statistics and main findings of the study. The presentation of results generally follows a funnel logic method, from more general to more specific. Overall, the authors provide a detailed description of the statistical methods used for data analysis, a justification for their adequacy, and the statistical software used in the analyses, including the version number (e.g., AMOS 20.0). The report of the statistical results should be clear and concise, but detailed enough to allow other researchers to replicate the procedures and cross-validate the findings. In general, reports of statistical tests appear in text, whereas descriptive statistics should be summed up in self-explanatory figures, tables and graphs (Vintzileos & Ananth, 2010). Further, non-standard statistical terms, abbreviations, and symbols used throughout the text should be defined. Two common flaws include overwriting and underwriting. When overwriting, authors give unnecessary details for data analysis. Indeed, if statistics are an important component of this section, they should not dominate it. In turn, underwriting concerns the failure to account for important results. That may give a wrong impression to readers related to the lack of relevance to key findings. An additional issue is related to the non-technical use of technical statistical terms, including *random*, *significant*, *correlation*

and *sample*. At the end of this section the reader should be able to conclude about the relevance of the findings and whether answers to the research questions and hypothesis were supported by the data. Importantly, presentation of findings should not include interpretation. That is a personal contribution from the authors that should be included in the Discussion and Conclusion section(s).

The Discussion section provides a theory-based interpretation of the findings, states their significance for current research and derive implications for theory and practice. Alternative interpretations for the findings are also provided, particularly when it is not possible to conclude for the directionality of the effects.

Adding to this, authors acknowledge the limitations or weaknesses of the study, and offer concrete directions about how to improve the findings in future work. Several questions are usually answered here, including “What research questions remain unanswered?”, “Is it necessary to test new hypotheses?” and “What kind of work can shed light on these issues?”. Common flaws include the presentation of new data or detailed statistical results that merely reiterate the findings presented in the results section.

The Conclusion summarize the main findings of the study and their original contribution to the field, giving particular emphasis to the way as the findings contribute to move the research literature significantly forward. The conclusion is the "business card" of the paper, i.e., the message that the reader will (hopefully) recall in the future. It may stand alone, as a subsection of the Discussion or may be presented as a combined Discussion and Conclusion section.

References, footnotes, tables, and figure captions should follow the guidelines of the APA Publication Manual (currently the 6th edition). References can be cited to a maximum of 35. Up-to-date references are commonly cited as means to provide the state of the art knowledge in the field. However, citations of older papers are also acceptable

and required when a historical framework is necessary to describe the evolution of the research area or concepts and definitions quoting its original authors. In any case, these should not represent more than 30%-40% of the total references, with only ¾ of the references being older than 5 to 10 years. It is also compulsory to present some references related to the statistical analyses, criteria or techniques used in the research. An over-referenced writing style is a common flaw, with citation of hundreds of relevant and irrelevant references.

Final Remarks and Limitations

In this article we provide a systematic approach about the structure of a research article. We examined the structure and key features of research papers according to the conventional IMRaD structure and enunciated some of the most relevant flaws. In addition, we organized the standards for a critical review by formulating a series of orienting questions that guide the review of each section of an article. One must note that this work is circumscribed to cross-sectional correlational research articles and not to the full range of scientific articles. Despite these limitations, we believe that this work provides a useful resource to guide the critical review of a research paper, and stimulates reflexive thinking and critical analysis skills on students. Future research should extend this reflections to other scientific publications, such as experimental or review articles. We expect that this paper inspires students to develop more systematic and research-based projects.

Table 2.1

Writing Scientific Articles. Standards for a Critical Review

Guideline questions
Cover
Is there any biographical information about the author given?
What are the authors 'qualifications and authority?
Who is the intended audience?
Title
Is the title specific and does it reflect the content of the manuscript?
Does the title presents a suitable length?
Abstract
Does the abstract state what is the purpose of the article?
What was done, found, and what is the significance of the results obtained?
Does the abstract provide information about the general field that the article relates to?
Can the abstract be understood without reading the manuscript?
Does the abstract clearly state what methodology was used?
Does the abstract provide a balanced description of the most important findings?
Does the abstract mention what are the practical implications of the research?
Are there discrepancies between the abstract and the remainder of the manuscript?
Are there portions that could be deleted and replaced to increase the information value?
Is the abstract followed by up to five keywords?
Introduction
Is the purpose of the study clearly defined?
Is the research problem clearly stated?
Are the research questions clearly identified?
Is/are the question(s) being asked relevant?
Are the research questions important for current research?
Are all the citations correct and necessary?
Does the introduction cover the most significant research conducted on the topic?
Is the background information enough and relevant?
Are the most relevant theories or models clearly identified?
Are the definitions, assumptions and predictions clearly stated?
Are there any key papers that have not been referenced?
Has the author been careful to cite prior reports contrary to the current hypothesis?
How does the current study differ from previous research?
Is it provided a rationale for the relations between previous and current research?
Are the hypotheses of the study clearly defined?
Are the hypotheses correctly derived from the theory that has been cited?
Are other, alternative hypotheses compatible with the same theory?
Method
Is the method clearly described?
Is it possible to replicate the study without any further information?
Are the methods appropriate and relevant for the research problem?
Is anything important omitted in the research?

Is it clear what variables are measuring and why?

Are the reasons to choose each procedure clearly explained?

Are the methods used valid?

Can the results can be trusted?

Participants

Is the sample adequate for answering the questions posed?

Are participants adequately described?

Are the participants sampled randomly?

When convenience sampling is used, is the procedure made explicit?

Is it provided a description of the age, sex and ethnicity of participants?

Have the study period and geographical area been clearly identified?

Are the generalizations proposed by the authors reasonable?

Are there probable biases in sampling (e.g., volunteers, high refusal rates, etc)?

Measurement

How were the variables measured?

Is there an adequate description of tasks, materials, apparatus, and so forth?

Are the measures appropriate for the participants in this sample?

Have appropriate psychometric characteristics been clearly established and reported?

Are the psychometric properties of measures reported for the previous and current studies?

When more than one measure was used, was the order counterbalanced?

If so, were order effects actually analysed statistically?

Was there a control task(s) to confirm specificity of results?

When measures are scored by observers, is the interrater reliability reported?

Was administration and scoring of the measures done using blind procedures?

Procedures

Do the author(s) report any pilot studies?

Where the ethical aspects being safeguarded?

Were the authorizations and informed consent obtained?

How have the purposes of the study been described to participants?

Figures and Tables

Does the author include figures tables or graphs that best depict their findings?

Do the figures tables or graphs adequately complement the text?

Are the figures and tables (a) necessary, sufficient and (b) self-explanatory?

Can they be simplified or condensed?

Are tables and figures sequentially numbered and titled?

Are the tables correctly referred in the text?

Do the figures include lettering that is proportionate to their size?

Are the axes and legends of figures clearly identified?

Do graphs correspond logically to the textual argument of the article?

Are the trade names, abbreviations and symbols misused?

Results

Are the results presented in a logical way?

Are the results presented coherently to the study goals?

Does enough information exist to understand the validity and accuracy of the results?

Do the results answer all the previous research questions?

Do the authors provide a balanced analysis to each one of the aspects of the results?

Does the results section clarify the statistical methods employed?

Is there an adequate rationale for the selection of statistics and programs?

Were tests of significance properly used and reported?

Are statistical significance levels accompanied by an analysis of practical significance levels?

Discussion

Do the authors provide alternative explanations for the findings?

Were the authors capable of integrating the findings in relevant theory and research?

Is there congruence between the results, their interpretation and the study objectives?

What are the implications of the findings to the existent theory and field practice?

Are the study limitations clearly identified?

Are the implications of the study limitations equated?

Do the authors make objective suggestions about future research?

Adapted from Maehr (1978), McKenzie (1995), and Wilkinson (1999).

3

The Portuguese Validation of the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS): Relations to Adjustment

Pedro Cordeiro, Paula Paixão, Willy Lens & Marlies Lacante (2015, under review)

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Abstract

In this study we perform a factor-analytic study to the Basic Psychological Needs Satisfaction and Frustration Scale to generate extended evidence for the validity of the original 6-factor model proposed to interpret the dimensionality of the scale. Further, we explored the dimensionality of the need satisfaction and frustration scales and examine their unique predictive effects on well-being (Satisfaction with life, subjective vitality) and ill-being (Anxiety, depression and somatization) outcomes. The confirmatory factor analysis, conducted in two samples of Portuguese undergraduate and high school students, replicated the good fit and the metric invariance of the 6-factor model in two samples of Portuguese high school students. Further regression analysis reported the primary effects of the satisfaction and frustration of the three needs on well-being and ill-being outcomes, but also the unique asymmetrical effects of need-frustration on well-being. Taken together, the findings provide further support for the substantive distinction between the satisfaction and frustration dimensions of each need, suggesting that need satisfaction and frustration constructs should be examined and interpreted as distinct motivational constructs. The limitations of our finding are discussed and guidelines for future research are proposed to validate and expand the findings.

Keywords: Self-Determination Theory, Basic Psychological Needs, Basic Psychological Need Satisfaction and Frustration Scale, Confirmatory, Factor Analysis, Multivariate Multiple Regression Analysis.

Introduction

Several multidimensional questionnaires have recently included distinct item sets to independently measure autonomy, competence and relatedness frustration, including the domain-specific Psychological Need Thwarting Scale – PNTS (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011), the domain-general scales of "Basic Psychological Needs Scale" (BPNS; Gagné, 2003), and the Balanced Measure of Psychological Needs scale (BMPN; Sheldon & Hilpert, 2012).

The research based on such measures has consistently demonstrated that basic need-frustration predicts unique variance on ill-being (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Stebbings, Taylor, Spray, & Ntoumanis, 2012; Sheldon, Abad, & Hinsch, 2011) and psychopathology (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011; Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013). Similar findings were obtained in a study based on objective (i.e., physiological) markers of distress (Bartholomew et al., 2011).

However, it is not so clear whether the distinction between the satisfaction and frustration is a substantive distinction (e.g., Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011) or reflects methodological artifacts, related to the different ways as the positive and negative formulation of the items (Sheldon & Hilpert, 2012). Further, it is also being discussed whether the need-satisfaction and need-thwarting scales provide evidence for the substantive distinction between the three needs (Sheldon & Hilpert, 2012) or for the components of need-satisfaction and need-frustration for each of the three needs (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Cordeiro, Paixão, Lens, Lacante & Sheldon, submitted).

These research questions were recently addressed in a study by Chen and Colleagues (2014) at the purpose of the cross-cultural validation of the Basic

Psychological Need Satisfaction and Frustration Scale (BPNSFS, Chen et al., 2014). In line with emerging research (see also Cordeiro, Paixão, Lens, & Sheldon, submitted, Bartholomew et al., 2011), the authors found that the theoretical organization of the BPNSFS was best represented in a structure of 6 factors that effectively discriminated the satisfaction and need-frustration components of autonomy, competence and relatedness needs. The three need-satisfaction factors predicted unique variance vitality and life satisfaction (with the exception of a non-significant contribution of competence in the latter case), whereas the three need-frustration factors were uniquely related to depressive symptoms.

Objectives

The aims of this study are twofold. In study 1 we aim to develop the Portuguese version of the Basic Psychological Need Satisfaction and Frustration Scale and perform a factor-analytic study of the internal structure of scales to provide extended evidence for the validity and metric invariance of the 6-factor solution proposed in the original studies. In study 2 we aim to replicate the goodness-of-fit of the 6-factor model in an independent sample of 12th grade students and we inspect the criterion-related validity of the scales, to ascertain whether the six scales predict unique variance on well-being (satisfaction with life and subjective vitality) and ill-being outcomes (anxiety, depression, somatization; for a similar approach, see Sheldon, Elliot, Kim & Kasser, 2001).

STUDY 1

In study 1 we examined the factor structure of the Basic Psychological Need Satisfaction and Frustration Scale into Portuguese in a sample of Portuguese undergraduate students. In a first step we translated the scale into Portuguese, following the back-translation procedures (Hambleton, 2001). In a second step we performed a

Confirmatory Factor Analyses (CFA, Byrne, 2010) on the six subscales, using AMOS 20.0 Structural Equation Modeling with Maximum Likelihood estimation of the BPNSFS, to produce evidence for their dimensionality. The six translated scales were modeled the as distinct latent factors (see above the description of the scale description). Goodness-of-fit was judged from multiple fit indices: the Chi square (X^2) statistics, the Standardized Root Mean Square Residual (*RMR*), the Comparative Fit Index (*CFI*) and the Root Mean Squared Error of Approximation (*RMSEA*). Model fit followed the cut-off values of .09 for *SRMR*, .06 for *RMSEA, p [rmsea* ≤ 0.05*]* and .90, or above, for *CFI* (Hu & Bentler, 1999). All items presenting poor factor loadings ($\lambda i \geq 0.5$; $\lambda^2_{ij} \geq 0.25$; Maroco, 2010) or high cross-loadings (MI>9) were excluded from further analysis. In a third step we examined the psychometric properties of the scale based on CFA statistics and the metric invariance of the six-factor structure across age and family structure, using CFA multigroup analysis. A sequential model testing approach was followed, with two models specified in AMOS 20.0: An unconstrained model (where factor loadings were allowed to vary between boys and girls) was compared to two increasingly constrained models, where factor loadings (measurement equality model) and factor variances and co-variances (structural parameters model) were set equal across the sexes. Model invariance was indicated by the combined χ^2 difference test (Byrne, 2010).

Method

Participants and Procedure

A total of 417 undergraduate students were sampled. Subjects were of both sexes (Male 41%; Female 59%) with an age range between 18 and 37 years (mean age = 20.41 years). The participants were attending the following majors: Psychology (1st year *N* = 144[34,5%]; 2nd *N* = 68 [16,3%]; 3rd 38[9,1%]), Social Service (1st year *N* = 32[7,7%], Journalism (3rd year *N* = 53 [12,7%]) and Mechanical Engineering (2nd year, *N* = 82

[19,7%]) at the universities of Lisbon (*N* = 141 [33,8%]), Porto (*N* = 38 [9,1%]), Coimbra (*N* = 103 [24,7%]) and at the Polytechnic Institute of Leiria (*N* = 135 [32,4%]). All subjects volunteered to take part in the study. No credits were received for participating in the study. In the instructions, aspects such as the voluntary participation and anonymity were safeguarded. Approximately 20 minutes were required to complete the survey.

Measures

Background Variables. Family structure was assessed with a 4-point question (1=Nuclear family, 2 = Single-parent family, 3 = Extended family, 4 = Institutionalized).

*Need satisfaction and Frustration***.** The Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2014) is a 24-item self-report scale measuring basic psychological need-satisfaction and need-frustration. The instrument comprises six independent scales. Three scales comprise 12 positively-worded items to measure the satisfaction of autonomy (e.g., "I feel a sense of choice and freedom in the things I undertake"), competence (e.g., "I feel confident that I can do things well") and relatedness (e.g., "I feel close and connected with other people who are important to me"). The three remaining scales included 12 negatively-worded items to assess the frustration of autonomy (e.g., "I feel pressured to do too many things"), competence (e.g., "I feel insecure about my abilities") and relatedness (e.g., "I feel the relationships I have are just superficial"). The items are rated on a 5-point Likert scale, ranging from 1 (*"Completely untrue"*) to 5 ("*Completely true*"). The alphas reported ranged between .73 and .89 for autonomy, competence and relatedness needs satisfaction and between .64 to .86 for autonomy, competence and relatedness needs frustration (Chen et al., 2014).

Translation. The original English BPNSFS was translated into Portuguese by a professional interpreter collaborating with the fluent English-speaking researchers. Next, the scales were translated back into English. Both original and back translated versions

were then checked for accuracy, with the discrepancies found in translations being discussed and resolved through consensus (Hambleton, 2001). The quality (readability and unambiguous understanding of the items) of the Portuguese version of the BPNSFS used was, then, checked in a pilot study using a sample of (N = 17) Portuguese undergraduate students, of both sexes, aged between 16 to 23 years old. Slight modifications were made under the suggestions of the students on the wording and syntax to enhance item clarity.

Results

CFA. Table 3.1 summarizes the goodness-of-fit results. Initial estimation of the models indicated the 6-factor model, differentiating the satisfaction and frustration components of the three needs, yielded a good fit to the data x^2 (237) = 519.13 p<.001, SRMR = .05, CFI = .95, RMSEA = .05. However, there was room for improvement in the model. Following the Modification Indices produced by AMOS, we excluded 2 items with poor factor loadings on the intended factors ($\lambda_{ij} \geq 0.5$) and six items with high cross-loadings on non-intended factors (*MI* > 9; Maroco, 2010).. The modified Model 2 (now designated Model 2r) was fitted to a solution of 18-items organized in six-factors. The results yield improved model fit x^2(249) = 226.23, p<.001, SRMR = .05, CFI = .97, GFI = .95, RMSEA = .05). The scales expressed good internal consistency ($F1_{AS}$: α = .71; $F2_{CS}$: α = .87; $F3_{RS}$: α = .85; $F4_{AF}$: α = .70; $F5_{CF}$: α = .82; $F6_{RF}$: α = .82). The standardized factor loadings of the items ranged between .69 and .89 (p < .001) In addition, the lower AIC estimates (AIC_{M2r} = 285,166), assert it as the most consistent with the theoretical structure of the data.

Table 3.1

BPNSFS. Global Fit Indices for the Six-factor Solution. Multiple-group Analysis

Confirmatory Factor Analysis	χ^2	*df*	χ^2/df	*CFI*	*GFI*	*RMSEA*	*SRMR*	*AIC*	*Comparison of models*		
									$\Delta\chi^2$	Δdf	*p-value*
Model											
Sample 1											
Model 1	519.13	237	2.19	.95	.91	.05	.05	645.13			
Model 1r	226.23	120	1.89	.97	.95	.05	.04	328.23			
Sample 2											
Model 1	739.21	237	2.81	.92	.92	.06	.06	865.32			
Model 1r	388.22	120	3.24	.94	.94	05	.05	490.22			
Multiple-group analysis for age											
Unconstrained	397.43	240	1.70	.96	.91	.04	.06				
Measurement weights	410.60	252	1.63	.96	.90	.40	.70		$\Delta\chi^2 = 13.17$	$\Delta df = 12$	**.36**
Structural covariances	444.92	273	1.63	.96	.90	.40	.10		$\Delta\chi^2 = 47.49$	$\Delta df = 33$	**.05**
Measurement residuals	553.18	291	1.90	.93	.89	.05	.10		$\Delta\chi^2 = 155.76$	$\Delta df = 51$	..01
Multiple-group analysis for family structure											
Unconstrained	846.09	411	2.06	93	90	04	.23				
Measurement weights	849.17	423	2.00	.93	.90	.04	.23		$\Delta\chi^2 = 8.57$	$\Delta df = 12$	**.74**
Structural covariances	855.87	444	1.93	.93	.90	.04	.24		$\Delta\chi^2 = 24.00$	$\Delta df = 33$	**.87**
Measurement residuals	879.15	462	1.90	.93	.90	.04	.24		$\Delta\chi^2 = 62.73$	$\Delta df = 51$	**.13**

Note$_1$*: X2* = qui-square*; CFI* = comparative fit index*; GFI* = goodness-of-fit index*; RMSEA* = Root Mean Square Error of Approximation*; SRMR* = Standardized Root Mean Square Residual; *AIC* = Akaike Information Criterion; $p < 0.0001$; $\Delta\chi^2$ = Qui-Square Difference; ΔCFI = Difference in Comparative Fit Index; "**Bold**" values indicate non-significant changes in model fit. Note$_2$ The Portuguese version of the items is provided in Appendix A, translated as "Escala de Satisfação e Frustração das Necessidades Psicológicas Básicas"

Model invariance: Age and Family Structure. We examine the metric equivalence of the six scales. The unconstrained model yielded an adequate fit to the BMPN data, considering age χ^2 (291) = 397.43 and family structure χ^2 (240) = 846.09 invariance models (see Table 4.1 for a summary of model estimates), with all factor loadings being statistically significant. The unconstrained and the constrained models were not significantly different, providing evidence for the invariance across age and family structure ($\chi^2 < .001$) in terms of factor loadings and structural covariances.

STUDY 2

In study 2 we replicated the goodness-of fit of the shortened 18-item BPNSFS in an independent sample of 755 Portuguese 12th grade students. In a fourth step we used Multivariate Multiple Regression Analysis (MMR) to test the main hypothesis of the study, with the six BPNSFS modeled as latent variables[4]. The individual items from each of the six scales were indexed as manifest indicators of the variables and the trajectories identified for the model were flagged as significant at $p < 0.05$. Statistics were computed in AMOS 20.0 with Maximum Likelihood Estimation.

As in the original studies (Chen et al., 2014), the MMR was estimated according to two measurement models. In a first model we examined the role of need-satisfaction and need-frustration scores on well-being and ill-being outcomes. More specifically we tested a model with composite need-satisfaction and need-frustration as predictors of subjective vitality, satisfaction with life, depression, anxiety and somatization, respectively. In a second model we broke down the two composite scores of need-satisfaction and of need-frustration into six scores of autonomy, competence and

[4] The Multivariate Multiple Regression Method was selected over the Univariate Multiple Regression since the correlations between the error terms of the dependent variables were high. In addition we used the six scales as predictors in the MMR structural model because the low-to-moderate correlations observed between the six scales do not indicate that it would be adequate to organize them in the super-ordinate factors of needs satisfaction/frustration (Maroco, 2010). This correlational pattern has also the advantage of providing more detailed information about the predictive effects of each the six latent variables on the outcomes.

relatedness need-satisfaction and frustration and examined their unique predictive effects on satisfaction with life, depression, anxiety and somatization (see Chen et al., 2014; Verstuyf et al., 2013 for similar approaches).

In line with the SDT model (Vansteenkiste & Ryan, 2013) and research (See introduction for a summary), we expect to find the primary effects of need-satisfaction on satisfaction with life and subjective vitality, and of need-frustration on anxiety, somatization and depression (Hypothesis 1). Moreover, based on the SDT assumption that the lack of needs satisfaction does not necessarily entails the experience of needs frustration, while experienced needs frustration, by definition, blocks the possibility of needs satisfaction (Vansteenkiste & Ryan, 2013), we expect the non-significant or marginally significant cross-lagged effects of need-satisfaction on anxiety, somatization and depression, contrasted by the significant cross-lagged effect of need-frustration on satisfaction with life and subjective vitality (Hypothesis 2). The significant cross-lagged effects are expected lower-sized than the primary effects. The unique effects outlined in both hypothesis are expected for the composite scores of need-satisfaction and need-frustration, but also for the individual scores obtained for each individual need, in line with the SDT assumption of the substantive distinction between the satisfaction and frustration components of basic needs (Vansteenkiste & Ryan, 2013)

Participants

Sample 2 involved 755 Portuguese grade twelve students, aged between 16 and 22 years, with a mean age of 17, 12 years (*SD* = 0, 92). Girls were 455 (60.3%) and boys 300 (39.7%) in the sample. Students attended scientific-humanistic (*N*=652 [86.4%]) or technical-vocational courses (*N*=103 [13.6%]). The procedures followed for questionnaire administration are similar to those described in study 1.

Measures

Need satisfaction and Frustration. The 18-item Portuguese version of the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2014), as described above.

Well-Being. The cognitive component of subjective well-being was measured with the Satisfaction With Life Scale - SWLS developed by Diener, Emmons, Larsen, and Griffin (1985; e.g., "I am satisfied with my life"; Portuguese version, Simões, 1992). The items were rated on a 5-point Likert scale, ranging from 1 (*"Completely untrue"*) to 5 ("*Completely true*"). The scale α reported was of .87 (Diener, Emmons, Larsen, & Griffin, 1985) and .77 (Simões, 1992).

Subjective Vitality. Subjective vitality was assessed by the Portuguese version of the Subjective Vitality Scale (Ryan & Frederick, 1997, α = .84; Portuguese version, Lemos & Gonçalves, 2010; α = .86), a 5-item measure developed to evaluate how alive and alert people have been feeling during the last month (e.g., "I feel alive and vital"). The items were rated on a 5-point Likert scale, ranging from 1 (*"Not at all true"*) to 5 ("*Very true*"). The SVS reported was of .84

Ill-Being. Ill-being was measured by the Portuguese version of the of the 18-item Brief Symptom Inventory (Derogatis, 2001; Portuguese version, Canavarro, 1999). The BSI-18 is a self-report symptom inventory designed to assess the psychological symptoms of anxiety (e.g., "Feeling tense or keyed up"), depression (e.g., "Feeling lonely") and somatization (e.g., "Pains in heart or chest"), and a General Severity Index. The items were rated on a 4-point Likert scale of distress, ranging from 0 (*"Not at all"*) to 4 ("*Extremely*").The internal consistency reported for the 9 subscales ranged between .70 for Somatization .89 for Depression (Derogatis, 2001) and between .62 and .80 for the Portuguese version of the scale (Canavarro, 2007).

Preliminary Results

Descriptive Statistics and Correlations: Table 3.2 sums up the descriptive statistics for the need-satisfaction and need-frustration variables and the well-being and ill-being outcomes. Table 3.3 presents the correlation matrix between the study variables. As expected (Ryan & Deci, 2011; Chen et al, 2014) we found moderate positive correlations between the three scales measuring need-satisfaction, and between the three scales measuring need-frustration. In addition, we found significant negative correlations between the satisfaction and frustration of each of the three needs. Likewise, the composite scores of need-satisfaction and frustration were negatively correlated. All the need-satisfaction measures were positively related to satisfaction with life and subjective vitality, and negatively correlated to anxiety, depression and somatization. Conversely, all the need-frustration scores were positively related to anxiety, depression and somatization and negatively related to satisfaction with life and subjective vitality. Finally, significant correlations were observed between subjective vitality, satisfaction with life, anxiety, depression and somatization, but in any case multicollinear ($R<.9$; $VIF<5$) thus suggesting that they are measuring different construct**s.**

Table 3.2

BPNSFS. Means, Standard Deviations, Range and Internal Consistency of the Variables

Variables	N	Minimum	Maximum	Mean	SD	Alpha
Autonomy Satisfaction	417 (755)	1.67 (1.00)	6.00 (6.00)	4.87 (4.58)	0.82 (.90)	.76 (76)
Autonomy Frustration	417 (755)	1.00 (1.00)	5.00 (6.00)	2.20 (2.42)	0.92 (.97)	.85 (70)
Competence Satisfaction	417 (755)	1.00 (1.00)	6.00 (6.00)	4.83 (4.72)	0.88 (.83)	.85 (73)
Competence Frustration	417 (755)	1.00 (1.00)	6.00 (6.00)	2.13 (2.50)	1.04 (1.0)	.74 (73)
Relatedness Satisfaction	417 (755)	1.25 (1.75)	6.00 (6.00)	5.25 (5.16)	0.78 (.80)	.78 (73)
Relatedness Frustration	417 (755)	1.00 (1.00)	6.00 (5.75)	1.80 (1.97)	0.88 (.98)	.80 (70)
General Satisfaction	417 (755)	1.78 (2.25)	6.00 (6.00)	3.74 (3.46)	0.86 (.95)	.90 (81)
General Frustration	417 (755)	1.00 (1.00)	4.89 (5.50)	4.67 (3.90)	1.15 (.83)	.88 (83)
Satisfaction With Life	417 (755)	1.00 (1.00)	6.00 (5.00)	1.96 (2.10)	0.79 (.93)	.85 (.82)
Vitality	417 (755)	1.00 (1.00)	7.00 (5.00)	1.97 (2.12)	0.87 (.93)	.89 (.92)
Anxiety	417 (755)	1.00 (1.00)	5.00 (5.00)	1.69 (1.63)	0.74 (.70)	.70 (.70)
Depression	417 (755)	1.00 (1.00)	5.00 (5.00)	4.99 (4.83)	0.70 (.65)	.87 (.83)
Somatization	417 (755)	1.00 (1.00)	7.00 (5.00)	2.02 (2.44)	0.79 (.81)	.82 (.80)

Note: values under brackets refer at the samples of high school students (N = 755) **.p<.01 level ; *. p <0.05

Table 3.3

BPNSFS. Correlations Between the Study Variables

Study variables	Zero-order correlations between the latent constructs												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomy Satisfaction	1	-.39**	.51**	-.38**	.51**	-.32**	.46**	.36**	-.15**	-.32**	-.12**	.80**	-.43**
2. Autonomy Frustration	-.50**	1	-.28**	.50**	-.47**	.55**	-.32**	-.28**	.28**	.43**	.21**	-.47**	.80**
3. Competence Satisfaction	.62**	-.39**	1	-.58**	.42**	-.29**	.41**	.37**	-.23**	-.37**	-.19**	.81**	-.46**
4. Competence Frustration	-.46**	.46**	-.72**	1	-.35**	.56**	-.40**	-.34**	.43**	.58**	.34**	-.54**	.84**
5. Relatedness Satisfaction	.63**	-.47**	.59**	-.49**	1	-.60**	.39**	.33**	-.17**	-.37**	-.15**	.79**	-.55**
6. Relatedness Frustration	-.50**	.51**	-.56**	.61**	-.75**	1	-.33**	-.27**	.27**	.45**	.28**	-.51**	.84**
7. Satisfaction With Life	.49**	-.47**	.48**	-.50**	.47**	-.42**	1	.49**	-.31**	-.53**	-.20**	.44**	-.36**
8. Vitality	.44**	-.28**	.54**	-.54**	.49**	-.41**	.53**	1	-.28**	-.43**	-.26**	.53**	-.42**
9. Anxiety	-.31**	.34**	-.39**	.49**	-.33**	.40**	-.36**	-.39**	1	.66**	.69**	-.23**	.39**
10. Depression	-.40**	.38**	-.52**	.65**	-.47**	.51**	-.56**	-.56**	.73**	1	.49**	-.44**	.58**
11. Somatization	-.14**	.21**	-.25**	.32**	-.22**	.27**	-.26**	-.23**	.63**	.49**	1	-.20**	.33**
12. Needs Satisfaction	.85**	-.52**	.87**	-.66**	.85**	-.69**	.55**	.58**	-.40**	-.54**	-.24**	1	-.59**
13. Needs Frustration	-.57**	.78**	-.68**	.85**	-.67**	.84**	-.56**	-.50**	.51**	.64**	.33**	-.74**	1

Note: SD = Standard Deviation; Intercorrelations, Mean and SD at the lower and upper diagonal refer respectively at the samples of undergraduate (N = 417) and high school students (N = 755), respectively

***** p <0.05

Gender and Age Effects. A MANCOVA was conducted to examine whether the demographic variables of gender and age were related to any of the assessed outcomes. The results indicated the non-significant effects of gender, but not age, on satisfaction with life and subjective vitality, but the significant multivariate effect of gender on ill-being indicators (Wilk's Λ = .931, F [1, 463] = 11.47, p < .01, multivariate η^2 = .07). Specifically, girls scored higher on anxiety (M = 2.29, SD = 0.53), depression (M = 2.20, SD = 0.54) and somatization (M = 1.74, SD = 0.40) than boys (M = 1.81, SD =.07; M = 1.94, SD = 0.66; and 1.45, SD = 0.49, respectively). Consequently, gender was included as covariate in all the subsequent SEM analyses.

Primary Results

Table 3.4 summarizes the regression analyses predicting well-being and ill-being. We examined the main hypothesis using Multivariate Multiple Regression Analyses (MMRA). As expected (Chen et al., 2014; Vansteenkiste & Ryan, 2013) we found that the combined score of need-satisfaction positively predicted satisfaction with life and subjective vitality, while composite need-frustration was uniquely related to anxiety, depression and somatization (primary effects). In addition, composite need-satisfaction was negatively related to depression, and uncorrelated to anxiety and somatization, whereas composite need-frustration was negatively related to both subjective vitality and satisfaction with life (cross-lagged effects). In all the analyses, we controlled for the effect of gender, that yielded a significant association to all the dependent variables (Anxiety: β = .32, p < .001: depression: β = .19, p < .001, somatization: β = .32, p < .001; subjective vitality: β = - .25, p < .001; satisfaction with life: β = - .10, p < .01). As to age, the unconstrained model did not fit the data $x^2(40) = 63.11$ p<.001, CFI = .99, SRMR = .02, RMSEA = .03, significantly better than the constrained models $x^2(25) = 50.57$, p = .0008, CFI = .99, SRMR = .02, RMSEA = .03).

We further examined the unique effects of the satisfaction and frustration components of each of the three needs on well-being an ill-being criteria. Following Chen and colleagues (2014) we analyzed in separate the unique relation between need-satisfaction and well-being and the unique effect of need-frustration on ill-being. As expected, autonomy, competence and relatedness satisfaction were positive predictors of subjective vitality and satisfaction with life. Conversely the frustration of each of the three needs yielded unique associations to the experience of anxiety, depression and somatization, except that relatedness frustration was not a significant predictor of anxiety. As to age, the unconstrained model did not fit the data $x^2(40) = 63.11$ $p<.001$, CFI = .99, SRMR = .02, RMSEA = .03, significantly better than the constrained models $x^2(25) = 50.57$, $p = .0008$, CFI = .99, SRMR = .02, RMSEA = .03).

Table 3.4

BPNSFS. Multivariate Multiple Regression Analysis Predicting Well-being and Ill-being

Predictor	Dependent Variables				
	Subjective vitality	Satisfaction with life	Anxiety	Depression	Somatization
Autonomy Satisfaction	.18***	.27***	------	-.08*	------
Competence Satisfaction	.21***	.19***	-.20***	-.24***	-.16***
Relatedness Satisfaction	.14***	.16***	-.15***	-.22***	-.14***
Autonomy Frustration	-.17***	-.14**	.11***	.16***	------
Competence Frustration	-.24***	-.28***	.35***	.43***	.24****
Relatedness Frustration	------	-.11**	------	.14***	.15**
Needs Satisfaction	.35***	.43***	------	-.11***	------
Needs Frustration	-.15***	-.17***	.41***	.51***	.34****

Note. Values correspond to Standardized estimates, * p <0.01**, p <0.005***, p <0.001

Discussion

The current study was designed to generate improved evidence for the factor structure and psychometric properties of the Basic Psychological Need Satisfaction and Frustration Scale in two samples of Portuguese students. The results obtained across two samples of Portuguese undergraduate (N = 417) and grade 12 students (N = 755) replicate the validity of the six-factor model to interpret the factorial structure of the 18-item BPNSFS, and, therefore, provide extended empirical evidence for the substantive distinction between the satisfaction and frustration components of autonomy, competence and relatedness needs. The 6-factor solution was found invariant across age and family structure. To provide further support for the substantive distinction between the autonomy, competence and relatedness need-satisfaction, we inspected the unique predictive effects of autonomy, competence and relatedness need frustration on well-being and ill-being criteria. The Portuguese data replicated the findings of Chen and colleagues (2014) in several ways. Firstly, in line with recent SDT theorization (Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013) and replicating previous findings (e.g., Chen et al., 2014) we found we observed, for both samples of Portuguese students, that the satisfaction of all the three basic needs were predicted unique variance on subjective well-being and satisfaction with life, and the frustration of the three needs explained unique variance on anxiety, depression and somatization. Secondly, extending previous research (e.g., Chen et al., 2014), and research findings (e.g. Cordeiro, Paixão, Lens, Lacante & Sheldon, submitted), we found the asymmetrical cross-lagged effects of need-frustration on subjective well-being and subjective vitality, contrasted by the non-significant or marginally significant effects of the three needs on anxiety, depression and somatization. This finding suggests that when Portuguese students feel less well in general does not necessarily makes them feel psychologically ill, but what makes them anxious and sad

also makes them feel less good in general. Thirdly, we found that competence satisfaction was the stronger positive predictor of satisfaction with life and subjective vitality and negative predictor of anxiety, depression and somatization. Conversely, competence frustration was the strongest positive predictor of anxiety, depression and somatization and the most robust negative predictor of satisfaction with life and subjective vitality. The findings seem to suggest the developmental and contextual salience of need-satisfaction and frustration experiences. In particular, both the grade 12 and undergraduate students targeted were facing important career-related transitions that are successfully resolved through academic success, within highly selective and competence-focused achievement contexts. Consequently, the anticipation or experienced failure and inability to perform well makes the perception of competence frustration particularly salient what ultimately results in the students´ experience of lower well-being, but also in the experience of symptoms of anxiety, depression and somatization. This is a key finding of our study suggesting that need satisfaction and need frustration are not opposite poles of one continuum but as having different substantive interpretations and effects (e.g., Sheldon, Abad, & Hinsch, 2011; Sheldon & Hilpert, 2012).

One must take the results with caution. In fact, the low mean scores obtained for the experience of ill-being (as expected in normative samples) might not represent the full experience of ill-being, introducing a potential bias in the conclusions. In particular, one could argue that the additive *versus* discrete effects found between needs satisfaction and need frustration might be more a function of the difference in mean scores of needs satisfaction and frustration, than an expression of the unique effects found between the variables. More research is required to clarify this topic. Additionally, the cross-sectional study design employed prevented us from drawing sustained causal interpretations about the underlying developmental dynamics linking the satisfaction and frustration of each

need to well-being and ill-being criteria, making it important to test the predictive relations with more prospective longitudinal research. A possible direction could be to inspect how progressive increases in need frustration relate to increases in ill-being and diminished well-being. Finally, we based our conclusions on a single study, using a relatively homogeneous and well-educated sample of Portuguese undergraduate students. However, one could argue that higher scores of need frustration and ill-being are related to early school drop-out and heightened incidence of early psychiatric problems. This being the case, targeting lower level students and clinical samples could be relevant to support, in future studies, the replicability and generalizability of the conclusions.

Conclusion

This study successfully replicated the 6-factor solution proposed for the BPNSFS (Chen et al., 2014), as it provides additional evidence for the substantive distinction between the need satisfaction and need frustration components of needs. Additional regression analysis showed that needs satisfaction *and* frustration mobilize asymmetrical cognitive-motivational processes and are related to different outcomes. The findings have important implications for measurement. They suggest breaking up with a tradition of research deducing need frustration from low scores on need satisfaction, towards an approach that measures satisfaction and frustration as content-specific constructs, opening an exciting heuristic framework to examine whether the three need-frustration dimensions are differentially related to adolescent normative developmental outcomes and psychopathological trajectories. Assuming the multidimensional tripartite structure of need frustration has important implications for research and practice in psychology, as they stimulates for the development of more specific intervention programs relevant for clinical and educational interventions.

4

Factor Structure and Dimensionality of the Balanced Measure of Psychological Needs (BMPN) Among Portuguese High School Students. Relations to Well-being and Ill-being

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Marlies Lacante & Kennon Sheldon (2015, under review)

Learning and Individual Differences

Abstract

Previous research on the Balanced Measure of Psychological Needs Scale (BMPN) fitted a 5- factor structure distinguishing the three need factors of autonomy, competence and relatedness and the two method factors of need satisfaction and dissatisfaction. The current study explores the dimensionality and construct validity of the Portuguese version of the Balanced Measure of Psychological Needs (Sheldon & Hilpert, 2012) in two samples of high school students. We compared the original 5-factor model to three alternative models to assess the ability of each model to represent the factorial organization of the data. Confirmatory factor analysis yielded good fit for solutions that separately modeled the satisfaction and frustration components of needs. The best-fitting solution of six factors, one per subscale, was supported in both high school samples, and was also shown by multigroup analysis to be invariant across gender. Regression analyses found that basic need satisfaction was related to subjective vitality and satisfaction with life (SWL) and need dissatisfaction predicted anxiety, depression and somatization. The substantive distinction between the satisfaction and frustration components of needs, and implications for educational settings, are discussed. Overall, the Portuguese BMPN appears to be reliable and valid to measure basic need satisfaction and need frustration for Portuguese high school students.

Introduction

SDT-based measures of psychological needs have recently evolved to include separate items sets that assess the subjective experiences of psychological need satisfaction/dissatisfaction (indexed by positively-worded items) and of need frustration (indexed by negatively-worded items). Among the most well-validated are the Balanced Measure of Psychological Needs Scale (BMPN; Sheldon & Hilpert, 2012), the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2014), and the domain- specific Psychological Need Thwarting Scale - PNTS (Bartholomew et al., 2011).

The BMPN (Sheldon & Hilpert, 2012) is generally used as three separate but distinguishable autonomy, competence, and relatedness subscales that measure the subjective experiences of need satisfaction for life as a whole. The internal structure of the BMPN was validated in a 3x2 model. Three factors distinguish the autonomy, competence and relatedness need satisfaction. Two additional method factors distinguish the *satisfaction* (scores of positively-worded items) and *dissatisfaction* (scores of negatively-worded items) of the three needs. The BPNSFS (Chen et al., 2014) is a measure of satisfaction and frustration of autonomy, competence and relatedness needs.

The BPNSFS was validated for a 6-factor model. Three scales, of 12 positively-worded items, assess the satisfaction of the three needs, and three other scales, of 12 negatively worded items, indicate the frustration of each need, as distinct substantive constructs. Finally, the domain-specific PNTS (Bartholomew et al., 2011) assess, in three separate scales, the subjective experiences of autonomy, competence and relatedness need thwarting in the sports context as independent constructs.

Two issues are noteworthy. As we can see the three above mentioned scales used conceptually diverse labels to describe subjective negative experiences related to basic

needs, either defined as need dissatisfaction (Sheldon & Hilpert, 2012), need frustration (Chen et al., 2014) or need thwarting (Bartholomew et al., 2011). In this paper we use the term need thwarting to reflect influence of contexts that block the needs` satisfaction (Ryan, 1995) and need frustration to describe the inner feelings that develop from these experiences. (Vansteenkiste & Ryan, 2013). In addition, the satisfaction *and* frustration constructs were examined in diverse ways. In the BMPN positive and reverse-scored negative items were joined together for each need, to form three trait-like factors corresponding to the satisfaction of the three needs (Sheldon & Hilpert, 2012). Differently, in the BPNSFS and PNSTS negatively-worded autonomy, competence and relatedness need frustration/thwarting scales were scored and modeled as substantively distinct constructs, either to distinguish the frustration from the satisfaction components of the three psychological needs (Chen et al., 2014) or the thwarting of each need (Bartholomew et al., 2011). Yet, to date, the comparative fit of the three models altogether was not yet performed for the BMPN, leaving unanswered the question of whether need frustration (dissatisfaction or thwarting) and satisfaction of needs are distinguished by virtue of statistical artifacts or, in fact, correspond to substantive constructs. To attain this goal we compared four non-nested models for model fit. Figure 4.1 provides a graphic portrayal of the four models tested in CFA.

Model 1 (Deci & Ryan, 2000) organized the six BMPN scales into three latent factors that distinguish the three psychological needs. Factor 1 assess autonomy satisfaction *versus* autonomy dissatisfaction; Factor 2, competence satisfaction *versus* competence dissatisfaction and Factor 3, relatedness satisfaction *versus* relatedness dissatisfaction. Best-fit of Model 1 suggests, in line with more traditional perspectives, that the satisfaction and dissatisfaction components of needs are opposite poles of the need satisfaction continuum, with need dissatisfaction being equated as the lack of need

satisfaction (e.g., Hodge, Lonsdale, & Ng, 2008).

Model 2, (Sheldon & Hilpert, 2012), adds to the structure of three factors described for Model 1, two additional method factors assessing the satisfaction (indicated by nine positively-worded items) and dissatisfaction of needs (indicated by nine negatively-worded items)[5]. Best-fit for Model 2 supports the tripartite structure of basic needs posited by SDT (Deci & Ryan, 2000), controlling for potential bias associated to the shared method variance of positively and negatively-worded items (Sheldon & Hilpert, 2012).

Model 3 (e.g., Haerens et al, 2015) organizes the six scales in a two-factor higher-order model of need satisfaction and need dissatisfaction, each indicated by three first order factors of autonomy, competence and relatedness satisfaction. Best-fit for Model 3 asserts the substantive nature of the satisfaction and dissatisfaction components of needs.

Finally, Model 4 (Chen et al., 2014) arranged the six scales in six latent factors that distinguish the components of satisfaction (3 scales) and dissatisfaction (3 scales) for autonomy, competence and relatedness needs. Best fit for Model 4 extends the structural distinction between need satisfaction and dissatisfaction (Model 3) to each of the three needs (Bartholomew et al., 2011; Chen et al., 2014).

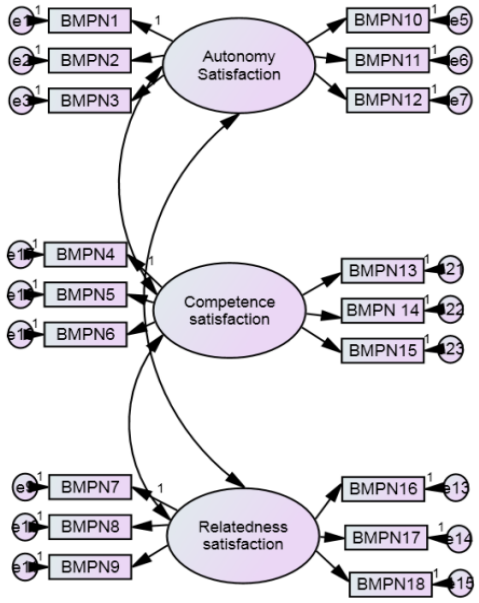
[5] For Sheldon and Hilpert (2012) the designation of dissatisfaction is equivalent to what currently is conceived and measured as need frustration.

Figure 4.1

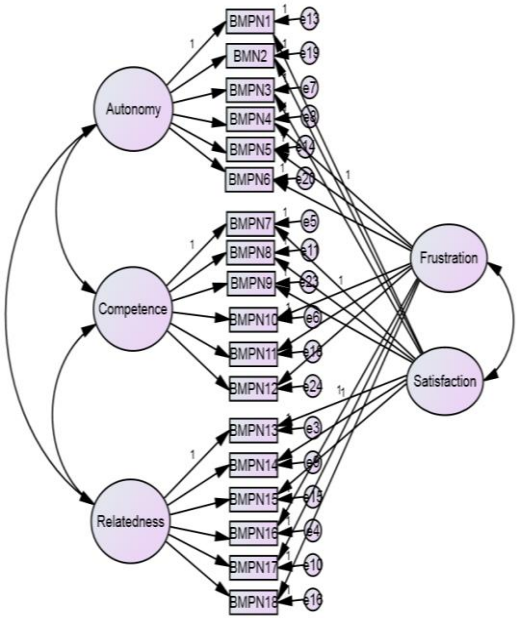
BMPN. Graphic Portrayal of the CFA Models

First panel: Model 1 (left); Model 2 (right). Second panel Model 3 (left); Model 4 (right).

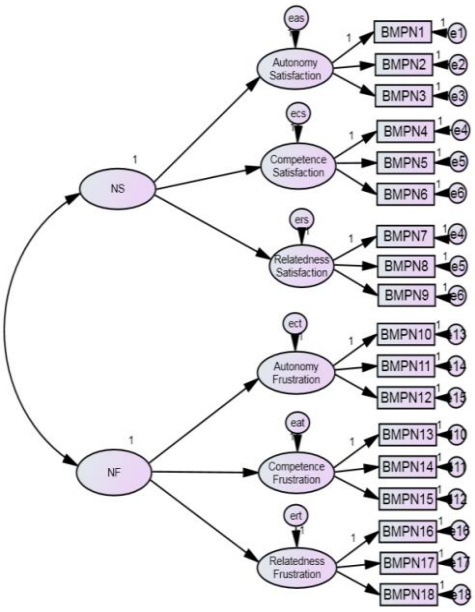
Model 1



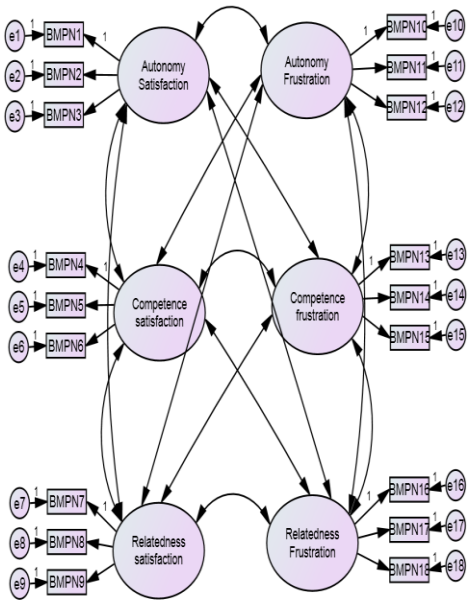
Model 2



Model 3



Model 4



Present Study and Hypotheses

We re-examined the internal structure of the BMPN in Study 1, to ascertain whether the six scores of satisfaction and frustration of the three needs should be best interpreted as two general method factors reflecting the positively/negatively wording of items (as in Sheldon & Hilpert, 2012), two higher-order substantive factors of need satisfaction and frustration (as in Bartholomew et al., 2011) or six substantive factors distinguishing the satisfaction and frustration components of each need (Chen et al., 2014). In so doing we fitted the BMPN data to four competitive models, conceptualizing the components of satisfaction and frustration of psychological needs as opposite dimensions (Model 1), as distinct method effects (Models 2) or as substantively distinct constructs (Models 3 and 4). We expect the good fit of Models 2, 3 and 4 but the poor fit of Model 1, under the assumption that need frustration is distinct (*versus* opposite) of need satisfaction (*Hypothesis 1a;* see also Bartholomew et al., 2011; Deci & Ryan, 2000; Sheldon & Gunz, 2009; Vlachopoulos & Michailidou, 2006). In addition we expect the progressive better fit from Models 2 to 4, as the distinction moves from distinct need satisfaction and frustration as method effects to substantively distinct constructs (*Hypothesis 1b*).

The best-fitting measurement model (here expected to be Model 4) was further examined in terms of internal consistency, considering the Composite Reliability (CR) of the scores). Construct validity was examined from estimates of Convergent Validity (CV) and Discriminant Validity (DV). With this procedure we intended to ascertain whether the 18 items converge to measure as to discriminate, the six latent constructs under analysis. If the six-factor solution of scales is, as assumed, adequate to interpret the theoretical structure of the BMPN we would expect no threats to reliability or to the validity of the six scales (*Hypothesis 2*). Furthermore, we would expect that the six scales related uniquely to the outcomes.

In Study 2 we examined the criterion-related validity of the expected best-fitting 6-factor model of scales, in an independent sample of high school students. As a pre-condition to proceed into further analysis we expect that the subjective experiences of need frustration predict students' adjustment over and above need satisfaction (*Hypothesis 3*, Bartholomew et al., 2011). More specifically, in line with Chen and colleagues (2014) we hypothesize that the satisfaction of the three needs positively predicts SWL and subjective vitality (*Hypothesis 4a*), controlling for need frustration, whereas the frustration of the three needs will positively predict anxiety, depression and somatization (*Hypothesis 4b*), controlling for need satisfaction. Additionally, consistent with recent research (Adie, Duda, & Ntoumanis, 2008) we expect that need satisfaction does not significantly relate to anxiety, depression and somatization after controlling for need frustration (*Hypothesis 4c*), whereas need frustration will be significantly negatively associated to SWL and subjective vitality after controlling for need satisfaction (*Hypothesis 4d*).

Plan of Analysis and Statistics

In Study 1 we report the procedures followed to develop the Portuguese version of BMPN. Next, we describe the analytical procedures used to investigate the internal structure of the BMPN. In a first step we used Exploratory Factor Analyses (*EFA*; McIver & Carmines, 1981) with principal components (*PCA*) and *varimax* orthogonal to explore the dimensionality of the BMPN items. In a second step we performed a confirmatory factor analysis (CFA; Byrne, 2010) on the BMPN items, on four competitive models and evaluated their fit. Model fit was judged from multiple fit indices, including the Chi square test (X^2), the Standardized Root Mean Square Residual (*RMR*), the Comparative Fit Index (CFI) and the Root Mean Squared Error of Approximation (RMSEA). Goodness-of-fit used the combined cut-off values of 0.09 for SRMR, 0.06 for RMSEA P

[rmsea ≤ 0.05] and ≥ 0.90 for CFI (Hu & Bentler, 1999). The factors were allowed to correlate, but no item cross-loadings or correlated error variances were allowed. To select the preferred model, we relied in Akaike´s Information Criteria with the lowest values indicating the preferred model (< AIC; Klyne, 2005). All estimates were computed in AMOS 20.0 (Amos Development Corporation, Florida, US). In a third step we examined model fit and the psychometric properties of the scales. Estimates of Composite Reliability (CR ≥ .70), convergent validity (*Average Variance* Extracted [AVE] ≥ 0.5) and discriminant validity (Maximum Shared Squared Variance [*MSV*] < [*AVE*] < Average Shared Squared Variance [*ASV*] < AVE)[6] were obtained from the *CFA* correlation matrix (Fornell & Larcker, 1981) and from standardized regression weights (e.g., Bartholomew et al., 2011). In a fourth step we examined the cross-gender invariance of the model that best-fitted the BMPN data. A sequential model testing approach was followed, with two models specified: An unconstrained model (where factor loadings were allowed to vary between boys and girls) was compared to two increasingly constrained models, where factor loadings (measurement equality model) and factor variances and co-variances (structural parameters model) were set equal across the sexes (Byrne, 2010). Model invariance was indicated by the $\chi 2$ difference test and the CFI difference approach (ΔCFI < .01; Cheung & Rensvold, 2002). In a fifth step (Step 1 of Study 2) we fitted the best-fitting model in Study 1 to an independent sample of 12th grade students, in order to generate cross-validation evidence. CFA with maximum likelihood estimation was performed. In a sixth step (Step 2 of Study 2) we computed multivariate multiple regression analyses to examine whether the six need-factors predict unique variance on well-being and ill-being outcomes (external validity; for similar approaches

[6] Discriminant Validity was achieved when the average variance extracted obtained for each scale was greater than the squared correlation estimates of each pair of latent constructs.

see Chen et al., 2014; Verstuyf et al., 2013). Finally, in a seventh step (Step 3 of Study **2)** we performed a hierarquical multiple regression analysis to examine whether need frustration added value to need satisfaction in the prediction of well/ill-being outcomes.

STUDY 1

Participants and Procedure

Sample 1 included 371 students (grade 10: *n* = 101 [27, 2%], grade 11: *n* = 148 [39, 9%], grade 12 *n* = 122 [32, 9%]), of both sexes (Male: *n* = 171 [43, 8%], female *n* = 200 [56, 2%]), aged between 16 and 23 years old (*M* = 18; *SD* = 1, 309). Students attended scientific-humanistic (*n* = 153 [41, 2%]) or technical-vocational courses (*n* = 218 [58, 8%]) in three private (n = 189 [50, 9%]), and two state run (*n* = 182 [49, 1%]) schools. A total of 15 classes was involved in the study. The Portuguese version of the BMPN was administered the in Portuguese secondary schools, after informed consent was obtained from students or parents of underage students and authorizations were guaranteed from the National Board of Education. The scale was group-administered by the primary researcher during regular school hours. Instructions were read aloud and aspects such as the voluntary participation and confidentiality of the data were secured by the researcher. Students took about 15 minutes to complete the survey. None of the participants refused collaboration and credits were not given for participation.

Measures

Psychological Need Satisfaction. The Portuguese version of the 18-item Balanced Measure of Psychological Needs (Sheldon & Hilpert, 2012) was used in this study. The BMPN comprises six 3-item subscales measuring autonomy satisfaction (F1: items 1, 2, 3; e.g., "My choices are based on my true interests and values"), competence satisfaction (F2: items 4, 5, 6; e.g., "I am successful at completing difficult tasks and projects") and

relatedness satisfaction (F3: items 7, 8, 9; e.g., "I feel a sense of contact with people who care for me, and whom I care for"). Three additional three-item subscales measure autonomy dissatisfaction, (F4: items 10, 11, 12; e.g. "I do things against my will"), competence dissatisfaction (F5: items 13, 14, 15; e.g., "I do stupid things, that make me feel incompetent"), and relatedness dissatisfaction (F6: items 16, 17, 18; e.g., "I feel unappreciated by one or more important people"). A 5-point Likert scale, ranging from 1 = *no agreement* to 5 = *much agreement*, was used to rate the items. In the original studies the internal consistency reported for the six scales ranged between .71 and .85 for positively and negatively worded relatedness, α = .71 and α = .70 for positively and negatively worded competence, and α = .69 and α = .72 for positively and negatively worded autonomy (Sheldon & Hilpert, 2012).

Questionnaire Translation. The 18-item BMPN was translated into Portuguese using the back-translation technique (Hambleton, 2001). Portuguese-speaking researchers, fluent in English, collaborated with a professional interpreter to translate the scale from English into Portuguese. Then an independent interpreter translated the scales back into English. Next, the original and back-translated versions of the scale were checked for accuracy, and non-equivalent translations were discussed until a final version was agreed. The readability and unambiguous understanding of the items was, then, checked in a pilot study using a sample of eleven Portuguese 10^{th} grade students. Following the students feedback, we modified two items in both wording and syntax (e.g., The Portuguese translation of the expression “true self” in item 3 was modified to “…express truly who I am”).

Preliminary Results

Table 4.1 presents the descriptive statistics and factor loadings of the BMPN items. In a preliminary analysis we screened the normality of the distribution of the P-

BMPN items (Sample 1; $N = 371$), at the univariate and multivariate levels. Missing data was dealt by mean replacement. The distribution of the BMPN items was approximately normal in terms of univariate Skewness and Kurtosis, but the multivariate kurtosis coefficient departed significantly from normality ($ku_M = 48.55$; Bentler & Wu, 2002, *cited in* Finney & DiStefano, 2006). Therefore, in all further analyses we used 1,000 bootstrap samples with replacement based on the original sample (Preacher & Hayes, 2004).

Primary Results

Exploratory Factor Analysis. EFA in Principal Components (PCA) and *Promax* Rotation was performed ($N = 371$) to determine the internal structure of the BMPN scale. PCA on the 18 items yielded six components with eigenvalues larger than 1 (Tinsley & Tinsley, 1987, see Table 4.1). The six factors explained 18, 63%, 12, 31%, 10, 17%, 9, 82%, 6, 39%, and 6, 36 % of the variance, respectively, and altogether they accounted for 63.69% of the total variance explained. All factors presented good internal consistency: autonomy satisfaction ($\alpha = .84$), competence satisfaction ($\alpha = .79$), relatedness satisfaction ($\alpha = .82$), autonomy frustration ($\alpha = .85$), competence frustration ($\alpha = .82$), and relatedness frustration ($\alpha = .77$) and the corrected item-total correlations of the six factors were in a satisfactory range (.68 - .70; .59 - . 74; .69 - .74; .64 - .72; .62 - .72; .46 - .51, respectively). All scale items loaded significantly on the intended factors ($\lambda ij > 0.5$; $\lambda 2ij \geq 0.25$, $p < .05$), suggesting the factorial validity of the six scales.

Table 4.1

BMPN: Item Means, Standard Deviations, Skewness and Kurtosis, Factor Loadings and Communalities

BMPN subscale and item	*M*	*SD*	*SK*	*Ku*	FL ($\lambda_{ij} \geq 0.5$; CI 95%)						
					F1	F2	F3	F4	F5	F6	R^2
F1. Autonomy satisfaction											
1. My choices are based on my true interests and values	4.22	.83	1.20	.67	.78	--	--	--	--	--	.63
2. I feel free to do things my own way	3.72	.95	-.99	.60	.83	--	--	--	--	--	.62
3. My choices express my true self	4.10	.83	-1.20	1.38	.78	--	--	--	--	--	.61
F2. Competence satisfaction											
4. I am successful at completing difficult tasks and projects	3.74	.82	-.68	.10	--	.73	--	--	--	--	.71
5. I am taking on mastering hard challenges	3.95	.80	-.36	-.41	--	.89	--	--	--	--	.65
6. I am very capable in what I do	3.78	.81	.16	-.62	--	.65	--	--	--	--	.66
F3. Relatedness satisfaction											
7. I feel a sense of contact with people who care for me. and whom I care for	4.33	.81	-.88	.32	--	--	.81	--	--	--	.76
8. I feel close and connected with other people who are important to me	4.32	.89	-1.01	.67	--	--	.82	--	--	--	.77
9. I feel a strong sense of intimacy with the people I spend time with	4.11	.93	1.65	2.06	--	--	.71	--	--	--	.76
F4. Autonomy frustration											
10. I have a lot of pressures I could do without	3.66	1.12	1.22	.60	--	--	--	.70	--	--	.60
11. There are people telling me what I have to do	3.17	1.23	.79	-.35	--	--	--	.86	--	--	.50
12. I do things against my will	2.77	1.25	.78	-.13	--	--	--	.88	--	--	.51
F5. Competence frustration											
13. I do stupid things that make me feel incompetent	2.71	1.24	.92	.24	--	--	--	--	.80	--	.60
14. I often experience failure. or find myself unable to do well at something	2.61	1.20	.84	-.08	--	--	--	--	.83	--	.58
15. I struggle doing things I should be good at	4.20	.78	1.20	.67	--	--	--	--	.71	--	.77
F6. Relatedness frustration											
16. I am lonely	2.10	1.20	-1.20	1.38	--	--	--	--	--	.66	.59
17. I feel unappreciated by one or more important people	2.52	1.33	-1.04	.47	--	--	--	--	--	.79	.61
18. I have disagreements or conflicts with important people	2.59	1.30	-.68	.10	--	--	--	--	--	.70	.54
Multivariate kurtosis				48.55							
Total Variance Explained (%)					18.60	12.31	10.17	9.82	6.39	6.36	

Note1. Numbers on the left side of each item represent the position of the item in the English version of the BMPN. *FL* = Factor Loadings. R^2 = Communalities. Factor loadings are statistically significant at $p < .05$

Note 2. Statistics were computed for Study 1 ($N = 371$). The Portuguese version of the items is provided in Appendix A, translated as "Escala Balanceada de Necessidades Psicológicas Básicas"

Confirmatory Factor Analysis. Table 4.2 summarizes the goodness-of-fit results for the four competitive models. *CFA* results show a poor fit of Model 1 across all the fit indices considered X^2 (249) = 1263.66; $p < .001$; *CFI* = .69*; RMSEA = .14 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .10. Models 2, 3 and 4 showed an adequate fit to the data with a progressive better fit observed from Model 2 to Model 4. The best fit of Model 4 X^2 (120) = 185.54; $p < .001$; *CFI* = .96*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .04, along with the lowest AIC estimates, guided our option to use it in further analyses.

Cross-gender Invariance Analysis. A subsequent multigroup confirmatory factor analysis examined the metric invariance of the Model 4 across gender (see table 4.2 for a summary of model estimates). The unconstrained model yielded an adequate fit to the BMPN data, χ^2 (299) = 399.73, with all factor loadings being statistically significant. The unconstrained and the constrained models were not significantly different ($\chi 2 < .001$; CFI < .01), providing evidence for the gender invariance in terms of factor loadings and structural covariances.

Reliability and Validity. Table 4.3 presents estimates of reliability and validity for the six-factor factors solution. Adequate reliability was also found for the six BMPN factors, with composite reliability coefficients ranging from .72 to .81. In terms of the validity of the scores, positive correlations found between the three factors measuring need satisfaction and also across the three factors assessing need frustration**,** suggest the convergent validity of the measures (all AVE ≥ 0.5). Further, the negative correlations found between the satisfaction and frustration scores for each need support the discriminant validity of the six constructs (*MSV* < *AVE* < *ASV* < AVE). All correlations were weak to moderate (from $r = .16$, $p < .01$ to $r = .35$, $p < .001$) indicating that multicollinearity was unlikely to be a problem (see Tabachnick and Fidell, 2007).

Table 4.2

BMPN. Goodness-of-fit Index for the Models Tested. Multiple-group Analysis

Model	χ^2	χ^2/df	*CFI*	*GFI*	*RMSEA*	*RMR*	*AIC*	*Comparison of models*			
								$\Delta\ \chi^2$	$\Delta\ df$	*p-value*	Δ *CFI*
Confirmatory Factor Analysis (Study1)											
Model 1 - 3-factor model	1263.66	9.57	.69	.71	.14	.10	1341.66				
Model 2 – 5-factor model	436.44	3.81	.92	.90	.08	.06	550.44				
Model 3 - 2-factor model	236.81	1.99	.97	.95	.05	.04	340.90				
Model 4 – 6-factor model	185.54	1.55	.96	.95	.04	.04	287.54				
Confirmatory Factor Analysis (Study2)											
Model 4 - 6-factor model	269.32	1.55	.95	.94	.05	.05	371.32				
Multiple-group Analysis (Study 1; Model 4)											
Unconstrained	329.12	1.29	.957	.91	.03	.06					
Measurement weights	343.22	1.28	.956	.91	.03	.06		$\Delta\ \chi^2 = 14.10$	$\Delta\ df = 12$	**.30**	**.001**
Structural weights	354.87	1.30	.953	.90	.03	.06		$\Delta\ \chi^2 = 25.75$	$\Delta\ df = 18$	**.11**	**.004**
Structural covariances	354.93	1.29	.953	.90	.03	.06		$\Delta\ \chi^2 = 25.81$	$\Delta\ df = 19$	**.14**	**.004**
Structural residuals	363.91	1.30	.941	.89	.03	.06		$\Delta\ \chi^2 = 34.79$	$\Delta\ df = 25$	**.09**	**.002**
Measurement residuals	399.73	1.34	.943	.89	.03	.06		$\Delta\ \chi^2 = 70.61$	$\Delta\ df = 43$	.01	.001

Note$_1$*: X2* = qui-square*; CFI* = comparative fit index*; GFI* = goodness-of-fit index*; RMSEA* = root-mean-square error of approximation*; RMR* = Standardized Root Mean Square Residual; *AIC* = Akaike information criterion; $p < 0.0001$*;* $\Delta\chi^2$ = qui-square difference; Δ*CFI* = difference in comparative fit index; "**Bold**" values indicate non-significant changes in model fit. S1 = Sample 1 (*N* = 371).

Table 4.3

BMPN. Composite Reliability, Convergent and Discriminant Validity of Subscales

BMPN subscales	Composite reliability	Convergent validity	Discriminant validity	
	CR	AVE	MSV	ASV
1. Autonomy Satisfaction	.84	.64	.30	.22
2. Competence Satisfaction	.80	.58	.23	.14
3. Relatedness Satisfaction	.83	.61	.30	.20
4. Autonomy Frustration	.85	.66	.45	.21
5. Competence Frustration	.82	.61	.45	.25
6. Relatedness Frustration	.72	.54	.19	.12

Note: Convergent Validity (*AVEi* ≥ 0.5); Composite Reliability (*CR* ≥ 0.7). Discriminant Validity (R^2); Average Variance Extracted (AVE); MSV = Maximum Shared Squared Variance; ASV = Average Shared Squared Variance.

STUDY 2

Participants and Procedure

A convenience sample of 12th grade high school students (*N* = 462) aged between 16 and 21 years, with a mean age of 17, 25 years (*SD* = 0, 92) completed the questionnaires. The participants were of both sexes (Male: *n* = 185 [40%], female *n* = 277 [60%]). Students attended regular high school scientific-humanistic courses in Portuguese public schools. Scale administration and ethical procedures were as described in Study 1.

Measures

Psychological Need Satisfaction. The Portuguese version of the BMPN was used, as above described.

Well-being. The Portuguese version of the Satisfaction With Life Scale - SWLS (Diener, Emmons, Larsen, & Griffin, 1985, α = .87; Portuguese version, Simões, 1992, α = .77) was used to measure the cognitive component of subjective well-being (e.g., "I am satisfied with my life"). Additionally we used the 5-item Portuguese version of the Subjective Subjective vitality = .04 P [rmsea $\leq$ 0.05] < 0.001 Scale (Ryan & Frederick, 1997, α = .84; Portuguese version, Lemos & Gonçalves, 2010; α = .86) to evaluate how

alive and alert people have been feeling during the last month (e.g., "I feel alive and vital"). Both scales were rated in a Likert-type 5-point scale, ranging from 1 ("*Completely untrue/Not at all true*") to 5 ("*Completely true/Very true*"). In the current sample, the unidimensional model estimated for SWL $\chi 2$ (5) = 10, 27 p < .001; CFI = .99; RMSEA; SRMR = .02) and for SV $\chi 2$ (9) = 68.73 p < .001; CFI = .97; RMSEA = .09 P [rmsea ≤ 0.05] < 0.001; SRMR = .03) yielded a good fit to the data. Items of both scales loaded above .60 and good internal consistency was found for both SWL (α = .81) and for SV (α = .81).

Ill-Being. The Portuguese version of the 18-item Brief Symptom Inventory (BSI - 18; Derogatis, 2001; Portuguese version, Canavarro, 2007) was used to assess the psychological symptoms of Anxiety (e.g., "Feeling tense or keyed up"), Depression (e.g., "Feeling lonely") and Somatization (e.g., "Pains in heart or chest"). The BSI-18 is rated on a 4-point Likert scale of distress, ranging from 1 (*"Not at all"*) to 5 ("*Extremely*"). The internal consistency reported for the 9 subscales ranged between .70 for Somatization .89 for Depression (Derogatis, 2001) and between .62 and .80 for the Portuguese version (Canavarro, 2007). In the current sample, CFA on the multidimensional model of three scales showed a good fit to the data $\chi 2$ (60) = 170, 02 *p* < .001; *CFI* = .96*; GFI = .95; RMSEA = .06 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .06). Items Good internal consistency was obtained for the items assessing somatization (α =.72) anxiety (α = .77) and depression (α = .84).

Preliminary Results

Descriptive Statistics for the Study Variables. Table 4.4 summarizes the means, standard deviations, range and correlations between the study variables. The correlation matrix of the study variables was examined. The exam of the mean scores show that, in general, students feel their needs more satisfied than frustrated, being relatedness the need more

satisfied, and autonomy the need more frustrated. In terms of adjustment, and, as expected from a normative sample, students scored higher on SWB and subjective vitality than on anxiety, depression and somatization. The exam of the correlation matrix show that the three need satisfaction scores positively related to SWB and subjective vitality, and negatively related to depression, somatization and anxiety. In turn, the three need frustration scores were positively related to anxiety, depression and somatization and negatively related to SWL and subjective vitality. The correlations between SWL and subjective vitality, and also between anxiety, depression and somatization were positive and high, whereas the associations between well-being and ill-being indicators were negative and high (all correlations with $R <. 9$; $VIF<5$).

Table 4.4

BPMN. Means, Standard Deviations, Range and Correlations Between the Variables

					Zero-order Correlations										
		Mean	SD	Range	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	Autonomy Satisfaction	4.05	.68	1-5	1										
2.	Competence Satisfaction	3.82	.66	1-5	.42**	1									
3.	Relatedness Satisfaction	4.25	.67	1-5	.43**	.42**	1								
4.	Autonomy Frustration	3.20	.88	1-5	-.34**	-.08	-.32**	1							
5.	Competence Frustration	2.66	1.06	1-5	-.38**	-.31**	-.34**	-.57**	1						
6.	Relatedness Frustration	2.40	1.05	1-5	-.16**	-.42**	-.44**	.38**	.05	1					
7.	Subjective Well-being	4.67	1.15	1-5	.29**	.23**	.33**	-.23**	-.35**	.09	1				
8.	Subjective Vitality	3.74	.86	1-5	.29**	.30**	.32**	-.22**	-.19**	-.16**	.51**	1			
9.	Somatization	1.69	.74	1-5	-.10*	.01	-.04	.25**	.19**	.12*	-.17**	-.17**	1		
10.	Depression	1.97	.87	1-5	-.18**	-.14**	-.21**	.30**	.39**	.03	-.50**	-.39**	.49**	1	
11.	Anxiety	1.96	.79	1-5	-.07	-.02	-.06	.24**	.24**	.11*	-.26**	-.21**	.70**	.64**	1

Note. Correlation values are computed for Study 2.
* $p<.05$. ** $p<.01$

Primary Results

Confirmatory Factor Analysis. CFA results cross-validated the good fit of Model 4 across all the fit indices considered $\chi^2(120) = 269.32$, $p < .001$; *CFI* = .95*; GFI* = .94*; RMR = .05; RMSEA* = .05 *P* [*rmsea* ≤ 0.05] < 0.001. No error cross-variances or threats to reliability or validity were identified for any of the six scales (see table 4.4).

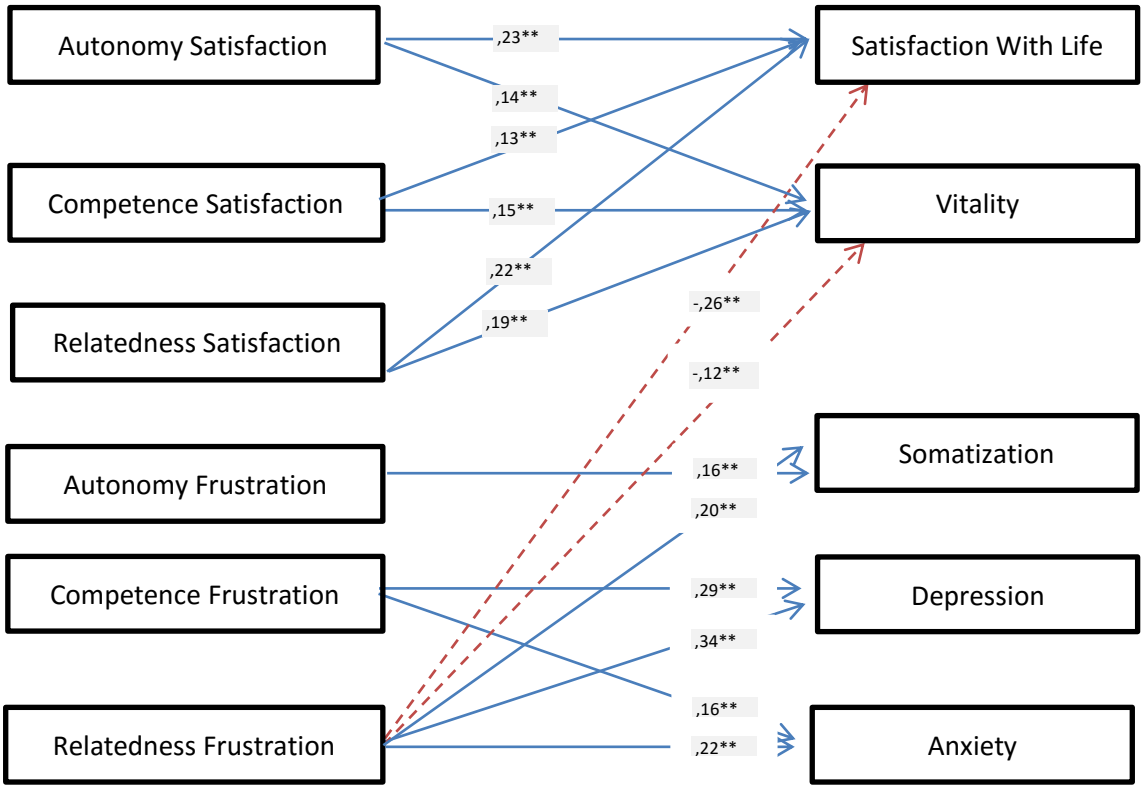
Hierarquical Regression Analysis. Hierarquical multiple regression analyses (HMR) were performed to examine whether the three need frustration scores predict unique variance on SWL, subjective vitality, anxiety, depression and somatization, over and above need satisfaction. In a first step autonomy, competence and relatedness satisfaction were entered as predictors. In a second step autonomy, competence and relatedness frustration were added to the prediction. Step 1 findings showed that the satisfaction of the three needs positively predicted SWL F (3, 456) = 26.80; p < .001 and subjective vitality F (3, 456) = 23.89; p < .001 (for β values see figure 3.2), whereas autonomy and relatedness satisfaction negatively predicted depression (β = -.14, p = .001). Model 1 explained 15% of variance in SWL, 14 % in subjective vitality and 7% in depression. Step 2 findings show that, after controlling for the satisfaction of the three needs, Model 2, with need frustration included, explained 24% the total variance in SWB, (F (3,456) = 26.80; p < .001), 15% in subjective vitality (F (3,456) = 23.89; p < .001), 27% in depression (F (3,456) = 27.38; p < .001), 11% in anxiety(F (3,456) = 9.37; p < .001), and 8% in somatization (F (3,456) = 6.80; p < .001). Thus, the introduction of the three need frustration variables explained additional 20 % variance in depression, 10 % in anxiety, and 6% in somatization, but also 9% of SWL and only 1.7 % in subjective vitality. The frustration of the three needs significantly added to the prediction of all three variables (p < .001), particularly of depression (R^2 Change = .20; F (6, 453) = 27.38; p < .001). In the final model the three need satisfaction scores become non-significant

predictors of anxiety, depression and somatization ($p > .05$).

Multivariate Regression Analysis. Figure 4.2 presents the structural coefficients associated with the Multivariate Multiple Regression model. We performed Multivariate Multiple Regression Analyses (MMR) on the BMPN data to inspect whether the scores of need satisfaction and need frustration predicted unique variance for well/ill-being outcomes after controlling for reciprocal associations. The variables examined followed the criteria defined for the normal distribution ($|sk| < 3$); $|ku < 10|$Finney & DiStefano, 2006). As expected, autonomy, competence and relatedness satisfaction positively predict SWL and subjective vitality, whereas the frustration of the three needs positively predict anxiety, depression and somatization (see figure 2 for complete β values). Curiously, autonomy frustration was found unrelated to depression ($b_{AutFru.Dep} = .041$; $SE_b = .037$, Z = 1.11; $p = .27$) and to anxiety ($b_{AutFru.Anx} = .050$; $SE_b = .041$, $Z = 1.20$; $p = .23$). In addition, competence and relatedness frustration negatively predicted SWL and subjective vitality, whereas the satisfaction of the three needs was not significantly related to anxiety, depression and somatization. As expected in SDT (Vansteenkiste & Ryan, 2013) the crossover negative associations were lower-sized than the positive symmetrical relations.

Figure 4.2

BMPN. Multivariate Multiple Regression Analysis Predicting SWL, Subjective Vitality, Anxiety, Depression and Somatization from the Satisfaction and Frustration of Needs



Note: Coefficients shown are standardized coefficients obtained for Model 4 trimmed (Sample 2). Solid lines correspond to primary effects; Dashed lines indicate crossover effects. **p<.001

Discussion

This study examined the dimensionality and psychometric properties of the BMPN in a sample of Portuguese high school students (Study 1) and inspected the criterion-related validity of the scales from an independent sample of high school students (Study 2). Findings were interpreted from Self-Determination Theory. Implications are now discussed for both research and practice in education.

In Study 1 we summarized the steps to develop the Portuguese version of the BMPN and the analytic procedures selected to examine the dimensionality and validity of the preferred model of scales. EFA performed on the 18-tem BMPN extracted six correlated, but distinct factors distinguishing the scales assessing the satisfaction and

frustration for autonomy, competence and relatedness needs. In subsequent CFAs we found that the models that somehow distinguished the components of satisfaction and frustration of basic needs (Model 2, 3, and 4) fitted better the data than the model that envisioned both components as opposite dimensions (Model 1) supporting H1a. CFA findings also support H1b, when they show the progressive better fit from models that organize need satisfaction and need frustration as two distinct components (Models 2 and 3) to the model that distinguishes the components of satisfaction and frustration for each need (Model 4). Indeed, Model 4 yielded a comparatively better fit than the other models across all the fit indices considered. In addition, the lowest AIC estimates obtained for Model 4, along with the absence of threats to the convergent and discriminant validity of the six scales. Therefore we preferred the six-factor solution to interpret the structural organization of the BMPN items (support for H2). These findings further suggest that the three frustration BMPN subscales can be examined in separate, what is in line with recent studies suggesting that that the satisfaction and frustration forms of the needs may be substantive and distinguishable in and of themselves (Bartholomew et al. 2011; Sheldon and Gunz 2009; Sheldon, 2011; Sheldon & Hilpert, 2012; Vlachopoulos and Michailidou 2006).

Study 2 replicated the CFA on Model 4, and inspected the criterion-related validity of the six BMPN scales. The exam of the mean scores indicated that, in general, Portuguese high school students feel their needs more satisfied than frustrated, being competence the less satisfied need and autonomy the more frustrated. Hence, the social, and namely educational environments, and particularly teachers, as primary socialization agents, should differentially promote competence-supportive behaviors, that reinforce feelings of self-efficacy on students. Competence support is attained when teachers (a) provide clear and consistent expectations about involvement and achievement, (b) set clear and

straightforward rules for class-related behavior and performance, (c) actively monitor class-related behavior, and (d) provide positive informational feedback for personal and effort-based progress (e.g., Deci & Ryan, 2000; Grolnick, Benjet, Kurowski & Apostoleris, 1997). In parallel, teachers would benefit from learning on how to refrain from actively using controlling behaviors that thwart the students 'volitional functioning and result in subjective experiences of need frustration. Autonomy thwart is conveyed when teachers use externally controlling tactics, such as punishment, yelling, "you must" or "you have to" expressions (Soenens & Vansteenkiste, 2010), but also when teachers refrain from using psychological controlling strategies such as guilt-induction, shaming, instilling anxiety, attention withdrawal and normative comparisons for whenever students do not comply with their expectations, standards for achievement and for behavior (Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012).

The HMR findings also show that frustration of the three needs predicted unique variance on well/ill-being indicators (Bartholomew et al., 2011) over and above need satisfaction (support for H3). Additionally, findings on regression analyses showed that the satisfaction of each need positively related to students' well-being (support for H3a), whereas the frustration of each need was uniquely related to ill-being (support for H3b), after controlling for reciprocal effects. As expected, after controlling for need frustration, need satisfaction could not predict ill-being (support for H3c), whereas need frustration predicted both ill-being and diminished well-being on students (support for H3d). To explain this non-significant effect, subsequent HMR analyses found that autonomy and relatedness satisfaction negative relate to depression in step 1 but this association was reduced to non-significance when need frustration was added to the model in step 2. These findings are consistent with the SDT assumption that the lack of needs fulfillment would not necessarily entail the experience of ill-being, while experienced need frustration, by

definition, blocks the possibility of needs fulfillment resulting on the experience of ill-being and diminished well-being (Vansteenkiste & Ryan, 2013). For instance, students 'feelings of depression may arise from both perceptions of lack of intimacy and deep connection to others (relatedness frustration) or/and feelings of being actively rejected from others (relatedness frustration). However, the experience of being actively rejected, not only involves, by inherence, the perception of lacking warm, intimate connections, but also produces consequences far more severe in adjustment, over and above the low satisfaction of the three needs.

These particular findings underline the importance of not equating need frustration as need dissatisfaction of low satisfaction. They also stress the pervasive and severe implications that the inner feelings of competence and relatedness frustration have on students 'maladjustment, what has important implications for education, and particularly for the teaching/learning process. In fact, they suggest the need to develop teacher-training programs that help teachers flag the students' problematic "signs" that are differentially associated to the adolescents´ experiences of competence and relatedness frustration, but also clarify the nature of teacher behaviors that actively thwart these needs and their consequences for students 'maladjustment, problem behaviors and underachievement. Specifically, teachers should be helped to identify and hinder from using competence and relatedness need thwarting behaviors within class settings. Competence thwarting is conveyed, for instance, when teachers negatively feedback the student´s performance in from of classmates, or compare the student´s performance unfavorably to classmates (e.g. Soenens et al., 2012). These attitudes hamper the growth of self-efficacy beliefs and make students feel incompetent, incapable to set or successfully accomplish academic goals or standards for achievement. Behaviors that thwart relatedness are typical of teachers that actively reject or show dislike for the

student (Deci & Ryan, 1985) undermining feelings of social acceptance and connectedness and increasing his/her vulnerability to experience social exclusion and loneliness. Such interventions are expected to increase awareness about the teacher responsibility in maintaining and/or lowering or removing students´ difficulties and as means to break up the vicious cycles of need frustration and maladjustment. They should also provide teachers with effective tools in order to adjust instruction and learning strategies according to the students´ individual differences. Future longitudinal studies are required to evaluate the efficacy of these type of interventions.

Against the background of the implications for education, it is not totally clear whether satisfaction and frustration are traits or method factors, although the data favor the trait approach. However, the findings that the six-factor solution best-fitted the BMPN data, the absence of threats detected for reliability and validity and the unique predictive value of need frustration of each need to predict ill-being, support the notion that, beyond discussing whether the satisfaction and frustration of each are methods *versus* traits, there is practical utility to examine the unique effects of these components in separate (as suggested by Sheldon & Hilpert, 2012), particularly to predict ill-being outcomes (Deci & Ryan, 2000).

Our study presents some limitations. First, the cultural and sampling specificities may not only exemplify two confounding variables to be controlled for, but they can themselves represent alternative explanations for the results found. Additional cross-cultural studies are necessary to document the significance of the cultural/sampling bias on the results. Second, the cross-sectional nature of the data prevented from drawing causal links between the study variables. More prospective longitudinal data is necessary to capture the specific links and universal dynamics underlying the effects of basic needs on well/ill-being (e.g., Boone, et al., 2014). Importantly, the longitudinal studies should

target earlier developmental periods, since we know that higher scores of need frustration and ill-being are related to early school drop-out and heightened incidence of early psychiatric problems. Third, the use of two normative samples of relatively homogeneous and well-educated high school students limited the representativeness and generalization of the results to the broader population. It would be advantageous for future studies to use data from both normative, at-risk and dropped out students, to allow for a more clear understanding of how teacher attitudes related to the frustration of specific needs to predict the development problem behaviors, (mal) adjustment, school failure and early drop-out.

Conclusion

Taken together, the results support the construct validity of the BMPN, adding critical evidence for the factorial distinctiveness of the need satisfaction and frustration components of basic psychological needs, what is in line with the conceptual argument of the substantive distinction between the satisfaction and frustration dimensions of basic needs. This approach is of major relevance to testify for the true dimensionality of the need constructs, associated to "bright" and "dark side" of human experience, helping to bridge the gap between remedial-oriented and strength-oriented frameworks and interventions in education (Vansteenkiste & Ryan, 2013).

5

Development and Validation of the Parental Need Support and Thwarting Scale (PNSTS): Relations to Well-Being and Psychological Symptomatology

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Motivation & Emotion (under review).

Abstract

In this research we developed the Parental Need Support and Thwarting Questionnaire, a multidimensional questionnaire based in Self-determination theory concerning how parents support or thwart the needs for autonomy, competence and relatedness in their children. In study 1 we developed and pilot tested a pool of 24 candidate items. In study 2 we validated the 18-item final version of the scale in a multidimensional 6-factor structure. Finally, in study 3 we established the criterion validity of the scores. Findings indicate that parental need-support positively predicts well-being indicators partially via basic psychological need satisfaction, whereas parental thwarting predicts psychosymptomatology via basic need frustration. We discuss the implications of these findings for theory as well as for the development of psychoeducational interventions.

Keywords: self-determination theory, scale development, perceived parenting, autonomy, competence and relatedness, well-being, psychosymptomatology.

Present Study and Hypotheses

SDT-based parenting research has been conducted under operational and measurement diversity. Specifically, the construct of parental thwarting, has been interchangeably used to define the subjective and inner experiences of having one's needs frustrated, or the actual behaviors encountered within the objective social context (e.g., Bartholomew, et al., 2011; Costa, Ntoumanis & Bartholomew, 2015; Gunnell et al., 2013; Haerens et al., 2015). The thwarting of needs, equated as a subjective experience, has been defined with terms such as need dissatisfaction (Sheldon & Hilpert, 2012), need-thwarting (Bartholomew et al., 2011b) or need frustration (Chen et al., 2014), and measured through original or modified versions of the Balanced Measure of Psychological Needs Scale (BMPN; Sheldon & Hilpert, 2012), the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2014), and the domain- specific Psychological Need Thwarting Scale - PNTS (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Costa, Ntoumanis & Bartholomew, 2015). Otherwise, most research addressing parental behavior as a contextual antecedent of basic need-frustration, focused on measures of the controlling features of parenting (Youth Self-Report; [PCS-YSR]; Barber, 1996) and teaching contexts (PCT; Soenens, Sierens, Vansteenkiste, Dochy & Goossens, 2012).

Consistent with recent SDT theorizing (Vansteenkiste & Ryan, 2013), we believe that controlling socialization represents only one of the features of contextual need-thwarting socialization (Vansteenkiste, 2015, personal communication). Thus, measures of parental thwart should not be narrowed to just the controlling aspects of contexts, but should assess different dimensions of parenting simultaneously (e.g., coercion, rejection, chaos; Skinner, Johnson & Snyder, 2005), validated from a unified conceptual framework that provides them with conceptual unity. Furthermore, the multidimensional measures

of parenting available focus almost exclusively on the positive or negative features of parenting, making it difficult to control for possible reciprocal effects associated to shared variance.

This is what we did, by developing the Parental Need Support and Thwarting Scale (PNSTS), a questionnaire designed to assess behavioral style of parents vis-à-vis both the supporting and the thwarting of the autonomy, competence and relatedness needs. The research comprises three studies. Study 1 describes the procedures followed to develop the pool of items, and the pilot study performed to examine their content validity. In Study 2 we examined the dimensionality of the 18 items using a combination of exploratory and confirmatory analytic procedures and inspected the psychometric properties of the scores, in terms of their reliability, convergent and discriminant validity. In terms of model fit, we expect that Model 1, 2, and 3 adequate fit the data, as they all distinguish, to some extent, the components of support and thwart of psychological needs (*Hypothesis 1a*). However we anticipate the significant better fit of Models 1 and 2 over Model 3, as they conceive the components of support and thwart for each need as substantively distinct constructs (*Hypothesis 1a*). Finally, in Study 3 we examined the criterion-related validity of a parsimonious second-order model of need-support and need-thwarting parenting in the prediction of adjustment. We modelled higher-order need-supportive and thwarting together, to control for reciprocal shared variance. Based on the current SDT model of needs (Deci & Ryan, 2000; Sheldon, 2011; Vansteenkiste & Ryan, 2013), we hypothesize that need-support positively predicts satisfaction with life and vitality, via the experience of basic needs satisfaction (*Hypothesis 2a*), whereas need-thwarting positively predicts anxiety, depression and somatization via the distinct experiences of psychological need frustration (*Hypothesis 2b*).

STUDY 1

Method

Participants

A sample of Portuguese high school students was administered a preliminary item set (N = 38; M = 17.7 years; SD = 0.92; 20 females and 18 males). In addition, a panel of researchers familiar with SDT was selected to review the content validity of the preliminary items from a theoretical viewpoint.

Procedure

We developed a pool of items following commonly-used guidelines for item wording (DeVellis, 2003). The original pool of 24 items (4 items per dimension) was formulated from the SDT literature to capture the behavioral meaning of the parental support and thwarting of autonomy, competence and relatedness needs (Deci & Ryan, 1985; 2000). Items were rated in a 5-point Likert-type scale (1 = *no match* to 5 = *excellent match*). The pool of items was then pilot-tested on a group of student volunteers recruited from local secondary schools. Students met in small focus groups of three to five persons and were informed about the nature and objectives of the study. Then, participants were asked to fill out a brief questionnaire containing the 24 scale items, and were also asked to provide feedback about the comprehensibility and relevance of each individual item for the six constructs presented. Based on the students´ feedback, a panel constituted by the primary researchers of this study (Lynn, 1986), all familiar with SDT, reviewed the questionnaire items and calculated the Content Validity Index (CVI; Lynn, 1986) of each item.

Results

We calculated the I-CVI (Item content validity) by dividing the number of experts that scored the items with 3 (relevant), 4, (highly relevant) by the number of experts on

the panel (Polit, Beck, & Owen, 2007). CVIs around .80 are deemed acceptable (Lynn, 1986). Six items exhibited CVIs of .61 and .72 and were deleted from the scale. The feedback provided by the students regarding unclear or confusing items was used to revise the wording and syntax of three of the remaining 18 items. The final 18 items (3 items per factor) had CVIs ranging between .83 and .94. In Study 2, these were administered to a larger sample of students.

STUDY 2

Method

Participants and Procedure

An independent sample of 755 Portuguese high school students completed the PNSTS. The sample consisted of 342 girls (61.6%) and 213 boys (38.4%), aged between 16 and 19 years old, with a mean age of 17. 52 years (*SD* = 0. 90). Questionnaires were administered within the classroom, after active informed consent was obtained from students or from parents of younger students (passive informed consent). Participation was voluntary, anonymity guaranteed and no credits were granted for participation. Students completed the questionnaires in about 20 minutes (*N* = 97% of completion rate). Missing data was dealt by mean replacement.

Measures

Perceived Parenting. We used the 18-item Parental Need Support and Thwarting Scale (PNSTS) derived from Study 1, which contains six scales measuring the extent to which parents support (e.g., "Allow me to decide things that I consider the best for me"; "Trust in my ability to achieve my academic goals"; "Are available to talk with me") or actively thwart ("Are always contradicting me"; "Pressure me to be the best at everything I do"; "Do not show that they love me or care about me") the three basic needs. Items are

rated in a 5-point Likert-type scale, ranging from 1 = *no agreement* to 5 = *much agreement*.

Results

Preliminary Analysis

Assessment of Normality. Table 5.1 presents the descriptive statistics and factor loadings for the items and scales.The distribution of the PNSTS items was within the accepted normal parameters for univariate Skweness and Kurtosis, but multivariate kurtosis departed significantly from normality (ku_M = 31.51; *in* Finney & DiStefano, 2006). Hence, to correct for partial non-normality we used in all further analyses 1,000 bootstrap samples with replacement based on the original sample (Preacher & Hayes, 2004).

Exploratory Factor Analysis. Exploratory Factor Analyses (*EFA*; McIver & Carmines, 1981) with principal components (*PCA*) and *promax* rotation was performed to explore the internal structure of the PNSTS items. EFA extracted a solution of six distinct components with eigenvalues greater than 1, explaining 41%, 27%, 13%, 7.28%, 7.01%, 5.3% and 3.4% of the variance, respectively. Altogether, the six factors explained 76.99% of the total variance of the scores (see Table 5.1). The 18 items present adequate individual reliability ($\lambda_{ij} \geq .50$, $\lambda^2_{ij} \geq .25$) with standardized item loadings ranging from .75 to .94 ($p < .001$), and a mean of .80. No cross-loadings above .35 were detected. The six factors extracted presented good composite reliability.

Table 5.1

PNSTS. Item Means, Standard Deviations, Factor Loadings, Skewness and Kurtosis Values Following CFA

	Items	*M*	*SD*	*Skewness*	Kurtosis	Factor Loadings					
						F1	F2	F3	F4	F5	F6
PNSTS1	My parents try to understand my point of view	4,75	1,07	-1,05	,78	.76					
PNSTS 2	My parents let me do the things I think are important	4,55	1,19	-1,09	1,71	.74					
PNSTS 3	My parents allow me to make decisions for myself	5,08	1,12	-,87	1,30	.74					
PNSTS 4	My parents trust in my ability to the things well	5,12	,92	-,99	,78		.88				
PNSTS 5	My parents trust in my ability to achieve my goals	5,25	,92	-1,17	,84		.79				
PNSTS 6	My parents believe that i will succeed at school	5,11	,93	-,88	,27		.72				
PNSTS 7	My parents are available to talk to me	5,31	1,05	-1,56	1,87			.74			
PNSTS 8	My parents enjoy being with me	5,36	,95	-1,47	1,55			.84			
PNSTS 9	My parents let me know they love me	5,27	,93	-1,38	2,21			.82			
PNSTS 10	My parents are always contradicting me	3,18	1,57	,23	-,98				.78		
PNSTS 11	My parents think that their way to do things is the best.	2,92	1,44	,41	-,70				.84		
PNSTS 12	My parents keep giving me orders	2,72	1,42	,66	-,38				.75		
PNSTS 13	My parents are disappointed at me whenever i have lower higher grades than my colleagues	2,66	1,62	1,90	2,79					.80	
PNSTS 14	My parents criticize me for having lower grades than they expect	2,71	1,67	2,48	2,61					.81	
PNSTS 15	My parents pressure me to be better than others in everything I do	2,23	1,52	2,28	2,50					.80	
PNSTS 16	My parents do not show that they love or care about me	1,69	1,23	,53	-1,03						.93
PNSTS 17	My parents do not spend as much time with me as I would like	1,47	1,04	,52	-1,03						.94
PNSTS 18	My parents make me feel like I'm not wanted	1,47	1,01	,94	-,43						.78
	Multivariate				31,51						
	Variance Explained						.41	.27	.13	.07	.03

Note: All items were statistically significant at (p <. 001). The Portuguese version of the items is provided in Appendix A, translated as "Escala de Suporte e Frustração Parental das Necessidades"

Primary Analysis

Confirmatory Factor Analysis. Table 5.2 summarizes the goodness-of-fit results for the three models tested. Confirmatory factor analysis (CFA; Byrne, 2010) with Maximum Likelihood Estimation was performed on the 18-item PNSTS to examine the replicability of the 6-factor model found in EFA (Model 1). Model 1 arranges the six parenting scales in six unipolar latent factors that distinguish the components of autonomy, competence and relatedness parental support (3 scales) and thwarting (3 scales) as correlated but distinct constructs. Next, to give conceptual unity to the six factors, we compared the fit of Model 1 against the competing measurement models 2 and 3. Model 2 specifies a structure of six factors organized in a 2-factor higher-order structure of parental support and parental thwart (See Skinner, Johnson & Snyder, 2005 for similar modelling). Each second-order factor comprised three first-order factors of autonomy, competence and relatedness. Finally, to investigate whether the six scales were more adequately represented as distinct methods, related to positive/negative wording of items, or tap into substantive constructs, we compared the fit of Model 1and 2 to Model 3. Model 3 is organized in a 3x2 structure, with 3 factors assessing support versus thwart of autonomy, competence and relatedness needs and 2 additional method factors that indicate perceived parental support (indicated by nine positively-worded items) and parental thwart of basic needs (indicated by nine negatively-worded items). Best-fit for model 1 and 2 extends the structural distinction between need support and thwart to each of the three needs (Skinner, Johnson & Snyder, 2005) as substantive constructs. In alternative, best fit for Model 3 would support the tripartite structure of basic needs posited by SDT, controlling for potential bias associated to the shared method variance of positively and negatively-worded items (see Sheldon & Hilpert, 2012 for a similar rationale). Goodness-of-fit was judged from multiple fit indices (Hu & Bentler, 1999), including the Chi square

(X2) statistics, the Standardized Root Mean Square Residual (RMR), the Comparative Fit Index (CFI) and the Root Mean Squared Error of Approximation (RMSEA). The cut-off values of .09 for SRMR, .06 for RMSEA, p [rmsea ≤ .05] and .90, or above, for CFI were followed (Byrne, 2010).

As expected the three models yielded a good fit to the PNSTS data (support for H1a; see Table 5.2 for goodness-of-fit estimates), but Models 2 Δx^2 (11, N = 462) = 273, p < .001 and, particularly Model 3 Δx^2 (8, N = 462) = 335.12., p < 001 fitted the PNSTS data significantly better fit than Model 1. In the best-fitting Model 3 X^2 (120) = 261.50 p < .001; *CFI* = .97*; RMSEA = .05 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .04 the item standardized factor loadings ranged from .72 to .92 with an average loading of .76 (all *ps* < .001). Items did not cross-loaded on non-intended factors (Modification Indices < 9) or associate to multiple standardized residuals (> ± 2.00; see table 5.2). For having the best psychometric qualities, Model 3 was used in further analyses (support for H1b).

Table 5.2

PNSTS. Fit Indices for Model 3 and Invariance Analysis

Model	χ²	*χ²/df*	*CFI*	*GFI*	*RMSEA*	*SRMR*	*Comparison of models*			
							Δ χ²	Δ *df*	*p-value*	Δ CFI
CFA										
Model 1	596.62	5.28	.90	.88	.10	.07				
Model 2	323.61	2.61	.96	.93	.06	.05	27	11	.01	06
Model 3	261.50	2.22	.97	.95	.05	.04	34	8	.01	.07

Note: X^2 = Qui Square*; CFI* = Comparative Fit Index*; GFI* = Goodness-of-Fit Index*; RMSEA* = Root Mean Square Error of Approximation*; SRMR* = Standardized Root Mean Square Residual; p < 0.0001*;* $\Delta\chi^2$ = Qui-Square Difference; Δ*CFI* = Difference in Comparative Fit Index. Estimates were computed for Study 2.

Reliability and Validity of the Scores. Table 5.3 summarizes the construct validity estimates for the six PNSTS scale scores. The reliability and validity of the scales was calculated from the CFA correlations and from estimates of standardized regression weights. Estimates of Composite Reliability (CR ≥ .70), convergent validity (*Average Variance* Extracted [AVE] ≥ 0.5) and discriminant validity (Maximum Shared Squared

Variance [*MSV*] < [*AVE*] < Average Shared Squared Variance [*ASV*] < AVE) were obtained from the *CFA* correlation matrix (Fornell & Larcker, 1981) and from standardized regression weights (e.g., Bartholomew et al., 2011). The six scales presented an adequate internal consistency, with composite reliability scores (CR >.7; Fornell & Larcker, 1981) ranging from .80 to .88. The convergent validity of the scores was supported (*AVEi* ≥ 0.5; Fornell & Larcker, 1981) with estimates of AVE ranging between .51 for autonomy-support and .67 for relatedness thwarting. Findings also supported also the discriminant validity (DV) of the six constructs, considering that the variance extracted for each scale was always greater than the squared correlation estimates of each pair of latent constructs (*MSV < AVE; ASV < AVE*). Based on these findings we conclude that the 18 items converge to measure, as well as to discriminate six correlated, but distinct latent constructs.

Table 5.3

PNSTS. Reliability and Validity of the Scores

	CR	AVE	MSV	ASV
Autonomy Support	.80	.51	.38	.26
Competence Support	.88	.64	.49	.30
Relatedness Support	.87	.62	.52	.33
Autonomy Thwart	.86	.60	.32	.27
Competence Thwart	.87	.63	.32	.16
Relatedness Thwart	.88	.67	.52	.30

Note: R^2 = *F*actor Square Correlations; CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Squared Variance; ASV = Average Shared Squared Variance. The estimates are computed for the sample used in Study 2

STUDY 3

Method

Participants and Procedure

Questionnaires were administered to an independent sample of 462 Portuguese 12th grade students of both sexes (Male: *n* = 174 [46.1%], female *n* = 203 [53.9%]), aged

between 16 and 19 years old (*M* = 17.2; *SD* = .99). Students completed the questionnaires within the classroom during day classes, after informed consent was obtained. The anonymity and confidentiality of the data was assured in the instructions and no credits were granted for collaboration. Students completed the questionnaires in about 30 minutes (95% of completion rate). Missing data was dealt by mean replacement.

Measures

Perceived Parenting. The 18-item Parental Need Support and Thwarting Scale was used, as described at Study 2.

Psychological Needs. We used the Portuguese version of the Balanced Measure of Psychological Needs scale (BMPN; Sheldon & Hilpert, 2012; Portuguese version Cordeiro, Paixão, Lens, Lacante, & Sheldon, 2015). Composite scores of basic need-satisfaction (e.g., "I am taking on mastering hard challenges") and need-frustration (e.g. "I do things against my will") were used, by averaging the scores of the three 3-item subscales measuring autonomy, competence and relatedness satisfaction. Items are rated in a 6-point Likert scale, ranging from 1 = *no agreement* to 6 = *much agreement*. In the current sample the internal consistency ranged between .81 for need satisfaction and .79 for need frustration. CFA on the two-factor solution fitted well the data **(***X^2* (291) = 513.81; *p*< .001; *CFI* = .94*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .09).

Well-being. The Portuguese version of the Satisfaction With Life Scale - SWLS (SWLS; Diener, 1984; Simões, 1992, α = .77) was used to measure the cognitive component of subjective well-being (e.g., "I am satisfied with my life"). In addition, the Portuguese version of the Subjective Vitality Scale (Ryan & Frederick, 1987; Lemos, Gonçalves & Coelho, 2011; α = .86) was used to evaluate how alive and alert people have been feeling during the last month (e.g., "I feel alive and vital"). Items of both scales were rated on a 5-point Likert scale, ranging from 1 ("Completely untrue/Not at all true") to 5

("Completely true/Very true"). In the current sample, the unidimensional model estimated for SWL χ^2 (3) = 3.18 p < .001; CFI = .99; RMSEA= .04 P [rmsea ≤ 0.05] < 0.001; SRMR = .02 and for subjective vitality χ^2 (9) = 9.83 p < .001; CFI = .99; RMSEA = .04 P [rmsea ≤ 0.05] < 0.001; SRMR = .02) yielded a good fit to the data. Items of both scales loaded between .59 and .84 on intended factors and good internal consistency was found for both SWL (α = .80) and for SV (α = .87).

Psychosymptomatology. The Portuguese version of the18-item Brief Symptom Inventory (BSI; Derogatis, 2001; Canavarro, 2007) was used to assess the psychological symptoms of anxiety (e.g., "Feeling tense or keyed up"), depression (e.g., "Feeling lonely") and somatization (e.g., "Pains in heart or chest"). Items are rated on a 4-point Likert scale of distress, ranging from 1 ("Not at all") to 5 ("Extremely"). The internal consistency reported for the 3 scales ranged between .62 and .80. In the current sample the scales exhibited an adequate internal consistency (α = .67 for somatization; α =.80 for depression and α = .75 for anxiety). The tripartite model of scales showed a good fit to the data χ^2 (50) = 109.49 *p* < .001; *CFI* = .96*; GFI = .95; RMSEA = .06 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .06).

Preliminary Results

Descriptive Statistics. Table 5.4 presents the descriptive statistics and correlations between the study variables. The exam of the mean scores show that, in general, students perceive their parents as more need supportive (*M* = 5.05) and less need thwarting (*M* = 2.43). Parents are perceived more supportive of the need for relatedness (*M* = 5.26) and less supportive of the need for autonomy (*M* = 4.80). In opposition students reported parents as more thwarting of the need for autonomy (*M* = 2.98) and less thwarting of the need for relatedness (*M* = 1.82).

Correlations. Zero-order correlations were then examined for the six PNSTS

scales. As expected in SDT (Deci & Ryan, 2000), perceived need-support was positively associated to need satisfaction (range from r = .19 to r = .33, p < .01) and well-being indicators (range from r = .25 to r =.46, p < .01) and negatively related to need frustration (range from r = -.23 to r =.36, p < .01) and psychosymptomatology (range from r = -.09, p < .05 to r =.30, p < .01). Contrariwise, need thwarting scores were positively associated to need frustration (range from r = .32 to r = .40, p < .01) and psychosymptomatology (range from r = .14 to r = .39, p < .01) and negatively related to need satisfaction (range from r = -.18 to r = -.19, p < .01) and well-being (range from r = .14 to r = .39, p < .01). Positive correlations were observed between SWL and subjective vitality (r = .51, p < .01) as well as between anxiety, depression and somatization (range from r = .49 to r = .70, p < .01). Need satisfaction and need frustration (r = -.42, p < .01) were negatively associated, as well as the well-being and psychosymptomatology scores (range from r = -.17 to r = -.50, p < .01). The magnitude of all correlations was weak to moderate-to-high, indicating that multicollinearity was unlikely to be a problem (see Tabachnick and Fidell, 2007).

Table 5.4

PNSTS. Means, Standard Deviations, Range and Correlations Between the Study Variables

Variables	Mean	SD	Range	Zero-order Correlations														
				1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Autonomy Support	4.80	.84	1-5	1														
2. Autonomy Thwart	2.98	1.26	1-5	-.43**	1													
3. Competence Support	5.10	.86	1-5	.52**	-.40**	1												
4. Competence Thwart	2.50	1.32	1-5	-.27**	.48**	-.33**	1											
5. Relatedness Support	5.26	.84	1-5	.41**	-.37**	.56**	-.20**	1										
6. Relatedness Thwart	1.82	1.08	1-5	-.33**	.43**	-.46**	.29**	-.65**	1									
7. Parental Support	5.05	.69	1-5	.79**	-.49**	.85**	-.33**	.80**	-.59**	1								
8. Parental Thwart	2.43	.95	1-5	-.44**	.83**	-.51**	.79**	-.51**	.70**	-.60**	1							
9. Satisfaction With Life	3.62	.83	1-5	.36**	-.27**	.46**	-.17**	.38**	-.35**	.49**	-.33**	1						
10. Subjective Vitality	3.74	.78	1-5	.25**	-.19**	.33**	-.09*	.29**	-.21**	.35**	-.20**	.51**	1					
11. Somatization	1.62	.69	1-5	-.11*	.18**	-.11*	.16**	-.17**	.32**	-.16**	.28**	-.17**	-.17**	1				
12. Anxiety	2.09	.91	1-5	-.09*	.15**	-.09*	.14**	-.19**	.34**	-.14**	.26**	-.26**	-.21**	.70**	1			
13. Depression	2.09	.92	1-5	-.19**	.25**	-.31**	.21**	-.30**	.39**	-.33**	.36**	-.50**	-.39**	.49**	.64**	1		
14. Needs Satisfaction	4.17	.53	1-5	.24**	-.19**	.33**	-.18**	.19**	-.18**	.31**	-.24**	.36**	.38**	-.06	-.06	-.22**	1	
15. Needs Frustration	2.09	.73	1-5	-.23**	.32**	-.36**	.32**	-.30**	.40**	-.37**	.44**	-.38**	-.25**	.30**	.32**	.49**	-.42**	1

Note. (*N* = 371); *p*<.05. **p*<.01

Primary Results

Modelling. Figure 1 depicts the mediation model with standardized path coefficients. For hypothesis testing we estimated a path model with manifest variables in AMOS 20.0 following the analytic method recommended by Holmbeck (1997). Variables were indicated by scale scores and goodness-of-fit was judged from the cutoff indices adopted in Study 2. For model identification, the variance of the second-order factors was fixed to 1.0 and the standardized loadings flagged as significant at $p < 0.05$. For model parsimony, the need supportive and thwarting scales were modeled in a two-factor higher order model. Each second-order factor comprises three first-order scales corresponding to the support or thwarting of each of the three basic needs.

Path Analysis. Prior to investigate the hypothesized mediation model we tested a cumulative series of simpler models. In a first structural model we specified direct paths from parental need-support and parental thwart to indicators of well-being and psychosymptomatology (χ^2 (7) = 79. 90; *CFI* = .96; *RMSEA* = .11: *RMR* = .02. Findings show that parental need-support positively predicts SWL and subjective vitality and negatively predicts depression ($p < .001$, see figure 1), whereas parental need-thwart positively predicts anxiety, depression and somatization and negatively predicts SWL. As expected from SDT, parental need-support is negatively associated to parental need-thwarting (r =.60; *VIF<5*; Vansteenkiste & Ryan, 2013). Altogether, the predictors explained 21% of the variance of SWL, 10% of subjective vitality, 10% of depression, 3% of anxiety and 5% of somatization.

In a second model (χ^2 (11) = 62. 44; *CFI* = .97; *RMSEA* = .09: *RMR* = .04) we tested full mediation in two theory-based indirect paths, from (a) parental need-support to vitality and satisfaction with life via need-satisfaction, and (b) from parental need-thwarting to anxiety, depression and somatization via need-satisfaction (Sheldon, 2011;

Vansteenkiste & Ryan, 2013). Cross-mediation paths were also allowed in the model. Findings show that parental support positively relates to need satisfaction, which, in turn, predicts vitality and satisfaction with life. Additionally, parental thwart positively predicts need frustration which, in turn, predicts anxiety, depression and somatization. The AMOS bias-corrected bootstrap confidence intervals found significant the two mediation effects above described ($p < .05$), whereas crossover mediation was not significant. Adding the indirect paths increased the total variance explained for all the outcome variables, particularly for depression (see figure 2).

In a third model (χ^2 (11) = 11. 51; *CFI* = .99.6; *RMSEA* = .07: *RMR* = .01) we tested partial mediation, modelling together the direct and indirect paths. Findings show that controlling for need-satisfaction reduced to half-size ($p < .001$) the effects of parental need-support on vitality and SWL, whereas controlling for need-frustration reduced to non-significance ($p > .05$) the effects of parental need-thwarting on anxiety, depression and somatization. In line with hypotheses 1 and 2 findings support that parental support positively predicts adolescents´ satisfaction with life and vitality, partially via the subjective experience of basic needs satisfaction, whereas parental thwarting positively predicts adolescents´ anxiety, depression and somatization via the inner feelings of need frustration. Despite the significant negative crossover effects of parental support and need satisfaction on depression and of parental thwarting and need frustration of SWL, again crossover mediation was not significant. Model 3 also explained the higher total variance in the outcomes, when compared to models 1 and 2 (see figure 2), thus showing incremental predictive power. We computed the X^2 difference test between nested Models 1, 2 and 3. The partial mediation model fitted the data significantly better than the full mediation model ΔX^2 (5) = 50.18 $p < .001$.

Figure 5.1

Model Overview

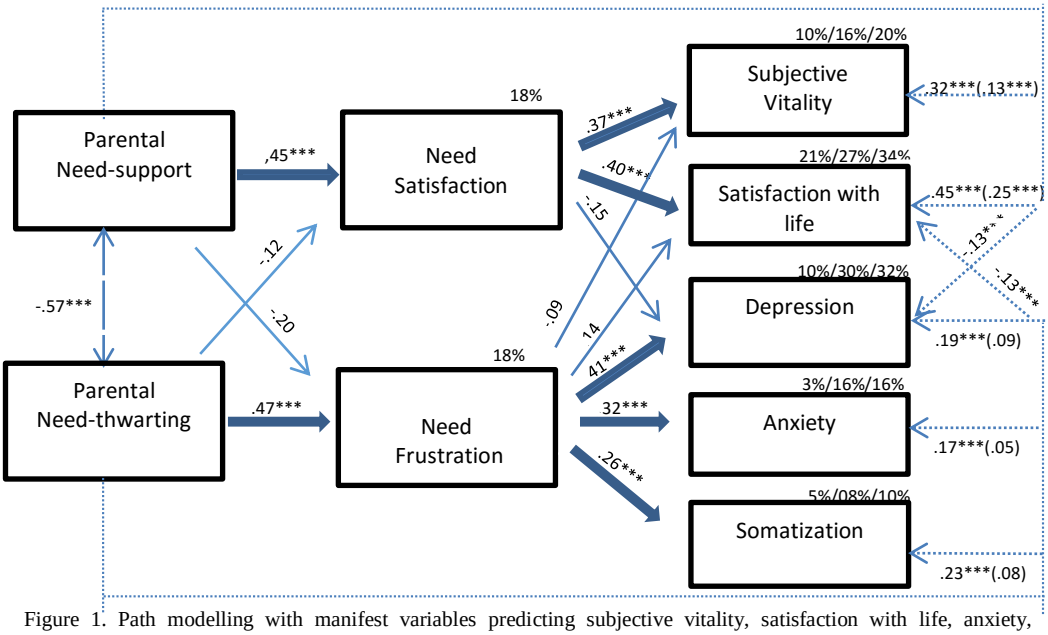

Figure 1. Path modelling with manifest variables predicting subjective vitality, satisfaction with life, anxiety, depression, and somatization. Coefficients shown are standardized path coefficients. Estimates under brackets refer to the partial mediation model. Estimates presented on the top of the outcome variables correspond to their explained variance. The first value corresponds to the direct effects model, the second to the full mediation model and the third to the partial mediation model. *p<.05, **p<.01, ***p<.001.

Alternative SEM Model. The cross-sectional nature of this study makes it relevant to compare the structural path model examined with alternative models, to more firmly assure the directionality of the effects. So, we tested a fourth structural model specifying two full mediation paths, (a) from subjective vitality/SWL – need satisfaction – parental need-support and (b) from anxiety/depression/somatization – need frustration - parental need-thwarting. This model is also conceptually plausible. It asserts that adolescents scoring high on psychosymptomatology would have a tendency to appraise their parents as highly need-thwarting, because they feel their needs more frustrated, whereas adolescents that experience higher vitality and satisfaction with life would score their parents as more need-supportive because they feel their needs to be more satisfied. The alternative model yielded a poor fit to the BMPN data χ^2 (17) = 194.48; *CFI* = .87; *RMSEA* = .17: *RMR* = .06), thus supporting the directionality of the effects specified in the partial mediation model.

Discussion

The purpose of the present research was to develop the Portuguese Parental Need Support and Thwarting Scale and examine its psychometric properties, paying special attention to the extent to the scales predict adjustment-related outcomes in high school students. We present the procedures followed in item development and pilot testing of candidate items (Study 1), the techniques employed to investigate the internal structure and psychometric properties of the scales (Study 2) and the analytic methods used to examine he criterion-related validity of the scores (Study 3). Research was conducted among three samples of Portuguese high school students.

From the initial pool of 24 items, eighteen items were selected from the criteria of univocal interpretation and content validity. The 18-item final version of the PNSTS was then administered to an independent sample of high school students. The combined results of EFA and CFA suggest that the 18-item PNSTS is organized in a theory-based multidimensional structure of six latent factors, corresponding to the features of the parental behavior that support and thwart the adolescent´s needs for autonomy, competence and relatedness (Support for H1a; SDT; Deci & Ryan, 2000). From the comparative model fit analysis (see confirmatory factor analysis section for model description) it was observed the good fit of both Models 2 and 3 in detriment of Model 1, indicating that the six parenting constructs have conceptual unity, as they are aligned with the SDT-based tripartite model of basic needs (Deci & Ryan, 2000). Finally, the superior fit of Model 3 suggests that there is a substantive distinction between the three dimensions of supporting and thwarting parenting styles (Support for H1b).

The psychometric properties of the six-factor model were examined in terms of reliability and validity of the scores. All six factors presented adequate internal consistency, as well as adequate convergent and discriminant validity. These results

demonstrate the reliability and validity of the PNSTS as a domain-general measure of perceived parental support and thwart, extending the innovations of previous measures of parental thwart in the sports context (PNTS).

In final analyses we tested the criterion-related validity of a two-factor higher order solution of need-support and need-thwarting parenting (Model 2). As expected from SDT, we found the primary effects of parental need-support on positive adjustment (subjective vitality and SWL) partially via subjective feelings of need satisfaction (support for H2a) and the unique role of parental need-thwarting on maladjustment (anxiety, depression and somatization) via experiences of need frustration (support for H2b; Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013). Findings suggest, in line with SDT, that parental need-support energizes behavior and induces feelings of SWL, in part because it allows for adolescents to feel more self-determined, competent and socially integrated. Conversely, parental thwarting puts adolescents at risk for the development of emotional psychopathology, to the extent as it promotes on children feelings of being controlled, incompetent or apart from others.

These findings have important implications for SDT-based research, when they suggest that that feelings of need (diss)satisfaction and frustration develop from distinct socialization styles and follow distinct mediational pathways in the prediction of the adolescents´ adjustment (Haerens et al., 2015; Vansteenkiste & Ryan, 2013). This assumption requires further clarification in a number of aspects. Firstly, SDT posits that parental support is associated to perceptions of need satisfaction, acute lack of parental support is associated to experiences of need dissatisfaction, and the chronic need thwarting to experiences of need frustration (Sheldon, 2011). The two latter relations are somehow confusing, because they combine the type of parental behavior (expressing lack of support *versus* thwart) and their frequency (acute *versus* chronic). Future research could examine

how acute *versus* chronic lack of parental support *versus* thwart differentially relate to the subjective experiences of need dissatisfaction or frustration to predict malfunctioning in diverse areas, including adjustment, school learning and achievement.

Further, in line with previous research showing that chronic experiences of need-thwarting link to specific outcomes through domain/situation/task-specific cognitive processes (e.g., early maladaptive self-schemas; Cordeiro, Paixão, Lens, Lacante & Rijo, 2015), future longitudinal studies could also examine (a) whether the experiences of acute *versus* chronic need satisfaction and/or frustration uniquely relate to adaptive *versus* maladaptive cognitive structures and coping strategies (Sheldon, 2011) to predict psychosocial criteria. For instance, when parents sometimes forget to positively feedback the child for good performance at school, while they usually do it (deprive students from competence support), this would represent an acute experience of need dissatisfaction for students, and would probably activate adaptive restoring behavior (e.g., remembering the parents about the feedback). However, when parents continuously provide negative feedback (e.g., criticize, unfavourably compare their child to his/her classmates, systematically underline his/her errors and flaws) to students´ results, this would most likely frustrate the satisfaction of the competence need, which, in turn, would elicit ill-being symptoms (depressive feelings, test anxiety), inhibit adaptive behavior (a-motivation, diminished involvement in learning tasks) or elicit maladaptive behavior patterns (e.g., opposition-defiance, cheating in exams) and school failure (test failure; drop-out).

The implications of the findings are also relevant for practice. Specifically, they underline the need to design differentiated interventions with parents, depending on whether they aim to promote need-support, or hold back need-thwarting behaviors. Interventions targeting need-supportive behaviors should capitalize on empathy, positive

informational feedback and responsive interactions (Deci & Ryan, 1985; Grolnick & Slowiaczek, 1994; Reeve, 2002) to help parents providing experiences of choice and volition, value effort-based success and provide secure attachment with minimum control and power assertion (Barber, 1996; Deci & Ryan, 1985; Grolnick, 2003). On the other hand, more remediative interventions should be devised to help parents to identify and refrain from using need-thwarting attitudes that arise feelings of anxiety, depression and somatization, including (a) controlling for autonomous behavior, (b) setting rigid standards and goals for achievement, (c) communicate failure-oriented feedback and (d) rejecting or neglecting their children (Barber & Harmon, 2002; Soenens & Vansteenkiste 2010).

Limitations and Directions for Future Research

The current design has several limitations that are worth noting. Firstly, the cross-sectional design used does not allow drawing firm conclusions about the directionality of the regression effects, making it plausible to formulate alternative hypotheses about the relations between the variables. Secondly, we measured only the parental attitudes perceived as dominant at home. However, there are consistent findings suggesting the need to examine the parental and maternal variables in separate (Skinner, Johnson & Snyder, 2005; Soenens, Vansteenkiste, Duriez & Goossens, 2006). Thirdly, we relied exclusively on community-based samples of high school students, while we recognize that this sampling method more easily captures the normative changes associated to adolescence than psychopathological symptoms. To enhance the variability of the scores we suggest that future studies should rely on a combination of normative, at-risk and clinically-referred adolescents.

Conclusion

In this study we developed a multidimensional scale of perceived parental need-support using SDT as the unified conceptual framework, and examined the construct validity of the PNSTS scores, in a rare broad-band factor-analytic study modelling together the supportive and thwarting types of perceived parenting. Altogether, the findings support the SDT-based organization of the parental attitudes in terms of how they support or thwart the needs for autonomy, competence and relatedness, and their differential power in predicting adolescents´ adjustment, via experiences of need satisfaction and frustration, respectively. Based on the findings it is suggested that interventions addressing the "bright" and "dark sides" of parenting styles should involve different actions designed, not only to strengthen the protective factors associated to parental need-support, but also to identify and minimize the risk factors associated to the lack of need-support and to parental need-thwarting.

6

Perceived Parenting and Basic Need Satisfaction Among Portuguese Adolescents

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Abstract

We examined the psychometric properties of the Parenting Questionnaire in a sample of Portuguese high school students. Two measurement models were specified. Model $1_{m,f}$ specifies a bi-dimensional structure of parental need-support and behavioral control. Model $2_{m,f}$ proposes a tripartite structure of parental need-support, psychological control and behavioral control. Model $2_{m,f.}$ best-fitted the data, being also supported in terms of convergent, discriminant validity. Regression results found the unique effect of autonomy-support ($M2_{mr,}$ b = .25 p < .001; $M2_{fr,}$ b = .14 p < .01), responsiveness-warmth (Model $2_{mr,}$ b = .19, p < .001; Model 2_{fr}, b = .13 p < .05) and behavior control on basic need-satisfaction (Model 2_{mr}:b = .14 p < .05), but a non-significant effect of psychological control on need-frustration (p > .05). Notably, psychological control predicted low need-satisfaction ($M2_{mr}$: b = –.10) and moderated of the positive effect of parental need-support on need-satisfaction, $M2_{mr}$: $F(3, 367) = 11.62$, p < .001. Psychological control and need-support also moderated the positive effect of behavior control on competence satisfaction, with parental need-support amplifying this effect and psychological control buffering it. Overall the findings support the substantive distinction between the parenting dimensions, suggesting that need-satisfaction is enhanced by need-supportive and behavioural control and undermined by psychological control.

Keywords: parenting, need satisfaction, adolescents, Portugal

The Present Study

In this study we will examine the factor structure of the Parenting Questionnaire Scales (PQS; Soenens, Vansteenkiste, Duriez & Goossens, 2006), to provide evidence for their and construct validity. This aim is of particular importance, for two reasons. From a conceptual point of view we are among the few to use of a top-down approach, and particularly the Self-Determination Theory, to integrate the findings. Methodologically we offer, for the first time, a broad factor-analysis of the full set of the scales.

As a first goal we examined the factor structure of the PQS in two Models. The first - Model$1_{m,f}$ ($_{m}$ for mothers; $_{f}$ for fathers), tested the PQS in a two-factor structure. The first factor measures parental need-support (Duriez, Soenens, & Vansteenkiste, 2007) in a composite score combining the scales of autonomy-support (POPS; Grolnick, Ryan, & Deci, 1991), responsiveness-warmth (CRPBI; Schaefer, 1965), and (a lack of) psychological control (YSR; Barber, 1996). The second factor assesses behavioural control in a composite score that aggregates the measures of expectations for behavior and monitoring of behavior (PRS – YSR; Barber, 2002). The second - Model $2_{m,f}$ tested the PQS in an alternative three-factor structure. The first factor measures parental need-support, in a composite score that aggregates the scales of autonomy-support and responsiveness-warmth. The second factor assesses behaviour control in a composite score that combines the measures of expectations for behavior and monitoring of behavior. The third factor measures parental psychological control from the psychological control scale. In both Model $1_{m,f}$ and Model $2_{m,f}$ the dimensions of behaviour control and psychological control are measured as two separate factors, in line with the SDT argument that behaviour control, deals with "what" parents do to regulate their children's behaviour outcomes, whereas autonomy-support refers to "how" parents implement it (Soenens & Vansteenkiste, 2010). However, Model $1_{m,f}$ and Model $2_{m,f}$ diverge in the way as the

Psychological Control items are codified. In fact, whereas in Model $1_{m,f}$ the psychological control items were reverse-scored to measure parental need-support (see Miklikowska, Duriez, & Soenens, 2011 for a similar approach), in Model $2_{m,f}$ they are direct-scored to assess psychological control. We expect a better fit for Model $2_{m,f}$, based on the SDT premise that the parental need-support and the psychological control dimensions of parenting have different substantive interpretations and effects (e.g., Bartholomew et al., 2011; Sheldon, Abad, & Hinsch, 2011; Vansteenkiste & Ryan, 2013).

In a second goal we examined the criterion-related validity of the best-fitting model, according to five SDT-based hypotheses (Vansteenkiste & Ryan, 2013). In a first hypothesis we expect the primary effects of parental need-support and of behaviour control on need-satisfaction and of parental psychological control on need-frustration (Hypothesis 1). Second, we expect the cross-lagged effects of parental need-support on need-frustration and of psychological control on need-satisfaction (Hypothesis 2). Third, we hypothesize that parental need-support and psychological control moderate the positive effect of behaviour control on need-satisfaction (Hypothesis 3a), that parental need-support moderates the positive effect of psychological control on need-frustration (Hypothesis 3b), and also that psychological control moderates the positive effect of parental need-support on need-satisfaction (Hypothesis 3c). We intended to verify wether our hypothesis are valid for the developmental stage of adolescence, the reason why we used a sample of high school students.

Participants

We sampled 371 Portuguese high school students (grade 10: *n* = 101 [27.2%], grade 11: *n* = 148 [39.9%], grade 12 *n* = 122 [32.9%]), of both sexes (Male: *n* = 171 [46.1%], female *n* = 200 [53.9%]), aged between 16 and 23 years old (*M* = 18; *SD* =

1.309)[7]. Students attended scientific-humanistic (*n* = 153 [41.2%]) and technical-vocational courses (*n* = 218 [58.8%]) in public (*n* = 182 [49.1%]) and private schools (*n* = 189 [50.9%]). Passive informed consent was obtained from the parents of younger students. All subjects volunteered for the study and completed the questionnaires without missing responses. No credits were granted for participating in the study.

Procedure

Prior to data collection the researchers obtained the mandatory permissions from the General Directorate for Innovation and Curricular Development and from the school principals. Next, the questionnaires were group-administered in the classroom, during regular class hours. The primary researcher read aloud the instructions of the PQS "The following statements deal with the way in which your father/mother behaves towards you; indicate to what degree you agree with these statements by circling one of the numbers", and of the Balanced Measure of Psychological Need Scale (Sheldon & Hilpert, 2012) ''Please read each of the following statements carefully, thinking about how true it is for you". Aspects such as the voluntary participation and confidentiality of the data were secured in the instructions. Students took around 20 minutes to complete the questionnaires.

Measures

Perceived Parenting. The 76-item Parenting Questionnaire Scales was used to measure perceived parenting. The PQS is not a questionnaire *per se*, but a composite instrument composed of five scales: the 7-item autonomy-support scale, retrieved from the Perceptions of Parents Scales (POPS; Grolnick, Ryan & Deci, 1991, e.g., "My mother/father is usually willing to consider things from my point of view), the 7-item responsiveness-warmth scale, included in the Child Report of Parent Behavior Inventory

[7] In the Portuguese education system, the secondary education level comprises the 10th, 11th and 12th school years. The age of students range from 17 and 23 years old, with older students commonly having an history of academic failure.

(CRPBI; Schaefer, 1965, e.g., "My father/mother makes me feel better after I discuss my worries with him/her"), the 8-item psychological control scale, integrated in the Youth Self-Report (PCS-YSR; Barber, 1996; e.g., "My mother/father changes the subject whenever I have something to say), the 8-item expectations for behavior scale (e.g., "My mother/father believes that children should not be able to do anything they want") and the 8-item Monitoring of Behavior Scale (e.g., "My mother/father asks me questions about how I am behaving outside the home"), included in the Parental Regulation Scale – Youth Self-Report (PRS-YSR; Barber, 2002). The PQS was rated separately for mothers (N = 38) and fathers (N = 38), on a 6-point Likert-type scale, ranging from 1 (*"Totally Agree"*) to 5 ("*Totally disagree*"). The Cronbach's alphas reported for maternal and paternal ratings ranged from .67 to .70 for autonomy-support (Grolnick, Ryan & Deci, 1991), .88 to .92 for responsiveness-warmth (Soenens et al., 2005), .82 to .80 for psychological control (Barber, 1996), and .83 to .82 for behaviour control (Soenens, Vansteenkiste, Luyckx & Goossens., 2006).

Translation. We translated the Parenting Questionnaire Scales into Portuguese using the back-translation procedure (Hambleton, 2001)[8]. A professional interpreter collaborating with the fluent English-speaking researchers translated the PQS from English to Portuguese. Next, an independent interpreter translated the scales back into English. Both original and back-translated versions were checked for accuracy, and the discrepancies resolved through consensus. The readability and unambiguous understanding of the PQS items was further examined in a pilot study (N = 11 Portuguese high school students), resulting in the wording and syntax modifications of three items (items 5, 29, and 14).

[8] The translated version of the PQ scales is presented in Appendix A, named as "Questionário Parental"

Basic Psychological needs. We used the Portuguese adaptation of the Balanced Measure of Psychological Needs Scale (BMPN; Sheldon & Hilpert, 2012; Portuguese version: Cordeiro, Paixão, Lens, Lacante & Sheldon, 2015). The BMPN is an 18-item self-report questionnaire measuring basic psychological need-satisfaction and need-frustration in six three-item scales. Three positively-worded scales measure the satisfaction of autonomy ("My choices are based on my true interests and values"), competence ("I am successful at completing difficult tasks and projects") and relatedness needs ("I feel a sense of contact with people who care for me, and whom I care for"). In addition, three negatively-worded scales measure the frustration of autonomy (e.g. "I do things against my will"), competence ("I do stupid things that make me feel incompetent"), and relatedness needs ("I feel unappreciated by one or more important people"). All items are rated on a 5-point Likert scale, ranging from 1 = *no agreement* to 5 = *much agreement*. The internal consistency of the scales reported for the Portuguese version of the BMPN was of .84, .79, and .82 for autonomy, competence, and relatedness satisfaction, and of .85, .82, and .77 for autonomy, competence, and relatedness frustration, respectively. In this study, we modelled the six BMPN scales in a structure of two second-order factors measuring the general experience of basic need-satisfaction and of basic need-frustration (α = .82, .85, respectively).

Plan of Analysis

We examined the internal structure of the Parenting Questionnaire Scales using AMOS (V.20, SPSS Inc, Chicago, IL). In the first step we computed successive confirmatory factor analyses (CFA, Byrne, 2010) with ML estimation, to test the fit of Model $1_{m,f}$ and Model $2_{m,f}$ to the PQS data. Goodness-of-fit was judged from multiple fit indices, namely the Chi square (X^2) statistics, the Standardized Root Mean Square Residual (*RMR*), the Comparative Fit Index (*CFI*) and the Root Mean Squared Error of

Approximation (*RMSEA*). The combined cut-off values of .09 for *SRMR*, .06 for *RMSEA*, *p [rmsea* ≤ 0.05*]* and .90, or above, for *CFI*, showed an acceptable fit (Hu & Bentler, 1999). The lowest values obtained in the Akaike's Information Criteria (*AIC*; Byrne, 2010) indicated the preferred model. Further, we used the Standardized Factor Loadings and the Modification Indices to modify the best-fitting model. We excluded from further analysis all items presenting poor factor loadings ($\lambda i \geq 0.5$; $\lambda^2_{ij} \geq 0.25$; Maroco, 2010) or high cross-loadings (MI > 9). In the second step we performed an Exploratory Factor Analyses (*EFA*; McIver & Carmines, 1981), in principal components (*PCA*), and promax rotation to the data, in order to corroborate the best-fitting model found in CFA. In the third step we used the STATS Tool Package (Gaskin, 2012) to examine the Convergent ($AVEi \geq 0.5$; Fornell & Larcker, 1981) and Discriminant Validities (*MSV < AVE; ASV < AVE*; Fornell & Larcker, 1981) of the factors. Finally, in the fourth step we performed successive Linear Regression Analyses to examine the main/cross-lagged effects between the variables. In addition, we used hierarquical regression analyses to examine for possible moderation effects. In the hierarquical regression procedure we examined the slope of the relationship between the predictors and the outcome variables, at low (one SD below the mean) and high (one SD above the mean) levels of moderator.

Preliminary Results

Confirmatory Factor Analysis. Table 6.1 summarizes the estimates of goodness-of-fit and model quality of Model $1_{m,f}$ and Model $2_{m,f}$. Figure 6.1 provides a graphical representation of the respecified models. Initial CFAs yield an important misfit for the two models tested, nevertheless favouring the Model$2_{m,f}$ across all the fit indices considered. We modified the Model $2_{m,f.}$ to improved goodness-of-fit. Firstly, we dropped from further analyses 14 items with high cross-loadings on non-intended factors (*MI* > 9; Maroco, 2010) and 12 items with poor loadings on the respective factor ($\lambda_{ij} \geq 0.5$). Secondly, we

aggregated several scales presenting high empirical correlations (Maroco, 2010). Specifically, we combined the scales of expectations of behaviour and monitoring of behaviour (Model 2_m r = .89, p < .001; Model 2_f, r = .84, p < .001) to measure behaviour control and the scales autonomy-support and responsiveness-warmth (Model$_{2m}$, r = .85, p < .001; Model 2_f, r = .95, p < .001) to measure parental need-support. In a final procedure we correlated the measurement errors of the items 1; 31, 31; 20, 5; 20. The resulting respecified Model (now designated Model $2_{mr,fr}$) is organized in a solution of 15 items and three factors, measuring parental need-support, behaviour control and parental psychological control. Subsequent CFA results show the improved fit of Model $2_{mr,fr.}$ In addition, the lowest AIC scores indicate that Model $2_{mr,fr}$ is preferred to interpret the factorial structure of the PQS.

Table 6.1

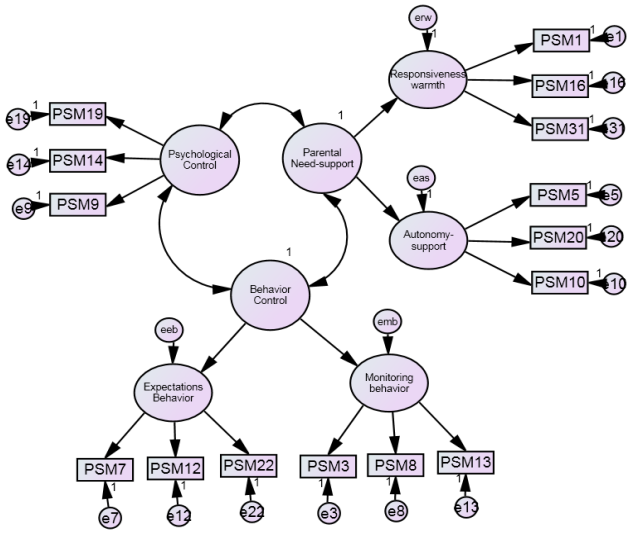
Global Fit Indices for the Hypothesized Models

Model	χ^2	*df*	*p*-value	χ^2/df	CFI	RMSEA	RMR	AIC
Model 1_m	2981.42	66	$p < .001$	4.49	.56	.10	.18	3135.42
Model 2_m	2796.01	66	$p < .001$	4.22	.56	.09	.18	2954.09
Model 2_{mr}	198.76	79	$p < .001$	2.52	.93	.06	.10	280.76
Model 1_f	3098.66	66	$p < .001$	4.67	.64	.10	.19	3252.66
Model 2_f	2635.70	66	$p < .001$	3.98	.71	.09	.18	2793.70
Model 2_{fr}	187.50	78	$p < .001$	2.40	.95	.06	.07	271.50

Note. X2 qui-square; CFI=comparative fit index; RMSEA=root-mean-square error of approximation; RMR = root-mean-square residual; AIC= Akaike information criterion

Figure 6.1

Standardized Estimates for Model 2 (Maternal and Paternal)



Exploratory Factor Analysis (EFA). Table 6.2 presents the reliability estimates for the PQS items and scales. The Exploratory Factor Analyses extracted a solution of three components with eigenvalues greater than 1, explaining 46, 20% (Model 2_{mr}) and 57, 28% (Model 2_{fr}) of the total variance of the data, respectively (Tiensley & Tiensley, 1987). The three scales demonstrated good internal consistency, for both the maternal and paternal ratings, with all items loading significantly on the intended factor ($\lambda_{ij} \geq .50$; $\lambda^2_{ij} \geq .25$). Together, the EFA results corroborate the 3-factor solution found in CFA.

Correlations. Table 6.3 summarizes the means, standard deviations and correlations obtained for the three factors**.** The examination of the correlation matrix shows a modest negative correlation (*VIF* < *5*) between parental need-support and psychological control ($M2_{mr}$ r = –.34, p < .001 $M2_{fr}$ r = –.43, p < .001), suggesting that the factors measure two distinct parental dimensions. In addition, behaviour control does not correlate to either parental need-support ($M2_{mr}$ r = .19, p = .72) nor to psychological control ($M2_{mr}$ r = .09, p = .79; $M2_{fr}$ r = –.07, p = .79), thus suggesting that behaviour control is orthogonal to both the supportive and thwarting dimensions of parenting (see Soenens & Vansteenkiste, 2010 for a discussion). Remarkably, the high correlation observed between the dimensions

of paternal behaviour control and need-support $M2_{fr}$ ($r = .56$, $p < .001$) suggests that, for the Portuguese context, the paternal enforcement of behaviour control is more positively-valued as an expression of need-support than the maternal.

Table 6.2

Reliability and Validity Estimates of the Portuguese Version of the Parenting Questionnaire Items and Scales

Item	$\lambda_{ij} \geq 0.5$ (CI 95%)			λ_{ij}^2 (≥0.25)
	F1	F2	F3	
9. My mother/father changes the subject whenever I have something to say	.82			.67
19. My mother/father blames me for other family members' problems	.81 (.81)			.66 (.66)
14. My mother/ father often interrupts me	.83 (.81)			.69 (.66)
38. If I have hurt his/her feelings, my mother/father stops talking to me until I please him/her again	(.79)			(.62)
29. My mother/father is less friendly with me if I do not see things /her way	(.57)			(.32)
3. My mother/father asks me questions about how I am behaving outside the home		.59 (.60)		.34 (.36)
13. My mother/father watches to make sure I behave appropriately		.71 (.76)		.50 (.58)
22. My mother/father believes parents have the right to set rules and regulations for how children should behave		.63 (.66)		.40 (.44)
2. My mother/father has clear expectations for how I should behave in and outside the home		(.61)		(.37)
37. My mother/father checks on me in reasonable ways to see if I am behaving like he/she wants me to		(.63)		(.40)
17. My mother/father wants me to learn to follow rules and regulations in and outside of the home		(.82)		(.67)
7. My mother/father requires that I behave in certain ways		.69		.48
12. My mother/father believes that children should not be able to do anything they want		.56		.31
8. My mother/father reminds me of the rules he/she has set for me		.76		.58
1. My mother/father makes me feel better after talking over my worries with him/her			.73 (.65)	.53 (.42)
16. My mother/father cheers me up when I am sad			.75 (.75)	.56 (.56)
31. My mother/father enjoys doing things with me			.69 (.73)	.48 (.53)
5. My mother/father listens to my opinion or perspective when I've got a problem			.73 (.75)	.53 (.56)
10. My mother/father is usually willing to consider things from my point of view			.81 (.73)	.66 (.53)
20. My mother/father allows me to decide things for myself			.67 (.67)	.45 (.45)
Cronbach's Alpha	.80 (.71)	.74 (.81)	.84 (.87)	

Note 1. $\lambda_{ii=}$ standardized factor score weights; λ_{ii}^2 individual-item reliability.
Note2. Values between brackets correspond to Model 2fr estimates

Table 6.3

Response rate (N), Means, Standard Deviations (SD), and Correlations of the Study Variables

Factors	*N*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. PNS	371	3.75 (3.45)	.87 (.93)	1	(-.43**)	(.56**)	(.15**)	(.10)	(.15**)	(-.00)	(-.03)	(-.05)	(.17**)	(-.04)
2. PC	371	2.42 (2.29)	1.11 (.89)	-.34**	1	(-.07)	(-.06)	(-.04)	(-.07)	(.01)	(.05)	(.01)	(-.07)	(.03)
3. BC	371	3.73 (3.57)	.70 (.78)	.02	.091	1	(.05)	(.08)	(.09)	(.02)	(-.03)	(-.09)	(.08)	(-.05)
4. AS	371	4.05	.68	.20**	-.08	.03	1	.(44**)	(.36**)	(-.07)	(-.06)	(-.19**)	(.79**)	(-.14**)
5. CS	371	3.82	.67	.15**	-.07	.16**	.44**	1	(.34**)	(-.00)	(-.10)	(-.11*)	.77**)	(-.09)
6. RS	371	4.26	.67	.20**	-.16**	-.02	.36**	.34**	1	(-.02)	(-.07)	(-.17**)	(.74**)	(-.11*)
7. AF	371	3.20	.89	-.05	.04	-.01	-.07	-.00	-.02	1	(.51**)	(.47**)	(-.04)	(.80**)
8. CF	371	2.66	1.06	-.09	.03	-.04	-.06	-.10	-.07	.51**	1	(.56**)	(-.10)	(.80**)
9. RF	371	2.40	1.05	-.10	.01	-.03	-.19**	-.11*	-.17**	.47**	.56**	1	(-.20**)	(.85**)
10. NS	371	4.04	.52	.24**	-.14**	.14*	.79**	.77**	.74**	-.04	-.10	-.20**	1	(-.15**)
11. NF	371	2.77	.81	-.10	.03	-.03	-.14**	-.09	-.11*	.80**	.80**	.85**	-.15**	1

Note. PNS = Parental Need-support; PPC = Parental Psychological Control; BC = Behaviour Control; AF = Autonomy Satisfaction; CF = Competence Satisfaction; RS = Relatedness Satisfaction; AF = Autonomy Frustration; CF = Competence Frustration; RF= Relatedness Frustration; NS = Need-satisfaction; NF = Need-frustration. Values between brackets correspond to Model $2f_r$ estimate.

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

Validity. Table 6.4 summarizes the validity estimates for the three PQS factors. We found Convergent validity (CV) for all the questionnaire factors except for the measures of maternal need-support and behaviour control. The CV threats found are explained by the modest correlations verified between the dimensions of monitoring of behaviour and autonomy-support in the respective second-order factors of need-support and behaviour control. The additional CV threat detected for the factor paternal psychological control is justified by the modest loadings of the items in the factor. No threats to the discriminant validity of the scales were verified, thus suggesting the divergent validity of the three factors.

Table 6.4

Factor Correlation, Reliability and Validity Estimates for the Models Tested

	Composed reliability	Convergent validity	Discriminant Validity		Correlation of latent constructs		
	CR	AVE	MSV	ASV	PNS	PNT	BC
Model 2mr							
F1. PNS	.80	.58	.10	.06	.76		
F2. PC	1.06	1.11	.10	.05	-.32	1.05	
F3. BC	2.05	2.98	.02	.01	.15	.03	1.73
Model 2fr							
F1. PNS	.95	.90	.48	.39	.95		
F2. PC	.73	.41	.30	.15	-.55	.64	
F3. BC	.95	.90	.48	.25	.70	-.07	.95

Note. R^2=factor square correlations; Convergent validity (AVEi ≥ 0.5); Composite reliability (CR≥0.7), Discriminant Validity (R^2) Average Variance Extracted (AVE), Maximum Shared Squared Variance (MSV), and Average Shared Squared Variance (ASV).

Primary Results

Table 6.5 portrays the results of linear regression analyses. We examined the effects of behaviour control, parental need-support and psychological control on the adolescents´ experience of basic need-satisfaction and of need-frustration (Vansteenkiste & Ryan, 2013).

Main Effects. The results support the main effects of parental need-support on general need-satisfaction. This effect was verified for both the first-order dimensions of autonomy-support ($M2_{mr,}$ β = .25, t[1,369] = 4.88, p < .001; $M2_{fr,}$ β = .14, t[1,369] = 2.78,

$p < .01$) and responsiveness-warmth (Model $2_{mr,}$ $\beta = .19$, $t[1,369] = 3.76$, $p < .001$; Model 2_{fr}, $\beta = .13$, $t[1,369] = 2.59$, $p < .05$). However, when autonomy-support and responsiveness-warmth were entered together in a hierarchical regression procedure, the effect of responsiveness-warmth was reduced to non-significance ($M2_{mr}$, $\beta = .05$, $t[1,369] = .66$, $p = .52$; $M2_{fr}$, $\beta = -.01$, $t[1,369] = -.06$, $p = .95$), suggesting suppression effects. The results also support the main effect of behaviour control on basic need-satisfaction (Model 2_{mr}: $\beta = .14$, $t[1,369] = 2,80$, $p < .05$; Model 2_{fr}: $\beta = .08$, $t[1,369] = 1,78$, $p = .08$), and, particularly, on competence satisfaction (Model 2_{mr}: $\beta = .16$ $t[1,369] = 3,16$, $p < .01$; Model 2_{fr}: $\beta = .05$, $t[1,369] = .88$, $p = .38$). However, behaviour control was not a significant predictor of need-frustration (Model 2_{mr}: $\beta = -.03$, $t[1,369] = -.53$, $p = .60$; Model 2_{fr} $\beta = -.05$, $t[1,369] = -.78$, $p = 43$)**.** Importantly**,** against what is predicted by SDT (Vansteenkiste & Ryan, 2013), the findings did not provide support for the main effect of psychological control on need-frustration ($M2_{mr}$ $\beta = .03$, $t[1.369] = .56$, $p = .57$; $M2_{fr}$, $\beta = .03$, $t[1.369] = .52$, $p = .60$). Overall, the results provided partial support for the first hypothesis of our study.

Table 6.5

Regression Analysis Predicting Basic Need Satisfaction and Need Frustration

Predictor	Dependent Variables					
	Mother ($M2_{mr}$)			Father ($M2_{fr}$)		
	BC	PNS	PC	BC	PNS	PC
Autonomy-satisfaction	.05	**.20****	-.08	.05	**.14***	-.06
Competence-satisfaction	**.16****	**.15***	-.07	.05	**.11***	-.04
Relatedness-satisfaction	.02	**.20****	**-.16****	.09	**.15***	-.07
Autonomy-frustration	-.01	-.05	.04	.02	-.01	.01
Competence-frustration	-.04	-.09	.03	-.03	-.03	.05
Relatedness-frustration	-.03	-.06	.01	-.09	-.05	.01
General Need Satisfaction	**.14***	**.24****	**-.14***	.08	**.17****	-.07
General Need Frustration	-.03	-.10	.03	-.04	-.04	.03

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

Crossover Effects. We further examined the predicted cross-lagged effects between the variables (Vansteenkiste & Ryan, 2013). We found that maternal psychological control had a significant negative effect on basic need-satisfaction ($M2_{mr}$: □□= –.14, *t*[1, 369] = –1, 36, $p < .05$), while parental need-support does not have a significant effect on need-frustration ($M2_{mr}$:□□□= –.10, *t*[1, 369] = –.61, $p > .05$, $M2_{fr}$: □□= .04, *t*[1, 369] = –1.94, $p > .05$).

Moderation Effects. In subsequent analyses we explored the existence of possible moderation effects between the variables. The results of hierarquical regression analysis showed that both parental need-support and psychological control moderated the positive effect of behaviour control on general need-satisfaction, with parental need-support amplifying this effect and psychological control buffering it. We also found that maternal psychological control buffered the positive effect of need-support on need-satisfaction ($M2_{mr}$: $F(3, 367) = 11.62$, $p < .001$; $M2_{fr}$: $F(3, 367) = 3.49$, $p < .05$). The asymmetrical cross-lagged and moderation effects found provided partial support the second and third (3a, 3c) hypotheses of our study.

Discussion

The aims of this study were twofold: (1) to perform a broad-band factor-analytic study of dimensionality and construct validity of the Parenting Questionnaire Scales in Portuguese sample of high school students, and (2) to examine the construct validity of the parenting dimensions, with reports of convergent, discriminant and criterion-related validity. The findings are interpreted on the basis of Self-Determination Theory.

The combined results of exploratory and confirmatory factor analyses, along with the lowest AIC estimates obtained for Models $2_{mr,fr}$ showed that the internal structure of the Parenting Questionnaire Scales is best-represented by a solution of 15-items and 3

factors that distinguish the dimensions of parental need-support, parental psychological control and behaviour control.

The improved construct validity of the three-factor solution was further demonstrated at the correlation matrix. As expected, parental need-support and parental psychological control were moderately correlated, signifying that the constructs lie within two distinct motivational continua. In addition, behaviour control does not significantly relate to both parental need-support and psychological control, suggesting that the parental efforts to regulate children's behaviour, based on reasonable expectations and adequate monitoring of behaviour, are independent of the supportive or thwarting ways through which these efforts are communicated (Soenens & Vansteenkiste, 2010).

The 3-factor model demonstrated adequate discriminant validity, but further adjustments are necessary to improve the Convergent Validity of some scales. The criterion-related validity of the three factors was also demonstrated. In particular, it was found that the Portuguese high school students experience basic need-satisfaction when they perceive their parents as highly need-supportive (particularly autonomy-supportive) and/or behaviourally controlling, but they do not necessarily experience basic need-frustration when they their parents display psychological control (or psychologically controlling) attitudes. Instead, the perception of parental psychological control, and particularly of maternal psychological control, is related to the experience of low need-satisfaction, whereas neither parental need-support nor behaviour control relate to the experience of low need-frustration.

Importantly, the effect of parental psychological control on (low) need-satisfaction was not affected by the degree to which parents are simultaneously perceived as need-supportive and behaviour controlling. On the contrary, the positive effects of parental

need-support on basic need-satisfaction are significantly buffered by the experience of psychological control.

Finally, we found that parental need-Support and maternal psychological control moderated the positive effect of behaviour control on the adolescents´ experience of basic need-satisfaction, with parental Need-support amplifying this effect and psychological control buffering it.

Overall, the results indicate that the most optimal pattern of adolescent need-satisfaction is attained when parents combine need-supportive, behaviour controlling, and (the lack of) parental psychological control attitudes. Put it in a different way, lower need-satisfaction is experienced when the parents exhibit psychological controlling attitudes, irrespectively on how much need-supportive and behaviour controlling they simultaneously are.

One should note, however, that the predictive effects were always stronger, if not only significant, for the maternal data. This particular finding underlines not only the importance of examining the maternal and paternal data separately, but also the need to examine the differential impact of parental and maternal variables in development.

Future studies could examine whether different parenting profiles, resulting from different combinations of the three parental dimensions, predict unique variance on motivational outcomes (e.g., psychosocial identity; Erikson, 1968; Marcia, 1980) and whether this relation is mediated by the experience of basic need-satisfaction and frustration. For instance, it could be examined whether the need-supportive or psychologically controlling behaviours are predominantly triggered by particular emotional states of the parents or by specific features of the child's behaviour. To this point, one could hypothesize that parents tend to be mainly need-supportive when they feel more relaxed or when the child displays appropriate behaviour, and more

psychological controlling when they feel more anxious or when the child is misbehaving (Soenens, 2014, personal communication).

Our research has several limitations. Firstly we conducted a single cross-sectional study based on self-report measures. This methodology prevented us from drawing firm conclusions about the distinctiveness of the three factors insofar as the differences found may also reflect methodological artifacts, such as the positive or negative way as items are worded. To overcome this problem, future research should combine adolescent and parental self-reports, or use more objective criteria, such as the physiological correlates associated to need-satisfaction and to need-frustration. Additionally, more prospective longitudinal studies should be undertaken to more completely address the way in which these effects develop over time.

Secondly, in this study we relied on a relatively homogeneous and well-educated sample of Portuguese high school adolescents. Now, the cultural and sampling specificity may not only exemplify two confounding variables to be controlled for, but they can themselves represent alternative explanations for the results. More cross-cultural validation studies are required to exclude the alternative hypothesis that the salience of the associations between the variables reflects the cultural a cultural bias rather than the real nature and dynamics of the constructs.

The use of a normative sample also restricted the variance of our data. In fact, we verified that the scores of parental psychological control were all below the scale mid-point, which, for many authors, indicate the absence of the construct under analysis (e.g., YSI; Young, Klosko, & Weishaar, 2003). Therefore, we may have not have measured the full experience of psychological control, leaving unchecked the hypothesis that high psychological control scores would have a significant impact on need-frustration. To

overcome this limitation, future research should rely on a combination of normative and clinical samples.

Finally, we based our conclusions on a shortened version of the Parenting Questionnaire Scales, and, as we know the findings obtained with shorter scales are less valid than those obtained with longer scales (Smith, McCarthy, & Anderson, 2000). Therefore it is necessary to cross-validate our findings in independent samples, if we want to generate extended evidence for the psychometric quality and predictive capacity of the 3-factor solution.

This study provided initial validation for the substantive distinction between the need-supportive, psychological control and behaviourally controlling dimensions of parenting, adding new questions on the antecedents, dimensionality and relations between perceived parenting and experienced need-satisfaction and/or frustration in adolescence.

7

Cognitive-motivational Antecedents of Career Decision-making Processes in Portuguese High School Students: A Longitudinal Study

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Abstract

In this study we propose an integrated framework of the antecedents of identity development and well/ill-being for high school students (N = 462) in the transition to higher education/job market. One study was conducted to investigate the effects of basic psychological need-satisfaction/frustration (as proposed within self-determination theory) and career decision-making self-efficacy (posited by social cognitive career theory) on the identity dimensions and experienced well/ill-being. Three longitudinal nested models were tested: a need-satisfaction/self-efficacy main-effects model, an identity main effects model and a reciprocal main-effects model. The reciprocal effects model was favored by the data. Basic need-satisfaction and career decision-making self-efficacy positively predicted proactive exploration and commitment-making, while basic need-frustration predicted both diminished well-being and ill-being. Reciprocally, proactive exploration investments positively predicted whereas ruminative exploration negatively predicted, need-satisfaction and career decision-making self-efficacy. Implications for the design of career interventions are discussed and suggestions for future research proposed.

Keywords*:* basic psychological needs, career decision-making self-efficacy, identity, self-determination theory, social learning career theory

Present Research and Hypotheses

Building on SDT and SCCT research, the primary aim of this study was to test an integrated model of the antecedents of identity development and experiences of well/ill-being for students involved in the transition to higher education/job market. More specifically, it is examined how broad appraisals of psychological needs (need satisfaction; need frustration) and career-specific self-efficacy beliefs (CDSE) predict changes in key dimensions of identity development (exploration in breadth, exploration in depth, ruminative exploration and commitment-making) and psychosocial adjustment (well-being, ill-being) over time. Five hypothesis were formulated for this study.

Hypothesis 1. Symmetrical effects of psychological needs and CDSME. Experiences of need satisfaction and CDMSE at T1 positively predict exploration in breadth, exploration in depth and well-being at T2 (Hypothesis 1a) whereas need frustration at T1 positively predict ruminative exploration and ill-being at T2 (Hypothesis 1b; Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Ryan & Deci, 2000; Lent, Brown & Hackett, 1994).

*Hypothesis 2. Crossover effects of psychological needs and CDSME. F*eelings of basic need satisfaction and CDSE at T1 negatively predict ruminative exploration and ill-being at T2 (Hypothesis 2a) whereas perceptions of need frustration at T1 negatively predict exploration in breadth, exploration in depth, commitment-making and well-being at T2 (Hypothesis 2b). The crossover effects are expected lower-sized than the symmetrical effects (Vansteenkiste & Ryan, 2013).

*Hypothesis 3.Symmetrical effects of identity and well-being. E*xploration in breadth, exploration in depth, commitment-making and well-being at T1 positively predict CDSE and need satisfaction at T2 (Hypothesis 3a) whereas ruminative exploration, and ill-being at T1 positively predict feelings of need-frustration at T2 (Hypothesis 3b).

*Hypothesis 4. Crossover effects of identity and well-being E*xploration in breadth, exploration in depth commitment-making and well-being at T1 negatively predict the inner feelings of need frustration at T2 (Hypothesis 4a), whereas ruminative exploration at T1 negatively predict need satisfaction and CDSME at T2 (Hypothesis 4b).

Hypothesis 5. *Reciprocal effects.* The relations between basic need-satisfaction, CDMSE, identity, and well/ill-being are reciprocal over time (Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Ryan & Deci, 2003).

Method

Participants and Procedure

Data was collected in two waves of measurement. The first wave took place at the beginning of the first term (Time 1: October, 2013). A sample of 755 12th grade students, selected from Portuguese secondary schools (455 girls [60.3%], mean age of 17, 36 years [*SD* = 0, 89]), completed the questionnaires. The second wave of measurement took place nine months later (Time 2: July, 2014) after the exams required to enter higher education were completed and their choice concerning their future career path is made. A subsample of Sample 1, consisting of 462 Portuguese students (278 girls [60.2%] and 184 boys [39.8%], aged between 16 and 22 years, with a mean age of 17.12 years (*SD* = 0.92), completed the questionnaires. The choice for 12th grade students was relevant because in the Portuguese Educational System it is mandatory for students that want to enter university to perform specific exams to access the preferred major. Therefore, we expect strong career-related exploration efforts and commitment-making throughout the 12th grade career transition, with important reflections on the quality of adjustment experienced. Questionnaires were administered during regular class hours, after approval from the ethical committee of Coimbra University and once informed consent was obtained from students or from parents of underage students. Participation was voluntary,

anonymity guaranteed and no credits were granted for participation in the study. In both measurement waves, students took no longer than 30 minutes to complete the questionnaires.

Measures

Need Satisfaction and Need Frustration. We used the Portuguese version of the Balanced Measure of Psychological Needs scale (BMPN; Sheldon & Hilpert, 2012; Portuguese version Cordeiro, Paixão, Lens, Lacante & Sheldon, 2015). Composite scores of basic need-satisfaction and need-frustration were calculated by averaging the scores of the three 3-item subscales measuring autonomy, competence and relatedness satisfaction (e.g., "I am taking on mastering hard challenges") and need-frustration, respectively (e.g. "I do things against my will"). Items are rated in a 5-point Likert scale, ranging from 1 = *no agreement* to 5 = *much agreement*. In the current sample the internal consistency ranged between .80 and .78 for need-satisfaction and need-frustration, respectively for Times 1 and 2. At Time 1, the CFA on the two-factor solution yielded a good fit to the data **(**X^2 (291) = 513.81; p< .001; *CFI* = .94*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .09).

Career Decision-Making Self-Efficacy. We used the 25-item short form of the Career Decision Self-Efficacy Scale (CDSE; Betz, Klein & Taylor, 1996; Portuguese version, Silva, Paixão, & Albuquerque, 2009) to measure an individual´s degree of belief that he/she can successfully perform and complete the tasks required to make career decisions (e.g., "Find information about professional activities that interest you"). The CDSE assesses five career choice competences, that are (1) accurate self-appraisal, (2) gathering occupational information, (3) goal selection, (4) making plans for the future and (5) problem-solving. Items are rated in a 5-point Likert-type format, ranging from 1 = *no confidence at all* to 5 = *complete confidence.* In the current study, CFA on the

unidimensional model showed a good fit to the data (Time 1; **(***X^2* (291) = 50.53; *p*< .001; *CFI* = .98*; RMSEA = .06 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .04).

Identity Development. We translated the 25-item Dimensions of Identity Development Scale (DIDS; Luyckx et al., 2008b)[9], following the recommendations for translating a scale into a different language (Hambleton, 2001). The DIDS dimensions of commitment making ("I have decided on the direction I am going to follow in my life"; Time 1 α =.89; Time 2 α =. 87), exploration in breadth ("I think about different things I might do in the future; Time 1 α = .86; Time 2 α =.88), exploration in depth ("I talk with other people about my plans for the future"; Time 1 α = .62; Time 2 α =.66) and ruminative exploration ("I am doubtful about what I really want to achieve in life"; Time 1 α = .82; Time 2 α =.72) were used in this study. For model parsimony the dimension of identification with commitment was excluded from analyses. Dimensions are rated on a 5-point Likert scale ranging from 1 *completely disagree* to 5 *completely agree*. At Time 1, CFA for the four-factor solution yielded a good fit to the data **(***X^2* (29) = 141.11; *p*< .001; *CFI* = .96*; RMSEA = .07 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .04).

Well-being. The 5-item Satisfaction With Life Scale – SWLS (Diener, Emmons, Larsen, and Griffin, 1985; e.g., "I am satisfied with my life"; Portuguese version, Simões, 1992) was used to assess the hedonic dimension of subjective well-being. The scale α reported was of .87 (Diener, Emmons, Larsen & Griffin., 1985) in the original study, and of .77 In the Portuguese version. Additionally we used the Subjective Vitality Scale (Ryan & Frederick, 1997, α = .84; Portuguese version, Lemos Gonçalves & Coelho, 2011; α = .86) to measure the eudaimonic component of well-being (Ryan & Deci, 2001). The SV is a 5-item measure developed to evaluate how alive and alert people have been feeling during the last month (e.g., "I feel alive and vital"). Both SWLS and SV scales were rated

[9] The Portuguese version of the DIDS is presented in Appendix A, as "Escala de Desenvolvimento da Identidade de Carreira".

in a Likert-type 5-point scale, ranging from 1 (*"Completely untrue/Not at all true"*) to 5 ("*Completely true/Very true*"). In the current study we combined both scales into a composite score of well-being. CFA on the unidimensional model yielded a good fit at Time 1 $\chi 2$ (12) = 95, 27 p < .001; CFI = .98; RMSEA = .04 P [rmsea ≤ 0.05] < 0.001; SRMR = .04). Items loaded above .60 and scales showed good internal consistency (Time 1 α = .86; Time 2 α = .90).

Ill-being. Ill-being was measured by the Portuguese version of the of the 18-item Brief Symptom Inventory (Derogatis, 2001; Portuguese version, Canavarro, 2007). The BSI-18 is a self-report symptom inventory designed to assess the psychological symptoms of anxiety (e.g., "Feeling tense or keyed up"), depression (e.g., "Feeling lonely") and somatization (e.g., "Pains in heart or chest"), and a General Severity Index. The items were rated on a 4-point Likert scale of distress, ranging from 0 (*"Not at all"*) to 4 ("*Extremely*"). The scales showed good internal consistency, ranging between .79 and .85 in the Portuguese version. In the current sample we used General Severity Index (GSI), based on the high correlations observed between the three variables (r = .64 to r = .96; Canavarro, 2007). GSI was modeled as a 2nd order factor indicated by the first-order factors of anxiety, depression and somatization that, in turn, used items as indicators. CFA on the unidimensional model yielded a good fit to the data at Time 1 $\chi 2$ (130) = 526.45 p < .001; CFI = .93; RMSEA = .06 P [rmsea ≤ 0.05] < 0.001; SRMR = .04). Scales evidenced good internal consistency (Time 1 α = .87; Time 2 α = .89) and indicator loadings ranged between .50 and .85 at both time moments (p < .001).

Preliminary Results

Sociodemographic Factors. A multivariate analysis of variance (MANOVA) was performed to determine the impact of the socio-demographic factors on the study variables. Gender as an independent variable and the study variables as dependent

variables. A multivariate effect of gender on the outcomes was found (Wilks´s $\Lambda = .87$), F (17, 444) = 3.97, $p < .001$, $\eta^2 = .13$. Follow-up univariate analysis of variance indicated, in line with previous research that girls (Time 1, $M = 1.90$, $SD = .69$; Time 2, $M = 1.88$, $SD = .68$) scored higher than boys (Time 1, $M = 1.64$, $SD = .55$; Time 2, $M = 1.58$, $SD = .50$) on ill-being. No other significant gender differences (all $ps < .05$) emerged. Based on the gender differences found we statistically controlled gender in the primary analysis.

Correlations. In a subsequent procedure we computed zero-order correlations among the study variables. Table 7.1 presents the within-time associations among the study variables at both waves of measurement. The correlations at Time 1 and 2 were highly similar. As expected, significant positive correlations ($p < .05$) were found between (a) need-satisfaction, CDMSE, exploration in breadth, commitment-making, and well-being, and between (b) need-frustration, ruminative exploration and ill-being. Exploration in depth and commitment-making were not significantly associated with basic needs and CDMSE. Conversely, need-satisfaction, CDMSE, exploration in breadth, commitment-making and well-being were negatively related to need-frustration, ruminative exploration and ill-being whereas need frustration as negatively related to need-satisfaction, CDMSE, exploration in breadth, commitment-making, and well-being.

Table 7.1

Correlations of the Study Variables

Variables	Zero-order correlations								
	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Needs Satisfaction	1	-.43**	.44**	.10	.45**	-.06	.14**	.50**	-.22**
2. Needs Frustration	-.61**	1	-.32**	.09	-.18**	.19**	.00	-.40**	.49**
3. Self-efficacy	.45**	-.27**	1	.09	.45**	-.13**	.31**	.41**	-.26**
4. Exploration in Depth	.11*	.02	.19**	1	.47**	.63**	.26**	.09	.09
5. Exploration in Breadth	.40**	-.16**	.54**	.35**	1	.27**	.37**	.31**	-.08
6. Ruminative Exploration	-.22**	.14**	-.34**	.16**	-.19**	1	-.01	-.11*	.11*
7. Commitment-making	.23**	-.02	.47**	.12*	.36**	-.70**	1	.17**	-.04
8. Well-being	.53**	-.44**	.44**	.12*	.30**	-.17**	.22**	1	-.44**
9. Ill-being	-.28**	.48**	-.15**	-.05	-.01	.04	-.01	-.33**	1

SD = Values at the lower and upper diagonals refer to the correlation matrix at Time 1 and 2, respectively.
* $p = .05$ ** $p < .01$ *** $p < .001$

Attrition. Two hundred and ninety three students (38%) of the initial group did not complete the questionnaires at T2. High attrition rate was justified was explained by the fact that students were randomly absent from classes or from school due to scheduled curricular activities that including sports competitions and apprenticeship activities in work settings. Those students did not differ in gender, age or on any psychological measure assessed at T1 from the remaining group. Missing data analysis showed that individual missing values were randomly observed at both waves of measurement. Mean replacement was used to deal with missing data.

Primary Results

Mean-level Changes. To assess mean-level changes between the constructs, a multivariate repeated-measures of variance (RANOVA) was conducted. Results are summarized in Table 7.2. Findings show that need satisfaction and commitment-making significantly increased from the first to the second waves of measurement whereas need-frustration, exploration in breadth, exploration in depth and ruminative exploration decreased over time.

Table 7.2

Mean-level Changes, Standard Deviations, and F-values of the Study Variables

	Time 1			Time 2				
	M	*SD*	*α*	*M*	*SD*	*α*	F^a	η^2
Needs Satisfaction	4.11	0.69	.81	4.79	0.54	.85	490.01***	.52
Needs Frustration	2.22	0.85	.83	2.00	0.71	.80	53.67***	.10
Exploration in Breadth	3.93	0.86	.70	3.67	0.88	.79	36.75***	.07
Exploration in Depth	3.55	0.89	.62	3.27	0.89	.66	36.13***	.07
Ruminative Exploration	3.35	1.04	.82	3.17	0.93	.77	11.64**	.03
Commitment-making	2.87	1.30	.87	3.09	0.81	.89	11.42**	.02
Well-being	3.46	0.77	.86	3.69	0.68	.90	48.55***	.11
Ill-being	1.80	0.66	.87	1.76	0.63	.89	2.44	.01

F-values represent differences between men scores for time 1 and time 2. ** $p < .01$ *** $p < .001$.

Hierarquical Multiple Regression Analysis. A two-step hierarquical regression analysis was computed to test the hypothesis that CDMSE significantly predicted identity development and adjustment over and above the effect of psychological need satisfaction and need frustration. Regression analysis were performed in separate for each of the six motivational outcomes, with gender entered as a control variable. In step 1 gender, psychological needs satisfaction and need frustration were entered as predictors. In step 2, CDMSE was added to the prediction. Results of hierarquical regression analyses are summarized in Table 7.3. In step 1, the findings show that need satisfaction at T1 had a strong predictive effect on exploration in breadth and well-being ($p < .001$), and less pronounced positive effects on exploration in depth and commitment-making at T2 ($p < .05$). In step 2, CDMSE was added to the regression equation. CDMSE significantly added to the prediction of exploration in breadth and well-being at T2 and, inclusively become the unique significant predictor of commitment-making, exploration in depth and ruminative exploration. However need satisfaction remained the strongest predictor of well-being and the unique predictor of ill-being at T2. In sum, findings show that CDMSE have significant predictive effects on identity and adjustment above and beyond need satisfaction, and it should be used in further analyses.

Table 7.3

Hierarquical Regression Analysis Regressing Identity and Adjustment on Psychological Needs and CDSME

Predictor	Exploration in Breadth		Exploration in Depth		Commitment-making		Ruminative Exploration		Well-being		Ill-being	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Gender	.03	.07	-.03	-.01	-.07	-.05	-.03	-.04	-.04	-.02	-.06	.26***
Need Satisfaction	.41***	.21***	.12*	.04	.11*	.04	-.12*	-.06	.39***	.25***	-.30***	-.27***
CDMSE		.45***		.17**		.33***		-.12*		.30***		-.07
R^2	.17***	.33***	.02***	.04***	.02	.10	.01	.03	.16***	.23***	.13***	.13
R^2 Change		.16		.02**		.08***		.02*		.07***		.00

* $p < 0.05$**; p < 0.01; ***, $p < 0.001$

Longitudinal Cross-lagged Associations. For hypothesis testing we estimated and longitudinal path models with manifest variables in AMOS 20.0, controlling for all within-time associations and stability coefficients (see Luyckx, Vansteenkiste, Goossens & Duriez, 2009 for a similar procedure). Variables were indicated by scale scores calculated on each construct. Goodness-of-fit was judged from multiple fit indices: the Chi square (X^2) statistics, the Standardized Root Mean Square Residual (*RMR*), the Comparative Fit Index (*CFI*) and the Root Mean Squared Error of Approximation (*RMSEA*). The cut-off values of .09 for *SRMR*, .06 for *RMSEA, p [rmsea* ≤ .05*]* and .90, or above, for *CFI* indicated good model fit (Hu & Bentler, 1999). Data screening of the observed variables showed partial non-normality at the multivariate level (multivariate kurtosis). To correct for non-normality solutions were generated with Maximum Likelihood Estimation with 1000 bootstrap samples with replacement based on the original sample. Gender was modeled as a single indicator with error variance fixed to 0.

Hypotheses 1 and 2 were tested in Model 1 (need-satisfaction/CDMSE main-effects model). Model 1 specified paths from basic need-satisfaction, need-frustration and CDMSE (T1) to exploration in breadth, exploration in depth, commitment-making, ruminative exploration, well-being, and ill-being (T2) controlling for self-regressive effects of identity dimensions and adjustment at T1. Estimation of trimmed Model 1 yielded a good fit to the data **(**X^2 (39) = 68.54; p< .001; *CFI* = .988*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .01). Findings show that CDMSE (T1) uniquely predicted commitment-making (β = .19, p < .001) and positively predicted well-being (β = -.16, p < .001), exploration in breadth (β = -.27, p < .001), and, to a less extent, exploration in depth (β = .07, p < .05) at T2. Additionally, need frustration positively predicted ruminative exploration (β = .10, p < .05), and uniquely predicted ill-being (β = .20, p < .001), and low well-being (β = -.13, p < .01) at T2. Finally, need satisfaction positively predicted well-

being (β = -.10, p < .01). Altogether the predictors explained 25% of exploration in breadth, 14% of commitment-making, 15% of ruminative exploration and 5% of exploration in depth at T2. In terms of adjustment, the predictors explained 37% of well-being and 53% of ill-being.

Hypotheses 3 and 4 were tested in Model 2 (Identity main-effects model). Model 2 specified paths from identity (exploration in breadth, exploration in depth, ruminative exploration and commitment-making) and adjustment (well-being and ill-being) at T1to need satisfaction, need frustration and CDSME, (T2), controlling for the self-regressive effects of need satisfaction, need frustration and CDMSE at T1. Estimation of the trimmed Model 2 yielded a good fit to the data **(**X^2 (17) = 35.14; p < .001; *CFI* = .992*; RMSEA* = *.03 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .02). Findings show that exploration in breadth at T1 positively predicted need satisfaction at T2 (β = .20, p < .001), exploration in depth at T1 positively predicted CDMSE at T2 (β = .08, p < .05) and well-being at T1 positively predicted need satisfaction at T2 (β = .18, p < .001). In addition, exploration in breadth at T1 negatively predicted need frustration at T2 (β = -.13, p < .01), ruminative exploration and exploration in depth at T1 negatively predicted CDMSE at T2 (β = -.11, p < .001; β = -.07, p < .01) and well-being at T1 negatively predicted need frustration at T2 (β = -.10, p < .05). Commitment-making and ill-being at T1 were not significant predictors of any of the outcomes at T2. Altogether the predictors explained 55% of CDMSE, 34% of need satisfaction and 46% of need frustration.

Finally, hypothesis 5 was tested in Model 3 (Reciprocal main-effects model). Standardized parameter estimates of Model 3 are summarized in Table 7.4. Model 3 includes the paths specified in Model 1 and Model 2, but also additional paths from Identity dimensions at T1 to adjustment at T2 and paths relating the four identity dimensions assessed at T1 and at T2.

The trimmed Model 3 yielded a good fit to the data across all the fit indices considered X^2 (58) = 86.42; $p < .01$; *CFI* = .996*; RMSEA = .03 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .01. The paths flagged as significant in Models 1 and 2 continued significant in Model 3. In addition it was observed that ruminative exploration at T1 positively predicted exploration in depth and negatively predicted well-being at T2 (see table 7.4). Model 3 improved the variance explained of exploration in depth in 2% (now 7%) and of well-being in 1% (now 38%), while the variance explained for the remaining variables stayed constant. Model 3 did not significantly differ from Model 1 Δx^2 (19, $N = 462$) = .05, $p > .05$ nor from Model 2 (41, $N = 462$) = .004, $p > .05$).

Table 7.4

Estimates of Path Analysis for Model 3

Time 1	Time 2								
	1	2	3	4	5	6	7	8	9
1. Needs Satisfaction	.29***	-.13**	.05	.14***	-.04	.06	.06	-.05	.05
2. Needs Frustration	-.03	.55***	-.06*	-.13***	.17***	-.06	-.02	.07	.04
3. CDMSE	.15**	-.06	.45***	.11**	-.06	.20***	.11*	.01	.22***
4. Well-being	.12*	-.13**	.00	.41***	-.08	.11*	.04	-.03	.04
5. Ill-being	-.09*	.06	-.03	-.08	.61***	.03	.05	-.03	.06
6. Exploration in Breadth	.17***	.08*	.04	.01	.01	.31***	.08	-.03	.04
7. Exploration in Depth	.03	.08*	.07**	-.04	.02	.04	.45***	.01	.06
8. Ruminative Exploration	.00	.03	-.10**	-.10**	.01	.05	.21***	.24***	.06
9. Commitment-making	.03	.04	.04	.10*	.02	.01	-.04	-.12**	.22***

Path estimates correspond to standardized regression coefficients (*βetas*). Values in grey correspond to within-time stability coefficients.
*$p < 0.05$**; p < 0.01; ***. $p < 0.001$

Discussion

In this longitudinal study we tested an integrated model of identity development for Portuguese 12th grade students who are facing the critical career transition to higher education/job market. Based on both SDT and SCCT perspectives, we examined the longitudinal reciprocal effects existing between basic psychological needs, CDMSE, identity development (Luyckx, Vansteenkiste, Goossens & Duriez, 2009) and adjustment (Cordeiro, Paixão, Lens, Lacante & Luyckx, 2015).

The results on the mean-level changes show that, from T1 to T2, students´ reported higher need-satisfaction and CDMSE, stronger commitments to specific career paths and higher experienced well-being. In opposition, from T1 to T2 students reported lower need-frustration and less proactive and ruminative identity exploration efforts. Ill-being did not significantly change over time. Collectively, the findings show that, in general, the students' career transition developed in a positive and adaptive way over time.

In subsequent analyses we examined the directionality of effects linking our study variables. Hierarquical regression analyses showed that CDMSE measured at T1 had an incremental explanatory value on identity and adjustment at T2, over and above the effects of need satisfaction. In addition, CDMSE heavily reduced the magnitude of the effects of need frustration on the identity dimensions and well-being at T2, suggesting possible mediation effects. Based on these findings one could hypothesize that psychological need satisfaction energize identity development and experiences of well-being during important career transitions to the extent as feelings of need satisfaction raise career-related feelings of self-efficacy for career commitment-making. The exam of this longitudinal mediation hypothesis would be of extended value to clarify the processes linking global and vocational identity development. Nevertheless need satisfaction remain a robust predictor of both high well-being and low Ill-being in the regression equation, suggesting that

CDMSE is fundamentally linked to the cognitive and behavioral aspects of identity development, whereas need satisfaction is a more powerful determinant of adjustment over time. In the second part of our study we provided a comprehensive exam of the relations between need satisfaction, need frustration, CDMSE, identity dimensions and adjustment. Overall, the findings provided support for the five hypothesis outlined.

Results on the *need-satisfaction/CDMSE main-effects model* reiterate the notion that inner feelings of need satisfaction primarily predict positive adjustment trajectories, CDMSE most significantly predict positive identity development pathways and need frustration predicts negative outcomes in both identity development and maladjustment (support for H1a). In line with previous research (Germeijis & Verschueren, 2007; Lent, Paixão, & Silva, & Leitão, 2010), these findings underscore the importance of including psychological needs and CDMSE as key predictors of integrated versus derailed processes of identity development and adjustment during important career transitions (e.g., Lent, 2004; Ezeofor & Lent, 2014). In Model 1 it was also observed that need frustration undermined well-being over time whereas need satisfaction CDMSE did not significantly impact on ill-being. These findings provide partial support for H1b, while they suggest that need satisfaction and need frustration have independent effects on adjustment (e.g., Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013).

The results obtained for the *identity main-effects model* support the hypothesis 3a,b. Findings show that high proactive exploration investments and experienced well-being increase feelings of need satisfaction and CDMSE over time, and protect against feelings of need frustration, whereas ruminative exploration undermine the perceptions of self-efficacy to make strong identity commitments. Overall, the findings stress the importance of assessing the quality of identity-related investments and adjustment prior to career

transitions as means to make more accurate predictions about how confidence in career decision-making and perceptions of need satisfaction will evolve across time.

Finally, the results obtained in Model 3 (*Reciprocal-effects model*) show the over-time persistence of significant paths imported from Models 1 and 2. In addition, it was observed that decreased intentionality and decidedness in the exploration of career alternatives, predicts in-depth reflections about the career options to follow, undermines the confidence in career commitment-making and well-being, but does not necessarily predict higher ill-being across time. Altogether, the findings suggest that identity development and adjustment are part of a transactional system mutually reinforcing one another during critical career transitions (Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Ryan & Deci, 2003). However, Model 3 did not fit the data significantly better than Models 1 and 2. Therefore support for hypothesis 5 is still prospective.

The implications of the findings are noteworthy. Overall, they point out the need to develop identity interventions oriented to satisfy the adolescents´ experiences of basic need satisfaction and to develop feelings of self-efficacy to make career commitments. We suggest that need-supportive interventions should designed parents, teachers and counsellors should be instructed in behaviors that (a) convey empathy (or acknowledge) for the adolescents´ perspectives in identity-related issues, (b) encourage self-expression and autonomous exploration of vocational information, d) communicate informational (i.e., competence-relevant) feedback, expressing confidence in the adolescents´ identity-related skills, and e) that convey warm, affective and responsive interactions with children. In parallel, educators should be trained to identify and refrain from using controlling techniques, including (a) set highly demanding, rigid standards (or goals) for identity-related efforts, b) instill shame, guilt and anxiety for non-compliance with standards/expectations, b) convey rejection, criticism and love withdrawal until other-

related career expectations are met, c) invalidate the adolescents´ perspective in career-related discussions, and d) communicate failure-inducing feedback on career-related investments. By reducing the inner conflict between complying with external requests and pursuing personally endorsed goals, such interventions should be able to reduce ruminative exploration and ill-being across key career transitions.

Limitations and Future Research

Our study presents several limitations. First, we relied uniquely on adolescent´s self-reported measures, what may artificially inflate the relations between the constructs due to shared method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Future research should examine the convergence of adolescent and parent's reports to enhance the validity of the conclusions. Second, the generalizability of the findings may be biased by the specificities of the community-based sample targeted. Findings should be replicated with at-risk or clinically referred adolescents. Third, despite the broad support for the hypothesis under study, alternative explanations might be formulated to interpret the findings. For instance, the modest variance explained for commitment-making and ruminative exploration, apply for the inclusion of other antecedent variables in the model, namely those related to family contexts (e.g., Whiston & Keller, 2004). A final limitation is related to having used general measures of identity development (DIDS; Luyckx, 2009) together with more specific measures of vocational identity (CDMSE; Betz, Klein & Taylor, 1996), when other more specific measures of vocational identity are available (Vocational Identity Status Assessment; VISA; Porfeli, Lee, Vondracek, & Weigold, 2011). However, in Portugal clearly the career transitions that students face from the 9th to the 12th grade are founded on global identity issues (Ludovina, Paixão & Silva, 2007), thereby it would be very restrictive to use a specific vocational identity measure that is not related to the global identity functioning and construction in late adolescence. From a

conceptual perspective, SDT (Deci & Ryan, 2000) tested the relations between psychological needs and global identity functioning, while for SCCT the impact of sociocognitive variables should not be only viewed related to the career identity but to global identity in which this transition moment is inscribed.

Conclusion

In this study we used a longitudinal study design to validate a comprehensive model of cognitive-motivational processes implied in identity development and adjustment during the critical career transition to higher education/job market. Hypothesis were derived from SDT, SCCT and identity theorizing and tested in three nested path models. Overall, the findings suggest that the dynamics of identity development and adjustment determine and are determined by cognitive-motivational processes related to basic need satisfaction and CDMSE, thereby suggesting they reciprocal nature.

8

Parenting Styles, Adolescent Identity Development and Adjustment: The Mediation of Psychological Needs

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Abstract

Drawing from Self-Determination Theory, this study examined the mediational role of psychological need satisfaction and frustration of the effect of parenting styles on adolescents´ identity development and adjustment. Portuguese high school students (N = 462) were sampled. Findings support the substantive distinctiveness between parental support and thwarting and between psychological need satisfaction and frustration. Path modelling suggests both a "growth-oriented path" from need-supporting parenting to proactive exploration, decision-making and well-being, via need-satisfaction, and a "vulnerability" pathway from need-thwarting parenting to diminished well-being and ill-being through need-frustration. No crossover mediation was found, suggesting distinct mediational pathways. Accordingly, the authors suggest the development of integrated educational programs that identify the protective and risk factors associated to the (un) adaptive trajectories of identity development and adjustment.

Keywords: Parental styles, psychological needs, identity development, well/ill-being

Present Study and Hypotheses

It is still relatively understudied (a) the possible distinct effects of basic need satisfaction and frustration on identity development (e.g., Costa, Ntoumanis & Bartholomew, 2015; Haerens et al., 2015), and (b) how parenting and basic psychological needs relate to predict identity development and well/ill-being experiences. These issues lead us to the purpose of the present study. The central aim of this study was to test an integrated SDT-based model of identity development and adjustment (Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Vansteenkiste & Ryan, 2013) in high school students that are going through the transition to higher education or to the job market. Based on SDT (Vansteenkiste & Ryan, 2013) we expect parental support to positively predict high exploration in breadth, exploration in depth, commitment-making and well-being through the adolescents´ subjective experiences of basic need satisfaction (Hypothesis 1a), whereas parental thwart is expected to have a primarily effect on ruminative exploration and ill-being through the subjective experience of basic need-frustration (Hypothesis 1b). Yet, cross-paths (albeit less strong) are also expected. Extending the SDT framework we expect parental support to play a buffering role against the emergence of ruminative exploration and ill-being through the experiences of basic need-satisfaction (Hypothesis 2a), because these kind of experiences give adolescents the necessary confidence to cope with complex choices and to be satisfied with career decision-making investments. On the contrary, parental thwart is expected to undermine the identity-related efforts and well-being because the experiences of basic need-frustration to which it relates lead individuals to develop fewer resources and a lack of confidence in their capability to deal with the career challenges that lie ahead (Hypothesis 2b).

Method

Participants and Procedure

Convenience sampling was used. Participants were 462 12th grade students of Portuguese secondary schools. The sample comprises 278 girls (60.2%) and 184 boys (39.8%) aged between 16 and 19 years, with a mean age of 17.12 years (*SD* = 0.92). As recommended by the ethical committee of the ministry of education, prior to scale administration we obtained active informed consent from the adolescents and passive informed consent from parents of underage students (< 18 years old). Three weeks before the scale administration parents were sent a letter about the nature and purpose of the study, and, in case they did not allow their child to participate in the study, they should fill the form provided and mail it to the school´s principal. When participation was allowed, parents should fill the informed consent form and hand it to the class director. The questionnaires were administered within the classroom during day-time classes by the primary researcher. Participation was voluntary, anonymity guaranteed and no credits were granted for participation. Students completed the questionnaires in about 20 minutes. Most students completed the questionnaires without missing responses. Missing data (N = 6; 1%) was dealt by mean replacement.

Measures

Perceived Parenting. We used the 18-item Parental Need-Support and Thwarting Scale (PNSTS; Cordeiro, Paixão, Lens, & Lacante, under review). The PNSTS measures how parents are perceived as having provided support (3 9-item scales; e.g., "Tried to understand my point of view") and thwart (3 9-item scales; e.g., "Pressured me to be the best at everything I do") of the adolescents´ needs of autonomy, competence, and relatedness. Items are rated in a 5-point Likert-type scale, ranging from 1 = *no agreement* to 5 = *total agreement*. In the original version, the factorial validity of the bi-dimensional

structure of factors was supported in terms of composite reliability (CR = .86 for parental need-support and .88 for parental need-thwarting), convergent and discriminant validity, and CFA multigroup analysis supported the cross-gender metric invariance of the model. Adequate Composite Reliability was found for parental support (CR= .84) and for parental thwart (CR = .86). A CFA on the two-factor model yielded a good fit to the data **(**X^2 (118) = 216.08; p< .001; *CFI* = .98*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .04).

Psychological Needs. We used the 18-item Portuguese version of the BMPN (Cordeiro, Paixão, Lens, Lacante & Luyckx, 2015). The BMPN measures, in distinct item sets, the components of satisfaction (3 scales: e.g., relatedness: "I feel a sense of contact with people who care for me, and whom I care for") and frustration (3 scales: e.g., autonomy: "I do things against my will") of autonomy, competence and relatedness needs (Deci & Ryan, 2000). Items are rated in a 5-point Likert scale, ranging from 1 = *no agreement* to 5 = *total agreement. Adequate* internal consistency was reported (α = .85 for need satisfaction and α = .77 for need frustration). In line with previous research (e.g., Haerens, Aelterman, Vansteenkiste, Soenens, & Petegem, 2015) in the current study we measured the three needs in a bi-dimensional higher order model of need-satisfaction and need-frustration. Good reliability was obtained for need satisfaction (α = .80) and need frustration (α = .78). The CFA on the two-factor solution yielded a good fit to the data **(**X^2 (291) = 513.81; p< .001; *CFI* = .94*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .09).

Identity Development. We used the 25-item Portuguese version of the Dimensions of Identity Development Scale (DIDS; Cordeiro, Paixão, Lens, Lacante, & Luyckx, 2015) to assess the exploration and commitment-making dimensions of identity formation. We used four of the five scales to measure the identity dimensions of (a) commitment making ("I have decided on the direction I am going to follow in my life"; α =.83), (b) exploration in breadth ("I think about different things I might do in the future; α = .75), (c) exploration

in depth ("I talk with other people about my plans for the future"; α = .62), (d) ruminative exploration ("I am doubtful about what I really want to achieve in life"; α = .82). Identification with commitment was not measured as a separate dimension because previous research found very high correlations between commitment-making and identification with commitment-making, especially in US research (.86; Ritchie et al., 2013). Dimensions are rated on a 5-point Likert scale ranging from 1 *completely disagree* to 5 *completely agree*. CFA on the four-factor solution yielded a good fit to the data **(***X^2* (29) = 141.11; *p*< .001; *CFI* = .96*; RMSEA = .07 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .04).

Well-being. We used the 5-item Portuguese version of the Subjective Vitality Scale (SV; Ryan and Frederick, 1997; Lemos, Gonçalves & Coelho, 2011). The SV evaluates how alive and alert people have been feeling during the last six months (e.g., "I feel alive and vital"). In addition we used the 6-item Portuguese version of the Satisfaction With Life Scale - SWLS (Diener, Emmons, Larsen, and Griffin, 1985; Simões, 1992, *α* = .77) to measure the students´ satisfaction with life (e.g., "I am satisfied with my life"). Both scales were rated in a Likert-type 5-point scale, ranging from 1 (*"Completely untrue/Not at all true"*) to 5 ("*Completely true/Very true*"). We combined both scales into a single score as a measure of well-being (*α* = .84). This option was guided for model parsimony, but also because combining both scales provides a more fully account of the eudaimonic (Ryan & Deci, 2001), and hedonic (Diener, 2000) dimensions of well-being. The unidimensional model showed a good fit to the data χ2 (60) = 170, 02 p < .001; CFI = .96; RMSEA = .06 P [rmsea ≤ 0.05] < 0.001; SRMR = .06).

Ill-being. We employed the Portuguese version of the18-item Brief Symptom Inventory (BSI; Derogatis, 2001; Canavarro, 2007) to assess the presence of psychological symptomatology associated to the experience of ill-being. The BSI measures, for the past six months, the students´ symptoms of anxiety (e.g., "Feeling tense or keyed up"),

depression (e.g., "Feeling lonely") and somatization (e.g., "Pains in heart or chest"). A general symptom index is also calculated for the total scale, here interpreted as an indicator of ill-being (α = .87). Items are rated on a 4-point Likert scale of distress, ranging from 0 (*"Not at all"*) to 4 ("*Extremely*"). The internal consistency reported for the 3 scales ranged between .62 and .80. The unidimensional model showed a good fit to the data χ^2 (60) = 170, 02 $p < .001$; *CFI* = .96*; GFI = .95; RMSEA = .06 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .06).

Statistics

For hypothesis testing we performed Path Analysis with manifest variables using AMOS 20.0 (Amos Development Corporation, Florida, US) with Maximum Likelihood Estimation. Goodness-of-fit of every path model was judged from multiple fit indices (Hu & Bentler, 1999): the Chi square (X^2) statistics, the Standardized Root Mean Square Residual (*RMR*), the Comparative Fit Index (*CFI*) and the Root Mean Squared Error of Approximation (*RMSEA*). The cut-off values defined for model fit are of .09 for *SRMR*, .06 for *RMSEA, p [rmsea* ≤ .05*]* and .90, or above, for *CFI* (Hu & Bentler, 1999).

Preliminary Results

Background Variables. Prior to testing the hypotheses we examined the distribution of the variables in our dataset. We found partial nonnormality of the data at the multivariate level (multivariate kurtosis). Therefore, to correct the non-normality of the distribution we used in all further analyses 1,000 bootstrap samples with replacement based on the original sample (Preacher & Hayes, 2004). In subsequent analyses we determined whether the background variables of gender and age significantly impacted the adolescents´ mean scores on the dependent measures. In fact, past research has already showed that girls reported higher maternal need-support (Miklikowska, Duriez & Soenens, 2011), exploration in depth, ruminative exploration (Luyckx et al., 2008b) and depressive

symptomatology than boys (Luyckx, et al., 2010), whereas boys reported higher maternal psychological control (Ahmad & Soenens, 2010), need satisfaction (Haerens et al., 2015), and need frustration than girls (Boone, Vansteenkiste, Soenens, Kaap-Deeder & Verstuyf, 2014). Based on these findings, we conducted successive multivariate analyses of variance (ANOVA) with gender and age as between-subjects variables and the study variables as dependent variables. We found a significant multivariate effect of age and gender on the outcomes (Wilk's $\Lambda = .931$, F [1, 463] = 11.47, $p < .01$, multivariate $\eta^2 = .07$). Follow-up univariate analyses indicated girls ($M = 1.90$, $SD = .69$) scoring higher than boys ($M = 1.64$, $SD = .55$) on ill-being, but gender did not have a significant moderator effect of ill-being. Age was unrelated to the outcomes. Based on these findings the influence of gender on the outcomes was statistically controlled by drawing paths from gender to ill-being in the structural model.

Descriptive Statistics and Correlational Analysis. Table 8.1 summarizes the descriptive statistics and correlations among the study variables. The exam of the mean scores show that at the beginning of the 12th grade, students are still active in the proactive exploration of the career options, and, in general, haven´t fully committed to a career path. These identity investments are associated to high levels of perceived parental support, feelings of need satisfaction and well-being, accompanied with low levels of perceived parental thwart, need frustration and correlates of ill-being. As expected, parental support is positively related to need satisfaction, proactive exploration (in breadth; in depth), commitment-making and well-being, and it is negatively related to parental thwart, need frustration, ruminative exploration and ill-being. In addition, parental thwart is associated with need frustration and ill-being, and negatively related to need satisfaction, exploration in breadth and well-being. Furthermore, need satisfaction was positively related to exploration in breadth and commitment-making and negatively related to need frustration,

ruminative exploration and ill-being, whereas need frustration displayed the opposite pattern of associations.

Table 8.1

Correlations of the Study Variables

Variables	Zero-order correlations											
	M	SD	1	2	3	4	5	6	7	8	9	10
1. Parental Support	5.01	.67	1									
2. Parental Thwart	2.42	.94	-.59**	1								
3. Needs Satisfaction	4.11	.69	.42**	-.33**	1							
4. Needs Frustration	2.22	.85	-.38**	.42**	-.61**	1						
5. Exploration in Depth	3.93	.86	.10	-.01	.11*	.02	1					
6. Exploration in Breadth	3.55	.89	.31**	-.13**	.40**	-.16**	.35**	1				
7. Ruminative Exploration	3.35	1.04	-.07	.05	-.22**	.14**	.16**	-.19**	1			
8. Commitment-making	2.87	1.30	.12*	.02	.23**	-.02	.12*	.36**	-.70**	1		
9. Well-being	3.46	0.77	.44**	-.27**	.53**	-.44**	.12*	.30**	-.17**	.22**	1	
10. Ill-being	1.80	0.66	-.19**	.26**	-.28**	.48**	-.05	-.01	.04	-.01	-.33**	1

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

Primary Analysis

Model Testing. Table 8.2 summarizes the fit indices for the structural models tested. Four structural models were tested, following the analytic method recommended by Holmbeck (1997). In a first *direct effects model* we specified parental support and parental thwart as direct predictors of well-being, commitment-making, exploration in depth, exploration in breadth, ruminative exploration and ill-being. Model 1 showed a very good fit to the data χ^2 (5) = 6.97; *CFI* = .99; *RMSEA* = .03: *RMR* = .02. As predicted, the standardized coefficients show the primary predictive relations between (a) parental support and exploration in breadth (β = .31, $p < .001$), exploration in depth (β = .30, $p < .001$), well-being (β = .44, $p < .001$), commitment-making (β = .11, $p < .001$), and (b) between parental thwart and ill-being (β = .25, $p < .001$). The two predictors were uncorrelated to ruminative exploration ($p > .05$). In addition, we found the crossover associations of parental thwart with well-being (β = -.15, $p < .001$), and with exploration in breadth (β = -.11, $p < .001$), but, as expected, they were lower-sized than the primary

relations abovementioned. Altogether the predictors explained 19% of the variance of well-being, 1% of commitment-making, 1% of exploration in depth, 9% of exploration in breadth and, 8% of ill-being.

Table 8.2

Goodness-of-fit Indexes for the Hypothesized Models

Model	χ2	df	χ2 /df	N	CFI	RMSEA	SRMR
Path Analysis							
Model 1	6.97	5	1.40	462	.99	.03	.02
Model 2	61.96	16	3.87	462	.97	.08	.03
Model 3	25.58	13	1.97	462	.99	.05	.02
Model 4	149.96	14	10.71	462	.89	.15	.05

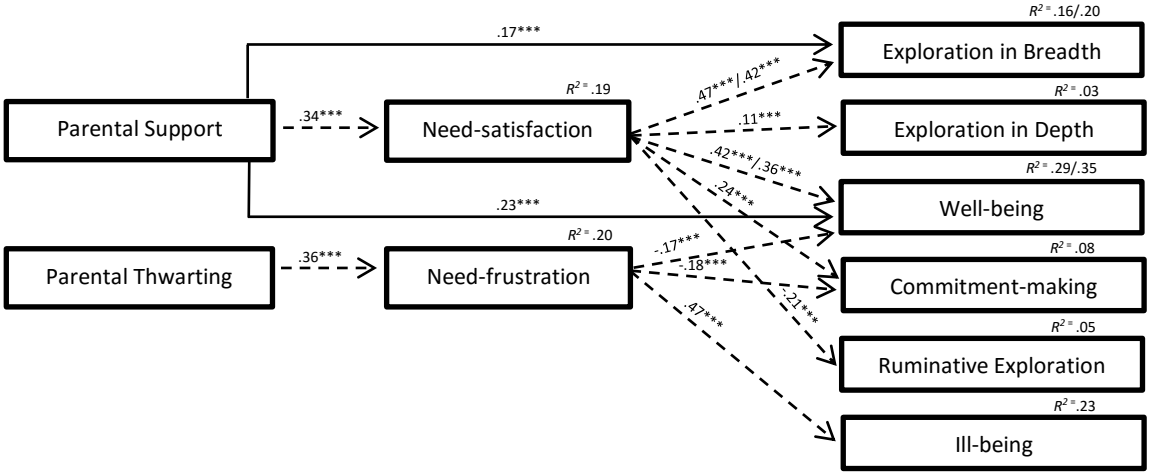
Note$_1$*: X2* = qui-square*; CFI* = comparative fit index*; RMSEA* = root mean-square error of approximation*; SRMR* = Standardized Root Mean Square Residual.

Subsequently, we tested a second, *full-mediation model* (Model 2) in which we constrained the direct effects to 0 and assumed that parental support and parental thwart predicted the outcomes only indirectly, through the mediation of needs satisfaction and of needs frustration, respectively. Figure 8.1 presents the standardized estimates for the full-mediation and partial mediation models, the latter below described. The indirect paths are represented by dashed lines in Figure 2, and the standardized regression values correspond to the first of the two values represented on the top of each path. Model 2 yielded a good fit to the data χ^2 (16) = 61.96; *CFI* = .97; *RMSEA* = .08: *RMR* = .03. The findings show that parental support positively predicts need satisfaction (β = .34, $p < .001$) which, in turn, positively relates to exploration in breadth (β = .47, $p < .001$), exploration in depth (β = 11, $p < .001$), well-being (β = .42, $p < .001$) and commitment-making (β = .24, $p < .001$) and negatively relates to ruminative exploration (β = -.21, $p < .001$). In addition, parental thwart relates to need frustration (β = .36, $p < .001$) that, in turn, was positively related to ill-being (β = .47, $p < .001$) and negatively related to well-being (β = -.17, $p < .001$) and commitment-making (β = -.18, $p < .001$). In a subsequent procedure we computed the bias-

corrected bootstrap confidence intervals in AMOS 20.0, to assess the significance of the indirect effects. The findings support the significance ($p < .01$) of the (b) indirect effect of parental support on exploration in breadth, exploration in depth, well-being, commitment-making and ruminative exploration through basic needs satisfaction, and of the indirect effect of (b) parental thwart on ill-being through basic needs frustration. In Model 2 the variables explain 16% of exploration in breadth, 3% of exploration in depth, 29% of well-being, 8% of commitment-making, 5% of ruminative exploration, and 23% of ill-being.

Figure 8.1

Graphic Portrayal of Hypothesized Model 2 and Model 3



Note. Dashed lines refer to Model 2; Dashed lines plus solid lines refer to Model 3. Standardized coefficients reported are significant at ***$p < .001$. The first coefficient shown for exploration in breadth and well-being was obtained in Model 2, the second was calculated for Model 3. For exploration in breadth and well-being the first value presented on the upper right corner of the outcome variables corresponds to the values of explained variance obtained for Model 2 and the second corresponds to the value of explained variance in Model 3.

In final analyses we tested a *partial mediation model* (Model 3; see Figure 8.1), in all similar with Model 2, except that the direct effects previously constrained to 0 were now unconstrained. Model 3 χ^2 (13) = 25.58; *CFI* = .99; *RMSEA* = .05: *RMR* = .02 yielded a significantly higher fit to the data than Model 2, $\Delta\chi^2(3) = 36.4$, $p < .05$. Findings show that after controlling for needs satisfaction, the positive effect of parental support on exploration in depth, commitment-making, and ruminative exploration became non-

significant (p >.05), and the association to exploration in breadth (β = .17; p < .001), and well-being (β = .23; p < .001) was reduced to half size (p < .01). In addition, when needs frustration was controlled for, the magnitude of the associations between parental thwart, and exploration in breadth, commitment-making and ill-being became nonsignificant (p >.05). Overall the mediation of needs satisfaction and needs frustration was demonstrated. Adding the direct paths to the model increased the explained variance of exploration in breadth to 20% and well-being to 35%.

Yet, the cross-sectional nature of the data makes it difficult to assert the directionality of the effects. To overcome this limitation we specified an alternative model (Model 4) in which we tested the alternative hypotheses that (a) adolescents scoring high on proactive exploration, decision-making and well-being perceive their parents as highly supportive, because they feel their basic needs as being more satisfied, whereas (b) the students who score high on ruminative exploration and ill-being perceive their parents as highly thwarting because they feel their basic needs more frustrated. Model 4 yielded a poor fit to the data χ^2 (16) = 149.96; *CFI* = .89; *RMSEA* = .15: *RMR* = .05, thus providing some support for the causal ordering proposed in Model 3.

Discussion

In this study we attempted to converge recent theorizing on self-determination theory and identity development, to validate an integrated model of the antecedent and mediating processes involved in identity development and adjustment. Overall the findings support Model 3 as the preferred to interpret the structural relations between the variables, since it provides a significant better fit to the data, but also accounts for higher explained variance in exploration in breadth and well-being. Taken together, the standardized regression coefficients support the hypotheses under study. The data shows that need satisfaction fully mediates the positive effects of parental support on exploration in depth

and commitment-making, and partially mediates the associations with exploration in breadth and well-being. Put differently, the adolescents´ perception of their parents as need-supportive relates to their experiencing high energy to invest in proactive identity exploration efforts and commitment-making, as well as feeling greater well-being during critical career transitions (Deci & Ryan, 1985; Farkas & Grolnick, 2010; Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Ryan, 1993). This effect is, in part, explained by the fact that need supportive parents induce experiences of basic need satisfaction in their children (Soenens & Vansteenkiste, 2010) which in turn, provide adolescents with resources, motivation and confidence in proactive exploration and commitment-making (see Smits et al., 2008; Soenens et al., 2011). In a different way, the perception of parents as need-depriving, or more importantly, as need-thwarting of the basic needs relates to the ruminative exploration of career-related pathways and to the experience of both diminished well-being and to the presence of ill-being during critical career transitions. Nevertheless, not in line with the initial expectation, parental thwart was related to ruminative exploration only to the extent as it is associated to the experience of low need satisfaction (e.g., Luyckx, Vansteenkiste, Goossens & Duriez, 2009). This suggests that when parents deprive children from the basic ingredients necessary to thrive and grow, these developmental experiences make the children progressively feel less self-determined, competent and supported in significant relations, which in turn, prone them to endlessly ruminate, hesitate and fear to explore identity options (Trapnell & Campbell, 1999 ;Vansteenkiste & Ryan, 2013). Notably, parents who systematically impose their goals and standards to their children, provide negative feedback for achievement, and convey rejection across development, make it less likely that adolescents proactively explore career options and make strong identity commitments. More importantly, need-thwarting behaviors contribute to the adolescents´ experiences of diminished well-being and feelings of ill-

being during career-definition transitions, because they closely associate to an higher subjective experience of basic need frustration (Deci & Ryan, 1985).

In sum, parental behaviors influence identity development and adjustment in positive or negative ways depending on whether they provide experiences of basic need satisfaction and need frustration, respectively.The combination of need-supportive parenting and the adolescents´ experiences of basic need satisfaction are suggested as protective factors for positive identity development and well-being during identity-defining moments, whereas the lack of need satisfaction and, notably, the experience of need frustration are identified as risk factors for the development of less integrated identity processes at severe emotional costs.

Limitations and Suggestions for Future Research

There are several limitations in this research which are noteworthy. Firstly, we relied exclusively on self-report instruments. Despite the adequacy of this procedure to examine internal states and perceived contexts, the use of self-report measures restricts the validity of the study due to shared methodological variance in all the assessed constructs, and limits the generalizability of the findings (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Secondly, we based our conclusions in single informants, as we were interested to understand how the perceived contextual and self-representational processes relate to predict identity-related processes and adjustment. However, multiple informants should be used whenever possible to control for possible self-fulfilling bias in the adolescents 'perception of the supportive or thwarting aspects of parenting. Thirdly, the current study targeted only the students who are making the transition to high school or to the job market. Future research should examine the validity of the structural relations posited in earlier life periods, particularly by the end of the 9th grade (average age 15 years), when Portuguese students are asked to choose a major in high school. Finally, due to its cross-sectional

nature, our study does not allow to draw firm conclusions about the antecedent-consequent links modelled for the variables. Hence, despite the alternative model tested which provided additional evidence for the directionality of the effects hypothesized, the model must be considered preliminary.

Conclusion

The present research supports the validity of an integrated model of the perceived contextual-motivational antecedents of identity development, and particularly of well (ill)-being in the transition to high school or to the job market. The findings suggest that the supportive and thwarting dimensions of parenting have a differential impact on identity development and well (ill)-being, because they associate to distinct experiences of (low) need satisfaction and frustration. These findings have important implications for the development of more robust and systemic intervention programs that accurately target the contextual and motivational protective and risk factors associated to the (un) adaptive trajectories of identity in late adolescence.

9

Mind the Gap! How Self and Motivation Interact to Predict Adjustment and Commitment-making During Critical Career Transitions

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Abstract

In this article we present an original integrative model of the cognitive-motivational antecedents of psychosocial adjustment and regulation of career decision-making for adolescents facing the career transition to higher education or to the job market. We converge, as never before, self-determination theory and schema model. It is examined how psychological need satisfaction and frustration relate to schematic functioning to predict the quality of the motivation for career commitment-making and experiences of well/ill-being across time. We offer a longitudinal research design with Portuguese 12th grade students. The findings suggest that the effects from psychological needs and schematic functioning on the outcomes go in two distinct pathways: A "bright" (Deci & Ryan, 2000) transition pathway of autonomous career decision-making and well-being, determined by experiences of psychological need satisfaction, and a distinct "dark" (Deci & Ryan, 2000) transition pathway of controlled career decision-making and experienced ill-being mediated by schematic functioning. Findings suggest the relevance of elaborating cognitive-motivational explanations for the factors involved in career transitions and the need to design differentiated career counseling interventions.

Study Objectives and Hypotheses

Both ST and SDT establish the functional antecedence of basic needs over cognition, and assume in theory the possible mediational role of psychological need frustration and schemas on maladjustment and ill-being. Extending previous research on Schema Model and Self-Determination Theory, we examine how psychological needs and schematic functioning relate to predict differential trajectories of career commitment-making and ill-being in high school students facing the post-secondary transition to work/higher education. We do this in a longitudinal study design involving Portuguese 12th grade students. We targeted this particular school year because in the Portuguese Education System, 12th grade students are expected to make a final career decision concerning their further training, and perform the compulsory exams to enter university. Therefore, this constitutes, for most students, a period of great uncertainty and ambiguity in self and career definition. Three central hypotheses guide this research.

Hypothesis 1. Need satisfaction at T1 predicts increased well-being, and autonomous commitment-making, as well as diminished ill-being at T2, controlling for need frustration and auto-regressive effects of well/ill-being at T1.

Hypothesis 2. Need frustration at T1 increases ill-being and controlled decision-making, and lowers well-being at T2, over and above need-satisfaction and auto-regressive effects of well/ill-being at T1 (hypothesis 2).

Hypothesis 3. Schematic functioning at T2 mediates the effect of need frustration at T1 on heightened ill-being and controlled commitment making at T2, over and above need satisfaction, and auto-regressive effects of well/ill-being at T1 (Hypothesis 3a).

Method

Participants and Procedure

Students were administered the questionnaires in two distinct time moments (T1: October, 2013, T2: July, 2014). In the first wave of measurement we used a sample of 755 12th grade Portuguese students (455 girls [60.3%], mean age of 17, 36 years [SD = 0, 89]). In the second wave of measurement a subsample of sample 1 was targeted, consisting of 462 Portuguese students (278 girls [60.2%] and 184 boys [39.8%], with a mean age of 17.12 years (SD= 0.92). We targeted 12th grade students as, in Portugal, this is the transition year from high school to job market or to higher education. Following approval from the ethical committee of the University of Coimbra, and once informed consent was obtained from students or from parents of underage students, the questionnaires were administered to them within the classroom, during regular class hours. Participation was voluntary and anonymity guaranteed. No credits were granted for participation. Students took about 30 minutes to complete the questionnaires.

Measures

Dysfunctional Schematic Functioning. We used the revised Portuguese version of the Young Schema Questionnaire (YSQ-S3; Young & Kolsko, 1994; Rijo, 2009). The YSQ-S3 is a self-report questionnaire organized to measure the extent to which individuals endorse early maladaptive schemas (5 items per factor) as influencing their information processing. The scale is rated in a 6-point Likert-type scale ranging from 1 = *completely untrue of me* to 6 = *describes me perfectly.* Questions range from general life experiences "Most of the time, I haven't had someone to nurture me, share him/herself with me, or care deeply about everything that happens to me," to current actions related to particular situations, "Often I allow myself to carry through on impulses and express emotions that get me into trouble or hurt other people" (Young, 2003). The short 90-item version we used

in this study (YSQ – S3) demonstrated good internal consistency of the items (e.g., range between α= .71 and α=.95, Lachenal-Chevallet, Mauchand, Cottraux, Bouvard, & Martin, 2006). Rijo, 2009). For model parsimony we used a combined score of schematic processing (α = .90) obtained from averaged scores on 13 unconditional schemas (65 items)[10]. We chose unconditional schemas we expected that they would relate more deeply to impaired adjustment and commitment-making than conditional schemas. Combined scores were also considered appropriate, because in previous analyses we verified that in school-based samples some EPMs did not significantly relate to the study variables, making it more difficult to establish the unique associations to commitment-making and adjustment. The unidimensional model of schematic functioning showed a good fit to the data χ^2 (163) = 147, 50 $p < .001$; *CFI* = .98*; GFI = .97; RMSEA = .05 P* [*rmsea* ≤ 0.05] < 0.001; *SRMR* = .07).

Psychological Need Satisfaction and Frustration. We used the Portuguese version of the Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012; Cordeiro, Paixão, Lens, Lacante & Sheldon, 2015). The BMPN measures the satisfaction (3 scales: e.g., "I feel a sense of contact with people who care for me, and whom I care for") and frustration (3 scales: e.g., "I do things against my will") of the autonomy, competence and relatedness needs. Items are rated in a 5-point Likert scale, ranging from 1 = *no agreement* to 5 = *much agreement*. CFA on the two-factor solution yielded a good fit to the data **(***X*^{2} (291) = 513.81; $p < .001$; *CFI* = .94*; RMSEA = .04 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .09) and cross-gender invariance of the two-factor model (χ^2 (299) = 399.73 < .001) was demonstrated. Adequate internal consistency was reported for need-satisfaction, α = .85 and for need-frustration, α = .77, along with adequate convergent

[10] The 13 unconditional schemas are: Abandonment/instability; Mistrust-Abuse; Emotional Deprivation; Defectiveness; Social Isolation; Dependence/Incompetence; Vulnerability to Harm and Illness; Enmeshment/Undeveloped Self; Failure; Negativity/Pessimism; Punitiveness; Entitlement/Grandiosity and Insufficient Self-control/Self-Discipline (Young, Klosko & Weishaar, 2003).

(*AVEi* ≥ 0.5) and discriminant validity estimates (MSV<AVE; ASV < AVE; Fornell & Larcker, 1981). At T1, the CFA bi-dimensional model yielded a good fit to the data (χ2 (291) = 513.81; p b .001; CFI = .94; RMSEA = .04 p [rmsea ≤ 0.05] b 0.001; SRMR= .09). The internal consistency of the six factors ranged between .80 and .78.

Motives for Career Commitment. We used 12 selected items (Soenens, Berzonsky, Dunkel, Papini, & Vansteenkiste, 2011) from the Self-Regulation Questionnaire (SRQ; Ryan & Connell, 1989) and back-translated them into Portuguese language to assess the students´ motives underlying their career commitments. The SRQ has been validated as a measure of autonomous *versus* controlled motivation (Ryan & Connell, 1989). Instructions read "Think of the decision that you made of going to higher education or enter the job market. I made this career decision because…" Students were then asked to rate the 12 items presenting four motives for their commitment (1) integration "these commitments fit well with who I am", (2) identification "they are personally meaningful to me", (3) introjected "I would feel guilty if I did not make these commitments", and (4) external "other people expect me to pursue these commitments". Items were rated on a 5-point Likert scale, ranging from 1 (*"Strongly disagree"*) to 5 ("*Strongly agree*"). Items were back-translated for the Portuguese language (Hambleton, 2001)[11] and pilot-tested in a sample of Portuguese high school students (N = 19; gender: 13 girls; 6 boys; age range 16-22 years old). In the current study the CFA on a two-factor higher-order measurement model of autonomous (dimensions of identification and integration) *versus* controlled motives (dimensions of external regulation, introjection) yielded a good fit to the data *X2* (291) = 50.53; *p*< .001; *CFI* = .98*; RMSEA = .06 P* [*rmsea* ≤ 0.05] < 0.001; *RMR* = .04. All indicator loadings were above .55. The internal consistency of the scales ranged between .83 and .86 for autonomous and controlled motivation, respectively.

[11] The Portuguese version of the SRS selected item is presented in Appendix A as "Questionário de Auto-regulação da Decisão Vocacional".

Well-being. The 5-item Satisfaction With Life Scale – SWLS developed by Diener, Emmons, Larsen, and Griffin (1985; e.g., "I am satisfied with my life"; Portuguese version, Simões, 1992) was used to assess the hedonic (Diener, 2000) dimension of subjective well-being. The scale α reported was of .87 in the original stud (Diener, Emmons, Larsen & Griffin, 1985)y, and of .77 In the Portuguese version (Simões, 1992). Additionally, we used the Subjective Vitality Scale (Ryan & Frederick, 1997, α = .84; Portuguese version, Lemos, Gonçalves & Coelho, 2011; α = .86) to measure the eudaimonic component of well-being (Ryan & Deci, 2001). The SV is a 5-item measure developed to evaluate how alive and alert people have been feeling during the last month (e.g., "I feel alive and vital"). Both SWLS and SV scales were rated in a Likert-type 5-point scale, ranging from 1 (*"Completely untrue/Not at all true"*) to 5 ("*Completely true/Very true*"). In the current sample, we used a unidimensional model of well-being, once we argue in favor of the complementarity of the eudamonic (subjective vitality; Ryan & Frederick, 1997) and hedonic perspectives on well-being (satisfaction with life; Diener, 2000). The unidimensional model fitted well the data $\chi 2$ (130) = 526.45 $p < .001$, CFI = .93; RMSEA = .06; SRMR = .04). Items measuring well-being showed good internal consistency (α = .86), all loading above .60.

Ill-being. We used the Portuguese version of the18-item Brief Symptom Inventory (BSI; Derogatis, 2001; Portuguese version, Canavarro, 2007). The BSI assesses the psychological symptoms of anxiety (e.g., "Feeling tense or keyed up"), depression (e.g., "Feeling lonely") and somatization (e.g., "Pains in heart or chest"). Items are rated on a 4-point Likert scale of distress, ranging from 0 (*"Not at all"*) to 4 ("*Extremely*"). In the Portuguese validation studies, the internal consistency of the 3 scales ranged between .62 and .80. In the current study we used the General Severity Index (GSI) as an indicator for ill-being. This choice was based on the high correlations found between the three scales in

previous research (r = .64 to r = .96; Canavarro, 2007). We modeled GSI as a 2nd order factor indicated by the first-order factors of anxiety, depression and somatization. For the three scales items were used as indicators. At T1, the CFA results showed good fit to the data $\chi 2$ (130) = 526.45 p b .001; CFI = .93; RMSEA = .06 p [rmsea ≤ 0.05] b 0.001; SRMR = .04). Good internal consistency was verified for the GSI items (α = .87)

Results

Preliminary Results

Descriptive Statistics. Prior to testing the hypotheses we examined the distribution of the variables in our dataset. We found partial nonnormality of the data at the multivariate level (multivariate kurtosis). To correct the non-normality we used in all further analyses 2000 bootstrap samples with replacement based on the original sample (Preacher & Hayes, 2004).

Socio-demographic Factors. We inspected the impact of the socio-demographic factors on the study variables via a multivariate analysis of variance (MANOVA). These analyses follow from previous research showing that girls score higher than boys on depressive symptomatology (e.g., Luyckx, Schwartz, Soenens, Vansteenkiste & Soenens, 2010), whereas boys report higher need satisfaction (Haerens et al., 2015) and need frustration than girls (Boone, Vansteenkiste, Soenens, Kaap-Deeder & Verstuyf, 2014). To inspect gender differences we performed successive multivariate analyses of variance (ANOVA) with gender and age as between-subjects variables and the study variables as dependent variables. We found the multivariate effect of gender and age on the outcomes (Wilks´s Λ = .89), F (17, 444) = 3.1, p < .001, η^2 = .11). Follow-up univariate analyses show that girls (T1: M = 1.91, SD = .71; T2: M = 1.89, SD = .69) scored higher than boys (T1: M = 1.89, SD = .69; T2: M = 1.58, SD = .51) on ill-being F (1, 382) = 23.63 p < .001. Yet gender did not have a significant moderator effect on ill-being. No other significant

gender differences emerged (all $p > .05$). Hence, in all subsequent SEM analyses, gender was controlled for by drawing paths from gender to ill-being in the structural model.

Correlational Analysis. Zero-order correlations between the study variables are shown in Table 9.1. We computed zero-order correlations to examine whether the study variables related in the expected directions. As predicted by SDT (Vansteenkiste & Ryan, 2013), bivariate correlations at both T1 and T2 show that need satisfaction is positively associated to well-being and autonomous regulation of career commitment, and negatively associated to ill-being and controlled regulation of career commitment. In turn, need frustration is positively related to ill-being and controlled regulation of career commitment and negatively associated to well-being. Further, at both T1 and T2 self-schemas positively relate to need frustration, ill-being, and controlled regulation of career commitment, and, to a lesser extent, negatively relate to need satisfaction and autonomous regulation of decision.

Table 9.1

Correlations of the Study Variables

Variables	1	2	3	4	5	6	7	8
1. Gender	1	.02	-.10	-.04	-.03	.20**	-.07	.08
2. Needs Satisfaction	.01	1	.44**	-.30**	.50**	-.21**	.37**	-.11*
3. Needs Frustration	-.01	-.62**	1	.52**	-.41**	.50**	-.17**	.25**
4. Schematic Processing	-.04	-.48**	.63**	1	-.31**	.48**	-.12	.30**
5. Well-being	-.02	.54**	-. 45**	-.46**	1	.44**	.22**	-.11*
6. Ill-being	.24**	-.28**	.47**	.50**	-.34**	1	.05	.17**
7. Autonomous Regulation	.08	.30**	-.14*	-.12	.28**	.06	1	-.15**
8. Controlled Regulation	-.02	-.20**	.26**	.26**	-.09	.16**	-.13*	1

Values in the lower diagonal represent correlations at T1; Values in the upper diagonal represent correlations at T2
* $p < .05$, ** $p < .01$.

Attrition. We observed a high attrition rate (38%) from T1 to T2. Missing students at T2 were randomly absent from classes or from school, either because they were involved in scheduled curricular activities (e.g., apprenticeship experiences in work settings) or in extra-curricular activities, (e.g., sports competitions). Students at T2 do not differ in

gender, age or on any psychological dimension assessed at T1. Further, missing data analysis showed that individual missing values were randomly observed at both T1 and T2. Mean replacement was used to deal with missing data.

Primary Results

Mean-level Changes. We performed a comparative analysis of the variables mean scores at T1 and T2, and examined how the mean scores for each variable evolved over time. Results on the multivariate repeated-measures of variance (RANOVA) are summarized in Table 9.2. At T1students reported significantly higher levels of need satisfaction than need frustration, higher well-being rather than ill-being and higher autonomous (rather than controlled) regulation of career commitment. Findings are as expected for a community-based sample data. Need satisfaction, well-being and autonomous commitment-making significantly increased over time, whereas need frustration and controlled commitment-making significantly decreased across time. Schematic processing and ill-being did not significantly change over time, a fact that suggests their enduring nature. Overall findings show that the career transition to university/job market was experienced in ways consistent with trajectories of growth, positive adjustment and self-integrated functioning.

Table 9.2

Mean-level Changes. Standard Deviations and F-Values of the Study Variables

	Time 1			Time 2				
	M	*SD*	*α*	*M*	*SD*	*α*	*F*	η^2
Needs Satisfaction	4.14	.52	.81	4.87	.54	.85	490.01***	.52
Needs Frustration	2.11	.85	.83	1.93	.71	.80	53.67***	.10
Schematic Processing	1.75	.66	.90	1.73	.64	.90	3.42	.02
Well-being	3.46	.77	.86	3.69	.68	.90	48.55***	.11
Ill-being	1.80	.70	.87	1.76	.63	.89	2.44	.01
Autonomous Regulation	3.48	.61	.87	4.05	.73	.88	859.23***	.76
Controlled Regulation	2.33	.73	.80	1.36	.55	.82	321.41***	.47

F-values represent differences between men scores for Time 1 and Time 2. ** $p < .01$ *** $p < .001$.

Hierarquical Regression. In subsequent analyses we performed a two-step multiple hierarquical regression analysis to examine whether T1schematic processing added to need satisfaction and need frustration to predict T2 well-being, ill-being, autonomous and controlled career commitments. Results are summarized in Table 9.3. In step 1 gender, need satisfaction and need frustration were entered as predictors. In step 2, schematic processing was added to the prediction. Findings in Step 1 show that, after controlling for need frustration, need satisfaction is ensured as the primary predictor of well-being and autonomous career commitment-making but does not significantly relate to ill-being and controlled regulation of career commitment. In addition, after controlling for need satisfaction, need frustration becomes the unique predictor of ill-being and controlled regulation of career commitment, and, to a less extent, remains as a negative predictor of well-being and autonomous regulation of career commitment. In step 2 schematic functioning lowered the regression weight of need frustration on ill-being, well-being and controlled regulation of career commitment, being the most powerful predictor of ill-being and the second most relevant predictor of controlled career commitment. However, unlike need frustration, schematic functioning was uncorrelated to well-being and autonomous career commitment. Model 2, with schematic functioning, added 10% of extra variance explained for ill-being and 3% for controlled regulation of career commitments. Taken together the findings suggest that schematic functioning not only adds to the prediction of ill-being and controlled regulation of career commitment, but also possibly mediates the effects of need frustration on these outcomes. Thus we decided to keep schematic functioning in the longitudinal SEM analysis.

Table 9.3

Hierarquical Regression Analysis Regressing Well/Ill-being on Psychological Needs, Schematic Processing and Regulation of Commitments.

Predictor	Well-being		Ill-being		Autonomous Regulation		Controlled Regulation	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Gender	-.04	-.02	.21***	.21***	.07	.07	-.02	-.01
Needs Satisfaction	.27***	.26***	.02	-.02	.39***	.39***	-.01	.02
Needs Frustration	-.20***	-.15***	.44***	.28***	.15*	.17*	.29***	.19***
Schematic Functioning		-.09		.31***		.03		.18***
R^2	.18***	.19***	.22***	.32***	.11***	.11***	.09***	.11**
R^2 Change		.01		.10***	.09	.00		.03**

Note1 Step 1: Need satisfaction and need frustration were entered in the regression equation; Step 2: Schematic functioning is added to the regression equation. In both steps, well-being, ill-being, autonomous and controlled regulation of career commitments are entered as dependent variables. *p <0.05; **p <0.01; ***. p <0.001

Measurement Model. In subsequent analysis we examined whether the manifest variables related to each other in the expected manner. In so doing we specified a measurement model with 7 latent constructs (T1 need satisfaction, need frustration and schematic processing, and T2 autonomous and controlled regulation of career commitment, well-being and ill-being) and 18 indicators: For need satisfaction and need frustration the scale scores on autonomy, competence and relatedness needs were used as indicators. Schematic processing was indicated by three 5-item parcels, each created by randomly assigning the 56 items assessing the 13 unconditional schemas into each parcel (Bagozzi & Heatherton, 1994; Coffman & MacCallum, 2005). Well-being was indicated by the scale scores of satisfaction with life and subjective vitality, and ill-being by the BSI scores of anxiety, depression and somatization. Finally, autonomous regulation was indicated by the scale scores of integration and identification, whereas controlled regulation was indicated by the scale scores on external and introjected regulation. Gender was modeled as a single indicator with error variance fixed to 0. Model fit was assessed in AMOS 20, via confirmatory factor analysis (CFA; Byrne, 2010) with Maximum Likelihood Estimation. Goodness-of-fit was judged from multiple fit indices: the Chi square (X^2) statistics, the

Standardized Root Mean Square Residual (*RMR*), the Comparative Fit Index (*CFI*) and the Root Mean Squared Error of Approximation (*RMSEA*). The cut-off values of .09 for *SRMR*, .06 for *RMSEA, p [rmsea* ≤ .05*]* and .90, or above, for *CFI* indicated good model fit (Hu & Bentler, 1999). The measurement model yielded a good fit to the data $\chi 2$ (95) = 235.36 p < .001; CFI = .94; RMSEA = .06 P [rmsea ≤ 0.05] < 0.001; SRMR = .03). All the model-estimated loadings were significant (p < .01) and in the expected directions, ranging from .51 to .95 (mean =.74). Standardized estimates show positive associations between need satisfaction at T1, and well-being and autonomous regulation of career commitment at T2 (β = .63, β = .47, p < .001, respectively). Positive associations were also verified (a) between schematic functioning at T1 and need frustration, ill-being and controlled regulation at T2 (β = .70, β = .75, β = .40, p < .001, respectively), and also (b) between T1 need frustration, and T2 ill-being and controlled regulation (β = .54, β = .32, p < .001, respectively). Negative associations were also observed between (a) need satisfaction at T1, controlled regulation and ill-being at T2 (β = -.24, β = -.36, p < .001, respectively), (b) schematic functioning at T1, autonomous regulation and well-being at T2 (β = -.18, β = -.45, p = < .001, respectively) and (c) need frustration at T1, well-being and autonomous regulation at T2 (β = -.15, β = -.42, p < .001, respectively).

Structural Model Without Controlling for Within-time Stability of the Constructs. Finally, we estimated SEM with latent variables to test mediation over time. To test for possible mediation effects we specified three structural models according to the guidelines recommended by Holmbeck (1997). In a first *direct effects* model we specified paths from need satisfaction and need frustration at T1 to well-being, ill-being, autonomous and controlled regulation at T2. In a second *full mediation model* we specified that the paths from T1 need satisfaction and frustration to T2 well-being, ill-being, autonomous and controlled regulation via schematic functioning. In a final *partial mediation* model we

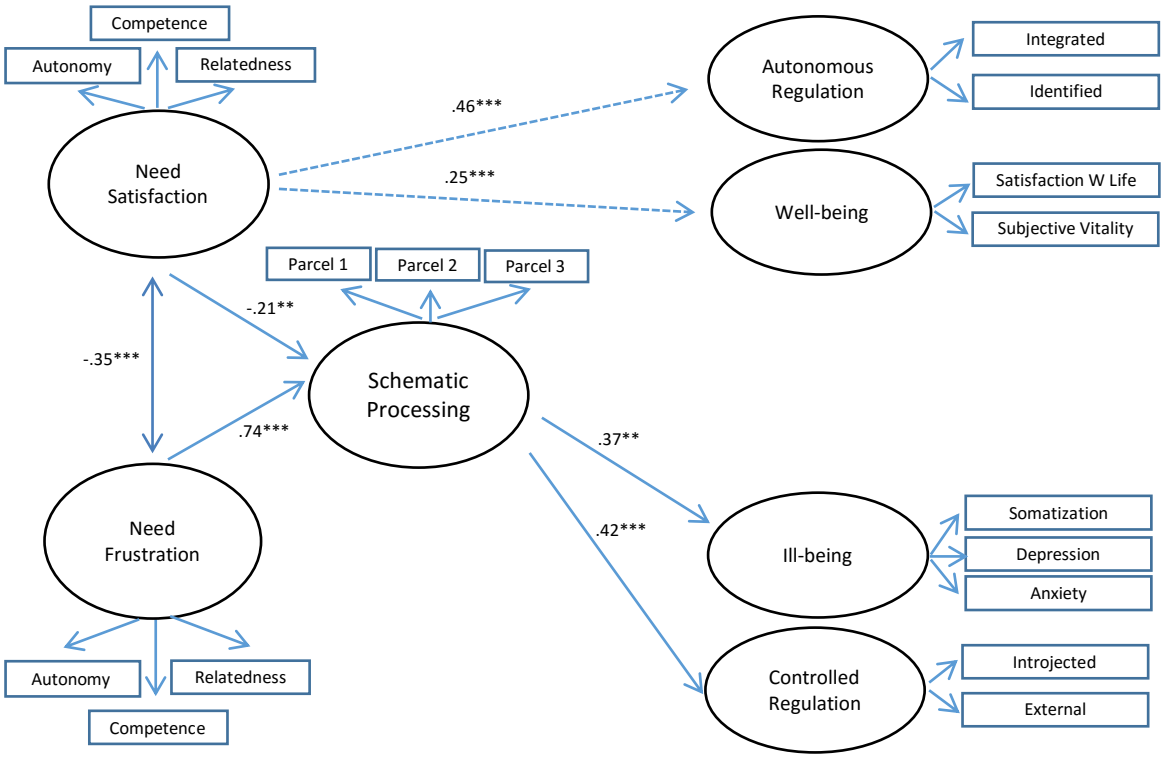
specified both direct and indirect paths. Findings show that the partial mediation model χ^2 (122) = 276.97, *CFI* = .94, *RMSEA* = .06, *SRMR* = .03 yielded a significant better fit than the full-mediation model, where direct effects were absent $\Delta \chi 2$ (1, *N* = 462) = 118.55, p < .001. All the model-estimated loadings were significant (p < .01) and in the expected directions, ranging from .57 to .99 (mean = .68). Findings show that need satisfaction at T1 negatively predicted T1 levels of schematic functioning (β = -.21), increased well-being and autonomous regulation of career commitment-making at T2 (β = .51, β = .46 *p* < .001, respectively) above and beyond need frustration. Further, in support of mediation, need frustration increased the levels of schematic processing (β = .74, *p* < .001) which in turn, increased ill-being, lowered well-being and regulated decision change for controlled reasons at T2 (β = .68, β = -.30 β = .42 *p* < .001). Subsequent bias-corrected bootstrapping analysis indicated that the mediated effect of need frustration on the outcomes was significant (*p* < .01). The trimmed partial mediation model explained the total variance of 47% for well-being, 47 % for ill-being, 23% for autonomous regulation and 18% for controlled regulation of career commitment at T2.

Longitudinal Model Controlling for Within-time Stability of the Constructs. Next we estimated the best-fitting partial-mediation SEM model with autoregressive effects (paths predicting T2 well/ill-being from its prior level) to test the robustness of the effects found. The motives for career commitment-making were not included in the model given that from T1 to T2 students changed their decision, and the regulations associated in important ways. Standardized estimates are summarized in Figure 9.1. Following Cole & Maxwell (2003) recommendations we first tested the factorial invariance of the model. The relations between the latent and the manifest variables remained constant over time $\Delta \chi 2$ (6, *N* = 462) = 11.93, *p* > .05. Significant autoregressive effects were found for well-being and ill-being (.59 and .76, respectively). Because the model contains 9 latent variables and

is estimated from a relatively modest sample size at T2 (N = 462) we separated the outcome measures into two longitudinal models. The first model specifies, in three latent variables, the direct effects of need satisfaction (T1) on well-being indicators (T2), controlling for self-regressive effects. The second model specifies the mediation of schematic processing (T1) on the effect of need frustration (T1) on indicators of well-being and ill-being (T2), also controlling for within-time effects. Both models yielded a good fit to the data: χ^2 (10) = 27.99; *CFI* = .98; *RMSEA* = .07: *RMR* = .02 for well-being and χ^2 (36) = 105.76; *CFI* = .97; *RMSEA* = .07: *RMR* = .02 for ill-being. T1 Need satisfaction increased well-being over time above and beyond autoregressive effects (β = .25, p < .001). After controlling for within-time effects, schematic processing mediated the positive effect of need frustration on higher ill-being (β = .37, p < .001). The Modification Indices did not suggest the need to add any bidirectional paths into the model, from outcomes at T1 to need satisfaction, need frustration and schematic processing at T2, neither of schematic processing to need frustration at T2. For this reason we did not test for concurrent models with different causal ordering.

Figure 9.1

Model Overview. Trimmed Partial Mediation Model with Autoregressive Effects



Graphical representation of SEM partial mediation model with latent variables controlling for autoregressive effects of well-being and ill-being. All coefficients shown are standardized coefficients. For ease of presentation autoregressive effects and gender effects are not displayed. ***. p <0.001

Discussion and Conclusion

The purpose of this study was to test an integrated model of the cognitive-motivational determinants of adjustment and regulation of career commitment-making in 12th grade students facing the critical school-to-work/higher education career transition. We attempted to bring together a self-determination perspective with schema theory, to clarify how innate psychological needs link to socially root schematic functioning to predict individual differences in adjustment and career commitment-making. Findings provide support for our hypotheses.

Consistent with H1 we found that students´ increases in over-time well-being and autonomous regulation of career commitment-making/change are determined by inner feelings of need satisfaction associated to low levels of schematic functioning. In addition, in support of H2, we found that after controlling for auto-regressive effects, need frustration

predicted high ill-being and career commitment made for controlled reasons via schematic functioning. This finding is in line with the SDT premise that need frustration primarily elicits malfunctioning (Vansteenkiste & Ryan, 2013), mainly because individuals develop self-invalidating and rigid schematic structures that prevent them to appraise the self and others in positive and flexible ways. When entered in the structural model schematic functioning reduced to non-significance the buffering effect of need satisfaction on ill-being, what suggests that, when combined, need frustration and schematic functioning predict high ill-being and controlled career commitment-making independently of need satisfaction. These are key findings on our study.

In fact, they suggest that universal experiences of need satisfaction predict well-being and autonomous career commitment-making, whereas need frustration predicts ill-being and controlled career commitment-making in distinct pathways. The effects of need satisfaction are direct, whereas the effects of need frustration go via schematic functioning. Despite somehow speculative, this argument underlines the idea that domain-specific schematic structures bridge the relationship between universal *judgements* of need frustration to explain individual differences in students' adjustment and regulation of commitment-making during career transitions (Ford & Smith, 2007; Rafaeli, Bernstein & Young, 2011).

The findings have important implications for career counseling in educational contexts. They underscore the need to differentiate interventions for cognitive-emotional "on track" and "off track" students in transition. For cognitive-emotional "on track" students who already feel their needs satisfied and experience high levels of well-being, career counseling interventions should be oriented to support continuous need satisfaction, autonomous career commitment-making and maintain flexible and positive self-other cognitions. Support for autonomy should include opportunities to (a) freely explore and

discuss information about career options, (b) set future, fully endorsed, freely chosen, and personally valued goals, (c) exercise autonomous decision-making and reinforce the importance of making future choices aligned with intrinsic interests, values and goals. Competence can be supported by boosting the confidence in the attainability of a future career goals.

This can be achieved by (a) providing positive expectations for goal attainment, as function of the level of effort, commitment and persistence, (b) providing positive informational feedback about current goal attainment, ensue that career goals are realistic and aligned with current skills, and give students greater responsibility for self-regulation in career goal pursuits (Urdan & Schoenfelder, 2006). Finally, support for relatedness should include displays of high levels of empathy, involvement and guidance in the construction of the students' view on their future, within warm, responsive and accepting interactions. Career interventions should open discussion moments between the students and significant others, preferentially involving the family, as privileged spaces to communicate trust, care and acceptance of their plans, and to give constructive feedback about their future choices.

However, according to our findings, these interventions alone seem quite inappropriate to redirect students from cognitive-emotional “off track” trajectories of ill-being and controlled decision-making. These students would benefit from differentiated interventions that are capable of identifying the controlled motives for career commitment-making, clarify their cognitive-motivational determinants and dynamics and manage the cognitive-interpersonal processes to which they are associated and that maintain dysfunctional cycles of maladjustment over time (Young & Kolsko, 1994; Young, Klosko & Weishaar, 2003). Further ahead career counselling interventions should help building more positive and flexible cognitions about transitions that realign the self with trajectories

of career growth, intrinsic motivations and volitionally endorsed interests and commitments. In a final point we suggest that training programs should be developed to help parents identify and refrain from the use of need-thwarting attitudes (e.g., Ryan & Deci, 2003) that elicit need frustration and schematic functioning across development (Ryan & Deci, 2000; Young, Klosko & Weishaar, 2003).

Limitations and Future Studies

Our study comprises several limitations. Firstly, we used combined scores of psychological needs, as presented in SDT (Deci & Ryan, 2000), and of schematic functioning and did not relate each of the three needs with each of the 13 unconditional EMSs proposed in Schema Theory (Young, Klosko & Weishaar, 2003). We did this because we were not interested in examining how each need contributes to the development of specific EMSs, but to establish psychological needs and cognitive structures as important antecedents of (mal) adjustment and career decision-making, and clarify the dynamics through which universal motivations translate into individual differences on these outcomes. Yet we recognize the importance of future research to highlight the specific links between the satisfaction and frustration components of each need and each of the EMSs, as a mean to inform more specific interventions in the school context. Secondly, the model proposed supported mediation for a community-based sample of Portuguese 12th school students, where scores of need frustration, schematic processing and psychological symptomatology are relatively low. Future studies should test model invariance in at-risk, and/or clinical referred samples, and also in earlier developmental periods, not only to assure higher variability in the scores, but also to allow for the generalization of findings to younger age and different developmental phases. Thirdly, data collection relied uniquely on adolescents´ self-reports, a methodology that may artificially inflate the relations between the constructs due to shared method variance (Podsakoff,

MacKenzie, Lee, & Podsakoff, 2003). Nonetheless, the focus was not to affirm the veracity of adolescent´s self-reports of experiences of need satisfaction and frustration, but on how these motivational processes relate to cognitive structures to predict adjustment. However, to enhance the validity of the conclusions, future research should examine the convergence of adolescent and parent/teacher self-reports. This is a research avenue that future studies should examine.

Conclusion

We supported an integrative model of cognitive-motivational antecedents of psychosocial adjustment and regulation of career decision-making for adolescents facing the transition to post-secondary career. We also provided a comprehensive view on the dynamics through which universal processes relate to cognitive structures to predict individual differences in these outcomes. Overall, findings successfully conciliate, as never before, clinical and motivational paradigms, opening a new research avenue to examine the complementary of relativistic and universalistic perspectives on motivation and cognition in the prediction of psychosocial development. Such an approach has also important implications for the design of more differentiated counseling interventions in educational contexts. We recognize that our findings are preliminary, but we hope that this research inspires more comprehensive studies in the future.

10

Career Identity Development and Adjustment

Transition to Higher Education/Job Market. Moving Forward

Present Chapter

The final chapter of this dissertation is focused on the implications of our findings. Through this dissertation various practical guides were provided. Now we intend to give them a spinal cord, i.e., internal consistency, merging them into a coherent set of guidelines that hopefully contribute to enrich career counselling programmes and interventions.

Career interventions must bring closer the primary socialization micro-systems if they intend to maintain effective and enduring effects in the promotion of "bright" trajectories of career exploration and commitment-making. These strategies are promotional, in nature. They are most suited for parents who are predominantly need supportive and who display low levels of need thwarting. On the other hand, these programs seem to benefit the most adolescents that have higher levels of need satisfaction and career decision-making self-efficacy, and low levels of need frustration. Thus, parent-focused interventions should be designed to support the subjective experiences of psychological need satisfaction and CDMSE during career transitions, whenever students proactively explore career information and essay commitment-making for autonomous reasons, intrinsic interests and goals and values that are authentic, or harmoniously integrated within their self (Deci & Ryan, 2000). Parents should also empathize to and support commitments that are perceived as instrumental to accomplish personal and occupational meaningful goals (*identified regulation*). These behaviours are supposed to result in increased career-related feelings of need satisfaction, boost the confidence in decision-making and facilitate the adoption of career decisions more integrated with the self. When parents behave in such a way, the adolescents feel more active and alive during these career transition periods, and feel more satisfied with their lives. However, when, at the same time, parents actively thwart the adolescents´ psychological need satisfaction, students feel less vitality and satisfaction with their life.

Career interventions with parents should be promotional in nature. They should capitalize what parents already do well, as examples of "good practices" in career support, and help create opportunities for parents to learn how to optimize their supportive skills. We suggest that parents should be an essential component of career counselling interventions in school contexts. Parents could be part of career sessions in many different ways. They could mentor apprenticeship activities in their workplace, creating opportunities for adolescents to experience that career during holidays, or after school periods. Parents could also discuss their own experience concerning career exploration, decision-making, and describe their job profile in order to reinforce instrumental bridges between these competences and the demands of the occupational world. Parents could also be part of initiatives along with their peers, such as meetings or forums, where they will be able to discuss and share experiences about need supportive practices. Finally, parents could be involved in training sessions devised to facilitate the acquisition of career supportive behaviours and their importance to determine positive and effective trajectories of career decision-making. Here they will acknowledge how career support is responsible for boosting feelings of psychological need satisfaction, confidence in career decision-making, stimulate proactive exploration efforts, and promote the experience of well-being during the transition to higher education/job market.

Across these interventions, the tone must be put on the types of career-related attitudes and behaviours that effectively support the adolescents´ need satisfaction process. We suggest that career-related autonomy is supported when parents provide their children with opportunities to explore and commit to career pathways, reinforce career pathways volitionally explored and autonomously chosen, stimulate self-expression for career interests and options, allow incursions into the occupational world, provide an adequate rationale for career options that should not be pursued, and refrain from using manipulative

and invasive techniques in order to make the adolescent comply with their own career standards or preferences (Deci & Ryan, 1985, 2000). Additionally, parents support the adolescents´ feelings of competence during career transitions whenever they provide structure **(**Barber, 1996; Barber, Olson, & Shaggle, 1994; Grolnick & Ryan, 1989) for career-related behaviour. This is accomplished when parents express confidence in the adolescents´ competence and skills to accomplish their career-related goals and choices, discuss previous success in previous vocational goal attainment, ensue that career goals are realistic and are aligned with current skills, convey clear expectations about the conditions and rules that regulate autonomous career pursuits, provide positive informative feedback about progress in career decision-making and allow for self-regulation in career goal pursuits (e.g., Urdan & Schoenfelder, 2006). Finally, parents support need for relatedness, when they become involved in, accepting of, and responsive to the adolescents´ career-related investments (Baumeister & Leary, 1995; Ryan, 1995; Deci & Ryan, 2000; Soenens, Vansteenkiste, Duriez & Goossens, 2006). Relatedness-supportive parents attune and empathize with the adolescent´s perspectives and feelings related to exploration and commitment-making activities, are involved in the construction of their career projects, are available to provide help and guidance when asked, convey trust, care and acceptance of their children career projects and are attentive and responsive to emotional symptoms (e.g., anxiety, depressive feelings) that may arise during this challenging period of career transition. Parents should also learn that the support provided in satisfying the adolescents' psychological needs is important to build their confidence in career decision-making, which, in turn boosts career commitment-making, autonomous career exploration and well-being during critical career transitions (Betz, 2001; Ezeofor & Lent, 2014; Guay, 2005; Lent, 2004; Germeijs & Verschueren, 2007).

We infer from SDT (Deci & Ryan, 2000) that both psychological need satisfaction and career decision-making self-efficacy represent critical cognitive-motivational determinants of "on track" trajectories of autonomous career identity development and adjustment, aligned with trajectories of personal growth and integrated functioning. Need-supportive environments are able to provide the necessary "vitamins" for their children thriving. Therefore, career counselling interventions should be organized to create experiences of need satisfaction and career decision-making self-efficacy beliefs, once they energize proactive exploration and commitment-making efforts that lead to an autonomous career decision and to the experience of well-being over time. In turn, success on these outcomes will create further experiences of psychological need satisfaction and are expected to increment confidence in career decision-making skills. However, the latter hypothesis remains untested.

One should note that traditional career counselling interventions taking place in the Portuguese 9th and 11th grades are focused on the exploration of career interests and skills and provide information about education and career opportunities. Now, having observed that students high in need satisfaction and career decision-making self-efficacy explore careers in a proactive fashion, commit more to a career path, and do it for autonomous reasons, one can easily conclude that standard career counselling interventions are suited for cognitive-motivational "on track" trajectories of identity development. But do these interventions equally benefit students with cognitive-emotional problems that feel their psychological needs frustrated and display high levels of schematic processing? According to our findings, these interventions seem to be quite ineffective. Indeed, adolescents with this "off track" cognitive-motivational profile report, either retrospectively and for the transition period they are currently going through, that they hardly engage in proactive career exploration, endlessly ruminate about their career options, make career

commitments essentially for controlled reasons and display high levels of anxiety, depression and somatization. This means that standard career interventions primarily conceived as contributing to growth through need satisfaction and career decision-making self-efficacy increase, do not necessarily play a buffering role against the emergence, or maintenance of maladaptive "or dark" trajectories of career identity development and adjustment. At this point one could ask "why"? Answering this question is difficult, and somehow speculative. Yet, we will present two arguments that seem to us quite relevant.

A first argument is focused on the cognitive-motivational *dynamics* of career identity development and adjustment. Our findings point for the fact that bright and dark trajectories of identity development and adjustment are rooted in distinct cognitive-motivational processes. Well-being, proactive exploration and autonomous decision-making are expected from a combination of high need satisfaction and career decision-making self-efficacy, whereas ill-being, ruminative exploration and controlled career decision-making are expected from feelings of need frustration and schematic functioning. Secondly, when need satisfaction and need frustration co-occur, they seem to operate in distinct mediational pathways. The positive effects of need satisfaction on well-being, proactive exploration and autonomous decision-making go via career decision-making self-efficacy, whereas the effects of need frustration on ill-being, ruminative exploration and controlled career decision-making go via schematic functioning. Hence, interventions supporting need satisfaction and career decision-making self-efficacy are helpful in raising the levels of well-being (subjective vitality; satisfaction with life) but do not necessarily buffer the levels of ill-being (anxiety; depression; somatization), whereas remediative or therapeutic interventions decrease the levels of ill-being but do not necessarily raise the levels of well-being.

A second argument is related to the theory-based characteristics of the cognitive-motivational *processes* involved in maladaptive trajectories of career identity development and adjustment. We hypothesize that the severe and enduring maladaptive effects of schematic functioning, to which experiences of need frustration are linked, would make the adolescents´ less permeable to need-supportive experiences (e.g., ignore positive informative feedback), or, in the more severe cases lead them to avoid commitments and exploratory identity work on a regular basis (Luyckx, 2006), thus protecting them from experiences that trigger painful emotions of anxiety or depression that accompany these cognitions, and from information that might infirm their initial negative expectations (Young & Kolsko, 1994). These dysfunctional cognitive-motivational set leads to a negative, rigid and self-fulfilling modes of coping (Young, Klosko & Weishaar, 2003) that is typical of diffusion status of identity development (Luyckx, Vansteenkiste, Goossens & Duriez, 2009). The presence of these processes must be considered as a sign of possible pathological (identity) trajectories that need remedy of some sort (Josselton, 1994). Such individuals benefit from more directive and differentiated career interventions, including individual counselling and therapy (Schwartz, 2001), particularly when they actively resist or avoid promotional career counselling interventions.

Some other adolescents (we believe the most part) attend the sessions, but passively resist to the exploration tasks proposed, taking little advantage from participation in their sessions. We believe that, for these adolescents´ career counselling interventions might include sessions that address the problems in career identity self-construction and self-discovery (Schwartz, 2002; Waterman, 1984, 1993) that are associated to "dark" trajectories of career identity development and adjustment. Topics such as controlled motivation for exploration and commitment-making, ruminative or random exploration of career options and experiences of anxiety and depression should be covered. Sessions

should (a) trace back their origins in feelings of need frustration (e.g., feeling pressured and controlled; perceptions of (in) competence; feelings of loneliness) and schematic functioning (e.g., emotional deprivation, failure to achieve, defectiveness-shame), (b) uncover the dynamics through with these translate into controlled motivation for career decision-making (e.g., avoiding feeling guilt, shame or prove value to self and others) and maladaptive coping strategies (e.g., avoid sessions; Elliot, 2006; Young & Kolsko, 1994), and also the cognitive-interpersonal processes that maintain maladaptive identity trajectories over time (e.g., Safran & Segal, 1990; e.g., ignore or under value information that is not consistent with the schema). The discussion around this information would allow for cognitive restructuring of maladaptive cognitions and expectations about career-related investments, a strategy that, hopefully will be able to reduce the psychological resistance to engage in self-endorsed and autonomous trajectories of career identity development and well-being.

Career counselling interventions should also include parent training programs oriented to identify and refrain from using need-thwarting attitudes that increment, maintain and generalize these problems over time (e.g., Josselton, 1994; Luyckx, 2006). Within these sessions, parents could learn to identify career-related need-thwarting behaviors, understand their role on the onset and maintenance of subjective feelings of need frustration and rigid self-schemas (Ryan & Deci, 2003), which, in turn, undermine career identity development and adjustment. In concrete, parents should be helped to abstain from pressuring the adolescents career choices in specific directions and use guilt-induction or love withdrawal for autonomous exploration and commitment-making efforts (autonomy thwarting; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). Parents could also learn more about the role of failure-oriented feedback in the frustration of the adolescents' need for

competence (e.g., Soucy & Larose, 2000). For instance, messages conveying the adolescents´ lack of skills, their inability in stabilizing their interests, etc., seem to frustrate their competence and reinforce feelings of being a failure, which, in turn, result in career-related task avoidance and commitment to pathways below their true potential (Young & Kolsko, 1994). Finally, parents should learn about the importance of conveying rejection and showing lack of interest in their children career investments (e.g., Assor, Roth, & Deci, 2004). Parents convey these messages, for instance, when they criticize the adolescents´ career interests and options, making them more susceptible to feeling undervalued, defective, different from others and alone. However, for cognitive-motivational "off track" career trajectories defective-oriented approaches, represent only an initial first step. To re-align the adolescents (and their parents) with self-integrated career trajectories, promotional interventions (as above described) must follow.

Our findings are very insightful. They suggest the design of more contextualized psychoeducational interventions that differentiate the students needing more intensive career counselling interventions from those who would benefit from both preventive and promotional career interventions. Promotional interventions should be designed to optimize the exploration and commitment-making processes by getting students to be involved in career-related tasks that encourage self-determination and volitional functioning, allow the essay of choice, increment feelings of self-efficacy, and involve significant others in the decision-making processes (Ryan & Deci, 2007). Interventions of a more preventive or remediative nature should be more focused in the re-alignment of the identity-related investments with personal growth-oriented values and goals, by combining individual counselling, deficit-focused career sessions, and preventive contextual interventions.

Limitations and Suggestions for Future Research

The current design has several limitations that are worth noting. Firstly, the model proposed was validated exclusively for a sample of Portuguese high school students. Future cross-cultural replication studies should be performed to exclude the hypothesis that the associations in the model are not threatened by cultural bias rather than uncovering the real nature and dynamics of the constructs. Secondly, we used a relatively homogeneous community-based sample of 12th grade students that more easily captures the normative changes in career identity development. Future longitudinal replication studies should use more heterogeneous samples covering at-risk or clinically referred adolescents or adolescents enrolled in different educational programmes (e.g., education and training – VET students). By increasing sampling heterogeneity these future studies should be able to enhance the variability of the scores and the generability of the findings, particularly for the "dark" trajectories of career identity development and adjustment.

A third word of caution can be raised regarding the sole reliance on adolescents´ self-reports. This procedure may artificially inflate the relations between the constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) and leave open the possibility that the results may be explained from more global internal variables related to the specific ways by which adolescents with "bright" and "dark" trajectories appraise their own psychological processes and recall their parents (e.g., neuroticism). Future replication studies should rely on parent and adolescent reports (Soenens et al., 2005) to check the consistency of the results across different methods of data collection. Data gathering using these different procedures would allow researchers to make more firm statements about the directionality of the effects that were reported in this dissertation. Finally, the variables used in our model are indicated by combined scores in specific subscales (need satisfaction is indicated by the scores of autonomy, competence and relatedness satisfaction) or

obtained from parceling (e.g., schematic functioning is measured from three parcels). This procedure is statistically defensible, and it is aligned with the aim of capturing the general dynamics of the contextual and dispositional determinants of career identity development and adjustment. However, future research could codify the subscores of each scale as variables in order to examine more fine-tuned relationships between the constructs (e.g., how is the frustration of specific needs related to the development of specific early maladaptive schemas and how maladaptive schemas most contribute to ruminative exploration modes do?).

We are aware that our suggestions for intervention are anchored on SDT (Deci & Ryan, 2000) and Waterman´s model (1984), according to which individuals must develop identity-relevant choices about values and goals coherent with the individual´s true self. However proponents of a "construction" perspective (Berzonsky, 1988) might argue that the strategies meant to realign identity-related efforts with the self would not produce the desired effects because they are not focused in building coping skills which make adolescents more capable of adapting to complex and ambiguous life challenges (Berzonsky, 1988). However, we argue that when career-related identity investments aligned with intrinsic motivations and interests energize more autonomous, competent and intimate career investments, and promote more flexible and positive career options appraisals, these processes will, in turn result in more adaptive commitments. On the contrary, self-alienated trajectories of identity development will be always harmful, even when they are maintained by the individual. However, these processes are sometimes functional for the individual (e.g., prevent from challenging internal controls) without being necessarily adaptive, once they result in increased ill-being, controlled decision-making and indecisiveness. We expect that the adolescents will benefit from more integrated career counselling interventions addressing both the "bright" and "dark"

processes of career identity development and adjustment. However, this hypothesis remains untested and is, foremost, speculative. Future research should include the guidelines for intervention proposed in this dissertation into career interventions and assess their validity in the optimization and promotion of adaptive trajectories of career identity development and adjustment during critical career transitions.

Conclusion

Taken together the findings provide support for the conceptual model proposed. They suggest, in line with SDT the existence of "bright" and "dark" trajectories of career identity development, motivation and adjustment during the critical career transition from high school to higher education or to the job market. We provided support for the cognitive-motivational determination of these trajectories, making an argument about the extent to which cognitive processes bridge the effect of innate motivations on individual differences in career identity development processes and adjustment. Conceptually, our findings suggest the importance of examining career identity outcomes using comprehensive explanation frameworks obtained from the conciliation of different psychological models. In terms of intervention, findings suggest the need to design differentiated interventions depending on whether they intend to optimize growth-oriented career trajectories or realign derailed career processes with paths of personal thriving. This dissertation finishes as it started, with new research questions and hypotheses, and expresses the hope that future research will explore in depth this research avenue, and expand this model to different populations and developmental periods.

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Appendix A

MEASURES

Questionário Sociodemográfico

Apresentação do Estudo

Na Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra, estamos a realizar uma investigação cujo objetivo é conhecer algumas características psicológicas e experiências familiares dos estudantes do Ensino Secundário. Estamos interessados em conhecer a tua opinião como estudante. **NÃO** se trata de um teste e **NÃO** existem respostas corretas ou erradas. Sê o mais sincero(a) possível nas tuas respostas. A informação que nos irás fornecer será totalmente **CONFIDENCIAL**. Responde, por favor, a **TODAS** as questões. Para cada afirmação, responde apenas **UMA VEZ**.

Instruções (Tempo 1; outubro, 2013)

De seguida, serão apresentadas uma série de afirmações que podemos utilizar quando nos queremos descrever. Lê, por favor, cada uma das afirmações e decide aquela que melhor te descreve. Quando tiveres dificuldade, responde tendo em conta o que sentes emocionalmente e não o que gostarias que acontecesse ou acreditas que é mais adequado. Para responder, utiliza as escalas de resposta apresentadas no cabeçalho de cada escala, escolhendo, de entre as respostas possíveis, aquela – apenas uma, que melhor se ajusta ao teu caso.

Instruções (Tempo 2; julho, 2014)

Participaste anteriormente no meu estudo, orientado para conhecer a tua decisão de carreira, isto é, o que pretendias fazer após o 12.º ano. Gostava agora de saber como evoluiu a tua decisão de carreira nos últimos meses. Em particular, pretendo conhecer os fatores (razões) que te levaram a manter ou alterar a tua decisão de carreira ao longo do tempo. Esta informação é particularmente importante, sobretudo agora que já tomaste a decisão de te inscrever (ou não) nos exames de acesso ao ensino superior. Reafirmo que **NÃO** se trata de um teste e **NÃO** existem respostas corretas ou erradas. Sê o mais sincero(a) possível nas tuas respostas. A informação que nos irás fornecer será totalmente **CONFIDENCIAL**. Responde, por favor, a **TODAS** as questões. Para cada afirmação, responde apenas **UMA VEZ**.

Questionário Sociodemográfico

Antes de começares a responder às questões específicas do questionário, por favor insere alguns dados relativos a ti, à tua escola, ao curso que frequentas e à tua família. Para cada uma destas afirmações desenha uma cruz dentro da opção que se aplicar a ti.

DSD_CD	Código	Iniciais do 1º e último nome _____/____		Data nascimento _____/_____/_____	
DSD _GE	Género	☐ Masculino		☐ Feminino	
DSD _ES	Escola	☐ Escola pública		☐ Escola privada	
DSD _CA	Curso/Área	☐ Científico-humanística		☐ Profissional	
DSD _EP	Escola Pai	☐ Até ao 4.^{0} ano	☐ Do 5.º-9.º ano	☐ Do 10.º - 12.º ano	☐ E. Superior
DSD_ES	Escola mãe	☐ Até ao 4.^{0} ano	☐ Do 5.º - 9.º ano	☐ Do 10.º - 12.º ano	☐ E. Superior
DSD_AF	Agregado	☐ Pai e mãe	☐ Só com o pai/mãe	☐ Pai e madrasta ☐ Mãe e padrasto	☐ Pais e familiares ☐ Outros familiares ☐ Instituição
DSD_MD	Média	☐ Valor _____			

Questionário Parental

Refere-te, em geral, à forma como os teus pais se relacionam contigo. Quando a atitude do pai/mãe forem diferentes, indica a que for mais saliente.

	1 DISCORDO MUITO	2	3	4	5 CONCORDO MUITO				
QP1	O meu pai/mãe faz-me sentir melhor depois de conversar com ele/a sobre as minhas preocupações	1	2	3	4	5
QP2	O meu pai/mãe tem expectativas claras acerca de como me devo comportar dentro e fora de casa	1	2	3	4	5
QP3	O meu pai/mãe faz-me perguntas relacionadas com o meu comportamento fora de casa	1	2	3	4	5
QP4	O meu pai/mãe está sempre a tentar mudar o que eu me sinto ou penso	1	2	3	4	5
QP5	O meu pai/mãe ouve a minha opinião ou ponto de vista quando tenho um problema	1	2	3	4	5
QP6	O meu pai/mãe sorri muitas vezes para mim	1	2	3	4	5
QP7	O meu pai/mãe exige que eu me comporte de uma certa maneira	1	2	3	4	5
QP8	O meu pai/mãe lembra-me das regras que definiu para mim	1	2	3	4	5
QP9	O meu pai/mãe muda de assunto sempre que estou a tentar dizer alguma coisa	1	2	3	4	5
QP10	O meu pai/mãe está geralmente disposto a ver as coisas de acordo com o meu ponto de vista	1	2	3	4	5
QP11	O meu pai/mãe é capaz de me fazer sentir melhor quando estou chateado(a)	1	2	3	4	5
QP12	O meu pai/mãe acredita que os jovens não podem fazer tudo o que desejam	1	2	3	4	5
QP13	O meu pai/mãe está atento ao meu comportamento para se assegurar que é adequado	1	2	3	4	5
QP14	O meu pai/mãe interrompe-me com frequência	1	2	3	4	5
QP15	Sempre que lhe é possível, o meu pai/mãe permite-me escolher o que quero fazer	1	2	3	4	5
QP16	O meu pai/mãe anima-me quando estou triste	1	2	3	4	5
QP17	O meu pai/mãe quer que eu aprenda a seguir regras e normas, dentro e fora de casa	1	2	3	4	5
QP18	O meu pai/mãe fala com os vizinhos, pais dos meus amigos e professores sobre o meu comportamento	1	2	3	4	5
QP19	O meu pai/mãe culpa-me pelos problemas dos outros membros da minha família	1	2	3	4	5
QP20	O meu pai/mãe permite-me tomar decisões por mim mesmo(a)	1	2	3	4	5
QP21	O meu pai/mãe cuida de mim e dá-me muita atenção	1	2	3	4	5
QP22	O meu pai/mãe acredita que os pais têm o direito de definir regras e normas para o comportamento dos jovens	1	2	3	4	5
QP23	O meu pai/mãe esforça-se para saber quem são meus amigos e onde é que eu passo o meu tempo	1	2	3	4	5
QP24	Quando me critica, o meu pai/mãe lembra-me os erros que cometi no passado	1	2	3	4	5
QP25	O meu pai/mãe insiste em fazer as coisas à sua maneira	1	2	3	4	5
QP26	O meu pai/mãe acredita que deve expressa o amor que sente por mim	1	2	3	4	5
QP27	O meu pai/mãe deixa-me fazer o que eu quero	1	2	3	4	5
QP28	O meu pai/mãe parece não se importar se eu me comporto ou não como ele quer	1	2	3	4	5
QP29	O meu pai/mãe é menos amigável comigo quando eu vejo as coisas de forma diferente da dele/a	1	2	3	4	5
QP30	O meu pai/mãe não é sensível a muitas das minhas necessidades	1	2	3	4	5
QP31	O meu pai/mãe gosta de realizar atividades comigo	1	2	3	4	5
QP32	O meu pai/mãe tem expectativas adequadas para o meu comportamento	1	2	3	4	5
QP33	O meu pai/mãe não sabe como me comporto dentro ou fora de casa	1	2	3	4	5
QP34	O meu pai/mãe evita olhar para mim quando o/a dececiono	1	2	3	4	5
QP35	O meu pai/mãe ajuda-me a escolher o meu caminho na vida	1	2	3	4	5
QP36	O meu pai/mãe é muito pouco claro relativamente ao que espera de mim	1	2	3	4	5
QP37	O meu pai/mãe verifica de forma sensata se me estou a comportar como ele/a deseja	1	2	3	4	5
QP38	Quando firo os sentimentos do meu pai/mãe, ele/a deixa de falar comigo até que me volte a comportar de uma forma que lhe agrade novamente	1	2	3	4	5

Título Original: Parenting Questionnaire (Soenens, Vansteenkiste, Luyckx, & Goossens, 2006); Versão Portuguesa, Cordeiro, P., Paixão, P., & Lens, W. (2015).

Escala de Suporte e Frustração Parental das Necessidades

As afirmações seguintes referem-se à forma como os teus pais se relacionam contigo. Indica o grau com que concordas com estas afirmações desenhando um círculo à volta um dos números. Quando o comportamento do pai e da mãe diferir, indica, por favor, aquele que é mais saliente.

	1 DISCORDO MUITO	2	3	4	5 CONCORDO MUITO				
ESFPN1	Os meus pais tentam compreender o meu ponto de vista				1	2	3	4	5
ESFPN2	Os meus pais estão sempre a contrariar-me				1	2	3	4	5
ESFPN3	Os meus pais ficam dececionados comigo quando não consigo ter melhores notas que os meus colegas				1	2	3	4	5
ESFPN4	Os meus pais confiam na minha capacidade para fazer bem as coisas				1	2	3	4	5
ESFPN5	Os meus pais não passam tanto tempo comigo como gostaria				1	2	3	4	5
ESFPN6	Os meus pais deixam-me fazer as coisas que considero importantes				1	2	3	4	5
ESFPN7	Os meus pais estão sempre a dar-me ordens				1	2	3	4	5
ESFPN8	Os meus pais estão disponíveis para falar comigo				1	2	3	4	5
ESFPN9	Os meus pais fazem-me sentir indesejado(a)				1	2	3	4	5
ESFPN10	Os meus pais pressionam-me para que eu seja melhor que os outros em tudo o que faço				1	2	3	4	5
ESFPN11	Os meus pais permitem-me tomar decisões por mim próprio				1	2	3	4	5
ESFPN12	Os meus pais mostram-me que gostam de mim				1	2	3	4	5
ESFPN13	Os meus pais confiam na minha capacidade para alcançar os meus objetivos				1	2	3	4	5
ESFPN14	Os meus pais não mostram que me amam ou que têm carinho por mim				1	2	3	4	5
ESFPN15	Os meus pais gostam de estar comigo				1	2	3	4	5
ESFPN16	Os meus pais acreditam que vou ter sucesso na escola				1	2	3	4	5
ESFPN17	Os meus pais acham que a sua maneira de fazer as coisas é a melhor				1	2	3	4	5
ESFPN18	Os meus pais criticam-me quando tenho notas mais baixas do que eles esperam				1	2	3	4	5

Título Original M., Paixão, M.P., Lens, W., Lacante, M. & Sheldon, K. (2015)

Escala Balanceada de Necessidades Psicológicas Básicas

Indica em que medida concordas com cada afirmação, referente a experiências que podem ocorrer na tua vida em geral.

	DISCORDO TOTALMENTE 1	DISCORDO 2	NÃO CONCORDO NEM DISCORDO 3	CONCORDO 4	CONCORDO TOTALMENTE 5				
EBNPB 1	As minhas escolhas são baseadas nos meus verdadeiros interesses e valores				1	2	3	4	5
EBNPB 2	Sinto-me livre para fazer as coisas à minha maneira				1	2	3	4	5
EBNPB 3	As minhas escolhas refletem verdadeiramente quem sou				1	2	3	4	5
EBNPB 4	Tenho bons resultados sempre que me envolvo em tarefas e projetos difíceis				1	2	3	4	5
EBNPB 5	Estou a tentar e a ser capaz de resolver tarefas desafiantes e difíceis				1	2	3	4	5
EBNPB 6	Sou bem-sucedido(a) naquilo que faço				1	2	3	4	5
EBNPB 7	Sinto-me ligado(a) a pessoas que se preocupam comigo e por quem me preocupo				1	2	3	4	5
EBNPB 8	Sinto-me próximo(a) e em sintonia com pessoas que são importantes para mim				1	2	3	4	5
EBNPB 9	Sinto uma grande intimidade com as pessoas com quem passo mais tempo				1	2	3	4	5
EBNPB 10	Eu passava bem sem muitas das pressões a que estou sujeito				1	2	3	4	5
EBNPB 11	Há pessoas que me dizem o que devo fazer				1	2	3	4	5
EBNPB 12	Faço coisas contra a minha vontade				1	2	3	4	5
EBNPB 13	Faço coisas disparatadas que me fizeram sentir incompetente				1	2	3	4	5
EBNPB 14	Sinto com frequência que fracasso, ou verifico que não sou capaz de ser bem-sucedido no que faço				1	2	3	4	5
EBNPB 15	Esforço-me para conseguir fazer as coisas em que devia ter sucesso				1	2	3	4	5
EBNPB 16	Sinto-me sozinho				1	2	3	4	5
EBNPB 17	Eu sinto-me desvalorizado(a) por uma ou mais pessoas importantes para mim				1	2	3	4	5
EBNPB 18	Eu tenho divergências ou conflitos com pessoas com as quais me costumava dar bem				1	2	3	4	5

Título Original: Balanced Measure of Psychological Needs Scale; Sheldon & Hilpert, 2012. Versão Portuguesa, Cordeiro, P., Paixão, P., Lens, W., Sheldon, K.(2015)

Escala de Satisfação e Frustração das Necessidades Psicológicas Básicas

Indica em que medida concordas com cada afirmação referente a experiências que podem ou não ocorrer na tua vida em geral. Indica em que medida concordas com estas afirmações, desenhando um círculo em torno do número que corresponde à tua opção.

		1 COMPLETAMENTE FALSO	2	3	4	5 ABSOLUTAMENTE VERDADEIRO
ESFNPB1	Tenho a possibilidade de escolher e a liberdade para fazer as coisas que faço	1	2	3	4	5
ESFNPB2	Faço a maior parte das coisas porque têm de ser feitas	1	2	3	4	5
ESFNPB3	Sinto que as pessoas de quem gosto também gostam de mim	1	2	3	4	5
ESFNPB4	Sinto-me excluído(a) do grupo a que gostava de pertencer	1	2	3	4	5
ESFNPB5	Confio na minha capacidade para fazer as coisas bem-feitas	1	2	3	4	5
ESFNPB6	Duvido seriamente que consiga fazer alguma coisa bem	1	2	3	4	5
ESFNPB7	Sinto que as minhas decisões refletem aquilo que realmente quero	1	2	3	4	5
ESFNPB8	Sinto-me obrigado(a) a fazer muitas coisas que não quero	1	2	3	4	5
ESFNPB9	Sinto-me ligado(a) a pessoas que se preocupam comigo e com quem eu me preocupo	1	2	3	4	5
ESFNPB10	Sinto que as pessoas que considero importantes se mostram frias e distantes comigo	1	2	3	4	5
ESFNPB11	Sinto que tenho capacidade para fazer bem as coisas que faço	1	2	3	4	5
ESFNPB12	Sinto-me desiludido(a) com muitos dos meus desempenhos	1	2	3	4	5
ESFNPB13	As escolhas que faço revelam a pessoa que eu sou	1	2	3	4	5
ESFNPB14	Faço a maior parte das coisas porque sou pressionado/a pelas outras pessoas	1	2	3	4	5
ESFNPB15	Sinto-me próximo(a) e ligado(a) a pessoas que considero importantes para mim	1	2	3	4	5
ESFNPB16	Tenho a impressão que a (s) pessoa(s) com quem eu passo o tempo não gostam de mim	1	2	3	4	5
ESFNPB17	Sinto que sou capaz de alcançar os meus objetivos	1	2	3	4	5
ESFNPB18	Sinto-me inseguro(a) em relação às minhas capacidades	1	2	3	4	5
ESFNPB19	Sinto que que tenho vindo a fazer as coisas que realmente me interessam	1	2	3	4	5
ESFNPB20	As minhas atividades diárias são feitas por obrigação	1	2	3	4	5
ESFNPB21	Sinto-me bem junto das pessoas com quem passo a maior parte do tempo	1	2	3	4	5
ESFNPB22	Sinto que as relações que tenho são apenas superficiais	1	2	3	4	5
ESFNPB23	Consigo ser bem-sucedido(a) em tarefas difíceis	1	2	3	4	5
ESFNPB24	Sinto que sou um fracasso por causa de todos os erros que tenho cometido	1	2	3	4	5

Título Original: Basic Psychological Need Satisfaction and Frustration (BPNSF; Chen et al., 2014), Versão Portuguesa, Cordeiro, P., Paixão, & P., Lens, W., (2015)

Escala de Vitalidade Subjetiva

Nos últimos meses...

	1 NADA VERDADEIRO	2	3 ALGO VERDADEIRO	4	5 MUITO VERDADEIRO
EVS1	Tenho-me sentido ativo(a) e com vitalidade	1	2	3	4 5
EVS2	Tenho-me sentido tão vivo(a) que parece que vou "explodir"	1	2	3	4 5
EVS3	Tenho tido energia e entusiasmo	1	2	3	4 5
EVS4	Tenho aguardado ansiosamente por cada novo dia	1	2	3	4 5
EVS5	Tenho-me sentido, quase sempre, alerta e desperto(a)/activo(a)	1	2	3	4 5
EVS6	Tenho-me sentido cheio de energia	1	2	3	4 5

Título Original: Subjective Vitality Scale (SV; Ryan & Frederick, 1997); Versão Portuguesa, Lemos, M. S. & Gonçalves, T. (2010)

Escala de Satisfação com a Vida

Nos últimos meses...

	1 DISCORDO MUITO	2 DISCORDO UM POUCO	3 NÃO CONCORDO NEM DISCORDO	4 CONCORDO UM POUCO	5 CONCORDO MUITO
ESV1	A minha vida tem-se parecido, em quase tudo, com o que eu desejaria que ela fosse	1	2	3	4 5
ESV2	As minhas condições de vida têm sido muito boas	1	2	3	4 5
ESV3	Tenho-me sentido satisfeito(a) com a minha vida	1	2	3	4 5
ESV4	Tenho conseguido alcançar coisas importantes para a minha vida	1	2	3	4 5
ESV5	Se eu pudesse recomeçar a minha vida, não mudaria quase nada	1	2	3	4 5

Título Original: Satisfaction With life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985); Versão Portuguesa, Simões, (1992)

Escala de Desenvolvimento da Identidade de Carreira

Nos últimos meses como como exploraste a tua decisão de carreira?

		1 DISCORDO MUITO	2 DISCORDO	3 NEM CONCORDO NEM DISCORDO	4 MUITAS VEZES	5 CONCORDO MUITO				
EDI1	Já decidi qual a direção que vou dar à minha vida profissional					1	2	3	4	5
EDI2	Tenho planos relativamente ao que vou fazer no meu futuro profissional					1	2	3	4	5
EDI3	Sei qual a direção que vou dar à minha vida profissional					1	2	3	4	5
EDI4	Tenho uma imagem definida acerca do que vou fazer no meu futuro profissional					1	2	3	4	5
EDI5	Já tomei uma decisão relativamente ao que vou fazer na minha vida profissional					1	2	3	4	5
EDI6	Penso ativamente acerca das diferentes direções em que pode ir a minha vida profissional					1	2	3	4	5
EDI7	Penso numa série de coisas diferentes que posso vir a fazer no meu futuro profissional					1	2	3	4	5
EDI8	Estou a considerar vários estilos de vida que se podem adequar a mim					1	2	3	4	5
EDI9	Penso acerca dos diversos objetivos que posso tentar alcançar profissionalmente					1	2	3	4	5
EDI0	Estou a ponderar diversos estilos de vida que podem ser adequados a mim					1	2	3	4	5
EDI1	Tenho dúvidas acerca daquilo que realmente quero alcançar na minha vida profissional					1	2	3	4	5
EDI2	Preocupo-me acerca daquilo que quero vir a fazer no meu futuro profissional					1	2	3	4	5
EDI3	Estou continuamente à procura da uma direção para a minha vida profissional					1	2	3	4	5
EDI4	Continuo a imaginar a direção que devo dar à minha vida profissional					1	2	3	4	5
EDI5	É-me difícil parar de pensar acerca do caminho que devo seguir profissionalmente					1	2	3	4	5
EDI6	Os planos que fiz para o meu futuro profissional correspondem aos meus verdadeiros interesses e valores					1	2	3	4	5
EDI7	Os planos que fiz para o meu futuro profissional dão-me autoconfiança					1	2	3	4	5
EDI8	Devido aos planos que fiz para o meu futuro profissional, sinto-me agora mais seguro de mim					1	2	3	4	5
EDI9	Acredito que o caminho que quero seguir na minha vida profissional é adequado a mim					1	2	3	4	5
ED20	Tenho a certeza que os planos que fiz para o meu futuro profissional são os mais indicados para mim					1	2	3	4	5
ED21	Penso acerca dos planos que já fiz para o meu futuro profissional					1	2	3	4	5
ED22	Falo com as outras pessoas acerca dos panos que fiz para o meu futuro profissional					1	2	3	4	5
ED23	Penso se os meus objetivos profissionais se adequam realmente a mim					1	2	3	4	5
ED24	Tento saber o que pensam as outras pessoas acerca da direção que decidi dar à minha vida profissional					1	2	3	4	5
ED25	Penso se os planos que elaborei para o meu futuro profissional revelam aquilo que realmente quero					1	2	3	4	5

Título Original: Dimensions of Identity Development Scale (DIDS; Luyckx et al., 2008b); Versão Portuguesa, Cordeiro, P., Paixão, P., Lens, W., Lacante, M. (2015)

Questionário de Auto-regulação da Decisão Vocacional

Indica, por favor, quais as razões que te levaram a escolher um percurso de carreira. Escolhi este percurso porque...

	1 Discordo Muito	2 Discordo um Pouco	3 Não Concordo Nem Discordo	4 Concordo Um Pouco	5 Concordo Muito
QARDV1	De outra forma as pessoas não me iriam respeitar				1 2 3 4 5
QARDV2	Iria-me sentir mal comigo próprio de se não o fizesse				1 2 3 4 5
QARDV3	É muito importante para mim				1 2 3 4 5
QARDV4	Reflete bem a pessoa que eu sou				1 2 3 4 5
QARDV5	Quero sentir-me uma pessoa especial				1 2 3 4 5
QARDV6	Iria sentir-me envergonhado se não o fizesse				1 2 3 4 5
QARDV7	É coerente com a pessoa que sou				1 2 3 4 5
QARDV8	Permite-me ganhar o respeito das outras pessoas				1 2 3 4 5
QARDV9	A minha família e amigos me pressionaram a fazê-lo				1 2 3 4 5
QARDV10	Tem um significado especial para mim				1 2 3 4 5
QARDV11	É o que as outras pessoas esperam que eu faça				1 2 3 4 5
QARDV12	Valorizo verdadeiramente este caminho profissional				1 2 3 4 5
QARDV13	Quero sentir orgulho em mim próprio(a)				1 2 3 4 5
QARDV14	Iria sentir-me culpado(a) se não o fizesse				1 2 3 4 5
QARDV15	Mostra verdadeiramente o tipo de pessoa que eu sou				1 2 3 4 5
QARDV16	Quero que as pessoas fiquem impressionadas comigo				1 2 3 4 5
QARDV17	É o que as outras pessoas me dizem que devo fazer				1 2 3 4 5
QARDV18	De outra forma, sentir-me-ia desiludido(a) comigo próprio				1 2 3 4 5
QARDV19	É um objetivo que quero mesmo tentar alcançar				1 2 3 4 5
QARDV20	Mostra o tipo de pessoa em que me quero tornar				1 2 3 4 5

Título Original: Self-Regulation Questionnaire (SRQ Ryan & Connell, 1989); Versão Portuguesa, Cordeiro, P., Paixão, P., & Lens, W., (2013).

Inventário de Sintomas Psicopatológicos

Indica em que medida foste incomodado(a) pelos seguintes sintomas, durante o último mês.

1 Discordo Muito	2 Discordo um Pouco	3 Não Concordo Nem Discordo	4 Concordo Um Pouco	5 Concordo Muito

ISP1	Desmaios ou tonturas	1	2	3	4	5
ISP2	Não ter interesse por nada	1	2	3	4	5
ISP3	Nervosismo ou tensão interior	1	2	3	4	5
ISP4	Dores sobre o coração ou no peito	1	2	3	4	5
ISP5	Sentir-me sozinho(a)	1	2	3	4	5
ISP6	Sentir-me em estado de tensão ou aflição	1	2	3	4	5
ISP7	Vontade de vomitar ou mal-estar do estômago	1	2	3	4	5
ISP8	Sentir-me triste	1	2	3	4	5
ISP9	Ter um medo súbito sem razão para isso	1	2	3	4	5
ISP10	Sensação de que me falta o ar	1	2	3	4	5
ISP11	Sentir que não tenho valor	1	2	3	4	5
ISP12	Ter ataques de terror ou pânico	1	2	3	4	5
ISP13	Sensação de anestesia (encortiçamento ou formigueiro) no corpo	1	2	3	4	5
ISP14	Sentir-me sem esperança perante o futuro	1	2	3	4	5
ISP15	Sentir-me tão desassossegado(a) que não consigo manter-me sentado(a) e quieto(a)	1	2	3	4	5
ISP16	Falta de força em partes do corpo	1	2	3	4	5
ISP17	Pensamentos de acabar com a vida	1	2	3	4	5
ISP18	Sentir-me atemorizado	1	2	3	4	5

Título Original: Brief Symptom Inventory (BSI-18; Derogatis, 2001); Versão Portuguesa, Canavarro, M. C., (2007)

Inventário de Esquemas de Young

Estão indicadas a seguir algumas afirmações que podemos utilizar quando nos queremos descrever Indica em que medida foste incomodado(a) pelos seguintes sintomas durante o último ano. Quando tiver dúvidas, responda baseando-se no que sente emocionalmente e não no que pensa ser verdade.

	1 COMPLETAMENTE FALSO	2 FALSO NA MAIORIA DAS VEZES	3 LIGEIRAMENTE MAIS VERDADEIRO QUE FALSO	4 MODERADAMENTE VERDADEIRO	5 VERDADEIRO NA MAIORIA DAS VEZES	6 DESCREVE-ME PERFEITAMENTE					
YSI1	Não tenho tido ninguém que cuide de mim, que partilhe comigo a sua vida ou que se preocupe realmente com tudo o que me acontece.					1	2	3	4	5	6
YSI2	Costumo apegar-me demasiado às pessoas que me são mais próximas porque tenho medo que elas me abandonem.					1	2	3	4	5	6
YSI3	Sinto que as pessoas se vão aproveitar de mim.					1	2	3	4	5	6
YSY4	Sou um(a) desajustado(a).					1	2	3	4	5	6
YSI5	Nenhum homem/mulher de quem eu goste pode gostar de mim depois de conhecer os meus defeitos ou fraquezas.					1	2	3	4	5	6
YSI6	Quase nada do que faço no trabalho (ou na escola) é tão bom como o que os outros são capazes de fazer.					1	2	3	4	5	6
YSI7	Não me sinto capaz de me desenvencilhar sozinho(a) no dia-a-dia.					1	2	3	4	5	6
YSI8	Não consigo deixar de sentir que alguma coisa de mal está para acontecer.					1	2	3	4	5	6
YSI9	Não tenho sido capaz de me separar dos meus pais, tal como fazem as outras pessoas da minha idade.					1	2	3	4	5	6
YSI10	Sinto que, se fizer o que quero, só vou arranjar sarilhos.					1	2	3	4	5	6
YSI11	Sou sempre eu que acabo por tomar conta das pessoas que me são mais chegadas.					1	2	3	4	5	6
YSI12	Sou demasiado controlado(a) para revelar os meus sentimentos positivos aos outros (por ex., afeto, mostrar que me preocupo).					1	2	3	4	5	6
YSI13	Tenho que ser o(a) melhor em quase tudo o que faço; não aceito ficar em segundo lugar.					1	2	3	4	5	6
YSI14	Tenho muita dificuldade em aceitar um "não" por resposta quando quero alguma coisa dos outros.					1	2	3	4	5	6
YSI15	Não sou capaz de me forçar a ter disciplina suficiente para cumprir tarefas rotineiras ou aborrecidas.					1	2	3	4	5	6
YSI16	Ter dinheiro e conhecer pessoas importantes faz-me sentir uma pessoa com valor.					1	2	3	4	5	6
YSI17	Mesmo quando as coisas parecem estar a correr bem, sinto que isso é apenas temporário.					1	2	3	4	5	6
YSI18	Se cometer um erro, mereço ser castigado.					1	2	3	4	5	6
YSI19	Não tenho pessoas que me deem carinho, apoio e afeto.					1	2	3	4	5	6
YSI20	Preciso tanto dos outros que me preocupo com o facto de os poder perder.					1	2	3	4	5	6
YSI21	Sinto que tenho sempre que me defender na presença dos outros, senão eles magoar-me-ão intencionalmente.					1	2	3	4	5	6
YSI22	Sou fundamentalmente diferente dos outros.					1	2	3	4	5	6
YSI23	Ninguém que me agrade gostaria de ficar comigo depois de me conhecer tal como eu sou na realidade.					1	2	3	4	5	6
YSI24	Sou um(a) incompetente quando se trata de atingir objetivos ou de levar a cabo uma tarefa no trabalho (ou na escola).					1	2	3	4	5	6
YSI25	Considero-me uma pessoa dependente relativamente ao que tenho que fazer no dia-a-dia.					1	2	3	4	5	6
YSI26	Sinto que uma desgraça (natural, criminal, financeira ou médica) pode atingir-me a qualquer momento.					1	2	3	4	5	6
YSI27	Eu e os meus pais temos tendência a envolvermo-nos demasiado na vida e nos problemas uns dos outros.					1	2	3	4	5	6
YSI28	Sinto que não tenho outro remédio senão ceder à vontade dos outros, caso contrário, eles irão retaliar, zangar-se ou rejeitar-me de alguma maneira.					1	2	3	4	5	6
YSI29	Sou uma boa pessoa porque penso mais nos outros do que em mim.					1	2	3	4	5	6
YSI30	Considero embaraçoso exprimir os meus sentimentos aos outros.					1	2	3	4	5	6
YSI31	Esforço-me por fazer o melhor; não me contento com ser suficientemente bom.					1	2	3	4	5	6
YSI32	Sou especial e não devia ser obrigado(a) a aceitar muitas das restrições ou limitações que são impostas aos outros.					1	2	3	4	5	6
YSI33	Se não consigo atingir um objetivo, fico facilmente frustrado(a) e desisto.					1	2	3	4	5	6

YSI34	Aquilo que consigo alcançar tem mais valor para mim se for algo em que os outros reparem.	1	2	3	4	5	6
YSI35	Se algo de bom acontecer, preocupa-me que esteja para acontecer algo de mau a seguir.	1	2	3	4	5	6
YSI36	Se não me esforçar ao máximo, é de esperar que as coisas corram mal.	1	2	3	4	5	6
YSI37	Tenho sentido que não sou uma pessoa especial para ninguém.	1	2	3	4	5	6
YSI38	Preocupa-me que as pessoas a que estou ligado(a) me deixem ou me abandonem.	1	2	3	4	5	6
YSI39	Mais tarde ou mais cedo, acabarei por ser traído(a) por alguém.	1	2	3	4	5	6
YSI40	Sinto que não pertenço a grupo nenhum; sou um solitário.	1	2	3	4	5	6
YSI41	Não tenho valor suficiente para merecer o amor, a atenção e o respeito dos outros.	1	2	3	4	5	6
YSI42	A maioria das pessoas tem mais capacidades do que eu no que diz respeito ao trabalho (ou à escola).	1	2	3	4	5	6
YSI43	Tenho falta de bom senso.	1	2	3	4	5	6
YSI44	Preocupa-me poder ser fisicamente agredido por alguém.	1	2	3	4	5	6
YSI45	É muito difícil, para mim e para os meus pais, termos segredos íntimos que não contamos uns aos outros, sem nos sentirmos traídos ou culpados por isso.	1	2	3	4	5	6
YSI46	Nas minhas relações com os outros deixo que eles me dominem.	1	2	3	4	5	6
YSI47	Estou tão ocupado(a) a fazer coisas para as pessoas de quem gosto que tenho pouco tempo para mim.	1	2	3	4	5	6
YSI48	Para mim é difícil ser caloroso(a) e espontâneo(a) com os outros.	1	2	3	4	5	6
YSI49	Devo de estar à altura de todas as minhas responsabilidades e funções.	1	2	3	4	5	6
YSI50	Detesto ser reprimido(a) ou impedido(a) de fazer o que quero.	1	2	3	4	5	6
YSI51	Tenho muita dificuldade em abdicar de uma recompensa ou prazer imediato, a favor de um objetivo a longo prazo.	1	2	3	4	5	6
YSI52	Sinto-me pouco importante, a não ser que receba muita atenção dos outros.	1	2	3	4	5	6
YSI53	Todo o cuidado é pouco; quase sempre alguma coisa corre mal.	1	2	3	4	5	6
YSI54	Se não fizer bem o que me compete, mereço sofrer as consequências.	1	2	3	4	5	6
YSI55	Não tenho tido ninguém que me ouça atentamente, que me compreenda ou que perceba os meus verdadeiros sentimentos e necessidades.	1	2	3	4	5	6
YSI56	Quando sinto que alguém de quem eu gosto se está a afastar de mim, sinto-me desesperado.	1	2	3	4	5	6
YSI57	Sou bastante desconfiado quanto às intenções das outras pessoas.	1	2	3	4	5	6
YSI58	Sinto-me afastado(a) ou desligado dos outros.	1	2	3	4	5	6
YSI59	Sinto que nunca poderei ser amado por alguém.	1	2	3	4	5	6
YSI60	Não sou tão talentoso(a) no trabalho como a maioria das pessoas.	1	2	3	4	5	6
YSI61	Não se pode confiar no meu julgamento em situações do dia-a-dia.	1	2	3	4	5	6
YSY62	Preocupa-me poder perder todo o dinheiro que tenho e ficar muito pobre ou na miséria.	1	2	3	4	5	6
YSI63	Sinto frequentemente que é como se os meus pais vivessem através de mim — não tenho uma vida própria.	1	2	3	4	5	6
YSI64	Sempre deixei que os outros escolhessem por mim; por isso, não sei realmente aquilo que quero para mim.	1	2	3	4	5	6
YSI65	Tenho sido sempre eu quem ouve os problemas dos outros.	1	2	3	4	5	6
YSI66	Controlo-me tanto que as pessoas pensam que não tenho sentimentos ou que tenho um coração de pedra.	1	2	3	4	5	6
YSI67	Sinto sobre mim uma pressão constante para fazer coisas e atingir objetivos.	1	2	3	4	5	6
YSI68	Sinto que não devia ter que seguir as regras e convenções habituais que as outras pessoas têm que seguir.	1	2	3	4	5	6
YSI69	Não me consigo obrigar a fazer coisas de que não gosto, mesmo quando sei que é para o meu bem.	1	2	3	4	5	6
YSI70	Quando faço uma intervenção numa reunião ou quando sou apresentado a alguém num grupo, é importante para mim obter reconhecimento e admiração.	1	2	3	4	5	6
YSI71	Por muito que trabalhe, preocupa-me poder ficar na miséria e perder quase tudo o que possuo.	1	2	3	4	5	6
YSI72	Não interessa porque é que cometi um erro; quando faço algo errado, há que pagar as consequências.	1	2	3	4	5	6
YSI73	Não tenho tido uma pessoa forte ou sensata para me dar bons conselhos e me dizer o que fazer quando não tenho a certeza da atitude que devo tomar.	1	2	3	4	5	6
YSI74	Por vezes, a preocupação que tenho com o facto de as pessoas me poderem deixar é tão grande, que acabo por as afastar.	1	2	3	4	5	6
YSI75	Estou habitualmente à procura de segundas intenções ou do verdadeiro motivo por detrás do comportamento dos outros.	1	2	3	4	5	6

YSI76	Em grupo, sinto sempre que estou de fora.	1	2	3	4	5	6
YSI77	Sou demasiado inaceitável para me poder mostrar tal como sou às outras pessoas ou para deixar que me conheçam bem.	1	2	3	4	5	6
YSI78	No que diz respeito ao trabalho (ou à escola) não sou tão inteligente como a maior parte das pessoas.	1	2	3	4	5	6
YSI79	Não tenho confiança nas minhas capacidades para resolver problemas que surjam no dia-a-dia.	1	2	3	4	5	6
YS80	Preocupa-me poder estar a desenvolver uma doença grave, ainda que não tenha sido diagnosticado nada de grave pelo médico.	1	2	3	4	5	6
YS81	Sinto frequentemente que não tenho uma identidade separada da dos meus pais ou companheiro(a).	1	2	3	4	5	6
YS82	Tenho imenso trabalho para conseguir que os meus sentimentos sejam tidos em consideração e os meus direitos sejam respeitados.	1	2	3	4	5	6
YS83	As outras pessoas consideram que faço muito pelos outros e não faço o suficiente por mim.	1	2	3	4	5	6
YSI84	As pessoas acham que tenho dificuldade em exprimir o que sinto.	1	2	3	4	5	6
YSI85	Não posso descuidar as minhas obrigações de forma leviana, nem desculpar-me pelos meus erros	1	2	3	4	5	6
YSI86	Sinto que o que tenho para oferecer tem mais valor do que aquilo que os outros têm para dar.	1	2	3	4	5	6
YS87	Raramente tenho sido capaz de levar as minhas decisões até ao fim.	1	2	3	4	5	6
YSI88	Receber muitos elogios dos outros faz-me sentir uma pessoa que tem valor.	1	2	3	4	5	6
YSI89	Preocupa-me que uma decisão errada possa provocar uma catástrofe.	1	2	3	4	5	6
YSI90	Sou uma pessoa má que merece ser castigada.	1	2	3	4	5	6

Título Original: Young Schema Inventory (YSQ-S3; Young, 2005); Versão Portuguesa revista, Pinto Gouveia, D. Rijo e M.C. Salvador, (2005).