SAPIENZA
UNIVERSITÀ DI ROMA

International PhD programme in Psychology and Social Neuroscience

Curriculum Personality and Organizational Psychology (POP)

XXXI Cycle

Doctoral Dissertation

INDIVIDUAL DIFFERENCES IN ADOLESCENTS' BEHAVIORAL AND EMOTIONAL PROBLEMS: A PERSON CENTERED APPROACH

PhD. Candidate:
Ainzara Favini

Tutor:
Maria Grazia Gerbino

TABLE OF CONTENTS

CHAPTER I

GENERAL INTRODUCTION

Individual development: the transitional stage of Adolescence

Bronfenbrenner's theory on human development (1979), posted that during the lifespan there are some "critical" periods, characterized by dramatic changes. Adolescence is one of these critical periods, a transition characterized by a lot of challenges. During this period, youths are exposed to many developmental demands and changes in several areas, such as biological (e.g., Steinberg & Morris, 2001; Susman & Dorn, 2009), cognitive (e.g., Collins & Steinberg, 2006; Eisenberg et al., 2009), emotional (e.g., Compas & Reeslund, 2009), and relational area (e.g., Laursen & Collins, 2009). How adolescents face with those demands set the basis for different developmental successful or unsuccessful trajectories (Collins & Steinberg, 2006; Compas & Reeslund, 2009; De Fruyt & De Clerq, 2014; Steinberg & Morris, 2001).

During adolescence, biological changes are of particular relevance and may have an impact on youths' development in several ways (Steinberg & Morris, 2001). This period is characterized by a wide variation in biological functioning, primarily because of somatic changes of puberty, and pubertal timing (e.g., Susman & Dorn, 2009; Susman & Rogol, 2004). So, it is important to consider sex maturation and differentiation in examining adolescents' development. Previous studies, in fact, evidenced important gender differences in how adolescents react to stressful and challenging demands during this period. For example, girls tend to be characterized by an earlier sex maturation than boys (i.e., going through puberty, the first menstrual cycle), and this affect girls' development in several areas, such as their relations with parents and peers, or their vulnerability to specific emotional and/or behavioral problems (those gender differences will be discussed in the next section, and more extensively in Chapters II, III, and IV; e.g., Buchanan et al., 1992; Collins & Steinberg, 2006; Galambos, Berenbaum, & McHale, 2009; Graber & Sontag, 2009; Muris et al., 2007; Steinberg & Morris, 2001; Susman & Dorn, 2009; Tackett, 2006).

Adolescence is a crucial period also for the cognitive maturation. For example, during this period several cognitive changes occur, such as the increase of decision-making, deductive reasoning, information processing, abstract thinking, and moral reasoning (e.g., Cauffman & Steinberg, 2000; Collins & Steinberg, 2006; Eisenberg et al., 2005; Eisenberg et al., 2009; Keating, 2004; Steinberg & Cauffman, 1996). In addition, this period is crucial for a solid construction of identity and Self (Berzonsky, 2004).

During adolescence, there are a variety of changes in the domain of interpersonal relations. Interactions with parents that from infancy trough childhood are one of the most important source of socialization, during adolescence tends to decrease, and youths tend to spend more time alone or with peers (Collins & Laursen, 2004). Moreover, relations with friends, as well as romantic

relationships, become increasingly important, and the quality of those relationships, as well as, adolescents' relational abilities, can influence youths' positive developmental pathways, because those new relational contexts have an impact on their socialization skills and adjustment overtime. In fact, the way in which adolescents deal with peer and romantic relationships set the basis for later relational experiences in adulthood (Connoly & McIsaac, 2009; Laursen & Collins, 2009).

It is important to consider also the influence of ethnicity and culture in adolescents' development: a growing body of research showed that adolescents' culture can influence some aspects of their development, such as the identity formation processes, the relationships with parents and the parenting strategies (e.g., Collins & Steinberg, 2006; Di Giunta et al., 2018; Fuligni, Hughes & Way, 2009; Lansford et al., 2004; Lansford et al., 2018; McLaughlin, Hilt, & Nolen-Hoeksema, 2007; Steinberg & Morris, 2001). For what concerns the domains that are strictly connected with the present dissertation, previous research emphasized that temperamental characteristics (such as emotionality and self-regulation) or personality traits substantially emerged in a similar way across different cultures, especially the Western cultures (e.g., Ahadi, Rothbart & Ye, 1993; Caspi, Roberts, & Shiner, 2005; Rothbart, Ahadi & Evans, 2000), but the way in which these characteristics are displayed can be affected by several environmental aspects, such as cultural norms and social values, especially during adolescence (we will discuss this point in Chapter III; Caspi, Roberts, & Shiner, 2005; Chen, Yang & Fu, 2012). Adolescents' culture can have an impact also in the way in which youths are more exposed to emotional or behavioral problems, as well as the development of these problems; previous research underlined that culture may affect the prevalence, the phenomenology, or the course of these symptoms (e.g., Achenbach, Dumenci, and Rescorla, 2003; Crijnen, Achenbach, & Verhulst, 1997). Examples of these interactions will be discussed in Chapter IV.

Behavioral and Emotional Problems During Adolescence

As stated above adolescence is a crucial developmental period for individual adjustment overtime (e.g., De Fruyt & De Clerq, 2014). Understanding mechanisms, processes, and antecedents of those successful or unsuccessful developmental trajectories it is crucial for promoting youths and adults' mental health, and for preventing psychopathology (e.g., Compas & Reeslund, 2009).

A large body of research on clinical psychology and developmental psychopathology focused on several emotional and behavioral problems, such as internalizing or externalizing problems; internalizing problems concern mood and emotional problems, while externalizing problems concern mainly behavioral dysregulation (Achenbach, 1991; Graber & Sontag, 2009). Previous studies underlined that during adolescence the emergence of those emotional and behavioral problems tends to increase, and that they can have an impact on later adjustment or maladjustment (Zahn-Waxler, Shirtcliff, & Marceau, 2008). However, Compas and Reeslund (2009) suggest that,

"most adolescents traverse this developmental period successfully without encountering significant psychological, social, or health problems" (p. 561). Therefore, adolescent' developmental pathways may be very heterogeneous, and it is important to consider continuity and change of emotional and behavioral changes during adolescence, in order to discriminate pathways of "normative" emotional and dysregulated experiences (i.e., internalizing or externalizing experiences "typical" of this developmental period), from those experiences that, differently, can lead to psychopathology (Cicchetti & Cohen, 1995; Masten & Curtis, 2000).

Based on these premises, it is important to conceive adolescents' development within a life-span perspective (e.g., Lerner & Schulenberg, 1986) that view development as a process characterized by continuities and discontinuities, depending on how people **organize** and **integrate** their characteristics in terms of personality with the environmental demands related to the developmental period that they are living. This approach emphasizes the continuum between adjustment and maladjustment, as well as in the whole developmental process, and underlines the importance to consider individual differences in continuity and discontinuity, and how individual differences are related to successful or unsuccessful pathways over the life course (e.g., Cicchetti, 1993; Cicchetti & Rogosch, 2002). In this view, emotional and behavioral problems can be considered as a "discontinuity aspect", occurring within the hypothesized continuum of the average developmental trajectories, because they affect the way in which adolescents' deal with their developmental demands and changes (Cicchetti & Cohen, 1995; Masten & Curtis, 2000; Sroufe, 1990).

In examining continuity and discontinuity in the development of emotional and behavioral problems, it is important to consider how adolescents' gender can influence the development of these problems (those aspects will discuss more exhaustively in Chapters II and IV). Previous studies supported the role of gender in the emergence of emotional and behavioral problems, reporting that girls tend to be more introverted, shy, to internalize more their emotions and feelings than boys, that in turn can lead to incur in emotional problems (e.g., Hale et al., 2008; Zahn-Waxler, Shirtcliff, & Marceau, 2008; Zahn-Waxler et al., 2000). In contrast, boys tend to be more extroverted, less capable to interpret and interiorize negative feelings and thoughts (such as anger or frustration), which in turn can lead them to be more vulnerable to behavioral problems (e.g., Farrington, 2009; Zahn-Waxler et al., 2000).

Another source of individual differences is adolescents' culture (this point will discuss more exhaustively in Chapter III and IV). Cultural norms and social values, that are two core aspects of culture differences, can influence adolescents' development, because they can affect both social environments in which youths develop (i.e., relationships with parents and peers), as well as their maturation, differentiation, and their pathways to adjustment overtime. Culture can have an impact both directly on the emergence of emotional and behavioral problems (i.e., because it can influences the normativeness of developmental pathways, and can increases individual differences leading to

adjustment), as well as indirectly (i.e., because it can affects other aspects, such as the different vulnerability between boys and girls that can lead to emotional or behavioral problems; e.g., Achenbach, Dumenci, & Rescorla, 2003; Crijnen, Achenbach, & Verhulst, 1997; Compas & Reeslund, 2009; Di Giunta et al., 2018; Lansford et al., 2018).

These two preliminary sections emphasized the importance to take into account the whole adolescents' development pathways, as well as some of the key aspects that may affects this process. In particular, in the present dissertation, we focused on the moderating role of gender in adolescents' development; in addition, in the last two studies we considered also the role of adolescents' culture in their development across adolescence.

Individual differences in Personality and Temperament

One of the core aspects of personality research is its focus on *individual differences* that represent the infinite number of ways in which individuals differ from each other (John, Robins, & Pervin, 2008). The key point, in this field, is to identify or summarize the most important aspects or dimensions of individual functioning that are reflected by those differences, such as psychological, cognitive, and emotional aspects of individual's human nature (John, Robins, & Pervin, 2008). Individual differences emerge during the development, and they came from biological (i.e., heritable aspects) and contextual (i.e., non-heritable aspects) factors that interact each other. Individual differences in thinking, behaving, and experience emotions can lead people to adaptive or maladaptive pathways across the lifespan, so the study of individual differences is crucial to better understand the variety of individual developmental routes that people follow along their lives (Buss & Greiling, 1999; John, Robins, & Pervin, 2008; Plomin, DeFries, & McClearn, 1990).

The most relevant individual differences addressed in the study of in individual functioning may be traced back to the constructs of "personality" and "temperament", that Caspi and colleagues considered as two interconnected facets of individual differences (Caspi, Roberts & Shiner, 2005; Matthews, 2009; McCrae et al., 2000). In this view, "temperament represents the affective, activational, and attentional core of personality, whereas personality includes…the content of thought, skills, habits, values, defenses, morals, beliefs, and social cognition" (Rothbart & Bates, 2006, p. 100). In line with this view, "personality characteristics" can be defined as "broader range of individual differences in thinking, feeling, and behaving" (Caspi, Roberts, & Shiner, 2005, p. 454), related to many different behaviours that can be solicited differently, depending on the individual's perception of the relevance of the situation (Matthews, 2009; Wright & Mischel, 1987). Personality characteristics encompass specific patterns of "thoughts, emotion, and behaviour that show consistency across situations and stability overtime" (Rothbart & Bates, 2006; p. 100).

As regards temperament, it concerns those behavioural characteristics relatively stable across different situations and overtime, but that appears earlier in life compared to personality aspects, and that have a strong emotional and self-regulative nature, and biological basis (Bates, 1987; Goldsmith et al., 1987; Rothbart & Bates, 2006; Shiner, 1998). Temperamental characteristics are "limited to basic processes of reactivity and self-regulation, and do not include the specific content of thought" (Rothbart & Bates, 2006; p. 100), as in the case of personality characteristics. Several researches supported a certain convergence between early childhood temperament and later adolescence and adulthood personality characteristics, and they have supported the existence of a continuum between personality and temperament structure across the lifespan (Caspi & Roberts, 1990; Matthews, 2009).

Personality and Temperament Structure

According with previous research, both personality and temperamental characteristics can be operationalized into macro-categories, definable "traits": personality traits are considered more inclusive, broader, *higher-order* traits, while temperamental traits are considered as narrow, *low-level* traits (Caspi, Roberts & Shiner, 2005; Rothbart & Bates, 1998; Tackett, 2006).

The present contribution considers one of the most accredited models for understanding the structure of personality, the "Big Five" or the "Five Factors" Model (Caprara et al., 1993; Digman, 1990; 1997; McCrae & Costa, 1995), which conceived personality as a complex combination of individual characteristics, which are an expression of thoughts, feelings and actions; in line with this model, there are five major personality characteristics, or traits, namely Extraversion/Energy, Agreeableness, Conscientiousness, Neuroticism/Emotional Stability, and Openness (this model will be explained exhaustively in Chapter 2). For what concerns temperament, this contribution assumed the model proposed by Rothbart and colleagues (Evans & Rothbart, 2007; Rothbart, 2007), which conceived temperament as individual differences in emotional, attentional and cognitive reactivity, as well as self-regulation mechanisms that modulate this reactivity; according with this theorization, there are three main temperamental characteristics, namely Effortful Control, Negative Affectivity, and Extraversion/surgency (this model will be explained exhaustively in Chapter 3). Those two models of personality and temperamental structure shared some macro-domains, as follow (Shiner & De Young, 2013):

- The domain of *Extraversion/Positive Emotionality*: people actively engage the world or avoids intense social experiences. In childhood, this trait is associated with the expression of positive emotions, whereas in adults is linked with positive moods (Goldsmith, 1996; Lemery et al., 1999; Watson & Clark, 1997).
- The domain of *Neuroticism/Negative Emotionality*: people experience the world as distressing or threatening. This trait concerning individual differences in susceptibility to

negative emotions (sadness, anxiety, fear, anger, or frustration); previous studies hypothesized two distinct low-order traits, one referred to anxiety and one referred to anger/frustration (Shiner & Caspi, 2003). In childhood, this trait is associated with difficulties in settling emotions when children are in aroused contexts, whereas in adults is linked with the general tendency to experience negative emotions, with the vulnerability to stressful situations, and with the tendency to incur in negative relationships (Tellegen, 1985; Watson & Clark, 1984).

- The domain of *Conscientiousness/Constraint*: concerning the strength and the extent of impulse control (delay of gratification, modulate impulsive expressions). This trait concerning individual differences in cognitive, behavioral, and emotional control, as well as the voluntary control of behavior (i.e., the Effortful Control dimension; Eisenberg et al., 2000; Rothbart et al., 2001). In childhood, this trait is associated with the capacity to control and constraint behaviors and responses, with the capacity to focus and shift attention, and with the capacity to be responsible, attentive, and persistent; in adults this trait is linked with the capacity to employ voluntary control, with cognitive, behavioral, and emotional self-regulation, and with the capacity to be attentive, careful, persistent, and planful (Eisenberg et al., 2000; Rothbart et al., 2001; Posner & Rothbart, 2000).

In addition, the Five-Factor model of personality includes two additional domains:

- The domain of *Agreeableness*: people's interpersonal behaviors (warmth or antagonism). This trait concerning individual differences in empathic, altruistic, helpful, and trusting behaviors and thinking towards others, as well as prosocial behaviors (Graziano & Eisenberg, 1997). In childhood, this trait is associated with the natural tendencies of behaving with warmth or antagonism through relationship with others, while in adults is linked with the capacity to be cooperative, kind, empathic, or cynical, aggressive, manipulative with others (Caspi, Roberts, & Shiner, 2005). The two poles of this trait, prosocial and antisocial tendencies, have been largely studied separately, and results showed a great connection between Agreeableness and Neuroticism (control of negative emotions-experience of negative emotions; Martin et al., 2000), as well as the link between Agreeableness and Conscientiousness (inhibition-disinhibition; Clark & Watson, 1999).
- The domain of *Openness to Experience*: people's mental and experiential life. This trait concerning individual differences referred to the complexity and the quality of individual's motivation to new experiences, and to knowledge. This trait is not included in temperamental models, because those tendencies appears later during the development, but several studies have shown associations between Openness and previous tendencies to seek stimuli and to explore actively new environments (Caspi, Roberts, & Shiner, 2005). In later childhood, this trait is associated with the general construct of Intellect (learning skills,

cleverness, insightful), whereas in adults is linked with the general construct of Openness (imagination, creativity, sensitivity to aesthetic, culturally opened) (Caspi, Roberts, & Shiner, 2005; John & Strivastava, 1999)

In line with previous studies that emphasized a convergence between temperamental and personality traits, temperamental traits in childhood can be considered as the "building blocks" of personality traits in adolescence and later adulthood, despite of the specific mechanisms beyond these relations, at the moment, are not fully clear, because of lack in empirical evidences (Shiner & Caspi, 2003). Although personality and temperamental characteristics showed several fundamental differences (Matthews, 2009; Strelau, 2001), these two domains have some theoretical and empirical features in common (Caspi, Roberts, & Shiner, 2005; McCrae et al., 2000): both personality and temperamental traits showed moderate genetic influences (Bouchard & Loehlin, 2001); they can shape developmental trends, and can be manipulated through experiences (Emde & Hewitt, 2001); in addition, some personality and temperamental aspects develop after early childhood, from middle childhood to adolescence (i.e., some self-regulative aspects, moral reasoning; Rothbart, Ahadi, & Evans, 2000). Another important similarity can be observed at the theoretical and operational level: both personality and temperamental models are hierarchically organized, with higher-order constructs (general dimensions), and lower-levels specific dispositions (Caspi, 1998; Rothbart & Bates, 1998; McCrae & Costa, 1995).

Individual Development: The Role of Personality and Temperament

As emphasized in the previous sections, individual differences in personality and temperamental structure can affect developmental pathways of people from the beginning of their lives throughout the whole lifespan. The study of how individual differences in the structure of personality and temperament can influence those pathways is crucial for understanding why some people follows successful trajectories in their lives, and why other people experience unsuccessful and negative events (e.g., Caspi, Roberts, & Shiner, 2005; John, Robins, & Pervin, 2008; Muris, 2006; Tackett, 2006). For simplicity, in line with the theoretical approach emphasized by Caspi and colleagues (e.g., Caspi & Roberts, 1990; 2001; Caspi, Roberts & Shiner, 2005; Shiner & Caspi, 2003) that underlined the continuity between personality and temperamental characteristics, in the following sections we referred to those two interconnected facets of individual differences using the general term of "personality".

A key point to understand how personality structure can influence individuals' development, is to consider several biological and contextual individual differences, such as gender or culture (as previously anticipated). For example, whereas previous studies supported the general structure of personality across gender, empirical results also attested gender differences in mean levels of personality traits (Costa et al., 2001; Rutter, Caspi, & Moffitt, 2003). In addition, previous studies

attested a similar structure in adults, as well as in younger people, in most of the western countries (i.e., Europe, or United States), but more research is needed to understand personality differences and structure in other countries (Caspi, Roberts, & Shiner, 2005). So, it is important to analyze the cross-cultural generalizability of the personality structure, especially in childhood and adolescence.

Personality and development: mediating mechanisms. Research emphasized the importance to take into account also the mechanisms through which personality can influence individual development in early development. As highlighted by Shiner and Caspi (2003), those mechanisms can be summarized in six different processes (Table 1; Shiner & Caspi, 2003). Those mechanisms are resulted of "person-environment transactions" (Shiner & Caspi, 2003, p. 10) that are the ways in which people engage with the surrounding world, and that represent the basic elaboration processes leading from early childhood's temperament to adolescents' and adults' personality.

Table 1

Processes through which personality and temperament may shape the development, adapted from Shiner and Caspi, 2003, p. 11

Emergence Period	Process	Personality Mechanism
First months of life	Learning Processes	Shape the child's experience of classical and operant conditioning
	Environmental elicitation	Shape the response of adults and peers to the child
Early and middle childhood	Environmental construal	Shape the ways that children interpret the environment and their experiences
	Social and temporal comparisons	Shape the ways children evaluate themselves relative to others and to themselves across time
Later childhood and adolescence	Environmental selection	Shape youths' choices about their day-to-day environments
	Environmental manipulation	Shape the ways in which youths alter, modify, and manipulate their environments

By the first months of life, personality influence individual experiences through several learning processes, such as reinforcement, or punishment; in this sense, parenting practices concerning children's socialization skills represent a key factor. For example, if children are anxious and interact with mothers that use power-assertive parenting strategies, they can incur in learning difficulties (Kochanska, 1997; Shiner & Caspi, 2003). In the same developmental period, personality can influence also the environmental elicitation; for example, different personality and

temperamental characteristics in children can elicit different responses in their parents (e.g., Eisenberg, Fabes, & Murphy, 1996; Eisenberg et al., 2005). In early and middle childhood, thanks to cognitive maturation and to the development of beliefs systems, personality can influence children's construction of their environments, as well as their self-evaluations about themselves; personality characteristics affects how environmental experiences are construed, and how children compare/contrast themselves to others (i.e., due to their socialization skills) and to themselves over time (i.e., temporal self-evaluation) (e.g., Arnett, 2000; Crick & Dodge, 1994; Derryberry & Reed, 1994).

Personality continue to influence individual development from later childhood to adulthood, affecting how adolescents select and manipulate their environments; people start to select environments (i.e., regarding their education, occupation, and relationships) that tend to support and fit with their personality characteristics; in addition, thanks to their refined self-regulatory capacities, youths learn to manipulate environments, in order to confirm and sustain their personality characteristics (e.g., Cole & Cole, 1996; McAdams, 1996; Magnus et al., 1993).

It is important to consider all these mechanisms underlying the association between personality and individuals' development, especially during the transition from childhood to adolescence, because, at this stage the development of some personality characteristics, such as self-regulatory abilities, self-concepts, or cognitive competences, is still an ongoing process, that can influence and can be influenced by the "person-environment transactions" (e.g. Rothbart, Ahadi, & Evans, 2000). Therefore, focusing on this developmental period become crucial in order to understand how individual differences in personality can affect concurrent and later development (e.g., Caspi, Roberts, & Shiner, 2005; Rothbart & Bates, 2006; Shiner & Caspi, 2003).

Influences between personality characteristics and individual development overtime can affect several important areas of individual functioning, such as the relational area, the occupational area, or individual's well-being.

- *Relational area*: personality can influence social competence. During childhood personality can influence the relationships with parents, whereas during adolescence personality significantly affect youths' capacity to establish successfully relationship with peers (i.e., friendship), as well as intimate and romantic relationships. Those influences take place due three mechanisms: people *select* others that are similar to themselves; people *react* to others following their own trait-correlated behaviors; people *evoke* others' behaviors reinforcing their own trait-correlated behaviors (Caspi, Roberts & Shiner, 2005; Shiner & Caspi, 2003; Yu et al., 2015).
- *Academic/occupational area*: personality can influence cumulatively academic and job achievement skills across the lifespan: starting from academic and school performances during childhood, personality can improve academic performance from early to late

adolescence (Shiner, 2000), that in turn can influence future orientations towards job and career searching, as well as job-related performances (Mount, Barrik & Stewart, 1998; Barrik & Mount, 1991; Barrick, Stewart, & Piotrowski, 2002). School adjustment and school performance are affected especially by the Conscientiousness/Constraint domain, which is fundamental for collecting successfully various performance tasks, but also by the Agreeableness and Openness domains (Shiner, 2000; Gerbino et al., 2018; Caspi, Roberts, & Shiner, 2005; Judge et al., 1999).

- *Well-being*: personality can influence health maintenance, promotion of physical integrity and well-being, affecting behaviors related to health, such as health-promoting or health-damaging behaviors: Conscientiousness can promote healthy and non-risky behaviors, such as coping behaviors, distress reduction, or treatment adherence (Caspi, Roberts, & Shiner, 2005); similarly, Disagreeableness and Neuroticism can promote damaging behaviors such as smoking, drinking, risky driving behaviors, or unhealthy eating behaviors (Caspi, Roberts, & Shiner, 2005).

According whit the above-mentioned theoretical premises, in the present dissertation we focused on individual differences in personality and temperamental structure in pre-adolescence, as well as on their relations with adolescents' developmental pathways during this period of life, taking into account some constitutional aspects, such as adolescents' gender and their culture.

Personality Continuity and Change

Developmental and personality psychologists agree on the fact that personality and temperament structure are not immutable and static, instead, they are interconnected with environment, and that experiences during the life span can influence these structures. Theoretical and empirical perspectives nowadays fit with the general idea that personality development in general is an ongoing process from childhood, through adolescence, and that tend to stabilize in adulthood (Caspi & Roberts, 2001). According with the *Aging Stability Theory* (Glenn, 1980), in line with the life-span developmental theories (e.g., Baltes, 1997), the current view of personality development consider psychological functioning as not fixed and immutable, instead can be considered as a continuous and discontinuous process of development, influenced by environment, such as social and cultural factors (e.g., Caspi & Roberts, 1990; Roberts, 1997; Roberts & Del Vecchio, 2000). Continuity and change, or continuity and discontinuity, are key points in the study of personality development. With the term "continuity", we referred to those individual differences in stability, constancy, persistence, and coherence of personality characteristics; synthetically, it refers to the consistency of a characteristic overtime (e.g., Caspi & Roberts, 2001; McAdams & Olson, 2010). In contrast, we considered personality "discontinuity", or change, when we focus on those individual

characteristics that differ overtime; as argued by Caspi and Roberts (1990; 1999; 2001), there are several types of continuity, or stability (for an exhaustive description, see Caspi & Roberts, 2001).

Mechanisms of continuity and change

As highlighted by Caspi and Roberts (1990; 2001), there are several mechanisms that can lead to continuity or change in personality over the life course, depending how individual differences affects individual's responses to contingencies overtime. Mechanisms that contribute to personality continuity and change overtime are summarized in Table 2.

Table 2

Mechanisms of Personality Continuity and Change (Caspi & Roberts, 1990; 2001)

	Mechanisms	Moderators of Continuity and Change
Continuity	Environmental Influences	Age, Time Span, and Method of Assessment
	Genetic Influences	
	Person-Environment Transactions	
Change	Responding to Contingencies	Biosocial Transitions
	Watching Ourselves	
	Watching Others	Historical Factors
	Listening to Others	

According with Caspi and colleagues' point of view (e.g., Caspi & Roberts, 1991; 2000), some of those mechanisms are more anchored to personality continuity, whereas other mechanisms are more anchored to change in personality overtime. *Environmental* influences, *genetic* influences, and *person-environment transactions* are mechanisms more anchored to personality continuity, as following:

a) Environment can contribute to personality continuity because environmental demands, experiences and influences in different contexts remain quite stable overtime. For example, experiences with parents, peers, or school-related experiences, are made up of some characteristics, the same characteristics, across time; this environmental stability can influence personality continuity, as well as individual differences can influence the environmental continuity, in a reciprocal process (Cairns & Hood, 1983; Plomin, 1994).

b) **Genetic** characteristics can contribute to personality continuity, due to physiological processes. This aspect was largely examined in twin-studies (e.g., De Fruyt et al., 2006; Plomin et al., 1993; Roberts, Wood, & Caspi, 2008), but at the moment more research is needed to well understand those processes. The general idea is that personality continuity may result of transactional processes, that can be in part affected by genetic factors.

c) During the life course there are many **transactions** that can contribute to personality continuity. These person-environment transactions resulting from the combination of individual differences and environmental characteristics, can be divided in six types (i.e., attractive, selective, reactive, evocative, proactive, de-selective; Caspi & Roberts, 2001; John, Robins, & Pervin, 2008). *Attractive* transactions occur when people tend to select environmental conditions that are in line with their individual characteristics (e.g., an extraverted adolescents prefers to stay with other extraverted adolescents); *selective* transactions occur when people select social roles that fit with their individual characteristics (e.g., opened and emotionally stable adolescents are involved in more romantic relationships than others); *reactive* transaction occur when people interpret in a subjective way objective environments, based on, and congruent with, their individual characteristics (e.g., an emotionally stable adolescent tends to interpret positively daily experiences, while an emotionally unstable adolescent tends to interpret daily experiences negatively, with feelings of anxiety, anger, etc.); *evocative* transactions occur when individual characteristics evoke specific responses from others (e.g., aggressive behaviors tend to evoke hostility from others); *proactive* transactions occur when people manipulate their environments, selecting or creating convenient new circumstances by their own (e.g., adolescents can change their school environment by re-organize their homework or their daily tasks); *de-selective* transactions (attrition with the environment) occur when people leave environments that they suppose to be over-demanding, or that do not fit with their individual characteristics (e.g., adolescents that broke up a romantic relationship).

As regards the mechanisms more anchored to personality discontinuity overtime, the abilities to reply to *environmental contingencies*, to *critically reflect* on their own actions, and to *watching and listening to others* can promote change in personality:

a) In a behaviourist perspective, people react to **environmental contingencies**, by changing their behaviors and creating new behaviors that will be maintained. Environmental contingencies can be divided into two types: implicit contingencies, that are unspoken expectations and demands, affected by the social context; explicit contingencies, that are concrete demands relevant for individual behavior (Kagan, 1994). For example, the way in which specific parenting practices influences children's psychological functioning is an example of these explicit influences (e.g., Thartori et al., 2018); expectations about the acquisition of a new social role (e.g., a leader position in a group), is associated with a variety of implicit demands that others consider appropriate for that role (Caspi & Roberts, 2001; John, Robins, & Pervin, 2008).
b) Another possible source of change is the individual ability to **reflect critically** on their owns actions and behaviors. This process is a result both of environmental contingencies

(reflecting on our behaviors in new situations) and self-insight (focusing in deep on our behaviors, in order to activate different behaviors in future; Deci & Ryan, 1990; Kohn & Schooler, 1983).

c) At least, according with the Bandurian approach (Bandura, 1977; 1986), individuals can learn and modify their own behaviors by **watching and listening to others**. People can achieve different perspective and different behaviors through the observation of other significant individuals, like parents and siblings, friends, and teachers in childhood and adolescence, as well as coaches, mentors, or boss in adulthood (Bandura, 1986; Chao, 1997; Holland, 1996). In addition, people can change their behaviors also through the interactions with others, and through the feedback that they provide to them (Blumer, 1986).

Overall, as underlined by Caspi and Roberts, those mechanisms "can work any time to engender continuity and change" (Caspi & Roberts, 1990; p. 319), and they can affect both continuity and discontinuity in personality development. For example, people try to select environments and events that fit with their own personality characteristics, but in some cases, even when individual proactively pick up environments, those selections do not fit perfectly, and several "imperfections", such as over demandingness, can lead to discontinuity in personality (Caspi & Roberts, 1990; 1999; 2001).

In examining the mechanism involved in continuity and change of personality, research emphasized the role of some moderators (i.e., age, biosocial transition and historical factors) that affect the way in which the above-mentioned mechanisms (summarized in Table 2) influence personality development during the lifespan, and promote continuity or discontinuity overtime. With regards to the role of age, previous studies attested the association between individuals' age and the increase in personality continuity overtime. As argued by Caspi and Roberts (2001), "personality appears to grow increasingly consistent with age and to reach a plateau later in life" (p. 51), and its stability peaks by age 50 to 70 (Roberts & Del Vecchio, 2000). It means that stability of personality may increase or decrease depending on age. Furthermore, according with a life-course perspective, **biosocial transitions** (e.g., puberty, become an adult, find a job, marriage, become parents, etc.) may influence personality changes overtime, because people can reply differently to those transitions: different individuals can show different responses to the same event, according with their own personality characteristics (Caspi & Roberts, 2001). In addition, individual responses can be influenced also by the developmental period in which a certain transition occurs; in fact, some transitional experiences are more anchored to specific developmental periods than others (Caspi & Moffit, 1993). According with the paradoxical theory (Stewart, Sokol, Healy, & Chester, 1986), transitions that occur when they are more expectable can buffer personality change, whereas transitions that occur unexpectedly promote continuity in personality: biosocial discontinuities (i.e., new and unexpected events) elicit more dispositional responses in individuals, because their kind of

struggles with these unexpected events is greater, so they can promote continuity (Caspi & Roberts, 2001). It is also fundamental to take into account the **historical period** in which theories and empirical findings are anchored. Both theories and empirical findings are conditioned by the historical period in which they emerged, or they were investigated, and they are socially constructed, despite they were generally considered as trans-historically valid (Caspi & Roberts, 2001). For example, some psychological processes operate in the same way in different historical periods, but some specific relations among specific personality characteristics and different outcomes may be historically influenced (i.e., associations between neuroticism and life events; Jeronimus et al., 2014). This issue represents one of the biggest limitations in longitudinal studies on individual development. As suggested by Caspi and colleagues (Caspi & Roberts, 1990; 2001; John, Roberts, & Pervin, 2008), developmental research would benefit from using multi-cohort samples, or different samples born in different periods, in order to test whether empirical findings can be extended in different historical periods.

Following this theoretical approach, in the present dissertation we considered personality and temperamental as antecedents of adolescents' development, focusing on those mechanisms that can lead youths to change their developmental pathways, as well as their longitudinal associations with emotional and behavioral problems.

Relations between Individual Differences and Maladjustment

A key point for understanding associations between personality and adjustment over the life course is to focus on continuity/discontinuity between personality structure and individual's developmental pathways overtime. This research question was largely investigated in the field of adults' clinical psychopathology, but growing evidences supported the importance to assume a life-span perspective, in order to understand how individual differences in personality development can be related to adjustment ad earlier stages, such as childhood and early adolescence (Krueger & Tackett, 2003; Widiger, Verheul, & van den Brink, 1999). A growing body of research support the role of personality in predicting adjustment overtime: it is now well known that some individual differences in personality can be considered as predictors of emotional and behavioral problems (e.g., Castellani et al., 2014; Klimstra et al., 2010; Krueger & Tackett, 2003; Maher & Maher, 1994; Tackett, 2006; Thartori et al., 2018).

Several theoretical models were proposed for explaining relations between personality and psychopathology, developed with adults but applicable also to children and adolescents (e.g., Caspi & Shiner, 2006; Shiner & Caspi, 2003). In particular, four models were proposed: the complication/scar model, the pathoplasty/exacerbation model, the vulnerability model, and the spectrum model (Tackett, 2006).

1 – The *complication* (scar) model: considers a psychopathology as a result of an individual's premorbid personality, that can influence that personality characteristic; for example, low levels of emotional stability can lead to some anxiety or depressive symptoms, that can lead to lower emotional stability.

2 – The *pathoplasty* (exacerbation) model: hypothesized that the emergence of a psychopathology can be influenced by an individual's pre-existing characteristic, that can affect the presentation, the severity, the course, and the resolution of that psychopathology; for example, an individual with a substance dependence problem, can be affected by his high level of inhibition which can lead to an increase in the severity of that problem.

3 – The *vulnerability* (predisposition) model: postulate that specific personality or temperamental characteristic can increase or decrease individual's vulnerability to incur in a particular form of psychopathology, which can affect also the severity and the maintenance of that psychopathology; for example, low conscientiousness can be associated with higher risk to incur in conduct or antisocial disorders, from childhood to adulthood, because of low inhibition.

4 – The *spectrum* model: posit that a manifestation of a psychopathology or a problematic behavior can be considered on a continuum, from adjustment to maladjustment, so the association between personality and psychopathology is a dimensional relation, hypothesized common processes underlying some personality characteristics and some disorders; for example, shyness and internalizing problems shared some predictors and common underlying processes.

At the moment more research is needed to clarify specific processes underlying the afore-mentioned four models for understanding relations between personality and psychopathology. It is important to take in mind the crucial role of continuity and change of individual development overtime, in order to focus on a more comprehensive picture of those relations in a developmental perspective (Caspi & Shiner, 2006; Tackett, 2006). In line with previous research, it is reasonable that each model can provide theoretical support for a specific research question, and each model can explain a specific link between emotional and behavioral problems and individual differences: for example, analyzing the extent to which individual differences in personality structure can predispose people to later specific unsuccessful pathways can provide support for the vulnerability model (Tackett, 2006). Nonetheless, as argued by Shiner and Caspi (2003), "longitudinal studies in which temperament, or personality, is measured prior to the emergence of psychopathology provide the most compelling evidence of a possible causal association" (p. 18). As a result, the vulnerability model can theoretically explain how early adolescents' personality can affects the development of emotional and behavioral problems later during adolescence, according with a dimensional conceptualization of the relation between personality and adjustment. Following this reasoning, in the present dissertation, we provided empirical findings for the vulnerability model, for explaining relations

between personality and temperamental characteristics and the development of emotional and behavioral problems during adolescence.

A Different Point of View in the Study of Individual Differences across the Development: A Person-centered Approach

In the previous section we discussed several theoretical models for explain the relationships between personality and individual adjustment overtime. Previous research emphasized the importance to assume an overarching approach in order to consider the associations between personality and emotional/behavioral problems in the light of the developmental continuum between adjustment and maladjustment over the life course (e.g., Asendorpf, 2003; Hart, Atkins, & Fegley, 2003). In this view, a crucial point is how those relationships between personality and adjustment are operationalized. In a developmental perspective, there are two main approaches largely use for the study of personality and its relations with problematic behaviors across time: the Variable- and the Person-centered approach. The *variable-centered approach* focused on the systematization of differences between individuals based on single variables (Caspi, Roberts, & Shiner, 2005). This approach aims to analyze specific psychologically meaningful characteristics (i.e., behaviors), but ignores inter-individual differences in the development, individual differences in the organization of personality and behaviors, and the specific individual mechanisms underlying relationships with specific environments (Asendorpf, 2015). In contrast, the *person-centred approach*, or the *typological* approach, focused on the overall structure of personality within individuals (Caspi, Roberts, & Shiner, 2005). This approach is more meaningful in terms of development, because it aims to analyze the inter-individual differences in the structure of individual functioning. In other words, the focus of this approach is to analyze the inter-individual differences of individual consistency (Asendorpf, 2002; 2015; Bergman, Magnusson, & El-Khouri, 2002).

According with Magnusson (2003), the person-centered approach is "the combination of a holistic-interactionistic theoretical perspective on developmental processes and a specific measurement model that considers the main properties of the dynamic, complex character of the developmental processes of the individual as an integrated psychological, biological, and social being" (Magnusson, 2003; p. 3). By assuming that, there are three theoretical assumptions (Magnusson, 2003; 1988):

1. People and contexts are in a mutual, reciprocal relation, in a complex, integrated, and dynamic person-environment system. Individual development is a result of those continuous interactions.

2. Characteristics of both individual (biology, and behaviors) and environment (society, culture, and physical contexts) are involved in the person-environment system, which lead to change, development, and maturation in people overtime.
3. A focal point for the developmental research would be to contribute to the knowledge about how those mechanisms of continuous interactions between individual and environment works.

This approach is in line with all the theorizations previously presented about personality continuity and change: if we consider people as "active and proactive in the context", the development is a complex process in which transformations and transactions happened for the whole life course. Those transactions influence individual development, as well as individual differences in continuity and change (Caspi & Roberts, 2001; Magnusson, 2003). In other words, "the implicit assumption that every behavior is the product of a single trait is implausible, because each individual is characterized by a personal pattern of multiple traits, working additively and interactively to influence behavior" (Shiner & Caspi 2003; p. 17). As highlighted by Asendorpf (2002; 2006), behaviors are products of different aspects of personality that operate in concert, and that influence each other. In a developmental perspective, it is crucial to consider development in a holistic view, in order to emphasize the continuous interactions among different domains of personality (Asendorpf, 2002; Shiner & Caspi, 2003).

The person-centered approach can be considered as the operationalization of the holistic-interactionistic theory of human development (Magnusson, 2003). In fact, individual development can follow different trajectories, based on their cognitive, personality and behavioral components; therefore, it is possible to organize, or "classify" those individual patterns of functioning into several, finite, number of specific patterns (Asendorpf, 2006; 2015; Block, 1971; Block & Block, 1980; Magnusson, 2003). Following this reasoning, in the present dissertation we adopted the person-centered approach, in order to identify and confirm patterns of functioning based on personality and temperamental characteristics, during adolescence.

Outline of the Dissertation

According to the above-mentioned theoretical premises, the general aim of the present dissertation was to focus on some domains of individual global functioning in adolescence, such as personality characteristics, that has been addressed considering personality traits according to the Big Five Model (Caprara et al., 1993; Digman, 1990; 1997; McCrae & Costa, 1995), and several temperamental dimensions, such as negative emotionality and self-regulation (e.g., Evans & Rothbart, 2007; Rothbart, 2007). The general idea was to investigate patterns of individual functioning based on these personality dimensions, in order to identify a finite number of profiles

according with the persona-centered approach (Magnusson, 2003). In addition, the present dissertation focused on the longitudinal associations between profiles of individual functioning and some indicators of maladjustment across adolescence, considering several emotional and/or behavioral problems that are extremely relevant during adolescence, such as internalizing and externalizing symptoms (Achenbach, 1991; Cicchetti & Rogosch, 2002; Graber & Sontag, 2009). Finally, another general aim of the present dissertation was to consider cross-cultural and gender differences, both in the profiles' structures, as well as in the associations between the profiles and the indicators of maladjustment across adolescence. In fact, as previously mentioned, a large body of research highlighted the importance to consider individual's culture and gender in these issues, in order to take into account cultural and gender differences in individual global functioning (e.g., Caspi, Roberts & Shiner, 2005; Rothbart & Bates, 2006), as well as in the developmental pathways of emotional and behavioral problems (e.g., Crijnen, Achenbach, & Verhulst, 1997; Di Giunta et al., 2018; Lansford et al., 2018; Zahn-Waxler, Shirtcliff, & Marceau, 2008).

In order to address these issues, the present dissertation was organized into three different studies, each of them with a specific research question, summarized as follow:

Chapter II was aimed to examine the associations among early adolescents' personality profiles and different indicators of internalizing and externalizing problems three years later. In addition, the moderating role of gender in these associations was explored.

Chapter III was aimed to identify patterns of temperamental domains among early adolescents of three different cultures, based on narrow dimensions of self-regulation and negative emotionality. In addition, we explored the associations among those patterns, adolescents' gender and their culture.

Chapter IV was aimed to analyze the specific links between the profiles that will emerge in the previous study and the development of Internalizing problems (i.e., Anxiety and Affective problems) in boys and girls from early to middle adolescence, controlling for adolescents' culture.

Finally, in **Chapter V** were presented the general conclusions of this dissertation, and the theoretical and empirical contributions of the results derived from the three studies.

REFERENCES

Achenbach T. M., (1991) Integrative guide for the 1991 CBCL/4-18, YSR and TRF profiles. Burlington: Department of Psychiatry, University of Vermont

Achenbach, T. M., Dumenci, L., & Rescorla, L. A. (2003). Are American children's problems still getting worse? A 23-year comparison. *Journal of Abnormal Child Psychology*, *31*(1), 1-11. DOI: 10.1023/A:1021700430364

Ahadi, S. A., Rothbart, M. K., & Ye, R. M. (1993). Child temperament in the U.S. and China: Similarities and differences. European Journal of Personality, 7, 359-378. DOI: 10.1002/per.2410070506

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist*, *55*(5), 469. DOI: 10.1037/0003-066X.55.5.469

Asendorpf, J. B. (2002). The puzzle of personality types. *European Journal of Personality*, *16*(S1), S1-S5. DOI: 10.1002/per.446

Asendorpf, J. B. (2003). Head-to-head comparison of the predictive validity of personality types and dimensions. *European Journal of Personality*, *17*(5), 327-346. DOI: 10.1002/per.492

Asendorpf, J. B. (2006) Typeness of Personality Profiles: A Continuous Person-Centred Approach to Personality Data. *European Journal of Personality*, 23, 83-106. DOI: 10.1002/per.575

Asendorpf, J. B. (2015). Person-centered approaches to personality. *APA handbook of personality and social psychology*, *4*, 403-424. DOI: 10.1037/14343-018

Baltes, P. B. (1997). On the incomplete architecture of human ontogeny: Selection, optimization, and compensation as foundation of developmental theory. *American psychologist*, *52*(4), 366. DOI: 10.1037/0003-066X.52.4.366

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191. DOI: 10.1037/0033-295X.84.2.191

Bandura, A. (1986) Social foundations of thought and action: A social-cognitive view. *Englewood Cliffs, NJ*, *1986*. Prentice.

Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel psychology*, *44*(1), 1-26. DOI: 10.1111/j.1744-6570.1991.tb00688.x

Barrick, M. R., Stewart, G. L., & Piotrowski, M. (2002). Personality and job performance: test of the mediating effects of motivation among sales representatives. *Journal of Applied Psychology*, *87*(1), 43. DOI: 10.1037//0021-90I0.87.1.000

Bates, J. E. (1987). Temperament in infancy. In JD Osofsky (Ed.), Wiley series on personality processes. *Handbook of infant development* (pp. 1101-1149). Oxford, England: John Wiley & Sons.

Bergman, L. R., Magnusson, D., & El Khouri, B. M. (2003). *Studying individual development in an interindividual context: A person-oriented approach*. Psychology Press.

Block, J. (1971). *Lives through time*. Berkeley: Psychology Press.

Block, J. H., Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.). *Development of cognition, affect, and social relations: The Minnesota symposia on child psychology* (Vol. 13, pp. 39-103). Hillsdale, NJ: Erlbaum.

Blumer, H. (1986). Symbolic interactionism: Perspective and method. *University of California Press.*

Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard university press.

Bouchard Jr, T. J., & Loehlin, J. C. (2001). Genes, personality and evolution. *Behavior Genetics*, *31*, 243-273. DOI: 10.1023/A:1012294324713

Buchanan, C. M., Eccles, J. S., & Becker, J. B. (1992). Are adolescents the victims of raging hormones? Evidence for activational effects of hormones on moods and behavior at adolescence. *Psychological Bulletin, 111*(1), 62-107. DOI: 10.1037/0033-2909.111.1.62

Buss, D. M., & Greiling, H. (1999). Adaptive individual differences. *Journal of Personality*, 67, 209–243. DOI: 10.1111/1467-6494.00053

Cairns, R. B., & Hood, K. E. (1983). Continuity in social development a comparative perspective on individual difference prediction. *Life-span development and behavior*.

Caprara, G. V., Barbaranelli, C., Borgogni, L., & Perugini, M. (1993). The "Big Five Questionnaire": A new questionnaire to assess the five-factor model. *Personality and individual Differences*, *15*(3), 281-288. DOI: 10.1016/0191-8869(93)90218-R

Caspi, A. (1998). Personality development across the life course. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), Handbook of child psychology: Vol. 3. Social, emotional, and personality development (5th edn, pp. 311–388). New York: Wiley

Caspi, A., & Moffitt, T. E. (1993). When do individual differences matter? A paradoxical theory of personality coherence. *Psychological Inquiry*, *4*(4), 247-271. DOI: 10.1207/s15327965pli0404_1

Caspi, A., & Roberts, B. W., (1990). Personality continuity and change across the life course. In *Handbook of personality: Theory and research*, *2*, 300-326.

Caspi, A., & Roberts, B. W. (1999). Personality change and continuity across the lifetime. *Handbook of personality: theory and research. 2nd ed. New York: Guilford*, 300-26.

Caspi, A., & Roberts, B. W. (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry*, *12*(2), 49-66. DOI: 10.1207/S15327965PLI1202_01

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, *56*, 453-484. DOI: 10.1146/annurev.psych.55.090902.141913

Caspi, A., & Shiner, R. L. (2006) Personality development. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of Child Psychology: Vol. 3. Social, emotional, and personality development* (6 ed). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0306

Castellani, V., Pastorelli, C., Eisenberg, N., Gerbino, M., Di Giunta, L., Ceravolo, R., & Milioni, M. (2014). Hostile, aggressive family conflict trajectories during the transition to adulthood: Associations with adolescent Big Five and emerging adulthood adjustment problems. *Journal of Adolescence*, *37*(5), 647-658. DOI: 10.1016/j.adolescence.2013.12.002

Cauffman, E., & Steinberg, L. (2000). Researching adolescents' judgment and culpability. In T. Grisso & R. G. Schwartz (Eds.), *Youth on trial: A developmental perspective on juvenile justice* (pp. 325-343). Chicago, IL, US: University of Chicago Press.

Chen, X., Yang, F., & Fu, R. (2012). Culture and temperament. In M. Zentner, & R. L. Shiner (Eds.), Handbook of temperament (pp. 462-478). New York: The Guildford Press.

Chao, G. T. (1997). Mentoring phases and outcomes. *Journal of vocational behavior*, *51*(1), 15-28. DOI: 10.1006/jvbe.1997.1591

Cicchetti, D. (1993). Developmental psychopathology: Reactions, reflections, projections. *Developmental review*, *13*(4), 471-502. DOI: 10.1006/drev.1993.1021

Cicchetti, D., & Cohen, D. (1995). Perspectives on developmental psychopathology. In D. Cicchetti & D. Cohen (Eds.), Developmental Psychopathology: Vol. 1. Theory and methods (pp. 3–20). New York: Wiley.

Cicchetti, D., & Rogosch, F. A. (2002). A developmental psychopathology perspective on adolescence. *Journal of consulting and clinical psychology*, *70*(1), 6. DOI: 10.1037/0022-006X.70.1.6

Clark L. A., & Watson D., (1999). Temperament: a new paradigm for trait psychology. In *Handbook of Personality: Theory and Research,* ed. L. A. Pervin, O. P. John, pp. 399–423. New York: Guilford. 2nd ed.

Cole, M., & Cole, S.R. (1996). The development of children (3rd edn). New York: W.H. Freeman.

Collins, W. A., & Steinberg, L. (2006). Adolescent development in interpersonal context. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology, vol. 3: Social, emotional, and personality development* (6th ed., pp. 1003 – 1067). Hoboken, NJ: John Wiley & Sons. DOI: 10.1002/9780470147658.chpsy0316

Collins,W. A., & Laursen, B. (2004). Parent-adolescent relationships and influences. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 331–361). New York: Wiley. DOI: 10.1002/9780471726746.ch11

Compas, B. E., & Reeslund, K. L. (2009) Processes of Risk and Resilience During Adolescence. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy001017

Connolly, J. A., & McIsaac, C. (2009) Romantic Relationships in Adolescence. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 2: Contextual Influences On Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy002005

Costa Jr, P. T., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: robust and surprising findings. *Journal of personality and social psychology*, *81*(2), 322. DOI: 10.1037/0022-3514.81.2.322

Crick N. R., & Dodge K. A. (1994). A review and reformulation of social information processing mechanisms in children's social adjustment. *Psychological Bullettin*. 115:74–101. DOI: 10.1037/0033-2909.115.1.74

Crijnen, A. A. M., Achenbach, T. M., & Verhulst, F. C. (1997) Comparisons of Problems Reported by Parents of Children in 12 Cultures: Total Problems, Externalizing, and Internalizing. *Journal of the*

American Academy of Child & Adolescent Psychiatry, 36, 1269-1277. DOI: 10.1097/00004583-199709000-00020

De Fruyt, F., & De Clercq, B. (2014). Antecedents of personality disorder in childhood and adolescence: toward an integrative developmental model. *Annual review of clinical psychology*, *10*, 449-476. DOI: 10.1146/annurev-clinpsy-032813-153634

De Fruyt, F., Bartels, M., Van Leeuwen, K. G., De Clercq, B., Decuyper, M., Mervielde, I. (2006) Five types of personality continuity in childhood and adolescence. *Journal of Personality and Social Psychology* 91(3):538–52. DOI: 10.1037/0022-3514.91.3.538

Di Giunta, L., Iselin, A. R., Lansford, J. E., Eisenberg, N., Lunetti, C., Thartori, E., Basili, E., Pastorelli, C., Bacchini, D., Uribe Tirado, L. M., & Gerbino, M. (2018). Parents' and early adolescents' self-efficacy about anger regulation and early adolescents' internalizing and externalizing problems: A longitudinal study in three countries. *Journal of adolescence*, *64*, 124-135. DOI: 10.1016/j.adolescence.2018.01.009

Deci, E. L., & Ryan, R. M. (1990). A motivational approach to self: Integration in personality. In R. A. Dienstbier (Ed.), *Perspectives on motivation: Nebraska Symposium on Motivation.* (pp. 237–288). Lincoln: University of Nebraska Press.

Derryberry, D., & Reed, M.A. (1994b). Temperament and the self-organization of personality. *Development and Psychopathology, 6*, 653–676. DOI: 10.1017/S0954579400004727

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual review of psychology*, *41*(1), 417-440. DOI: 10.1146/annurev.ps.41.020190.002221

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of personality and social psychology*, *73*(6), 1246. DOI: 10.1037/0022-3514.73.6.1246

Berzonsky, M. D. (2004). Identity processing style, self-construction, and personal epistemic assumptions: A social-cognitive perspective. European Journal of Developmental Psychology, 1(4), 303-315. DOI: 10.1080/17405620444000120

Eisenberg, N., Fabes, R. A., & Murphy, B. C. (1996). Parents' reactions to children's negative emotions: Relations to children's social competence and comforting behavior. *Child development*, *67*(5), 2227-2247. DOI: 10.2307/1131620

Eisenberg, N., Guthrie, I. K., Fabes, R. A., Shepard, S., Losoya, S., Murphy, B. C., et al. (2000). Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. *Child Development, 71,* 1367−1382. DOI: 10.1111/1467-8624.00233

Eisenberg, N., Sadovsky, A., Spinrad, T. L., Fabes, R. A., Losoya, S. H., Valiente, C., ... & Shepard, S. A. (2005). The relations of problem behavior status to children's negative emotionality, effortful control, and impulsivity: concurrent relations and prediction of change. *Developmental psychology*, *41*(1), 193. DOI: 10.1037/0012-1649.41.1.193

Eisenberg, N., Valiente, C., Spinrad, T. L., Cumberland, A., Liew, J., Reiser, M., Zhou, Q., & Losoya, S. H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental psychology*, *45*(4), 988. DOI: 10.1037/a0016213

Emde R. N., & Hewitt J. K., (2001). Infancy to Early Childhood: Genetic and Environmental Influences on Developmental Change. New York: *Oxford University Press*

Evans, D. E., & Rothbart, M. K. (2007). Developing a model for adult temperament. *Journal of Research in Personality*, *41*(4), 868-888. DOI: 10.1016/j.jrp.2006.11.002

Farrington, D. P. (2009) Conduct Disorder, Aggression and Delinquency. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy001021

Fuligni, A. J., Hughes, D. I., & Way, N. (2009) Ethnicity and Immigration. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 2: Contextual Influences On Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy002016

Galambos, N. L., Berenbaum, S. A., & McHale, S. M. (2009) Gender Development in Adolescence. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy001011

Gerbino, M., Zuffianò, A., Eisenberg, N., Castellani, V., Luengo Kanacri, B. P., Pastorelli, C., & Caprara, G. V. (2018). Adolescents' prosocial behavior predicts good grades beyond intelligence and personality traits. *Journal of personality*, *86*(2), 247-260. DOI: 10.1111/jopy.12309

Glenn, N. D. (1980). Values, attitudes, and beliefs. In O. G. Brim, Jr.& J. Kagan (Eds.), Constancy and change in human development (pp. 596–640). Cambridge, MA: Harvard University Press.

Graber, J. A., & Sontag, L. M. (2009) Internalizing Problems During Adolescence. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy001020

Graziano, W. G., & Eisenberg, N. (1997). Agreeableness: A dimension of personality. In *Handbook of personality psychology* (pp. 795-824). DOI: 10.1016/B978-012134645-4/50031-7

Goldsmith, H.H. (1996). Studying temperament via construction of the Toddler Temperament Behavior Assessment Questionnaire. *Child Development, 67*, 218–235. DOI: 10.1111/j.1467-8624.1996.tb01730.x

Goldsmith, H.H., Buss, A., Plomin, R., Rothbart, M.K., Thomas, A., Chess, S., Hinde, R.A., & McCall, R.B. (1987). Roundtable: What is temperament? *Child Development, 58*, 505–529. DOI: 10.2307/1130527

Hale III, W. W., Raaijmakers, Q., Muris, P., & Meeus, W. (2008). Developmental trajectories of adolescent anxiety disorder symptoms: A 5-year prospective community study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(5), 556-564. DOI: 10.1097/CHI.0b013e3181676583

Hart, D., Atkins, R., Fegley, S., Robins, R. W., & Tracy, J. L. (2003). Personality and development in childhood: A person-centered approach. *Monographs of the Society for Research in Child Development*, i-122. DOI: 10.1111/1540-5834.00231

Holland, J. L. (1996). Making vocational choices. Odessa, FL: PAR.

Jeronimus, B. F., Riese, H., Sanderman, R., & Ormel, J. (2014). Mutual reinforcement between neuroticism and life experiences: A five-wave, 16-year study to test reciprocal causation. *Journal of personality and social psychology*, *107*(4), 751. DOI: 10.1037/a0037009

John, O. P., Robins R. W., & Pervin, L. A., (2008) *Handbook of Personality. Theory and Research*. 3rd Edition. New York: Guilford Press.

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. *Handbook of personality: Theory and research*, *2*(1999), 102-138.

Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel psychology*, *52*(3), 621-652. DOI: 10.1111/j.1744-6570.1999.tb00174.x

Kagan, J. (1994). *Galen's prophecy: Temperament in human nature*. New York: Basic Books.

Keating, D. (2004). Cognitive and brain development. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 45–84). Hoboken, NJ: Wiley.

Klimstra, T. A., Akse, J., Hale III, W. W., Raaijmakers, Q. A., & Meeus, W. H. (2010). Longitudinal associations between personality traits and problem behavior symptoms in adolescence. *Journal of Research in Personality*, *44*(2), 273-284. DOI: 10.1016/j.jrp.2010.02.004

Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: from toddlerhood to age 5. *Developmental psychology*, *33*(2), 228. DOI: 10.1037/0012-1649.33.2.228

Kohn, M. L., & Schooler, C. (1983). *Work and personality: An inquiry into social stratification*. Norwood, NJ: Ablex.

Krueger, R. F., & Tackett, J. L. (2003). Personality and psychopathology: Working toward the bigger picture. *Journal of Personality Disorders*, *17*(2: Special issue), 109-128. DOI: 10.1521/pedi.17.2.109.23986

Laursen, B., & Collins, W. A. (2009). Parent-child relationships during adolescence. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 2: Contextual Influences On Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy002002

Lansford, J. E., Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2004). Ethnic differences in the link between physical discipline and later adolescent externalizing behaviors. *Journal of Child Psychology and Psychiatry*, *45*(4), 801-812. DOI: 10.1111/j.1469-7610.2004.00273.x

Lansford, J. E., Godwin, J., Bornstein, M. H., Chang, L., Deater-Deckard, K., Di Giunta, L., ... & Skinner, A. T. (2018). Parenting, culture, and the development of externalizing behaviors from age 7 to 14 in nine countries. *Development and psychopathology*, 1-22. DOI: 10.1017/S0954579418000925

Lemery, K. S., Goldsmith, H. H., Klinnert, M. D., & Mrazek, D. A. (1999). Developmental models of infant and childhood temperament. *Developmental Psychology*, *35*(1), 189. DOI: 10.1037/0012-1649.35.1.189

Lerner, R. M., & Schulenberg, J. E. (1986). *Career development: A life-span developmental approach*. Lawrence Erlbaum.

Maher, B. A., & Maher, W. B. (1994). Personality and psychopathology: A historical perspective. *Journal of Abnormal Psychology, 103*, 72−77. DOI: 10.1037/0021-843X.103.1.72

Magnus, K., Diener, E., Fujita, F., & Pavot, W. (1993). Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of personality and social psychology*, *65*(5), 1046. DOI: 10.1037/0022-3514.65.5.1046

Magnusson, D. (2003). The person approach: Concepts, measurement models, and research strategy. *New directions for child and adolescent development*, *2003*(101), 3-23. DOI: 10.1002/cd.79

Magnusson, D. (1988). *Individual development from an interactional perspective: A longitudinal study*. Lawrence Erlbaum Associates, Inc.

Martin, R., Watson, D., & Wan, C. K. (2000). A three-factor model of trait anger: Dimensions of affect, behavior, and cognition. *Journal of personality*, *68*(5), 869-897. DOI: 10.1111/1467-6494.00119

Masten, A. S., & Curtis, W. J. (2000). Integrating competence and psychopathology: Pathways toward a comprehensive science of adaptation in development. *Development and psychopathology*, *12*(3), 529-550. DOI: 10.1017/S095457940000314X

Matthews, G. (2009) The Nature of personality Traits. In Matthews, G., Deary, I. J., & Whiteman, M. C., (Eds.) *Personality Traits. 3rd Edition*. New York: Cambridge University Press

McAdams, D. P. (1996). Personality, modernity, and the storied self: A contemporary framework for studying persons. *Psychological inquiry*, *7*(4), 295-321. DOI: 10.1207/s15327965pli0704_1

McAdams, D. P., & Olson, B. D. (2010). Personality development: Continuity and change over the life course. *Annual review of psychology*, *61*, 517-542. DOI: 10.1146/annurev.psych.093008.100507

McCrae, R., R., Costa Jr, P. T. (1995). Domains and Facets: Hierarchical Personality Assessment Using the Revised NEO Personality Inventory. *Journal of Personality Assessment*, 64, 21-50. DOI: 10.1207/s15327752jpa6401_2

McCrae, R. R., Costa Jr, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D., ... & Saunders, P. R. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of personality and social psychology*, *78*(1), 173. DOI: 10.1037/0022-3514.78.1.173

McLaughlin, K. A., Hilt, L. M., & Nolen-Hoeksema, S. (2007). Racial/ethnic differences in internalizing and externalizing symptoms in adolescents. *Journal of abnormal child psychology*, *35*(5), 801-816. DOI: 10.1007/s10802-007-9128-1

Mount, M. K., Barrick, M. R., & Stewart, G. L. (1998). Five-factor model of personality and performance in jobs involving interpersonal interactions. *Human performance*, *11*(2-3), 145-165. DOI: 10.1080/08959285.1998.9668029

Muris, P. (2006). Freud was right… about the origins of abnormal behavior. *Journal of Child and Family Studies*, *15*(1), 1. DOI: 10.1007/s10826-005-9006-9

Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament in early adolescence: Relations to internalizing and externalizing problem behavior and "Big Three" personality factors. *Journal of adolescence*, *30*(6), 1035-1049. DOI: 10.1016/j.adolescence.2007.03.003

Plomin, R. (1994). *Genetics and experience: The interplay between nature and nurture*. Sage Publications, Inc.

Plomin, R., Defries, J. C., & McClearn, G. E. (1990). Behavior genetics: A primer. *Freeman, New York.*

Plomin, R., Emde, R. N., Braungart, J. M., Campos, J., Corley, R., Fulker, D. W., et al. (1993). Genetic change and continuity from 14 to 20 months: The MacArthur Longitudinal Twin Study. *Child Development, 64*, 1354–1376. DOI: 10.1111/j.1467-8624.1993.tb02957.x

Posner, M. I., & Rothbart, M. K. (2000). Developing mechanisms of self-regulation. *Development and psychopathology*, *12*(3), 427-441. DOI: 10.1017/S0954579400003096

Roberts, B. W. (1997). Plaster or plasticity: Are adult work experiences associated with personality change in women?. *Journal of Personality*, *65*(2), 205-232. DOI: 10.1111/j.1467-6494.1997.tb00953.x

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. *Psychological bulletin*, *126*(1), 3. DOI: 10.1037/0033-2909.126.1.3

Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. *Handbook of personality: Theory and research*, *3*, 375-398.

Rothbart, M. K. (2007). Temperament, development, and personality. *Current directions in psychological science*, *16*(4), 207-212. DOI: 10.1111/j.1467-8721.2007.00505.x

Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: origins and outcomes. *Journal of personality and social psychology*, *78*(1), 122. DOI: 10.1037/0022-3514.78.1.122

Rothbart, M. K., & Bates, J.E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social emotional and personality development* (5th ed., pp. 105-176). New York: Wiley.

Rothbart, M.K., & Bates, J.E. (2006). Temperament. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology: Vol.3. Social, emotional, and personality development* (6th ed., pp. 99–166). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0303

Rothbart, M. K., Ahadi, S. A., Hershey, K., & Fisher, P. (2001). Investigations of temperament at 3 to 7 years: The children's behavior questionnaire. *Child Development, 72*, 1394–1408. DOI: 10.1111/1467-8624.00355

Rutter, M., Caspi, A., & Moffitt, T. E. (2003). Using sex differences in psychopathology to study causal mechanisms: unifying issues and research strategies. *Journal of Child Psychology and Psychiatry*, *44*(8), 1092-1115. DOI: 10.1111/1469-7610.00194

Shiner, R. L. (1998). How shall we speak of children's personalities in middle childhood? A preliminary taxonomy. *Psychological bulletin*, *124*(3), 308. DOI: 10.1037/0033-2909.124.3.308

Shiner, R. L. (2000). Linking childhood personality with adaptation: evidence for continuity and change across time into late adolescence. *Journal of personality and social psychology*, *78*(2), 310. DOI: 10.1037/0022-3514.78.2.310

Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry*, *44*(1), 2-32. DOI: 10.1111/1469-7610.00101

Shiner, R. L., & DeYoung, C. G. (2013). The Structure of Temperament and Personality Traits: A Developmental. In *The Oxford handbook of developmental psychology, Vol. 2: Self and other*, *2*, 113.

Sroufe, L. A. (1990). Considering normal and abnormal together: The essence of developmental psychopathology. *Development and Psychopathology, 2,* 335–347. DOI: 10.1017/S0954579400005769

Steinberg, L., & Morris, A. S. (2001) Adolescent Development. *Annual Review of Psychology*, 52, 83-110. DOI: 10.1146/annurev.psych.52.1.83

Steinberg, L., & Cauffman, E. (1996). Maturity of judgment in adolescence: Psychosocial factors in adolescent decision making. *Law and Human Behavior*, *20*(3), 249-272. DOI: 10.1007/BF01499023

Stewart, A. J., Sokol, M., Healy, J. M., & Chester, N. L. (1986). Longitudinal studies of psychological consequences of life changes in children and adults. *Journal of personality and Social Psychology*, *50*(1), 143. DOI: 10.1037/0022-3514.50.1.143

Strelau, J. (2001) The concept and status of trait in research on temperament. *European Journal of Personality, 15*, 311–25. DOI: 10.1002/per.412

Susman, E., & Rogol, A. D. (Eds.). (2004). *Puberty and psychological development*. Hoboken, NJ: John Wiley & Sons . DOI: 10.1002/9780471726746.ch2

Susman, E. J., & Dorn, L. D. (2009). Puberty. Its Role In Development. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9781118133880.hop206012

Tackett, J. L. (2006). Evaluating models of the personality–psychopathology relationship in children and adolescents. *Clinical Psychology Review*, 26, 584–599. DOI: 10.1016/j.cpr.2006.04.003

Tellegen, A. (1985) Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma and J. D. Maser (eds.), *Anxiety and the anxiety disorders* (pp. 681–706). Hillsdale, NJ: Lawrence Erlbaum.

Thartori, E., Zuffianò, A., Pastorelli, C., Di Giunta, L., Lunetti, C., Lansford, J. E., Dodge K. A., Favini A., Gòmez Plata M., & Caprara, G. V. (2018). The interactive effects of maternal personality and adolescent temperament on externalizing behavior problem trajectories from age 12 to 14. *Personality and Individual Differences*, *134*, 301-307. DOI: 10.1016/j.paid.2018.06.021

Watson, D., & Clark, L.A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin, 96*, 465–490. DOI: 10.1037/0033-2909.96.3.465

Watson, D., & Clark, L.A. (1997). Extraversion and its positive emotional core. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of Personality Psychology* (pp. 767–793). San Diego, CA: Academic Press. DOI: 10.1016/B978-012134645-4/50030-5

Widiger, T.A., Verheul, R., & van den Brink, W. (1999). Personality and psychopathology. In L.A. Pervin & O.P. John (Eds.), *Handbook of personality: Theory and research* (2nd edn, pp. 347–366). New York: Guilford.

Wright, J. C. and Mischel, W. (1987) A conditional approach to dispositional constructs: the local predictability of social behavior. *Journal of Personality and Social Psychology, 53*, 1159–77. DOI: 10.1037/0022-3514.53.6.1159

Yu, R., Branje, S., Keijsers, L., & Meeus, W. (2015). Associations between young adult romantic relationship quality and problem behaviors: An examination of personality–environment interactions. *Journal of Research in Personality*, *57*, 1-10. DOI: 10.1016/j.jrp.2015.01.003

Zahn–Waxler, C., Klimes–Dougan, B., & Slattery, M. J. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and psychopathology*, *12*(3), 443-466. DOI: 10.1017/S0954579400003102

Zahn-Waxler, C., Shirtcliff, E. A., & Marceau, K. (2008). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology*, 4, 275-303. DOI: 10.1146/annurev.clinpsy.3.022806.091358

CHAPTER II

STUDY I

Personality Profiles and Adolescents' Maladjustment: A Longitudinal Study [1]

Abstract

During adolescence, some personality characteristics may represent vulnerabilities to adolescents' adjustment. Adopting a person-centered approach, the aims of this study were (a) to examine the relations of early adolescents' personality profiles to internalizing (i.e., anxious/depressed, withdrawal, and somatic complaints) and externalizing (i.e., aggressive and rule breaking behavior) problems three years later, and (b) to explore the moderating role of gender in these relations. Six hundred fifteen Italian preadolescents (mean age = 12.5) completed the Big Five Questionnaire for Children at age 12 and the Youth Self-Report at age 12 and three years later. Four personality types were identified using Latent Profile Analysis: Resilient, Moderate, Undercontrolled and Vulnerable. In multiple-group path analysis, after controlling for the stability of the outcomes, for both genders, Resilient reported low levels of externalizing problems three years later, whereas Vulnerable youths reported high levels of internalizing problems. Finally, Undercontrolled reported high levels of subsequent externalizing problems. The present study corroborated the unique and specific prediction by personality profiles of different types of subsequent maladjustment.

Keywords: Adolescence; Internalizing problems; Externalizing problems; Personality Profiles.

[1] The content of this chapter has been included in the following contribution:

Favini A., Gerbino M., Eisenberg N., Lunetti C., Thartori E. (2018) Personality Profiles and Adolescents' Maladjustment: A Longitudinal Study. *Personality and Individual Differences, 129, pp. 119-125*. doi: 10.1016/j.paid.2018.03.016

INTRODUCTION

Adolescence is a time of challenges due to adolescents' exposure to many developmental demands and changes (i.e., biological, cognitive, emotional, relational, or social). How adolescents face those challenges is crucial for their successful or unsuccessful development (Steinberg & Morris, 2001). Personality characteristics may affect how adolescents experience and react to this developmental transition, during which emotional and behavioral problems, such as internalizing (e.g., social withdrawal, psychosomatic reactions, anxiety, or depression) and externalizing problems (e.g., aggressive and rule breaking behavior; Achenbach, 1991), tend to increase (Zahn- Waxler, Shirtcliff, & Marceau, 2008).

Results from a variety of studies support the role of personality in predicting adolescents' emotional and behavioral problems (Klimstra, Akse, Hale, Raaijmakers, & Meeus, 2010). Based on the vulnerability model (see Tackett, 2006), which proposes that personality traits can increase or decrease individuals' vulnerability to emotional and behavioral problems, we examined the associations among early adolescents' personality profiles and different indicators of internalizing and externalizing problems three years later. In addition, we explored the moderating role of gender in these associations.

Personality

Personality can be defined as the set of psychological systems that contribute to unity and continuity of individual behaviors and experiences, conceiving both the expression and the perception of human being (Caprara & Cervone, 2000). As elucidated in Chapter 1, personality can be considered as a "substantially stable" aspect of individual differences, including thoughts, skills, habits, values, morals, beliefs, and social cognitions (Rothbart & Bates, 2006). This aspect of individual functioning gained great attention for a long time. Since the Greek theorizations of Hippocrates, retrieved later by Galen, more recently Lewin (Lewin, 1936) focused on the importance to consider environmental influences on individual behaviors; Stern (1923) underlined individual characteristics of unity, intentionality and indivisibility; Vygotskij's theory considered the role of social influences, and the perception of those influences, as essential for individual's development (Vygotskij, 1978).

The contemporary conceptualization consider personality as organized in some distinct *traits*, definable as the fundamental unit of personality that represent consistent patterns of behaviors, especially those expressive and stylistic, neuro-psychic systems with dynamic and motivational properties (John, Robins, & Pervin, 2008; Matthews, 2009; Winter et al., 1998). This definition basically derives from the studies of Allport (e.g., 1937; 1961), who defined a personality trait as a

"broad system of similar action tendencies existing in the person we are studying. Similar action tendencies are those that an observer, looking at them from an actor's point of view, can categorize together under one rubric of meaning" (Allport, 1961, p. 31).

Over the years, in personality research a wide variety of strategies were used for studying personality traits. Among them, several approaches gained more credit:

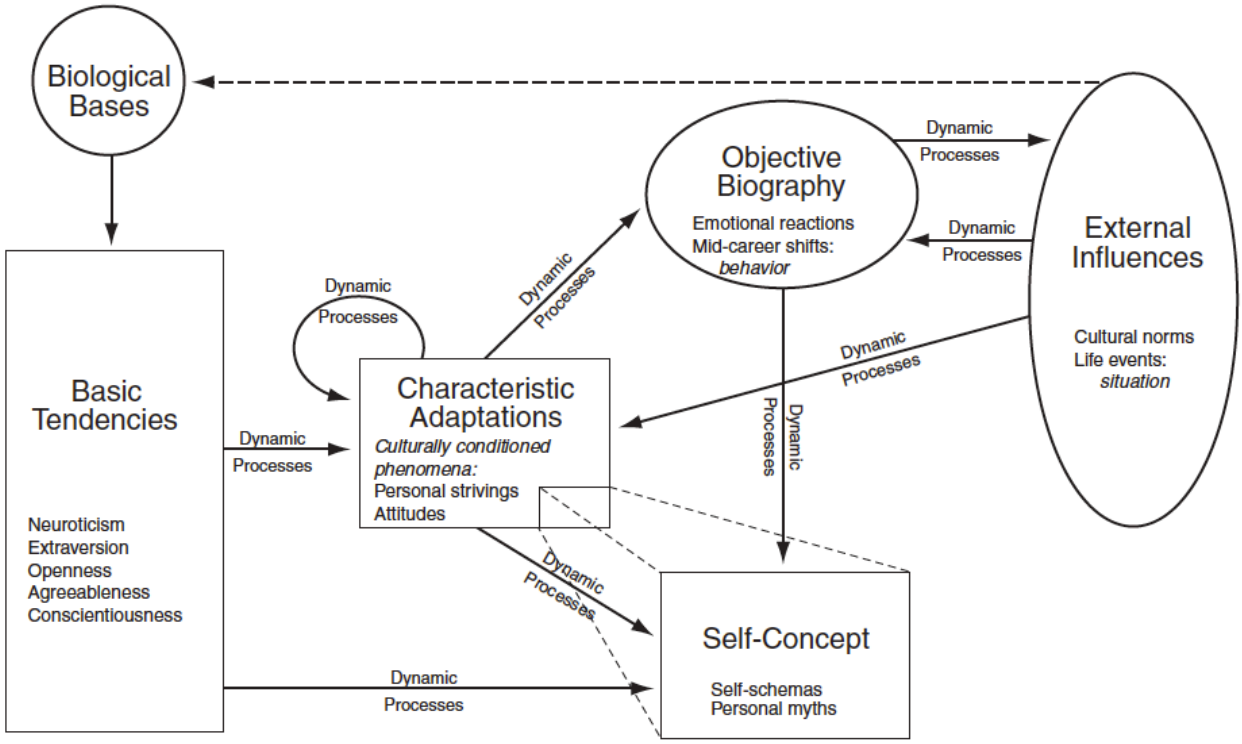
- The Factor-Analytic Approach: was an approach based on mathematical techniques, aimed to identify a small number of traits generalizable to people in different contexts. For example, the pioneering work of Cattel (1943), starting from the research of Allport and Odbert (1936), identified originally 16 personality traits derived from his work with his Personality Factor Test (16 Personality Factor Test – 16 PF). Instead, Eysenck and colleagues identified 3 super-factors (Extraversion, Neuroticism, and Psychoticism), hierarchically higher-ordered, each of them characterized by several more specific personality traits, that lead to specific habitual behaviors (Eysenck & Eysenck, 1985).
- The Idiographic Approach: was an approach based on lexical studies, aimed to identify combinations of adjectives or traits particularly relevant for a particular person, in order to make assumptions about individual behaviors (e.g., Allport, 1965; Grice et al., 2006). The general idea underlying this approach is that each individual is characterized by a unique set of personality traits, that organize his personality, and that makes him distinguishable from others. In this view, a taxonomy of personality traits generalizable to people it is not identifiable.
- The Alternative-Analyses Approach: represents a set of alternative approaches to the study of personality traits, aimed essentially to the construction of typologies of personality, applicable to sub-groups of individuals. For example, based on Murray's theory, Jackson and colleagues (e.g., Jackson & Tremblay, 2002) developed a personality inventory in order to measure individual characteristics based on people's needs. One of the most accredited examples is the approach developed by Block (Block, 1971; Block & Block, 1980), which identified three types of personality (this theory will be discussed in the next section).

Nonetheless, in the field of personality psychology at the moment one of the most accredited models for understanding the structure of personality is the "Big Five" or the "Five Factors" Model (Caprara et al., 1993; McCrae & Costa, 1995), that integrated two major approaches: the *lexical approach* (e.g., Allport, 1965; Goldberg, 1981; 1990), and the *factorial approach* (e.g., McCrae & Costa, 1995). The Five Factors Model (FFM) conceived personality as a complex combination of individual characteristics, which are an expression of thoughts, feelings and actions. In addition, FFM assumes that those personality traits can be quantitatively measured and generalizable to different populations (McCrae & Costa, 2008). This model is based on some theoretical assumptions: (1) knowability, which attested the specificity of this field of study; (2) rationality,

which highlighted the individual capacity to understand themselves and others; (3) variability, which focused on the existing differences among individual; (4) proactivity, which refers to the human agentic causation of their own actions, behaviors, and feelings. According with the FFM, personality traits represent the individual differences in personality structure that operate in a more complex system, composed of components and dynamic processes. It is impossible to understand personality traits, if we do not consider the whole personality structure. As Highlighted by McCrae and Costa (2008; 1996), personality structure can be represented as reported in Figure 1.

Figure 1

Graphical representation of personality system. (McCrae & Costa, 1996)



Note: Core components are in rectangles; interfacing components are in ellipses.

In this view, personality traits are conceptualized as basic tendencies, and represent one of the fundamental aspects, with characteristic adaptations and self-concept. This configuration can be considered both cross-sectionally and longitudinally: in the former case, external influences represent the context or the situation in which individual are acting; in the latter case, objective biography represents personality development over the life course, according with individual adaptations.

Following the Five Factors Model, personality traits are quantifiable into five dimensions (Caprara et al., 1993; John, Robins, & Pervin, 2008; Matthews, 2009):

- **Energy/Extraversion** (with the sub-domains of "*dynamism*" and "*dominance*"): energetic approach that includes characteristics such as sociability, activity, assertiveness, self-confidence, and positive emotionality; is characterized by facets of warmth, gregariousness, and excitement-seeking. Markers of the positive pole of this trait are social status in groups or the number of friends, while the negative pole is marked by poorer relationships or rejection by peers.
- **Agreeableness** (with the sub-domains of "*cooperativeness*" and "*politeness*"): refers to sensitivity towards others and their needs, it is a prosocial orientation that includes characteristics such as altruism, tender-mindedness, trust, and modesty; is characterized by facets of trust, straightforwardness, and compliance. A marker of the positive pole is a good performance in work groups, while the negative pole is marked by interpersonal problems or antagonistic approach toward others.
- **Conscientiousness** (with the sub-domains of "*scrupulousness*" and "*perseverance*"): socially prescribed control that orients behaviors, includes characteristics such as thinking before acting, delaying gratification, precision, fulfilling of commitments, following norms and rules, planning, organizing, and prioritizing tasks; is characterized by facets of competence, order, dutifulness, achievement striving, and self-discipline. Markers of the positive pole of this trait are higher academic and job performances or results, while the negative pole is marked by negative habits (such as smoking or substance abuse), and lack of self-control.
- **Neuroticism/Emotional Stability** (with the sub-domains of "*emotion control*" and "*impulse control*"): emotional stability that includes characteristics of changing mood, and negative feelings such as feeling anxious, nervous, sad, and tense; is characterized by facets of angry hostility, depression, self-consciousness, impulsiveness, vulnerability. Considering Emotional Stability, markers of the positive pole are positive feelings, mood stability, or satisfaction, while the negative pole is marked by poorer coping strategies and reactions, or frequent mood changes.
- **Openness** (with the sub-domains of "*openness to culture*" and "*openness to experiences*"): broader dimension that describes the complexity of an individual's mental and experiential life, includes intellect, cultural interests and interest in other people; is characterized by facets of fantasy, aesthetics, feelings actions, ideas, or values. Markers of the positive pole of this trait are good creativity, success in artistic activities, or better education, while the negative pole is marked by conservative attitudes, and closed-minded.

Personality Profiles

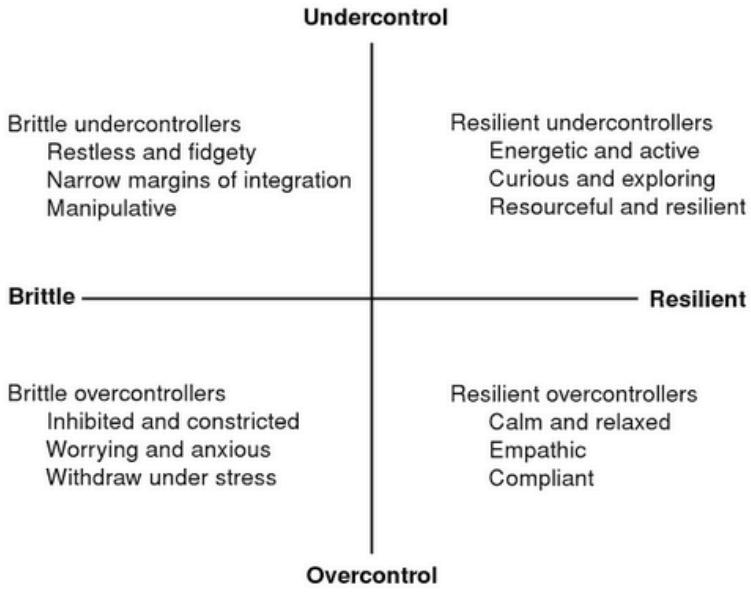
In the last 30 years, within a person-centered approach, numerous researchers have adopted the Five Five Model (McCrae & Costa, 1995) to identify a finite number of personality profiles that have been substantially replicated across different ages and cultures (e.g., Asendorpf & Van Aken, 1999; De Bolle & Tackett, 2013; De Clerq et al., 2012; Meeus et al., 2011; Robins et al., 1996; Xie et al., 2016). Most of those studies have identified a personality structure organized into three different profiles:

- The Resilient profile, characterized by high levels of all the personality traits (i.e., Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness); this profile was generally considered as the most adaptive profile, with high levels of psychological, emotional, and social adjustment.
- The Overcontrolled profile, characterized by low levels of Extraversion and Emotional Stability and high levels of Conscientiousness; this profile was generally considered as the most "introverted" and secretive, with high level of psychological and social inhibition.
- The Undercontrolled profile, characterized by low levels of Emotional Stability and Conscientiousness, and high levels of Extraversion; this profile was generally considered as reckless, with a pervasive lack in self-regulation, but substantially socially adjusted.

Those profiles generally have confirmed Block and Block' theory (1980) for understanding individual differences in personality structure (represented in Figure 2), which hypothesized and corroborated empirically the aforementioned three personality profiles and hypothesized a fourth profile, the most unadaptable, labelled Brittle, that was not empirically confirmed. Block and Block hypothesized personality structure reflecting the combination of two main personality characteristics: Ego control - the tendency to express or to constrain emotional and motivational impulses; and Ego resiliency - the tendency to be flexible in coping with contextual demands and stressful situations. The core assumption of this approach is that personality profiles are an expression of the adaptive/maladaptive qualities of both levels of control and resiliency (low and high), which are two independent (but interconnected) dimensions: different expressions of resiliency are linked to adjustment/maladjustment in terms of psychopathology (e.g., Resilient vs. Brittle), while different expressions of control are linked with interpersonal and motivational processes, as well as openness to experience (e.g., Undercontrolled vs. Overcontrolled).

Figure 2

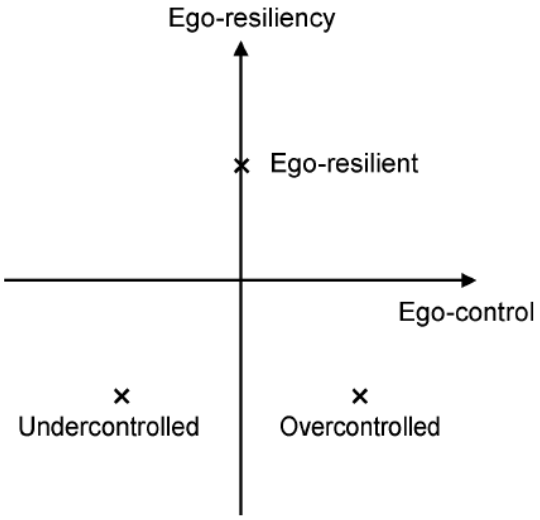
Hypothesized model of personality structure by Block and Block (Cook, 2012)



The three-profile structure, frequently defined "RUO" structure (in which R is for Resilient, U is for Undercontrolled, and O is for Overcontrolled; represented in Figure 3), has been substantially replicated for adults, as well as for late adolescents (e.g., Akse et al., 2004; Steca, Alessandri & Caprara, 2010).

Figure 3

The RUO structure of personality (Asendorpf 2015)



However, findings in early and middle adolescents are mixed. In particular, whereas some researchers have confirmed the three-profile solution (e.g. Asendorpf & Van Aken, 1999; Meeus et al., 2011), other investigators (e.g., De Bolle & Tackett, 2013; De Clercq et al., 2012; Xie et al., 2016) have identified four personality profiles. The four-profile solution confirmed presence of the

Resilient and Undercontrolled profile, but included also a Moderate profile (average levels in all the personality traits), and a Vulnerable profile (low in all traits). Although the Moderate profile was a novelty, the Vulnerable was previously hypothesized by Block and Block (1980) as the Brittle profile, the opposite of the Resilient.

Researchers have tried to explain the partial inconsistency of findings not only with a variety of methodological reasons (e.g., different instruments, analytic procedures, or age of participants Isler, Fletcher, Liu, & Sibley, 2017), but also with theoretical reasons. For example, Asendorpf (2006) highlighted the importance of taking into account the global variability within profiles, whereas Caspi and Shiner (2006) focused the attention on the utility of different personality profiles' for predicting adolescents' (mal)adjustment over time.

Adolescents' Personality Profiles, Externalizing and Internalizing Problems

According with the Vulnerability model (presented in Chapter I), personality characteristics may have a role in increasing (or decreasing) youths' vulnerability to specific problematic tendencies through a variety of cognitive, emotional, and interpersonal mechanisms, such as the nature of reactions elicited from others or how youths construe their experiences (Caspi & Shiner, 2006). Both longitudinal and cross-sectional studies have found differences in the psychosocial functioning associated with the three or four personality profiles. In particular, researchers have found that Resilients exhibit fewer internalizing and externalizing problems and the Moderate profile is generally a well-adapted profile, but with a slightly lower level of adjustment than the Resilient profile (e.g., De Clercq et al., 2012). In contrast, Undercontrollers tend to manifest aggressive and transgressive behaviors, probably related to their pervasive self-regulatory difficulties, and Overcontrollers tend to experience anxious and depressive feelings (e.g., Akse et al., 2004; 2007). Overcontrollers, because they are introverted and emotionally instable, are more vulnerable to negative emotions and more at risk for establishing negative interpersonal relationships and for experiencing high levels of stressors and low social support (Caspi & Shiner, 2006), factors that could increase the risk of internalizing problems (e.g., Hankin & Abramson, 2001). Finally, Vulnerable adolescents exhibit the most compromised profile on all traits and evidence concurrent risk for anxiety and depression (or internalizing problems) and aggression and problematic behaviors (externalizing problems). Vulnerable adolescents likely experience a variety of difficulties and risks, such as low self-regulation and a tendency to interpret events negatively, responses that elicit negative interpersonal reactions and lead to isolation and rejection (e.g., Caspi & Shiner, 2006), increasing the risk of pervasive maladjustment.

The Present Study: Aims and Hypotheses

As previously mentioned, previous research supported the importance of identify personality profiles, but findings in early and middle adolescents are mixed. In fact, several studies have confirmed a structure based on three profiles (i.e., the RUO structure; Asendorpf & Van Aken, 1999; Meeus et al., 2011), whereas some recent studies supported a structure based on four personality profiles in adolescence (i.e., Resilient – Moderate – Undercontrolled – Vulnerable; De Bolle & Tackett, 2013; De Clercq et al., 2012; Xie et al., 2016). Therefore, our general aim was to further clarify this empirical issue, providing support in the Italian context for one of these two personality structures in early adolescence.

In particular, we first attempted to identify the personality profiles of Italian pre-adolescents adopting the Big Five Traits model (McCrae & Costa, 1995), and using Latent Profile Analysis (LPA; Nylund, Asparouhov, & Muthén, 2007). Consistent with previous research (e.g., De Bolle & Tackett, 2013; De Clerq et al., 2012; Xie et al., 2016), we expected to find a relatively small number of personality profiles. In particular, we expected to find the following hypothesized profiles: (a) an adjusted profile, with high levels of Energy, Agreeableness, Conscientiousness, Emotional Stability, and Openness; (b) an average profile, with moderate scores in all the personality traits; (c) a maladaptive profile, with low scores in all the personality traits; (d) a moderately maladjusted profile, with a specific impairment in a specific area (e.g., in with low Emotional Stability).

Second, we examined the longitudinal associations of the personality profiles with narrow indicators of internalizing problems (i.e., withdrawn, somatic complaints, and anxiety/depression), and narrow externalizing problems (i.e., aggressive behavior and rule breaking behavior), evaluated three years later, during middle adolescence. Internalizing and externalizing problems are often correlated, especially in adolescence (Krueger, Caspi, & Moffitt, 2000), so we addressed both kinds of problems simultaneously. Unlike other studies, we also examined longitudinal associations between profiles and outcomes while taking into account the stability of the outcomes and correlations among them. To our knowledge there are no previous studies that investigated links between personality profiles and maladjustment, that have considered simultaneously the five above-mentioned problems, and that have considered also the stability of these outcomes. We tested the unique prediction of each personality profile, and we hypothesized that (a) profiles presenting pervasively maladaptive patterns of personality traits would uniquely predict, and would be concurrently associated with, high levels of narrow internalizing and externalizing problems; (b) profiles presenting pervasively adaptive patterns of personality traits would uniquely predict, and be concurrently associated with, low levels of both internalizing and externalizing problems; and (c) profiles presenting partially maladaptive patterns of personality traits would uniquely predict, and be concurrently associated with, narrow internalizing or externalizing problems.

Finally, we examined the moderating role of adolescents' gender in the relations of personality profiles to both internalizing and externalizing problems. To our knowledge, no studies have specifically addressed this moderating role of gender, although researchers have found gender differences both in personality profiles and in internalizing and externalizing problems (Achenbach et al., 2016; Akse et al., 2004). Compared to boys, girls have had higher probabilities of being Resilient or Overcontrolled and reporting internalizing problems, and lower probabilities of being Undercontrolled and reporting externalizing problems (e.g., Akse et al., 2004; Crijnen, Achenbach, & Verhulst, 1997; Meeus et al., 2011). Furthermore, gender has been considered as moderator of developmental processes (e.g., Perry & Pauletti, 2011). For example, boys have been found to be more vulnerable to peer influence than girls, so we hypothesized that that some profiles (e.g., Undercontrolled) render boys more vulnerable than girls to externalizing problems because of their higher vulnerability to transgressive peer pressure (Sumter, Bokhorst, Steinberg & Westenberg, 2009).

METHOD

Participants

Participants were part of the Genzano Longitudinal Study (Caprara, & Pastorelli, 1993; Caprara et al., 2005), an Italian longitudinal research started in the early 1990s. The study was approved by the University Ethics Committee and was designed to investigate personal and social determinants of children and adolescents' adjustment from childhood to young adulthood. The sample matched national data (ISTAT, 2002) in terms of socioeconomic status, occupation, and education. Indeed, the community of Genzano represents a socioeconomic microcosm of the larger society, composed of merchants or employees in various types of businesses (42%), unskilled workers (22%), professional or managerial ranks (16%), skilled workers (12%), retired (3%), and unemployed or temporarily unemployed (respectively, 3% and 2%). Overall, the Genzano Longitudinal Study adopted a staggered, multiple-cohort design (summarized in Table 1), with four different cohorts added in four different years. Cohort 1 began during the 1989-90 academic year, cohort 2 during the 1990-91 academic year, cohort 3 during the 1991-92 academic year, and cohort 4 during the 1993-94 academic year.

Table 1

Multiple cohort longitudinal design of the Genzano Longitudinal Project

Age	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Cohort 1	'92	'93	'94	'95	'96		'98		'00		'02		'04				'08				'12
Cohort 2	'93	'94	'95	'96		'98		'00		'02		'04				'08				'12	
Cohort 3	'94	**'95**	'96		**'98**		'00		'02		'04				'08				'12		
Cohort 4	**'95**	'96		**'98**		'00		'02		'04				'08				'12			

Note: bold indicates cohorts and Waves selected for the present study.

For the present study, we examined two of the total four cohorts of participants at 6th and 7th grades of junior high school. A total of 615 students (M age = 12.6 years, *SD* = 0.67), 331 males (53.8%) and 284 females (46.2%) were available at Wave 1 (W1). Three years later (Wave 2; W2), data were available for 427 adolescents (M age = 15.5 years, SD = 0.65). Retention rate from Wave 1 to Wave 2 was 69.4%. One-way ANOVAs showed that missing participants at Wave 2 did not significantly differ from their non-missing counterparts in the mean levels of most of the study variables: missing participants, compared to non-missing ones, reported only significantly lower Energy (F = 7.103; p = .008; d = -.168; respectively, $M_{missing}$ = 4.044; $M_{non\text{-}missing}$ = 4.184) and Openness (F = 4.575; p = .033; d = -.181; respectively, $M_{missing}$ = 3.430; $M_{non\text{-}missing}$ = 3.571). In addition, after the identification of personality profiles, we examined the association between

personality profiles and missing data at Wave 2, no significant association was found. Full information about the composition of the sample, is reported in Table 2.

Table 2

Descriptive statistics of the sample

		Age	Gender
Wave 1	Males	M_{age} = 12.6 (*SD* = 0.71)	331 (53.8%)
	Females	M_{age} = 12.5 (*SD* = 0.63)	284 (46.2%)
Wave 2	Males	M_{age} = 15.6 (*SD* = 0.67)	225 (52.7%)
	Females	M_{age} = 15.5 (*SD* = 0.62)	202 (47.3%)

Procedure

The Human Subjects Review Committee of the Sapienza University of Rome approved the project design and the data collection procedures. In addition, a school council composed of parent and teacher representatives at the junior high and high school levels approved each research proposal. Parents gave their signed consent, and children were free to decline participation if they so chose (3% declined). The written informed consent was obtained every year of this longitudinal research from both parents and school. Moreover, during the entire research project, participants received a small payment for their participation in the research (about 25€); confidentially and privacy were guaranteed for all participants; researchers offered explanations as needed.

The questionnaires were administered in classrooms during lessons by trained researchers that provided information and clarification about the aims of the project and the procedure. The administration was performed randomly in different days for each classroom.

From T1 to T6, the study was presented to parents, teachers, and children as a project designed to gain a better understanding of child and adolescent development. Two researchers administered the questionnaires in the classroom to participants during specific scheduled sessions in the schools. Mothers and fathers completed the questionnaire at the children's school while in a group setting (five to seven people at a time).

At T7 and T8, when the majority of participants were in college, they were contacted by phone and invited to participate in the study. Questionnaires were sent to participants by mail and they received a small payment. Participants returned questionnaires and consent forms to researchers during specifically scheduled meetings at a local school.

Measures

Socio-demographic variables

Adolescents reported information concerning parents' education (ranged from 1 = "5th Grade" to 5 = "higher education") and job (coded from 0 to 10; higher scores refer to higher-income jobs); a composite score of those two variables was created, in which higher scores refer to higher level of socio-economic status. Preadolescents' gender was coded 1 for males and 2 for females. The other measures used in this study are described below.

Personality Traits

Personality Traits at Wave 1 were assessed using a 30-item short form (6 item for each dimension) of the Big Five Questionnaire for Children, with Likert scales ranging from 1 = "very false for me" to 5 = "very true for me." (BFQ-C; Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003). The questionnaire, suitable for children and preadolescents from 9 to 13 years old, was developed in order to measure the Big Five traits (Digman, 1990; McCrae & Costa, 1995):

- *Energy/Extraversion* (i.e., "I like to move and to do a great deal of activity" or "I am happy and lively"), it refers to activity, enthusiasm, assertiveness, and self-confidence;
- *Agreeableness* (i.e., "I treat my peers with affection" or "I trust in others"), it refers to sensitivity towards others and their needs;
- *Conscientiousness* (i.e., "I respect the rules and the order" or "I play only when I finished my homework"), it refers to dependability, orderliness, precision, and fulfilling of commitments;
- *Emotional Instability* (i.e., "I am in a bad mood" or "I easily get angry"), it refers to emotional feelings, such as anxiety, depression, discontent, and anger;
- *Openness/Intellect* (i.e., "I know many things" or "I easily learn what I study at school"), it refers to intellect (especially in the academic domain), cultural interests, creativity, and interest in others.

In the present study, we reversed Emotional Instability in Emotional Stability in order to measure the adaptive pole of all the Big Five Traits because, as highlighted by Asendorpf (2006), if all the traits are measured as desirable, the interpretation of personality profiles is more psychologically meaningful. The psychometric properties of the BFQ-C have been firmly established in other studies (e.g., Barbaranelli, Fida, Paciello, Di Giunta, & Caprara, 2008). In our study, we used an average of the scores for each trait (higher scores represent higher levels); the internal consistency was acceptable (alphas ranged from .72 to .83; omegas ranged from .72 to .79). For more information about reliability and descriptive statistics, see the paragraph "Preliminary Analysis" and the Table 4 in the section "Results".

Internalizing and Externalizing Problems

Self-reports of adolescents' internalizing and externalizing problems were obtained at Wave 1 and Wave 2 using the Italian version of Youth Self-Report (YSR, Achenbach, 1991). The YSR is a questionnaire composed by 112 items, with a 3-point Likert scale ranging from 0 (not true) to 2 (very often true), suitable for children between 11 years and 18 years old, useful to examining a wide variety of behaviours and emotions. The questionnaire assesses some adaptive and maladaptive relevant areas, like behaviours, social competences, global functioning of individuals, and some distinct syndrome scales.

For the present study, we focused on five internalizing (emotional problems involving mainly within the self; Achenbach & Rescorla, 2001) and externalizing (behavioral problems involving mainly conflicts with other people and with their expectations for the individual; Achenbach & Rescorla, 2001) problems. For what concerns Internalizing Problems, we focused on the following dimensions:

- *Withdrawn* (i.e., "I would rather be alone than with others", "I am too shy or timid", or "I keep from getting involved with others"), is related to shyness, behavioral inhibition, avoidance, withdrawal, and social anxiety;
- *Somatic Complaints* (i.e., "I feel dizzy or lightheaded", "I feel overtired without good reason", "Physical problems without known medical cause, such as nausea"), is referred to physiological symptoms related to internalizing problems (e.g., anxiety and depression);
- *Anxious/depressed* (i.e., "I cry a lot", "I am afraid I might think or do something bad", or "I worry a lot"), is related to anxious and depressive symptoms;

As regards Externalizing Problems, indeed, we focused on the following dimensions:

- *Aggressive Behavior* (i.e., "I destroy my own things", "I get in many fights", or "I am louder than other kids"), is referred to emotional/behavioral disorder, that lead to aggressive and disruptive behaviors directed to others;
- *Rule Breaking* (i.e., "I don't feel guilty after doing something I shouldn't", "I steal from places other than home", or "I use drugs for nonmedical purposes"), is referred to covert aggressive behaviors, and delinquent behaviors.

The reliability and validity of this instrument were largely confirmed in Italy (e.g., Frigerio et al., 2004). In our study, alphas ranged from .61 to .85, and omegas ranged from .74 to .88. For more information about reliability and descriptive statistics, see the paragraph "Preliminary Analysis" and the Table 4 in the section "Results".

Analytic Approach

To test our hypotheses, we followed two steps: (a) We ran Latent Profile Analysis to identify personality profiles in our sample; and (b) we ran a path analysis model using a multiple-group approach, using the posterior probabilities of being in each of the personality profiles (obtained in the first step). These two steps are described below.

(a) Personality Profiles

Latent Profile Analysis (Nylund, Asparouhov, & Muthén, 2007) was used in order to identify personality profiles. LPA derived from the more general Latent Class Analysis (LCA), available for continuous indicators of underlying latent classes, whereas LCA can be used when indicators are categorical. LPA/LCA is a finite mixture modeling technique, which, based on the person-centered approach (see Chapter 1 for a general description of this approach), "provides a framework for describing population heterogeneity in terms of differences across individuals on a set of behaviors or characteristics" (Lanza & Cooper, 2016, p. 59). Overall, mixture models have the following applications: identify unknown "a priori" homogeneous groups/classes of individuals; examine the features of heterogeneity across the groups/classes; evaluate the effects of covariates on the groups/classes membership and/or formation; asses the relationship between the group/class and other outcomes; study the transition overtime between the latent groups/classes (Wang & Wang, 2012; Geiser, 2013; Wickrama et al., 2016). Those applications, can address several developmental research questions (e.g., identify subgroups of individuals whit similar characteristic, and with similar relations with different predictors and outcomes; analyze the development of several sub-groups of individuals across time). Lanza and Cooper (2016), summarized a general overview on finite mixture models, showed in Table 3.

Table 3

Finite Mixture Modeling: Common Models Used in Developmental Research (Lanza & Cooper, 2016).

	Type of categorical latent variable	
Type of indicators	**Static**	**Longitudinal**
Categorical	Latent class analysis	Latent transition analysis
Continuous	Latent profile analysis	Growth mixture modeling

In particular, for what concerns LPA/LCA, the general assumption underlying this approach is that a population can be organized, or classified, into several sub-groups (mutually exclusive and exhaustive), with a unique distribution, in which individuals have similar characteristics, but different characteristics from individuals from other sub-groups. The general aim of LPA/LCA is to

identify unobserved groups of subjects, based on their patterns of item responses, and the identification process is based on the posterior membership probabilities (Lanza & Cooper, 2016; Wang & Wang, 2012; Geiser, 2013). LPA/LCA is based on the principle that each identified latent class follows their unique distribution, in a group of other unique distributions (i.e., the principle of "mixture of distributions"; Robbins, 1948). The mathematical framework underlying this approach is the Bayes' Theorem and the conditional probabilities (van de Schoot et al, 2014): posterior probabilities that an individual would be member of each latent classes estimated will computed, but subjects will locate in the class that will show the highest probability to "fit" with each subject, based on their scores in each indicator. This estimation follows the Log Likelihood algorithm, with multiple iterations, in order to estimate a set of parameters for maximize the log-likelihood function (Expectation-Maximizaion, EM; Dempster, Laird, & Rubin, 1977) (Collins & Lanza, 2010).

LPA/LCA approach estimates two types of information:

1) A nominal variable that represents, for each individual, the categorical membership based on their higher posterior probability to being in one of the four latent classes (e.g., the first individual is in the class number 1, the second individual is in the class number 3, etc.);
2) Several continuous variables, one for each latent class, (from .00 to 1.00) that represent, for each individual, the posterior probabilities for being in each of the four latent classes (e.g., the first individual has the value of .90 in the first posterior probability variable, the value of .01 in the second posterior probability variable, the value of .03 in the third posterior probability variable, and the value of .06 in the fourth posterior probability variable, etc.).

Thus, it is important to consider that, due to the nature of those estimated parameters as well as the nature of the approach itself, memberships for all the individuals are merely probabilities, the "real" class for each individual is unknown, because the class is latent, and because that variable is estimated through a process based on probabilities (Lanza & Cooper, 2016; Collins & Lanza, 2010). However, as previously mentioned, the identification process follows estimation mechanisms that aim to maximize those probabilities.

For what concerns the application of this approach, to select the model that best represents the number of latent profiles, comparing the 2-, 3-, 4-, and 5- class models, we started from the 2-profile solution and compared this model with the model with an additional latent class, the 3-profiles model with the model with an additional latent class, and so on. For this evaluation, the following criteria were considered:

a) The information criterion indices, such as Akaike Information Criterion (AIC; Akaike, 1973), and the Bayesian Information Criterion (BIC; Schwartz, 1978); lower values indicate a better model fit.
b) The Bootstrap Likelihood Ratio Test (BLRT; McLachlan, 1987): significant values ($p < .05$) indicate that the model with $k + 1$ classes is better than the k class model.

c) Entropy: a level of .06 or higher is considered acceptable (Asparouhov & Muthèn, 2013; Reinecke, 2006).
d) The percentage of each profile: each class had to represent at least 5% of the sample (Speece, 1994);
e) The interpretability of each profile (Wang & Wang, 2012).

To examine invariance of the personality profiles across gender, we conducted a series of multi-group LPAs with gender as the grouping variable, following the procedure reported by Eid and colleagues (Eid, Langehiene, & Diener, 2003). We compared two different models using the BIC index: we compared a model in which we forced the means of the latent classes to be equal across groups, with a model in which the means of the latent classes were free across groups; the lowest BIC index indicates the best model. Finally, to test for gender differences, we used a *n* (Class1, Class2, Class3, … etc.) X 2 (boys and girls) contingency table with chi-square test, and we examined the adjusted standardized residuals obtained to determine any significant differences.

(b) The Prediction by Personality Profiles of Internalizing and Externalizing Problems

To answer to our second and third hypotheses, we examined the association of personality profiles with later externalizing and internalizing problems, and the moderating role of gender, using a path analysis model and adopting a multiple-group approach.

In this second step, in line with previous studies (e.g., Broidy et al., 2003; Luengo Kanacri et al., 2014), in the path analysis we used the continuous variables that represent for each individual, the posterior probabilities for being in each of the four latent classes.

We tested a multigroup path analysis model in which we considered the three-abovementioned variables as indices of the personality profiles, that predicted the five dimensions of internalizing and externalizing problems simultaneously, using gender as grouping variable. We controlled for the preadolescents' age and socio-economic status, and for the stability of each of the problem behavior from W1 to W2.

We used Maximum Likelihood Estimation (MLE, Yuan & Bentler, 2006) for continuous variables, and considered the following criteria to evaluate the goodness of fit: χ^2 Likelihood Ratio Statistic, the Comparative-Fit Index (CFI) and the Tucker-Lewis-Fit Index (TLI) greater than .95 (Hu & Bentler, 1999), the Root Mean Square Error of Approximation (RMSEA) with associated confidence intervals lower than .05, and the Standardized Root Mean Square Residual (SRMR) lower than .06 (Kline, 2015). We did not report correlations between externalizing and internalizing problems, but they ranged from .37 to .65 at W1, and from .37 to .72 at W2.

The model was tested for males and females using a multiple-group approach. We estimated a full-constrained model (a model in which we forced all the parameters to be equal across gender), and a full-unconstrained model (a model in which we freely estimated all the parameters across gender).

If the chi-square difference was significant (suggesting that some parameters could differ across gender), starting from the linear full-constrained model, we released one parameter at time, comparing those partially constrained models with the full-unconstrained model each time, until the chi-square difference was no longer significant (suggesting that if we freely estimate that parameters, the chi square did not significantly increase), adopting a cutoff of $p < .01$ (Kline, 1998).

RESULTS

Preliminary Analysis

For all the study variables, observed means and standard deviations, as well as correlations, are presented in Table 4.

Table 4

Correlations, Descriptive Statistic and Reliability of the Study 1 Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Age (1)	-																
SES (2)	-.141***	-															
E W1 (3)	-.069	.124**	-														
A W1 (4)	-.039	.069	.397**	-													
C W1 (5)	-.124**	-.070	.239**	.484**	-												
ES W1 (6)	-.042	.010	.133**	.195**	.308**	-											
O W1 (7)	-.153***	.232***	.396**	.365**	.449**	.195**	-										
With W1 (8)	.014	-.040	-.292***	-.138**	-.207***	-.266***	-.261***	-									
Som W1 (9)	-.104*	-.057	-.130**	-.120**	-.178***	-.249***	-.263***	.531***	-								
Anx/dep W1 (10)	-.086*	-.109**	-.238***	-.142***	-.175***	-.361***	-.271***	.636***	.625***	-							
Agg W1 (11)	.063	.037	-.046	-.279***	-.453***	-.446***	-.216***	.419***	.470***	.505***	-						
Rule W1 (12)	.170***	-.014	-.123**	-.262***	-.385***	-.248***	-.282***	.277***	.353***	.354***	.644***	-					
With W2 (13)	.063	-.036	-.182**	-.101*	-.142**	-.138**	-.112*	.350***	.169***	.257***	.161**	.078	-				
Som W2 (14)	.094	-.044	-.109*	-.102*	-.141**	-.151**	-.110*	.148**	.243***	.180***	.165**	.172***	.585**	-			
Anx/dep W2 (15)	.068	-.056	-.158**	-.067	-.133**	-.229**	-.155**	.281***	.233***	.327***	.227**	.169***	.735**	.702**	-		
Agg W2 (16)	.097*	-.049	-.054	-.227**	-.327**	-.303**	-.140**	.155**	.195***	.228***	.482***	.374***	.484**	.503**	.590**	-	
Rule W2 (17)	.163**	-.010	-.020	-.198**	-.281**	-.176**	-.155**	.040	.104*	.125*	.412***	.485***	.325**	.425**	.442**	.690**	-
M	12.60	.000	4.141	3.280	3.557	3.336	3.528	.458	.394	.410	.481	.281	.402	.272	.317	.447	.300
SD	.674	1.000	.603	.707	.719	.757	.757	.323	.330	.294	.309	.257	.324	.306	.306	.314	.267
Cronbach's alpha			.764	.739	.717	.776	.826	.605	.751	.727	.824	.714	.693	.786	.814	.852	.759

Note: SES = socio-economic status; E = Energy; A = Agreeableness; C = Conscientiousness; ES = Emotional Stability; O = Opennes; With = Withdrawn; Som = Somatic Complaints; Anx/dep = Anxious/depressed; Agg = Aggressive Behavior; Rule = Rule Breaking; M = Mean; SD = Standard Deviation.

† $p \leq .060$ * $p < .050$, ** $p < .010$, *** $p < .001$.

As shown in Table 4, most of the variables were significantly associated with each other. For simplicity, in the following section we will discuss only the main associations, greater than [.30].
Overall, all the Big Five traits are positively associated each other. In particular, Energy is associated with Agreeableness and Opennes; Agreeableness is associated with Conscientiousness and Opennes; Conscientiousness is associated with Emotional Stability and Openness.
As regards associations between Internalizing and Externalizing problems, they were significantly associated each other, both cross-sectionally and longitudinally. In particular, for what concerns associations between Internalizing and Externalizing problems in the same Waves of the Study, Withdrawn is positively associated with Somatic Complaints at W1 and W2, with Anxious/depressed at W1 and W2, with Aggressive Behavior at W1 and W2, and with Rule Breaking at W2; Somatic Complaints is positively associated with Anxious/depressed at W1 and W2, with Aggressive Behavior at W1 and W2, and with Rule Breaking at W1 and W2; Anxious/depressed is positively associated also with Aggressive behavior and Rule Breaking at W1 and W2. In addition, Aggressive Behavior and Rule Breaking were positively associated each other at W1 and W2. For what concerns longitudinal associations, Aggressive Behavior W1 is positively associated with Rule Breaking W2; similarly, Rule Breaking W1 is positively associated with Aggressive Behavior W2. As regards the stability of Internalizing and Externalizing problems, most of the problems reported moderate stability across time.
As regards associations between the Big Five traits with Internalizing and Externalizing problems, most of them are significantly associated each other. In particular, associations among Energy, as well as Agreeableness, and Internalizing/Externalizing problems were negative and low-to-weak; Conscientiousness was negatively associated with Aggressive Behavior both at W1 and W2, and with Rule Breaking W1; Emotional Stability was negatively associated especially with Anxious/depressed W1, and with Aggressive Behavior both at W1 and W2; finally, associations among Openness and Internalizing/Externalizing problems were negative and low-to-weak.

Lastly, for what concerns age and socio-economic status, most of the study variables were barely associated with adolescents'' age and socio-economic status.

Latent Profile Analysis: Identification of Personality Profiles

Latent Profile Analysis (LPA; Nylund, Asparouhov, & Muthén, 2007) was applied in order to identify adolescents' personality profiles. We compared the two-class, three-class, four-class, and five-class models, based on the criteria and procedures discussed in the "Statistical Approach" section (results are shown in Table 5).

Table 5

Model fit statistics for the Latent Profile Analysis of the Big Five Traits.

					Classes		
	BIC	AIC	BLRT	Entropy	n°	%	N
2 classes	6312.136	6241.390	< .0001	.640	1	38%	236
					2	62%	379
3 classes	6224.003	6126.727	< .0001	.717	1	8%	52
					2	62%	381
					3	30%	182
4 classes	6225.594	6101.789	< .0001	.730	1	10%	64
					2	55%	337
					3	5%	28
					4	30%	186
5 classes	6225.067	6074.732	< .0001	.738	1	1%	8
					2	26%	158
					3	8%	48
					4	53%	325
					5	12%	76

Note: BIC = Bayesian Information Criterion; AIC = Akaike Information Criterion; BLRT = Bootstrap Likelihood Ratio Test.

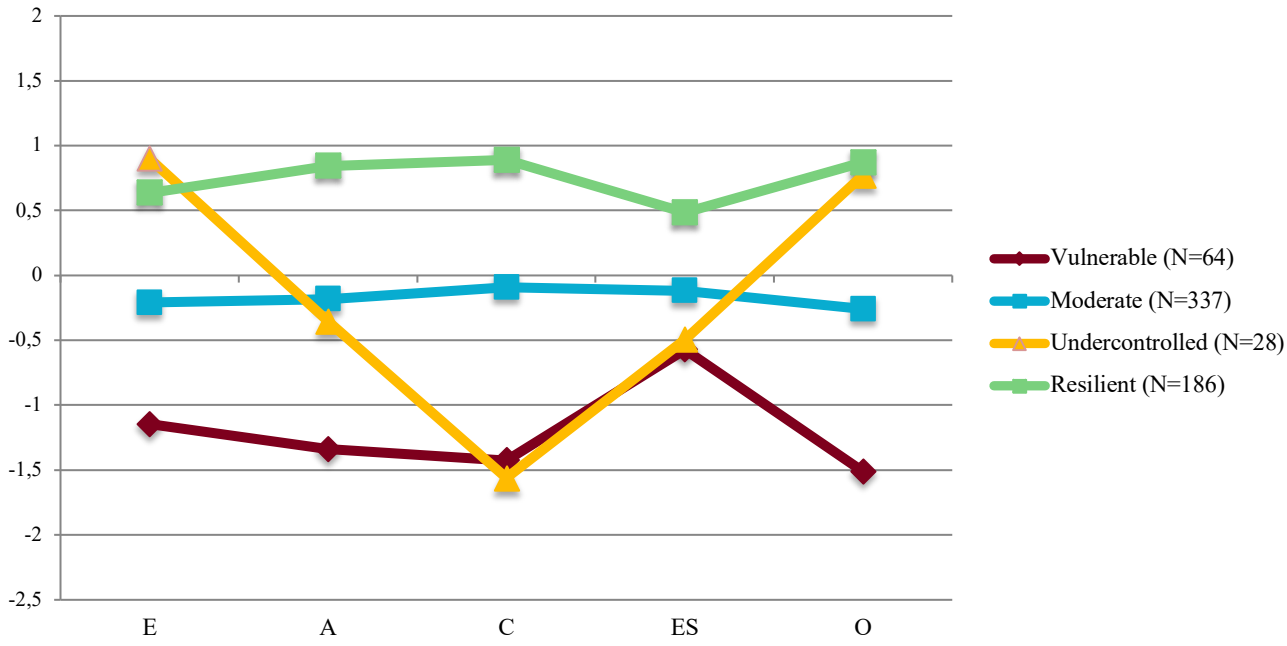
We excluded the 5-class (because this model included one class with a too small a percentage of individuals) and the 2-class models (because this model had the worst fit in terms of AIC, BIC, and Entropy). Both 3-class and 4-class models had good fit indices, but we decided to adopt the 4-class model because the AIC and Entropy were better in the 4-class model, and also because in the 3-class model we found a solution that was not in line with previous studies (the 3-class model was characterized by the following profiles: (a) Vulnerable, (b) Moderate, and (c) Resilient).

Therefore, we selected the 4-class model as the best model, that unambiguously identified the following same profiles found in previous studies (e.g., De Bolle & Tackett, 2013; De Clercq et al., 2012; Xie et al., 2016): (a) Moderate, (b) Resilient, (c) Vulnerable, and (d) Undercontrolled (see Figure 1):

- The Moderate profile (the most prevalent class, that could be considered as a "normative profile") was characterized by average scores on all the personality dimensions;
- The Resilient profile was characterized by high scores in all the personality dimensions;
- The Vulnerable profile was characterized by below-average Emotional Stability and low scores in all other personality dimensions;
- The Undercontrolled profile (the less prevalent profile), was characterized by high scores on Energy and Openness, very low Conscientiousness, and below-average Emotional Stability.

Figure 4

Graphical representation of personality profiles



Note: The graphical representation was done using Z score for each personality trait.

E = Extraversion; A = Agreeableness; C = Conscientiousness; ES = Emotional Stability; O = Opennes.

Gender Invariance and Distribution of Gender

We tested the measurement invariance of the personality profiles across gender, in a multi-group LPA framework, following the procedure reported in the "Analytic Approach" section (Eid et al., 2003). We compared two different models, with gender as a grouping variable: a model in which we forced the means of the latent classes to be equal across gender, with a model in which the means of the latent classes were free between boys and girls. The comparison through the BIC index suggested that personality profiles did not differ across gender (BIC_{equal} = 7158.89< BIC_{free} = 7192.28), because the BIC index of the first model was better than the BIC index of the second model, so we concluded that the four identified personality profiles were the same across gender.

For what concerns adolescents' gender, we used a 4 (Moderate, Resilient, Vulnerable, and Undercontrolled) X 2 (boys and girls) contingency table with chi-square test in order to analyze the distribution of gender across profiles, and we examined the adjusted standardized residuals obtained to determine any significant differences. Adjusted standardized residuals indicated that there were significantly more boys than girls (67%; Standardized residual = |2.3|) in the Vulnerable profile, whereas there were significantly more girls than boys (53% females; standardized residuals = |2.1|) in the Resilient profile ($\chi 2$ (3) > 9.993, p = .019). No significant gender differences were found for

the Moderate and the Undercontrolled profiles, despite the percentage of boys in the Undercontrolled was 68%.

Prediction by Personality Profiles of Internalizing and Externalizing Problems

To examine the unique prediction of the personality profiles for later externalizing and internalizing problems (i.e., anxiety/depression, withdrawal, somatic complaints, aggressive problems, and rule-breaking), we tested a path analysis using a multiple-group approach in which we considered the effects of the probability of belonging to personality profiles on the indices of internalizing and externalizing problems simultaneously, using gender as grouping variable.

We used only three of the four posterior probabilities variables (Resilient, Undercontrolled, and Vulnerable) and excluded the variable that represents the probabilities of being Moderate for two reasons:

1) The posterior probabilities of group membership in each group would add up from .00 to 1.00 for each individual, so if we considered all the four variables with the posterior probabilities these four independent variables would be perfectly correlated each other.

2) The Moderate profile represents a normative/average profile, so we hypothesized that this profile would be the less informative in terms of cross-sectional and longitudinal associations with externalizing and internalizing problems.

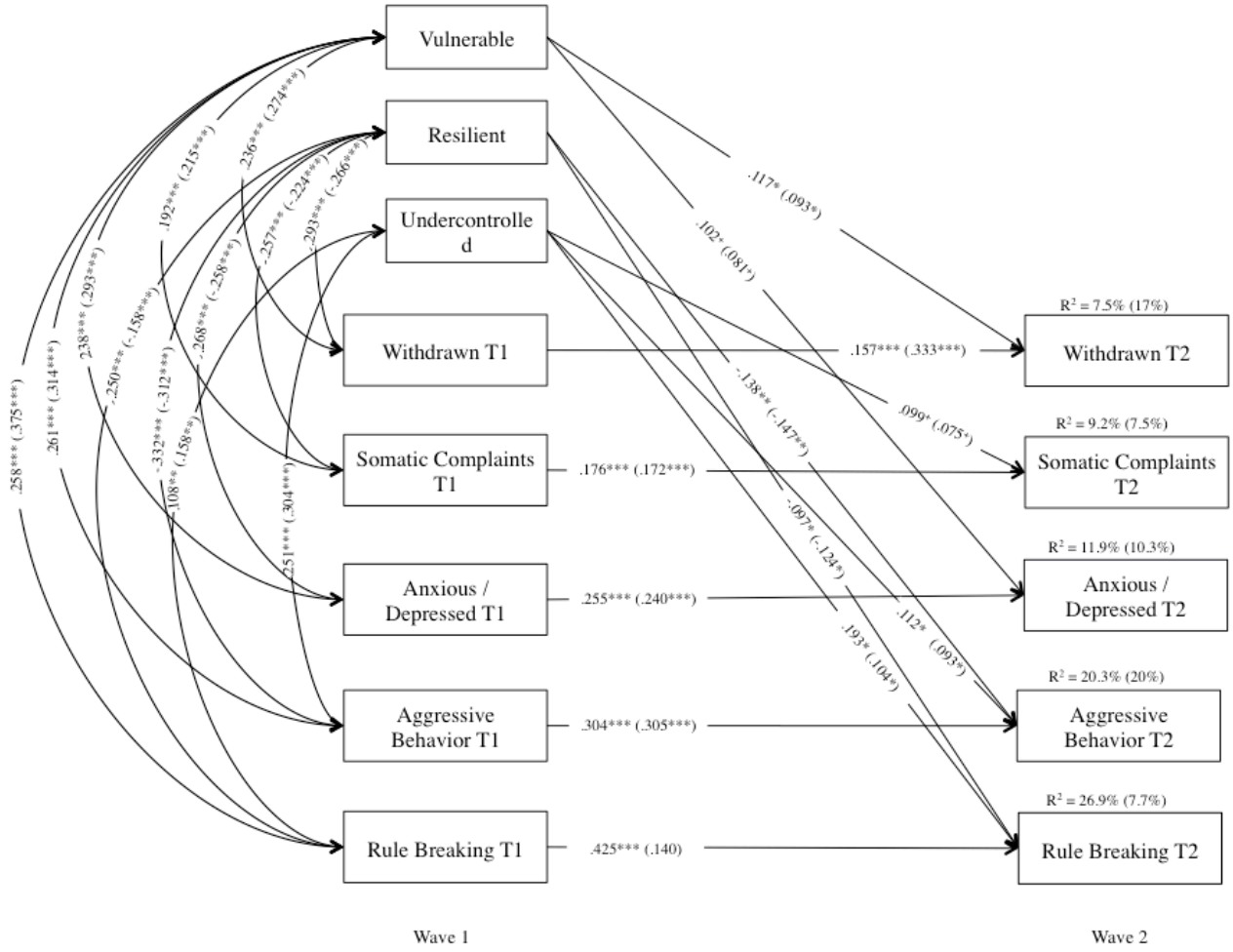
In addition, we controlled for the preadolescents' age and socioeconomic status, and for the stability of each of the problem behavior from W1 to W2.

The model was tested for males and females using a multiple-group approach. An unconstrained model with path coefficients freely estimated across gender groups was compared to a constrained model with path coefficients constrained to be equal. After we released the constraints associated with the stability of withdrawal and of rule-breaking behavior, the partially constrained model showed a non-significant increase in the chi-square ($\Delta\chi^2$ (40) = 109.268, p = .016), adopting a cutoff of $p < .01$ (given that obtaining a significant χ^2 becomes increasingly likely with large sample sizes; Kline, 1998). The final partially constrained model showed good fit indexes (see Figure 5).

At W1, after controlling for age and SES, all the internalizing and externalizing problems were negatively associated with the Resilient profile and positively with the Vulnerable profile. Externalizing but not internalizing problems were associated with the Undercontrolled profile. Overall, internalizing and externalizing problems were significantly stable across three years, but boys reported higher stability than girls for rule-breaking behaviors and lower stability for withdrawal.

Figure 5

Personality profiles, internalizing and externalizing problems 3 years later, separately for boys and girls controlling for age and socioeconomic status.



Model fit: χ^2 (120) = 181.166 (p < .000); CFI = .980; TLI = .965; RMSEA = .041 (C.I. .028 - .053); SRMR = .055.
Note: + $p \leq .07$ * $p < .05$, ** $p < .01$, *** $p < .001$.
The first values refers to males, the second values refers to females. Paths fixed to zero, and non-significant paths are not shown. Correlations among outcomes at W1 and W2 were estimated but not depicted for simplicity.
The stability path of Rule Breaking behaviors in females is non-significant.

No gender differences were found in the longitudinal associations. After controlling for the stability of outcomes and for age and SES, the Resilient profile significantly predicted low levels of aggressive behavior and rule-breaking behaviors; the Vulnerable profile predicted a high level of withdrawal and, at near significance, high anxious/depressive symptoms. Finally, the Undercontrolled profile significantly predicted high aggressive behavior and rule-breaking behaviors, and near significantly predicted high somatic complaints (p = .061).

DISCUSSION

Our study corroborated previous findings by obtaining four configurations of personality characteristics with different levels of adaptive and maladaptive personality traits that differentially and uniquely predicted later emotional and behavioral problems, over and above the stability of these problems. Overall, the study did not corroborate a moderating role of gender in the association between personality profiles and maladjustment, although there were some gender differences in the stability of outcomes.

Personality Profiles

According with previous studies (e.g., De Bolle & Tackett, 2013; De Clercq et al., 2012; Xie et al., 2016), we confirmed the Resilient profile (a well-adapted profile), and the Moderate profile (the most prevalent in the population) that represents a normative profile, with average scores for all personality dimensions. We also verified the presence of the Undercontrolled profile, the smallest profile in the sample, that showed some adaptive characteristics, such as high energy, high openness, but also low conscientiousness, average-low agreeableness, and average-low emotional stability. Finally, we found a Vulnerable profile that was the most compromised, with average-low emotional stability and low scores on all other personality dimensions. In accord with most of studies that have found four profiles (e.g., De Bolle & Tackett, 2013; De Clercq et al., 2012; Xie et al., 2016), we did not find the Overcontrolled profile.

Our findings supported the body of research that highlighted the importance to identify personality profiles in adolescence and to further investigate the structure of personality that better reflect this developmental period (e.g., Asendorpf, 2006; Isler et al., 2017). Consistent with some recent findings (e.g., De Bolle & Tackett, 2013; De Clercq et al., 2012; Xie et al., 2016), our findings supported a personality structure in adolescence based on four different profiles. As highlighted by some recent findings (e.g. Isler et al., 2017), compared to the three-profile solution, four profiles may better reflect the original theoretical framework for understanding personality profiles proposed by Block and Block, and they are considered as more theoretical and empirically powerful (Isler et al., 2017). Moreover, in contrast to our study, in which we considered a specific and limited age range, most of the studies that have confirmed the presence of the Overcontrolled and the tree-profiles solution in adolescence have considered heterogeneous age groups, (e.g., Meeus et al., 2011). It is possible that the heterogeneity of samples could influence findings concerning configurations of personality profiles, so further research is needed.

Personality Profiles and Later Internalizing and Externalizing Problems

Our findings supported the expected associations between personality profiles and maladjustment in young adolescents, and the unique, differential predictive value of personality profiles for internalizing and externalizing problems three years later, controlling for adolescents' age, socioeconomic status, and for the stability of the outcomes. This was the first study that specifically addressed this issue. Contrary to our expectations, we did not find any gender moderation in the relations between personality profiles and later adjustment problems. However, it is possible that a larger sample is needed to obtain significant moderation, especially because moderation effects might be expected to be small.

Consistent with previous studies (e.g., Asendorpf & Van Aken, 1999; De Clerq et al., 2012; Meeus et al., 2011), the Resilient profile was associated with lower internalizing and externalizing problems in both early and middle adolescence. Resilient adolescents possess personality characteristics that make them able to appropriately regulate their emotions and behavior, and that may protect them from developing behavioral and emotional difficulties in the short term. With regard to the absence of unique longitudinal relations to internalizing problems, perhaps the protective role of resilient profile in the development of some internalizing problems is stronger in other specific periods during adolescence.

As expected, the Undercontrolled profile was associated with high aggressive and rule breaking behaviors (e.g., Robins et al., 1996; Xie et al., 2016), but not with internalizing problems (Asendorpf & Van Aken, 1999; De Clerq et al., 2012), both concurrently and longitudinally. Externalizing problems in these adolescents probably were related to low self-regulation, as reflected in low emotional stability and conscientiousness. Undercontrolled youth were also quite extraverted and open to experience, and moderately agreeable, so they might have had a large network of peer relationships, and sought new experiences, that in turn could expose them to deviant peer pressure and to the temptation to try various transgressive experiences (McGhee, Ehrler, Buckhalt, & Phillips, 2012). The association between Undercontrolled and somatic problems was partially unexpected, although it is recognized that externalizing problems may contribute to the increase in internalizing problems (e.g., Capaldi, & Stoolmiller, 1999). The finding was only near significant and may not be reliable; further studies should verify this association.

Similar to other studies (e.g., De Clercq et al., 2012; Xie et al., 2016), the most maladaptive profile was the Vulnerable profile. These adolescents reported pervasive maladjustment in early adolescence, but they appeared longitudinally uniquely prone only to internalizing problems (i.e., withdrawal and anxious/depression). We reasoned that due to being low in all Big Five traits, Vulnerables were less adaptable than other youths, they had fewer resources for dealing with stressors and daily difficulties, and they had limited opportunities for, and potential to, establish a large and rewarding network of interpersonal relationships, which could make them more

susceptible to internalizing problems (see Rueger, Malecki, Pyun. Aycock, & Coyle, 2016). The association between the Vulnerable profile and anxiety/depression was only marginally significant for boys, so one should use caution in interpreting those findings. Perhaps, it is possible that this marginal association becomes stronger across later years, when internalizing symptoms increase (Leadbeater, Thompson, & Gruppuso, 2012).

Those findings underline the usefulness of adopting a holistic approach to examining the predictive value of personality characteristics rather than focusing on single traits. In particular, findings concerning the different predictive value of Undercontrolled and Vulnerable profiles (that share similar low levels of self-regulation) suggest that the lack of self-regulation might be differentially associated to an increase in later externalizing or internalizing problems, depending on the configuration of adolescents' personality profiles.

Finally, in line with previous findings (Miller, Malone, Dodge & CPPRG, 2010), compared to girls, boys showed stronger stability of rule-breaking and a lower stability of withdrawn behavior. Some authors (e.g. Doey, Coplan, & Kingsbury, 2014) have suggested that withdrawn boys are more likely than withdrawn girls to elicit negative social reactions. Thus, it is reasonable to suggest that the different relevance of withdrawal in interpersonal experiences might affect the stability of withdrawal across gender.

Probably, research on the associations among personality profiles and internalizing and externalizing problems in adolescents would benefit from using large-scale samples that allow for the comparison of different age groups, or from using a limited age range when samples are relatively small. Adolescence is a period of change for internalizing and externalizing problems; so, addressing specific developmental periods (e.g., from early-to-mid adolescence or from early-to-late adolescence) would provide more specific information concerning which personality profiles represent vulnerability factors for specific outcomes during this period.

CONCLUSIONS

Overall, this study contributes to knowledge concerning personality in the field of typological research (Asendorpf & Van Aken, 1999; Meeus et al., 2011) with pre-adolescents in European contexts, and provides support for the vulnerability/predisposition hypothesis (Tackett, 2006) by linking different personality profiles to different internalizing and externalizing problems. To our knowledge, this is the first study that identified personality profiles with early adolescents in Italy and assessed their prediction of subsequent internalizing and externalizing problems, that have considered several internalizing and externalizing problems simultaneously, taking into account the stability of these outcomes, and considering the moderating role of gender in these longitudinal associations. Nonetheless, our study has some limitations. First, we assessed only youths' self-

reports about their personality characteristics as well as their internalizing and externalizing problems, so it is possible that our findings were partially affected by some method effect. However, previous research underlined the importance to consider adolescents' self-perceptions about their own personality characteristics (e.g., Rothbart & Bates, 2006), as well as about their own perception of their internalizing symptoms (e.g., Ormel et al., 2005). In contrast, for what concerns externalizing problems, previous studies underlined the importance to consider other reports about adolescents' behavioral problems, such as aggressive behaviors or rule breaking behaviors (e.g., De Los Reyes et al., 2015). Therefore, further studies, using different informants, adopting the same methodology used in the present contribution, would clarify more in deep the unique associations between personality profiles and internalizing and externalizing problems across adolescence (e.g., Noordhof, Oldehinkel, Verhulst, & Ormel, 2008).

Secondly, we did not consider changes in personality profiles across time, so we did not consider change in personality configurations such a part of normative development. Some previous studies (e.g., Meeus et al., 2001; Leiksas & Salmela-Aro, 2014) underlined the usefulness of considering how personality profiles change, especially during adolescence that is a period characterized by low stability of personality profiles. In fact, these previous studies supported the general idea that during adolescence individuals tend to move from their profile into the direction of a more adjusted profile, emphasizing how adolescence is crucial for individuals' developmental successful or unsuccessful pathways (e.g., Steinberg & Morris, 2001). Therefore, further studies should take into account the low stability of personality profiles across adolescence, taking into account mechanisms of continuity and change in personality.

Despite the limitations, our findings support the relevance of adopting a holistic approach to the study of personality and adjustment relations, and corroborate the identification of adolescents' four personality profiles, and their usefulness for predicting different adjustment outcomes over the course of adolescence.

REFERENCES

Achenbach T. M., (1991) Integrative guide for the 1991 CBCL/4-18, YSR and TRF profiles. Burlington: Department of Psychiatry, University of Vermont

Achenbach, T. M., Ivanova, M. Y., Rescorla, L. A., Turner, L. V., & Althoff, R. R. (2016). Internalizing/externalizing problems: Review and recommendations for clinical and research applications. *Journal of the American Academy of Child & Adolescent Psychiatry*, 55, 647-656. DOI: 10.1016/j.jaac.2016.05.012

Achenbach, T.M., & Rescorla, L.A. (2001). Manual for the ASEBA School-Age Forms & Profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Akaike, H. (1973). Maximum likelihood identification of Gaussian autoregressive moving average models. *Biometrika*, *60*(2), 255-265. DOI: 10.1093/biomet/60.2.255

Akse, J., Hale III, W. W., Engels, R. C., Raaijmakers, Q. A., & Meeus, W. H. (2004). Personality, perceived parental rejection and problem behavior in adolescence. *Social Psychiatry and Psychiatric Epidemiology*, 39, 980-988. DOI: 10.1007/s00127-004-0834-5

Akse, J., Hale, W. W., Engels, R. C., Raaijmakers, Q. A., & Meeus, W. H. (2007). Co-Occurrence of Depression and Delinquency in Personality Types. *European Journal of Personality*, 21, 235-256. DOI: 10.1002/per.604

Allport, G. W. (1937). *Personality: A psychological interpretation.* New York: Holt.

Allport, G. W. (1961). *Pattern and growth in personality.* New York, Rinehart and Winston.

Allport, G. W. (1965). *Letters from jenny*. New York: Harcourt, Brace & World.

Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. *Psychological monographs*, *47*(1), i. DOI: 10.1037/h0093360

Asendorpf, J. B. (2006) Typeness of Personality Profiles: A Continuous Person-Centred Approach to Personality Data. *European Journal of Personality*, 23, 83-106. DOI: 10.1002/per.575

Asendorpf, J. B. (2015). Person-centered approaches to personality. *APA handbook of personality and social psychology*, *4*, 403-424. DOI: 10.1037/14343-018

Asendorpf, J. B., & van Aken, M. A. (1999). Resilient, overcontrolled, and undercontrolled personality prototypes in childhood: Replicability, predictive power, and the trait-type Issue. *Journal of Personality and Social Psychology*, 77, 815-832. DOI: 10.1037/0022-3514.77.4.815

Asparouhov, T., & Muthén, B. (2013). Auxiliary variables in mixture modeling: 3-step approaches using Mplus. Mplus Web Notes: No. 15. *Retrievable from www. statmodel. com*.

Barbaranelli, C., Caprara, G. V., Rabasca, A., & Pastorelli, C. (2003). A questionnaire for measuring the Big Five in late childhood. *Personality and Individual Differences*, 34, 645-664. DOI: 10.1016/S0191-8869(02)00051-X

Barbaranelli, C., Fida, R., Paciello, M., Di Giunta, L., & Caprara, G. V., (2008). Assessing personality in early adolescence through self-report and other-ratings a multitrait-multimethod analysis of the BFQ-C. *Personality and Individual Differences*, 44, 876-886. DOI: 10.1016/j.paid.2007.10.014

Block, J. (1971). *Lives through time*. Berkeley: Psychology Press.

Block, J. H., Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.). *Development of cognition, affect, and social relations: The Minnesota symposia on child psychology* (Vol. 13, pp. 39-103). Hillsdale, NJ: Erlbaum.

Broidy, L. M., Nagin, D. S., Tremblay, R. E., Bates, J. E., Brame, B., Dodge, K. A., ... & Lynam, D. R. (2003). Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: a six-site, cross-national study. *Developmental psychology*, *39*(2), 222. DOI: 10.1037/0012-1649.39.2.222

Capaldi, D. M., & Stoolmiller, M. (1999). Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: III. Prediction to young-adult adjustment. *Development and Psychopathology*, 11, 59–84. DOI: 10.1017/S0954579499001959

Caprara, G. V. and Cervone, D. (2000) *Personality: determinants, dynamics, and potentials*. New York: Cambridge University Press. DOI: 10.1017/CBO9780511812767

Caprara, G. V., Pastorelli, C., Regalia, C., Scabini, E., & Bandura, A. (2005). Impact of adolescents' filial self-efficacy on quality of family functioning and satisfaction. *Journal of Research on Adolescence*, *15*(1), 71-97. DOI: 10.1111/j.1532-7795.2005.00087.x

Caprara, G. V., & Pastorelli, C. (1993). Early emotional instability, prosocial behaviour, and aggression: Some methodological aspects. *European Journal of Personality*, 7, 19-36. DOI: 10.1002/per.2410070103

Caprara, G. V., Pastorelli, C., Regalia, C., Scabini, E., & Bandura, A. (2005). Impact of adolescents' filial self‐efficacy on quality of family functioning and satisfaction. *Journal of Research on Adolescence*, *15*(1), 71-97. DOI: 10.1111/j.1532-7795.2005.00087.x

Caspi, A., & Shiner, R. L. (2006) Personality development. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of Child Psychology: Vol. 3. Social, emotional, and personality development* (6 ed). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0306

Cattell, R. B. (1943) The description of personality: basic traits resolved into clusters. *Journal of Abnormal and Social Psychology, 38*, 476–506. DOI: 10.1037/h0054116

Collins, L. M., & Lanza, S. T. (2010). *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences* (Vol. 718). John Wiley & Sons. DOI: 10.1002/9780470567333

Cook, M. (2012). *Levels of personality*. Cambridge University Press.

Crijnen, A. A. M., Achenbach, T. M., & Verhulst, F. C. (1997) Comparisons of Problems Reported by Parents of Children in 12 Cultures: Total Problems, Externalizing, and Internalizing. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 1269-1277. DOI: 10.1097/00004583-199709000-00020

De Bolle, M., & Tackett, J. L. (2013). Anchoring bullying and victimization in children within a Five-Factor Model-based person-centred framework. *European Journal of Personality*, *27*(3), 280-289. DOI: 10.1002/per.1901

De Clercq, B., Rettew, D., Althoff, R. R., & De Bolle, M. (2012). Childhood personality types: vulnerability and adaptation over time. *Journal of Child Psychology and Psychiatry*, 53, 716-722. DOI: 10.1111/j.1469-7610.2011.02512.x

De Los Reyes, A., Augenstein, T. M., Wang, M., Thomas, S. A., Drabick, D. A., Burgers, D. E., & Rabinowitz, J. (2015). The validity of the multi-informant approach to assessing child and adolescent mental health. *Psychological Bulletin*, *141*(4), 858. DOI: 10.1037/a0038498

Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the royal statistical society. Series B (methodological)*, 1-38. DOI: 10.2307/2984875

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual review of psychology*, *41*(1), 417-440. DOI: 10.1146/annurev.ps.41.020190.002221

Doey, L., Coplan, R. J., & Kingsbury, M. (2014). Bashful boys and coy girls: A review of gender differences in childhood shyness. *Sex Roles*, 70(7-8), 255-266. DOI: 10.1007/s11199-013-0317-9

Eid, M., Langeheine, R., & Diener, E. (2003). Comparing typological structures across cultures by multigroup latent class analysis: A primer. *Journal of Cross-Cultural Psychology*, *34*(2), 195-210. DOI: 10.1177/0022022102250427

Eysenck, H. J. and Eysenck, M. W. (1985) *Personality and individual differences: a natural science approach.* New York: Plenum.

Frigerio, A., Cattaneo, C., Cataldo, M. G., Schiatti, A., Molteni, M., & Battaglia, M. (2004). Behavioral and Emotional Problems Among Italian Children and Adolescents Ages 4 to 18 Years as Reported by Parents and Teachers. *European Journal of Psychological Assessment*, 20, 124-133. DOI: 10.1027/1015-5759.20.2.124

Geiser, C. (2013). *Data analysis with Mplus*. Guilford press.

Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. *Review of personality and social psychology*, *2*(1), 141-165.

Goldberg, L. R. (1990). An alternative 'Description of personality': the Big-Five factor structure. *Journal of Personality and Social Psychology, 59*, 1216–29. DOI: 10.1037//0022-3514.59.6.1216

Grice, J. W., Jackson, B. J., & McDaniel, B. L. (2006). Bridging the idiographic-nomothetic divide: A follow-up study. *Journal of Personality*, *74*(4), 1191-1218. DOI: 10.1111/j.1467-6494.2006.00407.x

Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability–transactional stress theory. *Psychological bulletin*, 127, 773-796. DOI: 10.1037/0033-2909.127.6.773

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55. DOI: 10.1080/10705519909540118

Isler, L., Fletcher, G. J. O., Liu, J. H., & Sibley, C. G. (2017) Validation of the four-profile configuration of personality types within the Five-Factor Model. *Personality and Individual Differences*, 106, 257-262. DOI: 10.1016/j.paid.2016.10.058

Istituto Italiano di Statistica (2002) Annuario statistico italiano 2002 [Italian yearbook of statistics 2002]. ISTAT, Rome

Jackson, D. N., & Tremblay, P. F. (2002). The six factor personality questionnaire. In B. de Raad & M. Perugini (Eds.), *Big Five assessment.* Ashland, OH: Hogrefe & Huber.

John, O. P., Robins R. W., & Pervin, L. A., (2008) *Handbook of Personality. Theory and Research*. 3rd Edition. New York: Guilford Press.

Klimstra, T. A., Akse, J., Hale, W. W., Raaijmakers, Q. A., & Meeus, W. H. (2010). Longitudinal associations between personality traits and problem behavior symptoms in adolescence. *Journal of Research in Personality*, 44, 273-284. DOI: 10.1016/j.jrp.2010.02.004

Kline, R.B. (1998). *Principles and practices of structural equation modeling*. New York: Guilford Press.

Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.). New York: Guilford Press.

Krueger, R. F., Caspi, A., & Moffitt, T. E. (2000). Epidemiological personology: the unifying role of personality in population‐based research on problem behaviors. *Journal of personality*, 68 (6), 967-998. DOI: 10.1111/1467-6494.00123

Lanza, S. T., & Cooper, B. R. (2016). Latent class analysis for developmental research. *Child Development Perspectives*, *10*(1), 59-64. DOI: 10.1111/cdep.12163

Leadbeater, B., Thompson, K., & Gruppuso, V. (2012). Co-occurring trajectories of symptoms of anxiety, depression, and oppositional defiance from adolescence to young adulthood. *Journal of Clinical Child & Adolescent Psychology*, 41, 719-730. DOI: 10.1080/15374416.2012.694608

Lewin, K. (1936). *Principles of topological psychology*. New York: McGraw Hill. DOI: 10.1086/286440

Luengo Kanacri, B. P., Pastorelli, C., Zuffianò, A., Eisenberg, N., Ceravolo, R., & Caprara, G. V. (2014). Trajectories of prosocial behaviors conducive to civic outcomes during the transition to adulthood: The predictive role of family dynamics. *Journal of Adolescence*, *37*(8), 1529-1539. DOI: 10.1016/j.adolescence.2014.07.002

Matthews, G. (2009) The Nature of personality Traits, In Matthews, G., Deary, I. J., & Whiteman, M. C., (Eds.) *Personality Traits. 3rd Edition*. New York: Cambridge University Press

McCrae, R. R., Costa Jr, P. T. (1995). Domains and Facets: Hierarchical Personality Assessment Using the Revised NEO Personality Inventory. *Journal of Personality Assessment*, 64, 21-50. DOI: 10.1207/s15327752jpa6401_2

McCrae, R., R., Costa Jr, P. T. (1996). Toward a new generation of personality theories: Theoretical contexts for the Five-Factor Model. In J. S. Wiggins (ed.), *The Five-Factor Model of Personality: Theoretical Perspectives* (pp. 51–87). New York: Guilford.

McCrae, R. R., & Costa Jr, P. T. (2008). Empirical and theoretical status of the five-factor model of personality traits. *The SAGE handbook of personality theory and assessment*, *1*, 273-294. DOI: 10.4135/9781849200462.n13

McGhee, R. L., Ehrler, D. J., Buckhalt, J. A., & Phillips, C. (2012). The relation between five-factor personality traits and risk-taking behavior in preadolescents. *Psychology*, 3, 558-561. DOI: 10.4236/psych.2012.38083

McLachlan, G. J. (1987). On bootstrapping the likelihood ratio test stastistic for the number of components in a normal mixture. *Applied statistics*, 318-324. DOI: 10.2307/2347790

Meeus, W., Van de Schoot, R., Klimstra, T., & Branje, S. (2011). Personality types in adolescence: change and stability and links with adjustment and relationships: a five-wave longitudinal study. *Developmental Psychology*, 47, 1181-1195. DOI: 10.1037/a0023816

Miller, S., Malone, P. S., Dodge, K. A., & Conduct Problems Prevention Research Group. (2010). Developmental trajectories of boys' and girls' delinquency: Sex differences and links to later adolescent outcomes. *Journal of Abnormal Child Psychology*, 38(7), 1021-1032. DOI: 10.1007/s10802-010-9430-1

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007) Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study. *Structural Equation Modeling: A Multidisciplinary Journal*, 14, 535-569. DOI: 10.1080/10705510701793320

Noordhof, A., Oldehinkel, A. J., Verhulst, F. C., & Ormel, J. (2008). Optimal use of multi-informant data on co-occurrence of internalizing and externalizing problems: the TRAILS study. *International Journal of Methods in Psychiatric Research*, *17*(3), 174-183. DOI: 10.1002/mpr.258

Ormel, J., Oldehinkel, A. J., Ferdinand, R. F., Hartman, C. A., De Winter, A. F., Veenstra, R., Vollebergh, W., Minderaa, R. B., Buitelaar, J. K., & Verhulst, F. C. (2005). Internalizing and externalizing problems in adolescence: general and dimension-specific effects of familial loadings and preadolescent temperament traits. *Psychological Medicine*, *35*(12), 1825-1835. DOI: 10.1017/S003329170500582

Perry, D. G., & Pauletti, R. E. (2011). Gender and adolescent development. *Journal of Research on Adolescence*, 21, 61-74. DOI: 10.1111/j.1532-7795.2010.00715.x

Reinecke, J. (2006). Longitudinal analysis of adolescents' deviant and delinquent behavior. *Methodology*, *2*(3), 100-112. DOI: 10.1027/1614-2241.2.3.100

Robbins, H. (1948). Mixture of distributions. *The Annals of Mathematical Statistics*, *19*(3), 360-369.

Robins, R. W., John, O. P., Caspi, A., Moffitt, T. E., & Stouthamer-Loeber, M. (1996). Resilient, overcontrolled, and undercontrolled boys: Three replicable personality types. *Journal of Personality and Social psychology*, 70, 157-171. DOI: 10.1037/0022-3514.70.1.157

Rothbart, M.K., & Bates, J.E. (2006). Temperament. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology: Vol.3. Social, emotional, and personality development* (6th ed., pp. 99–166). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0303

Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycock, C., & Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychological Bulletin*, 142, 1017-1067. DOI: 10.1037/bul0000058

Schwarz, G. (1978). Estimating the dimension of a model. *The annals of statistics*, *6*(2), 461-464. DOI: 10.1214/aos/1176344136

Speece, D. L. (1994). Cluster analysis in perspective. *Exceptionality*, *5*(1), 31-44. DOI: 10.1207/s15327035ex0501_3

Steca, P., Alessandri, G., & Caprara, G. V. (2010). The utility of a well-known personality typology in studying successful aging: Resilients, undercontrollers, and overcontrollers in old age. *Personality and Individual Differences*, 48, 442-446. DOI: 10.1016/j.paid.2009.11.016

Steinberg, L., & Morris, A. S. (2001) Adolescent Development. *Annual Review of Psychology*, 52, 83-110. DOI: 10.1146/annurev.psych.52.1.83

Stern, W. (1923). *Person und Sache: System des kritischen Personalismus: zweiter Band. Die Menschliche Persönlichkeit*. Verlag von Johann Ambrosius Barth.

Sumter, S. R., Bokhorst, C. L., Steinberg, L., & Westenberg, P. M. (2009). The developmental pattern of resistance to peer influence in adolescence: Will the teenager ever be able to resist? *Journal of Adolescence*, 32, 1009-1021. DOI: 10.1016/j.adolescence.2008.08.010

Tackett, J. L. (2006). Evaluating models of the personality–psychopathology relationship in children and adolescents. *Clinical Psychology Review*, 26, 584–599. DOI: 10.1016/j.cpr.2006.04.003

Van de Schoot, R., Kaplan, D., Denissen, J., Asendorpf, J. B., Neyer, F. J., & van Aken, M. A. (2014). A gentle introduction to Bayesian analysis: Applications to developmental research. *Child development*, *85*(3), 842-860. DOI: 10.1111/cdev.12169

Vygotskij, L. (1978). *Mind in Society: The Development of Higher Psychological Processes.* (M. Cole, V John-Steiner, S. Scribner e E. Souberman, eds.), Cambrigde, MA.

Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using Mplus*. John Wiley & Sons. DOI: 10.1002/9781118356258

Wickrama, K. K., Lee, T. K., O'Neal, C. W., & Lorenz, F. O. (2016). *Higher-order growth curves and mixture modeling with Mplus: a practical guide*. Routledge.

Winter, D. G., John, O. P., Stewart, A. J., Klohnen, E. C., & Duncan, L. E. (1998). Traits and motives: Toward an integration of two traditions in personality research. *Psychological Review, 105*, 230–250. DOI. 10.1037/0033-295X.105.2.230

Xie, X., Chen, W., Lei, L., Xing, C., & Zhang, Y. (2016) The relationship between personality types and prosocial behavior and aggression in Chinese adolescents. *Personality and Individual Differences*, 95, 56-61. DOI: 10.1016/j.paid.2016.02.002

Yuan, K. H., & Bentler, P. M. (2006). 10 structural equation modeling. *Handbook of statistics*, *26*, 297-358. DOI: 10.1016/S0169-7161(06)26010-3

Zahn-Waxler, C., Shirtcliff, E. A., & Marceau, K. (2008). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology*, 4, 275-303. DOI: 10.1146/annurev.clinpsy.3.022806.091358

CHAPTER III

STUDY II

Profiles of Negative Emotionality and Self-Regulation in Preadolescence: A Cross-Cultural Study

Abstract

Emotionality and Self-regulation processes are two fundamental temperamental domains of children' and adolescents' functioning, that interact each other, and together can influence personality development and adjustment overtime (e.g., Eisenberg et al., 2005; Rothbart & Bates, 1998; Muris et al., 2007; Shiner & Caspi, 2003). Adopting a person-centered approach, the aims of this study were (a) to identify the characteristic temperamental patterns in preadolescence, based on narrow dimensions of Negative Emotionality (i.e., Anger/Frustration, and Sadness/Depressive Mood) and Self-Regulation (i.e., Activation Control, Attention, and Inhibitory Control), in a cross-cultural sample (b) to explore the effects of preadolescents' gender and culture in the identification of these profiles. Five hundred twenty-seven mothers from three different countries (Italy, Colombia, and United States) completed the Early Adolescent Temperament Questionnaire about their preadolescent child (mean age = 12.6). Four temperamental types were identified using Latent Profile Analysis: the Average, the Regulated, the Over-reactive/regulated and the Over-reactive/disregulated. Using the three-step method specification, we found that girls had high probabilities to be Regulated or Over-reactive/regulated, whereas Americans had low probabilities to be Over-reactive/regulated or Over-reactive/disregulated. The present study corroborated the hypothesis of cultural and gender differences in adolescents' functioning based on their temperamental patterns.

Keywords: Self-regulation; Negative Emotionality; Person-Centered Approach.

INTRODUCTION

A large body of research has examined how some temperamental factors, such as negative emotionality (i.e., emotional and affective reactivity, such as anger-frustration or sadness) and self-regulation processes (i.e., flexible regulation of reactivity, effortful control), can predict adjustment or maladjustment, especially during adolescence (e.g., Muris et al., 2007). In particular, in examining the development of emotional and behavioral problems, previous findings attested the importance to consider the unique predictive value of different temperamental factors, such as Negative Emotionality and Self-Regulation, as well as the predictive role of their interaction (e.g., Rettew et al., 2008; Vervoort et al., 2011). Following this reasoning, recently a growing amount of research has focused on the identification of profiles based on some temperamental dimensions, and their links with later adjustment and maladjustment (e.g., Althoff et al., 2012; Laible et al., 2014; Rettew et al., 2004; Rettew et al., 2008), but most of them focused on young childhood (e.g., Laible et al., 2014), or they focused on temperamental dimensions more linked to biological and cognitive systems (i.e., like novelty seeking, harm avoidance, persistence, reward dependence; Rettew et al., 2004; 2008). According to the Person-Centered approach (see Chapter 1 for a more exhaustive description), that emphasized a holistic view of the individual global functioning during the development, we aimed to identify pattern of temperamental domains among early adolescents, based on narrow dimensions of self-regulation and negative emotionality. In addition, we explored the associations among those patterns, the adolescents' gender and the adolescents' culture.

The Structure of Temperament: The Model proposed by Rothbart and colleagues

Temperament is typically defined as the broad expression of individual differences in the emotional nature, as well as in the attention and activity levels; those individual differences are largely hereditary, because of their biological bases (Allport, 1961; Thomas & Chess, 1977). Despite its biological bases, as elucidated in Chapter 1, temperament is not static and unchangeable, but it can be adaptable to environmental demands and individual experiences (Rothbart & Ahadi, 1994). In fact, temperament, together with environment transactions, can shape and influence later personality development and adjustment overtime (Shiner & Caspi, 2003). It is important to take into account this "transformative nature" of temperament (i.e., its relations with the environment and the development) during the life span, in order to clearly discriminate normative and individual differences in temperament development (Goldsmith et al., 1997; Rothbart & Derryberry, 1981), to well understand how temperament development can change its expression overtime, and to identify the links between temperament and individual development overtime (Rothbart & Bates, 2006).

According with the model proposed by Rothbart and colleagues (e.g., Ellis & Rothbart, 2001; Evans & Rothbart, 2007; Rothbart, 2007; Rothbart & Bates, 2006; Rothbart & Derryberry, 1981; Rothbart et al., 2001), temperament was viewed as "individual differences in emotional, motor, and attentional reactivity measured by latency, intensity, and recovery of response, and self-regulation processes such as effortful control that modulate reactivity. These differences are biologically based and are linked to an individual's genetic endowment" (Rothbart, 2007; p. 207), and they are affected by biological factors, experiences, and maturation. In this view, according with the *Influential Theory* (Putnam, Ellis, & Rothbart, 2001; Rothbart & Bates, 2006; Vervoort et al., 2011), temperament can be organized into two core aspects (or factors); *reactivity* mechanisms are considered as processes involved in motor, affective, and sensory systems, whereas *self-regulation* mechanisms are considered as processes that can control and orient functioning (Rothbart et al., 2001):

- *The Reactive Factor*: is related to Emotionality. This factor appears earlier during the development, and is the most anchored to the psychobiological system; it includes both tendencies (i.e., negative emotionality) and reactions (i.e., specific emotions, physiological activation), and it is related to the individual's responsiveness to external and internal environment, as well as to the expression or inhibition of those reactions and tendencies (Rothbart & Ahadi, 1994; Rothbart, Ahadi, & Evans, 2000; Rothbart & Bates, 2006).
- *The Regulative Factor*: is related to Self-regulation. This factor, that develops later comparing with reactivity, is more anchored with the social development, and it includes a wide range of processes, such as effortful control and orienting, which allow to the flexible regulation of reactivity (Rothbart & Ahadi, 1994; Rothbart, Ahadi, & Evans, 2000; Rothbart & Bates, 2006).

Although the development of reactivity and self-regulation processes appears early in life, those individual characteristics set their basis in infancy and early childhood, when there is the lowest level of normative stability (Roberts & Del Vecchio 2000), that is defined by Alwin (1994, p. 139) as "the preservation of a set of individual ranks on a quality within a constant population over a specified amount of time.". In other words, the reactive and the regulative facets of temperament set their basis in a developmental period characterized by a wide variation and several developmental changes, so it is crucial to consider relations among those temperamental characteristics and individual development, in order to understand the processes underlying people's emotional and self-regulative experience overtime (Rothbart & Bates, 2006).

Those two core aspects of temperament can be operationalized in line with one of the most accredited models, that consider the structure of temperament, specifically in childhood and early adolescence, as composed by three broad dimensions of temperament, comparable with the structure of temperament of other higher-ordered animals, which in turn are characterized by

several more specific dimensions (Rothbart & Bates, 2006; Rothbart et al., 2001), as summarized in Table 1 (taken from Rothbart, 2007). In particular, the domain of Effortful Control conceives the voluntary part of the regulative factor, whereas the domains of Negative Affectivity and Extraversion/Surgency are the expression of the reactive factor.

Table 1

Dimensions of the Temperament Structure (Rothbart, 2007)

Temperamental dimensions	Definitions
Effortful control	
Attention Control	The capacity to focus attention as well as to shift attention when desired
Inhibitory Control	The capacity to plan future action and to suppress inappropriate responses
Perceptual Sensitivity	Detection or perceptual awareness of slight, low-intensity stimulation in the environment
Low-Intensity Pleasure	Pleasured derived from activities or stimuli involving low intensity, rate, complexity, novelty, and incongruity
Negative affectivity	
Frustration	Negative affect related to interrupt of ongoing tasks or goal blocking
Fear	Negative affect related to anticipation of distress
Discomfort	Negative affect related to sensory qualities of stimulation, including intensity, rate, or complexity of light, movement, sound, or texture
Sadness	Negative affect and lowered mood and energy related to exposure to suffering, disappointment, and object loss
Soothability	Rate of recovery from peak distress, excitement, or general arousal
Extraversion/surgency	
Activity	Level of gross motor activity including rate and extent of locomotion
Low-Shyness	Behavioral inhibition to novelty and challenge, especially social
High-Intensity Pleasure	Pleasure derived from activities involving high intensity or novelty
Smiling & Laughter	Positive affect in response to changes in stimulus intensity, rate, complexity, and incongruity
Impulsivity	Speed of response initiation
Positive Anticipation	Positive excitement and anticipation for expected pleasurable activities
Affiliation	Desire for warmth and closeness with others, independent of shyness or extraversion

The domain of Effortful Control is the expression of the self-regulatory processes, and includes aspects related to attention (i.e., the ability to maintain attentional focus or to shift the focus as needed to deal with task demands), inhibition (i.e., the capacity to effortfully suppress inappropriate responses under instructions or in novel/uncertain situations), perceptual sensitivity (i.e., how

people detect stimuli from the external environment, independently from their physiological perceptions), and low pleasure (i.e., the pleasure derived from activities or stimuli with low intensity, complexity, novelty or incongruity; Ellis, 2002; Muris, Meesters, & Blijlevens, 2007; Rothbart, 2007; Rothbart & Bates, 2006). The domain of Negative Affectivity conceives individual emotional tendencies and responsiveness in terms of negative emotions, such as frustration (i.e., interruption or block of an ongoing activity or task), fear (i.e., anticipation of threats of danger, pain, or harm), discomfort (i.e., uncomfortable feelings related to intensity, rate or complexity of external or internal stimuli), sadness (i.e., negative feelings including unhappiness, sorrow regret), or soothability (i.e., the ability to calm and recover from emotional distress; Ellis, 2002; Rothbart, 2007; Rothbart & Bates, 2006). The domain of Extraversion/Surgency conceives approach or appetitive behaviors, and it is related to activity level (i.e., physiological an motor activity), low shyness (i.e., few behavioral inhibition in new and unexpected situations), high pleasure (i.e., the pleasure derived from activities or stimuli with high intensity, complexity, novelty or incongruity), smiling (i.e., individual responsiveness in terms of positive emotions), impulsivity (i.e., speed of the response initiation), positive anticipation (i.e., positive feelings derived from expected pleasurable events), and affiliation (i.e., desire of closeness with others; Ellis, 2002; Rothbart, 2007; Rothbart & Bates, 2006). These three temperamental domains are related in terms of mechanisms and behaviors, with some personality traits of the Big Five model: in particular, Effortful control is related to Conscientiousness, Negative affectivity to Neuroticism, and Extraversion/surgency to Energy/Extraversion (e.g., Caspi, Roberts, & Shiner, 2005; Muris, Meesters, & Blijlevens, 2007; Rothbart, 2007).

The role of culture.

Those three broad temperamental domains were found to be substantially similar across different cultures, especially in the Western cultures, probably because of their biological bases, but their characteristics, such as their mean levels or their associations with other outcomes, or the way in which temperamental characteristics can be displayed in different contexts, can vary across culture, suggesting a great influence of environment (Ahadi, Rothbart & Ye, 1993; Chen, Yang & Fu, 2012; Rothbart, 2007). According with the model of personality presented by McCrae and Costa (presented in Chapter 2; 1996), individuals' dispositional characteristics operate in a complex system, characterized by several dynamic processes and components that interact each other in order to produce individual differences (McCrae & Costa, 1996). In this view, the external influences of the environment, such as cultural norms and life events and situations, contribute together with individuals' adaptation, that is culturally conditioned, to individual differences and behaviors. Culture play a key role in these processes, because a possible explanation of cultural differences could be related to the variability of cultural norms and social values. More specific,

cross-cultural differences in value orientations and motivation (Markus & Kitayama, 1991; Stevenson & Stigler, 1992) can lead to a different internalization of those value systems, a different thought about specific temperamental characteristics, and a different valuation of them (Rothbart, Ahadi, & Evans, 2000). Fox example, behavioral inhibition, such as Inhibitory Control, in the United States is generally considered as a negative characteristic, whereas in China is considered a positive attitude (Chen et al., 1998). For what concerns temperamental characteristics of Self-regulation and Emotionality, previous research (e.g., Hofer & Eisenberg, 2008) attested that they tend to interact each other similarly in most of the Western cultures, but we have to point out that most of the previous studies have been conducted in the United States, and only few studies have considered other cultures, especially in adolescence (Chen, Yang, & Fu, 2012). Overall, in most of the Western countries, higher levels of Self-regulative abilities, such as Effortful Control, are associated with lower experiences of negative emotions (e.g., Ahadi et al., 1993; Chen et al., 1998; Rothbart, 2007; Rothbart, Ahadi, & Evans, 2000). As regards the cultures considered in the present dissertation (United States, Colombia, and Italy), previous studies attested that American youths tend to show adequate self-regulative abilities (e.g., Ahadi et al., 1993; Rothbart, 2007; Rothbart, Ahadi, & Evans, 2000); Hispanic and Italian youths tend to show moderate self-regulative abilities (Rubin et al., 2006); and Hispanic youths tend to show lower attention and inhibitory control than their American counterpart (e.g., Brewis, Schmidt & Casas, 2003; Oakland and Mata, 2007). In addition, American and European youths tend to express more emotions (both positive and negative; Gartstein et al., 2006) but American youths tend to be less anxious and fearful than others (Ahadi et al., 1993; Chen et al., 1998); Hispanic youths tend to experience more negative emotions (e.g., Brewis, Schmidt & Casas, 2003), but they tend to not express them, probably because they tend to internalize their negative affects (e.g., Oakland and Mata, 2007); finally, Italian youths, similarly to Americans, tend to be scarcely anxious and fearful in novel situations (Rubin et al., 2006).

We considered cross-cultural differences in temperamental characteristics following the model proposed by Chen and colleagues (Chen et al., 2012; Chen & French, 2008). According to this model, that represents one of the most recent operationalization of the socio-ecological and the socio-cultural perspective, the culture can mediate and moderate the influences between social contexts and the individual development. In line with this view, the dispositional temperamental characteristics represent in earlier life individual differences; peer and adults interpret these individual differences according with their cultural beliefs, and they can reply differently to these temperamental characteristics, according to their attitudes (that are regulated by their culture). Cultural norms and social values influence, on the other hand, also the way in which children and adolescents regulate their responses to social evaluations, that in turn can influence their developmental patterns. In this view, individuals' self-regulative abilities, that in earlier stages are

mainly biological determined, are increasingly relevant in social interactions, affecting how individual react to their culture of origin and the construction of individual's evaluation and agreement with that specific culture (Chen et al., 2012).

Therefore, according to the above-mentioned premises, it is important to take into account cross-cultural differences in the study of temperament, because culture may influence the way in which temperamental characteristics can be considered, and a specific culture can promote the development of a specific characteristic, valuable in that context but not in another one (Rothbart, Ahadi, & Evans, 2000).

Temperament and individual development.

As regards the relations between temperament and individual development, previous studies underlined that temperamental characteristics are implicated in many developmental processes and that they may influence some specific aspects, such as social learning, cognitive development, and relationships with others (for example, parents or siblings) (Rothbart & Ahadi, 1994; Rothbart & Bates, 2006). In particular, contributions of temperament to individual development can be summarized as follow:

- Temperament influence *learning* and social learning processes, because it elicited specific reactions to different situations; in fact, the same experience can affect differently individuals, due to their specific reactivity a reaction to that situation. In addition, individuals' reactions can influence in turn the environment in which experiences occur. Those associations are affected by self-perception and emotional reactivity, as well as by how individual perceive themselves and others (Rothbart & Ahadi, 1994; Rothbart & Bates, 2006).
- Temperament influence *cognitive* processes, such as the tendency to attribute qualities to objects and persons, the capacity to make judgments about themselves and others, the development of coping strategies, and the active seeking/avoiding different environments (based on reinforcements mechanisms) (Rothbart & Ahadi, 1994; Rothbart & Bates, 2006; Kagan, 1989).
- Temperament influence the *social* area, the relationships with others and specific social behaviors (such as empathy and conscience); in fact, individuals' temperamental characteristics can elicit specific reactions from others, that in turn can influence individuals. For example, a positive disposition can promote the support of others in negative or risky situations. Feedback from others can provide to individuals confirmation about their selves, which support self-judgments; this process can influence socialization (Eisenberg & Morris, 2002; Rothbart, 2007; Rothbart & Ahadi, 1994; Rothbart & Bates, 2006; Snyder, Higgins, & Strucky, 1983; Scarr & McCartney, 1983).

Emotionality and Self-regulation

Researchers in the last thirty years have focused on the relationships between temperamental domains of emotionality and voluntary self-regulation with adjustment in children and adolescents (e.g., Eisenberg et al., 2005; Rothbart & Bates, 1998; Muris et al., 2007; Lengua & Long, 2002; Lonigan & Philips, 2001). As presented in the previous section, Negative Affectivity is referred to individual reactivity and proneness to experience a variety of negative emotions and feelings, such as Anger, Frustration, Fear, Discomfort, Anxiety, or Sadness (Rothbart, 1998). In contrast, Effortful Control represents the "voluntary" part of self-regulation processes (Rothbart & Bates, 2006), which refers to the capacity to regulate behavior and attention, as well as the ability to inhibit impulsive reactions and to regulate emotionality (Rothbart, 1998). There are many empirical evidences about the existence of underlying psychobiological and psychological models that organized sub-domains of Negative Affectivity and Effortful Control (Rothbart et al., 1994; Rothbart, Ahadi, & Evans, 2000; Rothbart & Bates, 2006).

In particular, for what concerns the domain of *Negative Affectivity*, previous research supported the existence of two separate underlying processes, that emerge earlier in childhood, that works differently, and that can lead to different emotional experiences: the sub-domain of Fear, and the sub-domain of Anger (Rothbart & Bates, 1998; Rothbart, Ahadi, & Evans, 2000). **Fear** is referred to the behavioral Inhibition System (Gray, 1982), and it involves serotonin and norepinephrine (Fowles, 1988). This emotion can be considered as a proxy for later Fear and Sadness, as well as low Impulsivity, low Activity, and low Aggression (Rothbart et al., 2000). In other words, fear is a protective factor for externalizing problems, such as aggressive behaviors, but can also predispose individuals to later internalizing problems, such as anxiety (Rothbart & Bates, 1998). **Anger** is referred to the "rage" system (Panksepp, 1982), in which are involved hypothalamus and amygdala, and the serotonergic systems. This emotion can be considered as a proxy for later Anger and Frustration, high Activity, Discomfort, and Impulsivity (Rothbart et al., 2000). Anger can be a predisposition to later externalizing problems but not to later increase of Fear (Rothbart & Bates, 1998).

For what concerns the domain of *Effortful Control*, it is related to the activity of the prefrontal cortex and involves the executive functioning mechanisms (Posner & Rothbart, 1998). Effortful Control can be divided into three sub-domains, such as Activation Control, Attention and Inhibitory control (Ahadi et al., 1993; Evans & Rothbart, 1999). As anticipated in the previous section, the sub-domain of Attention refers to the ability of maintain attentional focus or shift one's focus as needed to deal with task demands; the sub-domain of Inhibitory Control refers to the capacity to effortfully suppress inappropriate responses under instructions or in novel or uncertain situations; the sub-domain of Activation Control refers to the ability to effortfully activate behaviors when

they are more appropriate (Eisenberg & Morris, 2002; Posner & Rothbart, 2000; Rothbart, 1998; Rothbart & Bates, 2006). It is important to distinguish these types of self-regulatory mechanisms from the innate and involuntary processes underlying the orienting of attention. Effortful Control can be considered as the voluntary control system (that appears later than the involuntary control system), and that has social bases, because it can be affected by social contexts (Rothbart & Ahadi, 1994). Voluntary self-regulatory processes are involved in several processes, such as the voluntary coordination of attention, thinking actively and perform in a functional way, inhibition of aggressive responses, development of normative standards of behaviors, understanding consequences of our actions on others, development of empathy, conscience, guilt, and moral behaviors, development of motivation and achievement (that are influenced also by negative affectivity; Eisenberg, 2000; Kagan, 1989; Posner & Rothbart, 1992; Rothbart et al., 1994; Rothbart & Ahadi, 1994; Zahn-Waxler, Cole & Barrett, 1991). Abilities and skills that are involved in Effortful Control emerged early in infancy, and continue to develop through childhood, adolescence, until early adulthood (Casey, Geidd, & Thomas, 2000; Gogtay et al., 2004; Murphy et al., 1999).

Despite earlier in life Fear and Anger represent two sub-domains of the same broad temperamental factor of negative affectivity and they are associated each other, during the life span those two domains tends to become not associated (Rothbart & Putnam, 2002), because they are involved in very different feelings, that tend to lead to opposite outcomes. In particular, Fear can lead especially to Internalizing behaviors, whereas Anger can lead specifically to Externalizing behaviors (e.g., Eisenberg et al., 2001; Oldehinkel et al., 2004; Rydell, Berlin & Bholin, 2003).

Similarly to the two sub-domains of Negative Affectivity, also the sub-domains of Effortful Control can be involved in different outcomes. For example, previous studies showed that low levels of Attention are associated with Internalizing problems, as well as low levels of Inhibitory Control are associated with Externalizing problems (e.g., Muris, 2006). Empirical findings support the crucial role of Effortful Control for a positive and successful social development (e.g., Eisenberg et al., 2000). Self-regulation skills are especially useful and relevant during adolescence, because, as elucidated in Chapter 1, this period is extremely challenging and demanding, and adolescents' resources to face with the several transformations (i.e., biological, cognitive, emotional, relational, or social) they encounter are crucial for their successful or unsuccessful development (Steinberg & Morris, 2001; Collins & Steinberg, 2006). In this period, it can be "normative" an increase in Negative Emotionality, and the role of Effortful Control in regulating and inhibiting intense negative emotions become increasingly important (Eisenberg et al., 2000; Muris & Ollendick, 2005; Rothbart & Bates, 2006). As highlighted by Oldehinkel and colleagues (2007, p. 524), "adolescents who do not react strongly to potentially stressful stimuli have less need for self-regulation than

those who tend to be emotionally very reactive. If their self-regulatory capacity is limited, such highly reactive youngsters may be at particular risk to develop behavioral and emotional problems". In this view, it is crucial to analyze associations and interactions between Negative Affectivity and Effortful Control during adolescence, when it is well attested the incidence of several behavioral and emotional problems, such as Depression or Antisocial Behaviors (Eisenberg et al., 2001; Hankin et al., 1998; Rutter, Caspi, & Moffit, 2003). On the other hand, the effects of high Negative Emotionality and pervasive negative affects can be "buffered" by self-regulative mechanisms, which can regulate negative emotions and promote effective coping strategies (Lengua & Long, 2002). In sum, according with the temperamental model proposed by Rothbart and colleagues (e.g., Evans & Rothbart, 2007; Rothbart, 2007; Rothbart & Bates, 2006), researchers have emphasized the importance of understanding how the two broad temperamental factors of *emotionality* and *self-regulation* (and their sub-domains) can work together, and how they can influence adjustment in childhood and adolescence, taking into account gender and culture differences (e.g., Muris et al, 2007; Oldehinkel et al., 2004; 2007; Posner & Rothbart, 2000; Rothbart & Ahadi, 2000; Rothbart & Bates, 2006; Vervoort et al., 2011).

A Person-centered Approach in the Study of Temperamental Individual Differences

According to that body of research that emphasizing the importance to consider the joined effects of Self-regulation and Negative emotionality in adolescents' development, in the last decades, developmental and personality researchers emphasized the importance of examining inter-individual differences in the structure of temperament and personality, by adopting a holistic view of individual development, namely person-centered, or typological, approach (Bergman, Magnusson, & El-Khouri, 2002; Magnusson, 1988; 2003). For an exhaustive description of this approach, see Chapter 1.

As mentioned in Chapter 2, the study conducted by Block and Block (1980) was the first that emphasized this holistic view, sustained by empirical findings. They started from two general underlying dimensions of personality, ego-control (i.e., the tendency to express or to constrain emotional and motivational impulses) and ego-resiliency (i.e., the tendency to be flexible in coping with contextual demands and stressful situations), they found essentially three types (Resilient, Undercontrolled, and Overcontrolled), based on the combination between these two dimensions (see the Introduction section in Chapter 2). As highlighted by Rothbart and Bates (2006), the two dimensions of ego-control and ego-resiliency overlap in some ways with the two broad temperamental factors of reactivity and self-regulation, because the dimension of ego-control is referred to fearful and inhibitory control of impulsive responses, whereas the dimension of ego-resiliency is referred to flexible adaptation, related to the Attention domain of Effortful Control

(Eisenberg et al., 1996; Rothbart & Bates, 2006). Lack in ego-control may lead to a rigid functioning, whereas ego-resiliency is influenced by experiences that empower both the expression as well as the control of impulses and reactions; in this way, Effortful Control can provide an important basis for the development of both ego-control and ego-resiliency (Rothbart & Bates, 2006).

Starting from the study conducted by Block and Block (1980), several researchers tried to replicate their findings, in personality studies (e.g., Asendorpf & Van Aken, Meeus et al., 2011; De Bolle & Tackett, 2013) as well as in the study of temperament structure (e.g., Caspi et al., 2003; Laible et al., 2010). In Chapter 2 we focused on studies addressing personality, whereas in this second study we focused on studies addressing temperament.

In particular, for what concerns that body of research focusing on the identification of profiles based on some temperamental dimensions, and their links with later adjustment and maladjustment, despite its great theoretical anchoring, at the moment there are only few studies that addressed these issues, and this body of research is characterized by a great heterogeneity in terms of temperamental dimensions considered, and empirical findings in many cases were mixed. For example, for what concerns the identification of temperamental patterns of functioning in infancy and childhood, Caspi and colleagues (Caspi et al., 2003) found five temperamental types in early childhood (3 years old), predicting adjustment in adulthood: a *well-adjusted* profile (i.e., with high self-regulation, self-confident, and that positively experienced new situations); an *undercontrolled* profile (i.e., with low self-regulation, and labile in their emotional reactions); a *confident* profile (i.e., friendly and impulsive, scarcely fearful); an *inhibited* profile (i.e., fearful, scared, very upset by social context, and extremely shy); and a *reserved* profile (i.e., introverted, scared by new situations, and shy). These results were partially replicated by other studies that found, for example, with 8-year-old children, three temperament profiles: *well-adjusted*; *inhibited*; and *undercontrolled* (Capriola, Booker, & Ollendick, 2017).

Other studies considered different domains of temperament. For example, Rettew and colleagues (2008), considered Novelty Seeking (i.e., refers to approach and exploration), Harm Avoidance (i.e., refers to anxiety and risk taking), Reward Dependent (i.e., refers to attachment and dependence), and Persistence (i.e., refers to achievement striving), and they found in youths between 6 and 18 years old the following three types: a *Disengaged* profile (i.e., high Novelty Seeking, low Persistence and Reward Dependent, those children were fearful, less socially and connected with others); a *Moderate* profile (i.e., average scores in all the four temperamental dimensions, the most prevalent type); and a *Steady* profile (i.e., low Novelty Seeking and high Persistence, those children were ordinary, perseverant, and with good capacities to regulate frustration and impulsivity).

Another study addressing children is the work of Laible and colleagues (Laible et al., 2014), who considered several domains of Negative Affectivity (i.e., Anger, Sadness, and Fear), and Effortful Control, that found in a sample of 4-year old children the following four types: a *moderate regulation/moderate negative emotionality* profile (i.e., average-low Anger, Sadness, and Fear; average-high Effortful Control); a *very low regulation/Anger* profile (i.e., low Effortful Control; high Anger; average Sadness, and Fear); a *low regulation/high negative emotionality* profile (i.e., high Anger, Sadness, and Fear; low Effortful Control); and a *high regulation/low negative emotionality* profile (i.e., high Effortful Control, low Anger, Sadness, and Fear).

Although the importance to identify temperamental patterns in youths, research on early adolescence and adolescence is lacking and there are only few studies that focused specifically on this period. For example, Laible and colleagues (Laible et al., 2010), considered the same broad domains of Negative Emotionality of their study conducted with children (Laible et al., 2014) and a general domain of Self-Regulation, in a sample of adolescents from 12 to 16 years. In this study, Laible and colleagues (2010) found four profiles: the *Moderate Negative Emotionality/Moderate Regulation* profile (i.e., average Anger, Sadness, and Fear; average self-regulation), the *High Negative Emotionality/Low Regulation* profile (i.e., high Anger, Sadness, and Fear; low self-regulation), and the *Low Negative Emotionality/High Regulation* profile (i.e., low Anger, Sadness, and Fear; high self-regulation) were substantially replicated in the study with children, whereas the *Low Negative Emotionality/Low Regulation* profile (i.e., low Anger, Sadness, and Fear; low self-regulation) was a distinctive profile emerged with adolescents.

Overall, despite researchers highlighted the importance to consider the joined effects of Negative Emotionality and Self-Regulation in predicting positive developmental pathways in childhood and adolescence, and emphasized the usefulness of adopting an holistic view of how those individual differences work together, empirical studies in this field are scarce and still not consistent, and more studies are needed in order to capture the crucial combined effects of Negative Emotionality and Self-Regulation in adolescents' adjustment.

The Present Study: Aims and Hypotheses

As mentioned above, previous studies supported the crucial role of the joined effects of Negative Emotionality and Self-regulation in predicting development, especially during adolescence that is a period in which Negative Emotionality normatively tend to increase, and the Self-regulation skills become more relevant because they can "buffer" adolescents' emotional experience (e.g., Muris et al, 2007; Oldehinkel et al., 2007; Rothbart & Bates, 2006). However, research focused on the identification of temperamental profiles based on those dimensions in adolescence is lacking, so our general aim was to identify pattern of temperamental domains among early adolescents.

We first attempted to identify the temperamental profiles, based on some indicators of Effortful Control (i.e., Activation Control, Attention, and Inhibitory Control), and some indicators of Negative Emotionality (i.e., Anger/Frustration, and Sadness/Depressive Mood), according with the model proposed by Rothbart and colleagues (e.g., Rothbart, 2007), in a sample of preadolescents of three different cultures (i.e., Italian, Colombian, and American), using Latent Profile Analysis (LPA; Vermunt & Magidson, 2002; Nylund, Asparouhov, & Muthén, 2007). Consistent with previous research (e.g., Laible et al., 2010; Rettew et al, 2008), we expected to find a relatively small number of temperamental profiles. In particular, based on previous studies (e.g., Laible et al., 2010), we expected to find the following hypothesized profiles:

a) an adjusted profile, with high self-regulative capacities to manage their behaviors and their emotions, with few negative emotions such as anger or sadness (with high Effortful Control and low Negative Emotionality);
b) an average profile, with adequate self-regulative capacities to manage their behaviors and emotions, that tend to experience average negative emotions (with average Effortful Control and Negative Emotionality);
c) a maladaptive profile, with scarce self-regulative capacities to manage their behaviors and emotions, and that tend to experience frequently negative emotions (with low Effortful Control and high Negative Emotionality);
d) a moderately maladjusted profile, with a specific impairment in a specific area, such as in their self-regulative capacities to manage their behaviors and emotions, or in their emotional experience (with low Effortful Control, **or** low Negative Emotionality).

Second, we examined the effects of adolescents' gender and culture in the identification of temperamental profile, using the 3-step method (Asparouhov & Muthén, 2013; Asparouhov & Muthén, 2014), in order to verify if those variables can be considered as "antecedents" that can influence the formation of temperamental profiles. To our knowledge, there are no previous studies that investigated this issue on patterns of temperamental profiles in preadolescence. On the basis of on previous research conducted on single temperamental characteristic, we hypothesized the following:

- *Adolescents' gender:* previous studies showed that whereas girls tend to be more self-regulated and more prone to experience Sadness than males, boys are more prone to experience Anger/Frustration (e.g., Rothbart & Bates, 2006). We hypothesized to find positive associations among girls and those profiles characterized by average-to-high Effortful Control and low Anger/Frustration; in addition, we hypothesized to find positive associations among boys and those profiles characterized by high Anger/Frustration, and average-to-low Effortful Control.

- *Adolescents' culture*: most of the previous studies have been conducted in the United States, and showed that high levels of Effortful Control were related to low Negative Emotionality, and that American youths tend to experience few negative emotions and adequate self-regulative abilities (e.g., Ahadi et al., 1993; Chen et al., 1998; Rothbart, 2007; Rothbart, Ahadi, & Evans, 2000). In contrast, Hispanic youths tend to experience more negative emotions, and moderate-to-low self-regulative abilities (e.g., Brewis, Schmidt & Casas, 2003; Oakland and Mata, 2007). Italian youths tend to experience few negative emotions and moderate self-regulative abilities (Rubin et al., 2006). Despite these cross-cultural differences, as highlighted by Hofer and Eisenberg (2008), Emotionality and Self-Regulation processes interact each other in a similar way in most of the Western cultures, so we could hypothesize similar patterns of individual differences in Colombia, Italy, and United States. However, regarding the specific associations between adolescents' culture and the identification of temperamental profiles, considering that to our knowledge there are no previous studies addressing in particular this point, we do not have specific hypotheses in this regard, so this study can be considered as a preliminary exploration.

METHOD

Participants

Participants were drawn from a wider cross-cultural and longitudinal study entitled "Parenting, Adolescent Self-Regulation, and Risk-Taking Across Culture - PAC" (e.g., Lansford, 2011; Lansford et al., 2014). The overall aim of the project was to study biological, familial, and cultural processes in the development of self-regulation and risk-taking during adolescence, as a function of maturation and socialization. The project started in 2009 with a total sample of 1,417 families with 8-year-olds children from 13 different cultures (Jinan and Shanghai for China; Colombia; Naples and Rome for Italy; Jordan; Kenya; Philippines; Sweden; Thailand; African, European, and Hispanic Americans for the United States). At the moment the tenth year of data collection is still ongoing. A synthesis of the project design is reported in Table 1.

Table 1

Longitudinal design of the Parenting Across Cultures Project

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9
Mothers	X	X	X	**X**	X	X	X	X	X
Fathers	X	X	X		X	X	X	X	X
Youths	X	X	X	X	X	X	X	X	X
Child's Age	8	9	10	12	13	14	15	16	17

Note: Y = Wave; the X represents the data collection.

Bold indicates data selected for the present study.

We selected data from the 4th Wave of the PAC project. Due to the project design, originally in the 4th year was administered only a computer-based battery for the total sample. Thanks to a limited funding obtained by the Jacobs Foundation, a limited data collection was planned only in 3 different cultures (Italy, Colombia, and United States): a total sample of 541 mother-child dyads provided data (88 dyads from Colombia, 190 dyads from Italy, and 263 dyads from United States). For the purposes of the present study, data were available for 527 mother-child dyads, 87 from Colombia (17% of the sample), 190 from Italy (36% of the sample), and 250 from United States (47% of the sample); in this study we considered only mother reports about their children. In Italy, the sample was composed by 90 participants from Naples (47% of the Italian sample) and 100 participants from Rome (53% of the Italian sample); in the United States, the sample was composed by 87 African American participants (35% of the American sample), 93 European American participants

(37% of the American sample), and 70 Hispanic participants (28% of the American sample); in Colombia, the total sample was homogeneous. Overall, one Wave before (the "Family Information Form" was available only in Wave 3), mothers averaged 40.45 years of age (SD = 6.92), completed 13.09 years of education (SD = 4.36). In the selected Wave of the project (Wave 4), children (49% males) averaged 12.62 (SD = 0.67) years old. Mothers reported that 58% were married, 9% divorced, 6% separated, 2% widowed, 7% cohabiting, and 18% never married. Full information about the composition of the sample, separated for each culture, are reported in Table 2.

Table 2

Descriptive statistics of the sample for each country, for mothers and child

	Colombia	Italy	United States
Mothers' Age*	M_{age} = 32.17 (*SD* = 4.167)	M_{age} = 41.75 (*SD* = 5.17)	M_{age} = 39.66 (*SD* = 7.84)
Child' Age	M_{age} = 12.53 (*SD* = 0.77)	M_{age} = 12.37 (*SD* = 0.62)	M_{age} = 12.82 (*SD* = 0.64)
Child' Gender	47% males; 53% females	48% males; 52% females	52% males; 48% females
Mothers' years of education*	M_{edu} = 6.00 (*SD* = 2.76)	M_{edu} = 12.14 (*SD* = 4.43)	M_{edu} = 14.00 (*SD* = 4.02)
Mothers' marital status	83% married	79% married	58% married

Note: *Information about Mothers' age and education are taken from the previous Wave of the PAC project because in Wave 4 the "Family Information Form" was not administered.

Procedure

Letters describing the study were sent home, and parents were asked to return a signed form if they were willing to be contacted further to take part in the PAC project. The eligibility criteria were the following:

- the children age range (8 - 9);
- the children should attend one of the schools in which samples were recruited;
- parents and children were able to understand the local language(s);
- their ethnic groups matched one of the ethnical groups selected in the PAC project.

If a family included more than one eligible child (i.e., if in a family there were twins), one child was randomly selected to be the child considered as the "target", who completed the questionnaire and about whom parents completed the questionnaires. A total of approximately 100 families were selected for each site or ethnic group. In order to make the samples selected for each country as representative as possible, families were selected from schools serving high, middle, and low-income families, in a proportion similar to the proportion of high, middle, and low-income families of that country. Thanks to this procedure, each site sample resulted as economically heterogeneous, ranged from low- to high- income, and matched the socioeconomic distribution of the general population.

Approvals by local Institutional Review Boards at universities, parental informed consent, and child assent were obtained in each participating country. Interviews were conducted by graduate and/or PhD students, or paid research assistants, that were trained by the local principal investigator in each site, using a set of materials that covered the ethical treatment of human subjects, building rapport with participants, and other logistical issues. Interviews were conducted in a location chosen by the participants (i.e., homes, schools, or other locations), and lasted approximately 1.5-2 hours per family. Participants selected the best method for conducting their interview (oral, written, in part oral and in part written, e-mail, etc.). Depending on the site, participants were given a modest financial compensation or small gifts such as movie tickets or vouchers to bookstores to thank them for their participation.

For what concerns the measures that were administered, an "a priori" procedure of independent forward- and back-translation was used, in order to ensure the linguistic and conceptual equivalence of measures across languages (Maxwell, 1996). Translators were fluent in English and in the target language. This procedure guaranteed that all the instruments would be cross-cultural valid across all the sites, because the focus is on linguistic equivalence as well as the cultural meanings that each measure can be characterized (Erkut, 2010). Questionnaires were administered in the following languages: Spanish (Colombia and the United States), Italian (Italy), and English (the United States).

Measures

Preadolescents' gender was coded 1 for males and 2 for females. Adolescents' country of origin was originally coded 1 for Colombia, 2 for Italy, and 3 for United States, but for the purposes of the study we created three dummy variables, one for each country, coded 1 for the country of origin and 0 for other countries. The other measures used in this study are described below.

Temperament

To assess preadolescents' temperamental dimensions of negative emotionality and self-regulation, we used mother rating of the five dimensions (Anger-Frustration, Sadness-Depressive Mood, Activation control, Attention, and Inhibitory control,) taken from the Early Adolescent Temperament Questionnaire – Revised (EATQ-R; Capaldi & Rothbart, 1992) and the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001). For the PAC project, it was created an ad hoc questionnaire, combined items from EATQ-R and CBQ. Overall, The EATQ-R is a questionnaire, suitable for children and adolescents from 9 to 15 years (Ellis & Rothbart, 2001), composed by 11 sub-scales that measure various domains of temperament, and 2 scales that measure anger and depression. The CBQ is developed with the same purpose, and aimed to asses temperament in

younger children. Each item was rated on a 5-points scale, ranging from 1 = "Almost always untrue" to 5 = "Almost always true". In particular, considering the five subscales of the present study, they were composed as follows:

Negative Emotionality:

- The sub-scale of Anger-frustration was composed of 9 items in total (i.e., "Hates it when people don't agree with him/her" or "Gets angry when s/he can't find something s/he wants", 6 items of Frustration from the EATQ-R and 3 items of Anger from the CBQ);
- The sub-scale of Sadness-Depressive Mood was composed of 8 items in total (i.e., "Is sad more often than other people realize" or "Seems to feel depressed when unable to accomplish some task", 5 items of Depressive Mood from the EATQ-R and 3 items of Sadness from the CBQ);

Effortful Control:

- The sub-scale of Activation Control was composed of 7 items in total, all derived from the EATQ-R (i.e., "Has a hard time finishing things on time" or "Usually puts off working on a project until it is due");
- The sub-scale of Attention was composed of 9 items in total (i.e., "Finds it easy to really concentrate on a problem" or "Will move from one task to another without completing any of them", 7 items of Attention from the EATQ-R, 1 item of Attentional Shifting and 1 item of Attentional Focusing from the CBQ);
- The sub-scale of Inhibitory Control was composed of 5 items in total, all derived from the EATQ-R (i.e., "Has a hard time waiting his/her turn to speak when excited" or "Is more likely to do something s/he shouldn't do the more s/he tries to stop her/himself").

Previous studies have supported the psychometric proprieties of the instruments (i.e., reliability, factor structure and predictive values; Ellis & Rothbart, 2001; Rothbart et al, 2001). In our study, the Cronbach alpha coefficients ranged from .56 (for Inhibitory Control) to .88 (for Anger-Frustration). For more information about reliability and descriptive statistics, see the paragraph "Preliminary Analysis" and the Table 2 in the section "Results".

Analytic Approach

Latent Profile Analysis (LPA; Vermunt & Magidson, 2002; Nylund, Asparouhov, & Muthén, 2007), using the M*plus* 7.1 statistical package (Muthén & Muthén, 2012), was applied in order to identify adolescents' temperamental profiles. For a general description of the LPA technique, see the "Analytic Approach" section in Chapter 2.

For the purposes of the present study, we used the 3-step method (Asparouhov, & Muthén, 2013; Asparouhov, & Muthén, 2014) specification, in order to analyze the associations among latent classes, adolescents' gender and country of origin, in order to analyze if those two covariates

(gender and country) can be considered as "antecedents" that can influence a particular latent class. As highlighted by Wickrama and colleagues (2016), the 3-step approach was developed "for the incorporation of predictors and/or outcomes, while still protecting the class formation from the potential influence of covariates" (pg. 238). The general statistical model underlying this approach is multinomial logistic regression, but in the LPA framework the outcome is the latent class categorical membership (Lanza & Cooper, 2016). An increase in a covariate would result in a higher probability that an individual belongs to one class over another. In other words, positive values indicate that higher values on the covariate make an individual more likely to be in the latent class analyzed, compared with the reference ones; negative values indicate that higher value on the covariate make and individual more likely to be in the reference class, compared with the latent class analyzed.

The 3-step method is composed by the following three steps (Vermunt, 2010), that, for simple secondary models that includes a latent class variable, such as our theoretical model, could be implemented automatically:

a) In the first step, a simple Latent Class Model was estimated, using the observed scores (means) for the following variables: Anger-frustration, Sadness-Depressive Mood, Activation Control, Attention, Inhibitory Control;
b) In the second step, a nominal categorical latent variable was created, that represents the most likely class for each subject, based on the posterior probabilities derived from the previous step, that are estimated in every latent class for each individual;
c) In the last step, the nominal categorical latent variable was regressed on the covariates (adolescents' gender and country of origin), taking into account the misclassification of the second step.

This specification could be simply obtained automatically using the "Auxiliary" option of Mplus: if an auxiliary variable is specified as (R3STEP), that variable would be considered as a predictor. Using the 3-step approach, we examined the extent to which each profile, compared with the reference class, was significantly associated with different levels of each covariate that we considered.

In addition, we tested invariance of the latent classes across gender and country of origin, conducting a series of multi-group LPAs with gender and country as the grouping variables, following the procedure reported by Eid and colleagues (Eid, Langehiene, & Diener, 2003). We compared two different sets of models, one to test gender invariance and one to test country invariance, through the BIC index: for both gender and country invariance, we compared a model in which we forced the means of the latent classes to be equal across groups, with a model in which the means of the latent classes were free across groups. Finally, to analyze the distribution of gender and country in the latent classes, we used a *n* (Class1, Class2, Class3, … etc.) X 2 (boys and girls)

contingency table for what concerns gender differences, and a *n* (Class1, Class2, Class3, … etc.) X 3 (Colombia, Italy, and United States) contingency table for country differences, with chi-square test, and we examined the adjusted standardized residuals obtained to determine any significant differences.

RESULTS

Preliminary Analysis

Preliminarily, because results on the validity of the EATQ in large samples are mixed, we selected for each temperamental factor the best items combination, based on their reliability structure. We determined the reliability of the five temperamental factors. For each factor, items whose absence would lead to an increase in reliability were removed one by one. Items that, if they were removed, did not further increase the reliability of the sub-scale composed the final sub-scale. The Anger-Frustration sub-scale was composed by all the 9 items; for the Sadness-Depressive Mood sub-scale, we excluded only one item; for the Activation Control and Attention sub-scales, we excluded 3 items for each sub-scale; at last, for the Inhibitory Control sub-scale, we excluded 2 items.

For all the study variables, observed means and standard deviations, as well as correlations, are presented in Table 3.

Table 3

Correlations, Descriptive Statistic and Reliability of the Study 2 Variables

	(1)	(2)	(3)	(4)	(5)
Anger - Frustration (1)	-				
Sadness – Depressive Mood (2)	.666***	-			
Attention (3)	-.332***	-.266***	-		
Activation Control (4)	-.234***	-.172***	.672***	-	
Inhibitory Control (5)	-.539***	-.404***	.388***	.312***	-
Mean	2.619	2.017	3.649	3.437	3.632
SD	.914	.787	.766	1.073	.973
Cronbach's Alpha	.876	.801	.713	.803	.565

Notes: SD = Standard Deviation.

† $p \leq .060$ * $p < .050$, ** $p < .010$, *** $p < .001$.

As shown in Table 3, all the variables were significantly associated with each other. Specifically, Anger – Frustration and Sadness – Depressive Mood are positively associated each other, and negatively associated with the three components of Effortful Control: respectively, Anger – Frustration is negatively associated with Attention, Activation Control, and Inhibitory Control; also Sadness – Depressive Mood is negatively associated with Attention, Activation Control, and Inhibitory Control. Lastly, the three components of Effortful Control are positively associated each other, with the strongest correlation between Attention and Activation Control.

Latent Profile Analysis

Latent Profile Analysis (LPA; Nylund, Asparouhov, & Muthén, 2007) was applied to identify adolescents' temperamental profiles. We compared the two-class, three-class, four-class, and five-class models, based on the procedures discussed in Chapter 2 (results are shown in Table 4).

Table 4

Model fit statistics for the Latent Profile Analysis of the six temperamental domains.

					Classes		
	BIC	AIC	BLRT	ENTROPY	n°	%	N
2 classes	6504.687	6436.411	< .0001	.736	1	59%	308
					2	41%	214
3 classes	6400.162	6306.284	< .0001	.764	1	12%	61
					2	46%	243
					3	42%	223
4 classes	6274.936	6155.455	< .0001	.777	1	34%	176
					2	36%	191
					3	19%	101
					3	11%	59
5 classes	6235.060	6089.975	< .0001	.781	1	28%	149
					2	6%	32
					3	31%	163
					4	24%	125
					5	11%	58

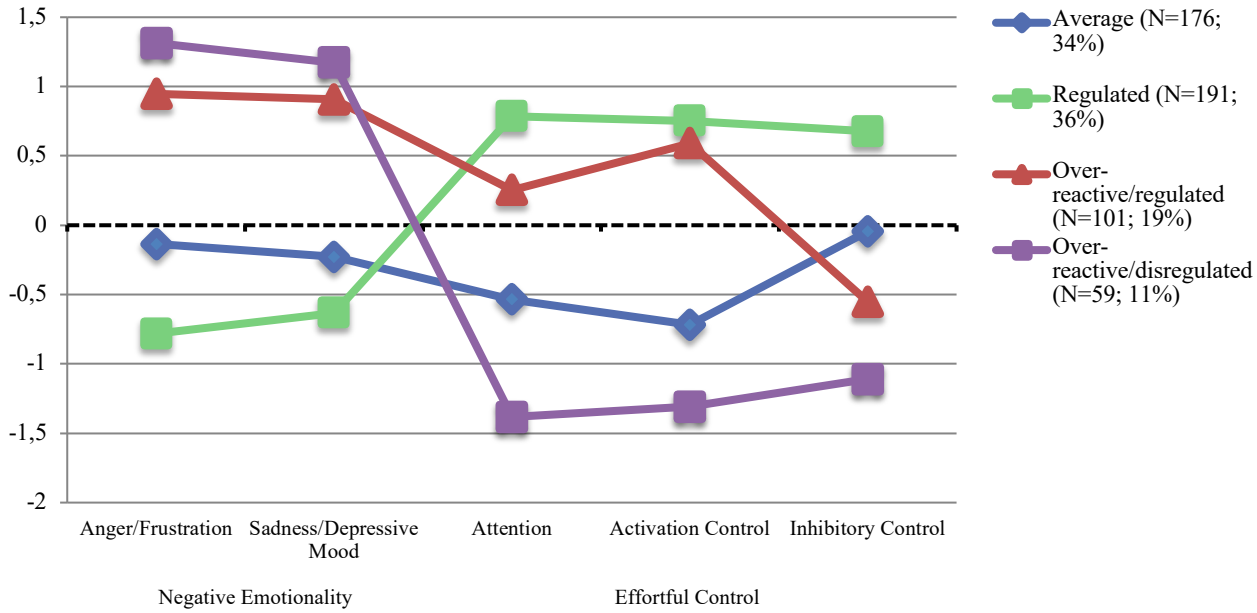
Note: BIC = Bayesian Information Criterion; AIC = Akaike Information Criterion; BLRT = Bootstrap Likelihood Ratio Test.

First, we excluded the 2-class model (because this model showed the worst fit in terms of AIC, BIC, and Entropy). The 5-class model was excluded because, despite its good fit, their classes were not interpretable. For the same reason, we excluded the 3-class model, and we decided to select the 4-class model because the AIC, the BIC, and Entropy were better than the 3-class model. Therefore, we selected the 4-class model as the final model that was characterized by the following profiles: (a) Average, (b) Regulated, (c) Over-reactive/regulated, and (d) Over-reactive/disregulated (see Figure 1).

- The Average profile (the most prevalent class, that could be considered as a "normative profile") was characterized by average scores on all temperamental factors, and average-to-low Activation Control;
- The Regulated profile was characterized by high scores in all the three components of Effortful Control (i.e., Attention, Activation Control, and Inhibitory), and low scores of Anger-Frustration and Sadness-Depressive Mood;
- The Over-reactive/regulated profile was characterized by high scores in Anger-Frustration and Sadness-Depressive Mood, average Attention, average-to-high Activation Control, and low Inhibitory Control;
- The Over-reactive/disregulated profile (the least prevalent profile) was characterized by high scores on Anger-Frustration and Sadness-Depressive Mood, and very low Attention, Activation Control, and Inhibitory Control.

Figure 1

Graphical representation of temperamental profiles



Note: The graphical representation was done using Z score for each temperamental factor.

For what concerns the 3-step approach, a model with the two covariates (adolescents' gender and country of origin) was specified, in order to analyze the associations between the two covariates and the categorical latent class variable that represent the most likely class for each individual. Results of this specification are reported in Table 5.

Table 5

Country and Adolescents' Gender 3-step specification. Multinomial logistic regressions.

Profile		β non stand. vs. Ref.
Regulated	Gender	**0.775****
	Culture	-0.122
Over-reactive/regulated	Gender	**1.376*****
	Culture	**-0.609****
Over-reactive/disregulated	Gender	0.446
	Culture	**-0.505***

Note: Reference Class = Average. Bold represents significant paths.

† $p \leq .060$ * $p < .050$, ** $p < .010$, *** $p < .001$.

As reported in Table 5, for what concerns adolescents' gender, female showed higher probabilities than males to be in the Regulated or in the Over-reactive/regulated, compared with the Average profile. Instead, for what concerns adolescents' country of origin, American showed lower probabilities than Italian or Colombian to be in the Over-reactive/regulated or in the Over-reactive/disregulated, compared with the Average profile.

Gender and country Invariance

We tested the measurement invariance of the temperamental profiles across gender and country of origin, in a multi-group LPA framework, following the procedure reported in the "Analytic Approach" section (Eid et al., 2003).

For what concerns the invariance across gender, we compared two different models, with gender as a grouping variable: a model in which we forced the means of the latent classes to be equal across gender, with a model in which the means of the latent classes were free between boys and girls. The comparison through the BIC index suggested that the temperamental profiles did not differ across gender ($BIC_{equal} = 7010.70 < BIC_{free} = 7164.92$). The same procedure was used to test for the invariance across countries: we compared two different models, with country as grouping variable: a model in which we forced the means to be equal across countries, with a model in which we

freely estimated the means across countries. The comparison through the BIC index suggested that the temperamental profiles were the same across countries (BIC_{equal} = 7490.00 < BIC_{free} = 7549.30).

Distribution of gender and country

For what concerns adolescents' gender, adjusted standardized residuals indicated that there were significantly more boys than girls (60%; St. res. 3.6) in the Average profile, whereas there were significantly more girls than boys (65%; St. res. 3.3) in the Over-reactive/regulated profile. No significant gender differences were found for the Regulated and the Over-reactive/disregulated profile (χ^2 (3) > 18.272, p = .000).

As regards adolescents' country of origin, adjusted standardized residuals indicated that there were significantly more Americans then others (53%; St. res. 2.1) in the Regulated profile. No significant country differences were found for the Average, the Over-reactive/regulated and the Over-reactive/disregulated profile (χ^2 (6) > 18.681, p = .005).

DISCUSSION

This study can be considered a step forward in the study of Emotionality and Self-Regulation adopting a person-centered approach in cross-cultural research. The aim of the study was to identify patterns of individual differences based on narrow sub-domains of Negative Emotionality and Effortful Control among early adolescents of three different cultures. This contribution corroborated previous findings by obtaining four temperamental profiles, with different levels of adaptive and maladaptive characteristics across cultures. In addition, the study attested the presence of similar patterns of individual differences based on temperamental dimensions in three different cultures, above and beyond the effects of adolescents' gender and culture.

Temperamental Profiles

According with previous studies (e.g., Laible et al., 2010), we confirmed a temperament structure based on four different profiles in pre-adolescence, and their characteristics referred to the sub-domains of Negative Emotionality (i.e., Anger/Frustration, and Sadness/Depressive Mood) and Effortful Control (i.e., Attention, Activation Control, and Inhibitory Control; Rothbart, 2007).

In particular, we confirmed the presence of a Regulated profile, a well-adapted profile characterized by high levels of Effortful Control, and low levels of Negative Emotionality. According with previous studies in children and adolescence (e.g., Capriola, Booker, & Ollendick, 2017; Caspi et al., 2003; Laible et al., 2010; 2014), those adolescents possess the abilities to effortfully regulate their behaviors and their emotions, and they tend to experience scarcely negative emotions, such as Anger/Frustration or Sadness/Depressive Mood. We also verified the presence of an Average profile, the most prevalent profile in our sample that can be considered as a normative profile, characterized by average Effortful Control, and average Negative Emotionality. Those adolescents are adequately capable to regulate their behaviors and emotions, and tend to experience moderately negative emotions (e.g., Laible et al., 2010; 2014).

We found an Over-reactive/disregulated profile, with high levels of Negative Emotionality and low levels of Effortful Control. This profile is the smallest profile in the sample and the most compromised one, characterized by a pervasive maladjustment both in the emotional and in the self-regulation domains; those adolescents are characterized by low self-regulation, unstable emotional reactions, they tend to experience frequently negative emotions, and possess few capacities to regulate their emotions, as well as their behaviors (e.g., Capriola, Booker, & Ollendick, 2017; Caspi et al., 2003; Laible et al., 2010; 2014).

Finally, contrary to previous research (e.g. Laible et al., 2010; 2014), we found an Over-reactive/regulated profile, characterized by a specific impairment for what concerns the Negative Emotionality dimension, with high levels of both Anger/Frustration and Sadness/Depressive Mood,

but also with average Attention, Activation Control, and average-low Inhibitory Control. Those adolescents tend to experience frequently negative emotions (such as Anger, Frustration, and Sadness), but they possess adequate self-regulation abilities, such as the ability to activate appropriate behaviors and emotional responses or the ability to maintain focused their attention. Their self-regulative skills can "buffer" the negative consequences associated with a pervasive negative emotionality, because they are able to modulate and coordinate internal emotional state as well as their behavioral expression, that in turn can be considered as a resource for those adolescents (e.g., Eisenberg et al., 2000; Lengua & Long, 2002; Oldehinkel et al., 2007).

Overall, those findings supported the crucial role of Effortful Control, especially in adolescence. In fact, as elucidated by previous research (e.g., Eisenberg et al., 2000; Muris et al., 2007; Muris & Ollendick, 2005; Oldehinkel et al., 2007; Steinberg & Morris, 2001), during adolescence Negative Emotionality tend to increase, and the Self-regulative skills become crucial for adolescents that are more prone to experience negative emotions and reactions. Most of the existing studies emphasized the importance of considering how Negative Emotionality and Effortful Control work together in predicting successful or unsuccessful development in youths, underlined the crucial role of Effortful Control in modulating the whole emotional experience (Oldehinkel et al., 2007; Muris et al., 2007).

Despite researchers agree that more research is needed in order to well understand associations between Negative Emotionality and Self-Regulation, and their influences on adolescents' development, at the moment there is a lack in this field of study adopting a person-centered approach in order to identify temperamental profiles based on these two temperamental domains. Moreover, as highlighted by Laible and colleagues (2010), previous studies examined associations between Emotionality and Self-Regulation almost exclusively considering those two dimensions separately (e.g., Eisenberg et al., 2001; 2005).

This study contributed to improve the knowledge in this field, underlined the usefulness of adopting a person-centered approach, in order to examine patterns of individual differences based on Emotionality and Self-Regulation in a holistic way. In particular the study emphasized the importance to consider different patterns of temperamental characteristics, with different levels of adaptive and maladaptive characteristics, and attested the importance of adolescents' self-regulative skills for promoting their development. In fact, our findings underlined that, during preadolescence, if some adolescents are more prone to experience negative emotions, several self-regulative mechanisms, especially related to attention and activation control, can support their adjustment, as in the case of the Over-reactive/regulated profile. Differently, in some cases, as for adolescents characterized by an Over-reactive/disregulated profile, high negative emotionality is associated with lack in self-regulation, that in turn may lead those adolescents to incur in emotional and behavioral problems (Oldehinkel et al., 2007). In this view, future research should clarify the links between those different patterns of individual differences and specific emotional and behavioral problems.

Temperamental Profiles: The role of Adolescents' Gender and Culture

Overall, our findings supported the validity of the four-temperamental profile structure across gender and culture. However, we have also found that gender and culture can influence the identification of temperamental profiles, so they can be considered as "antecedents" (i.e., precursors, variables that can influence individuals' probability to belong in a specific profile) of these profiles, supporting the hypothesis of cultural and gender differences in adolescents' patterns based on Emotionality and Self-Regulation (Ahadi, Rothbart & Ye, 1993).

In particular, for what concerns adolescents' gender, consistent with our hypothesis, we found that girls had higher probabilities of being in the Regulated or in the Over-Reactive/regulated profile, comparing with the Average profile. In fact, according with previous studies (e.g., Rothbart & Bates, 2006), girls tend to show higher self-regulative abilities and Effortful Control than males, so these results were in line with our expectations. Those findings supported the role of adolescents' gender as an "antecedent" of being Regulated of Over-Reactive/regulated. Contrary to our expectations, our results did not support the role of the masculine gender in the identification of profiles characterized by high Anger/Frustration and low Effortful Control (i.e., the Over-reactive/disregulated profile). We reasoned that probably these kinds of associations could be stronger in previous developmental stages, such as childhood, in which the formation of Emotionality and Self-Regulation processes is still ongoing (e.g., Rothbart & Bates, 2006; Rothbart et al., 2001). Self-regulation processes, in line with previous studies (e.g., Casey, Geidd, & Thomas, 2000; Gogtay et al., 2004; Murphy et al., 1999; Rothbart & Ahadi, 1994), are more anchored to social development in childhood and adolescence. Girls, that showed higher regulatory abilities than males, and that are more prone to socialization, could be subsequently more prone to improve their self-regulation during their development, that in turn can increase their probabilities of being in a temperamental profile characterized by adequate self-regulative abilities.

For what concerns adolescents' culture, our study underlined the presence of cross-cultural differences in the expression and in the development of temperamental characteristics. In particular, findings showed that American adolescents had lower probabilities of being Over-reactive/regulated or Over-reactive/disregulated, comparing with the Average profile. In other words, American adolescents seem to be more capable to manage their emotional experience and regulate their behaviors, and they tend to experience moderately or scarce negative emotions and feelings. In contrast, Colombian and Italian youths seem to be more prone to frequently experience negative emotions and feelings, and to have fewer capacities to manage and regulate their emotions and behaviors. Those findings supported the role of adolescents' culture as an "antecedent" of being Over-Reactive/regulated or Over-Reactive/disregulated. As regards the role of culture, we did not make specific hypotheses, because to our knowledge this is the first study addressing in particular this point. Previous studies (e.g., Rothbart, 2007; Ahadi et al., 1993; Rothbart, Ahadi, & Evans,

2000; Chen et al., 1998) attested that, in general, in most of the Western Countries higher levels of Effortful Control were associated to lower Negative Emotionality, suggesting a negative relation between these two temperamental aspects. In particular, according with Chen and colleagues (Chen, Yang, & Fu, 2012), cultural norms and social values may have an impact in facilitating/impeding the display of temperamental characteristics. For example, previous studies with adolescents and adults found that South American individual (e.g., from Costa Rica) tend to exhibit fewer negative emotions, because they tend to internalize more their emotions and reactions (e.g., Oakland and Mata, 2007). Similarly, Mexican children showed lower attention and inhibitory control than American children (Brewis, Schmidt & Casas, 2003). For what concerns the United States, American children are less anxious and fearful than other children (e.g., Ahadi, Rothbart, & Ye, 993); in addition, American children tend to show fewer self-regulative skills than eastern children (e.g., Sabbagh et al., 2006; Oh & Lewis, 2008). Both American and European children tend to express more negative and positive emotion (e.g., Gartstein et al., 2006); as regards Italy, previous studies showed that Italian children showed less fearful and anxious reactions in novel situations (Rubin and colleagues, 2006). Despite several previous studies (e.g., Hoefer and Eisenberg, 2008) suggested that Emotionality and Self-Regulation interact each other similarly in most of the Western countries, our findings supported the existence of some cultural differences in temperamental patterns based on Emotionality and Self-Regulation that can widely vary across cultures, and supported the hypothesized role of culture in affecting the displaying of temperamental characteristics overtime (Chen, Yang, & Fu, 2012).

CONCLUSIONS

Overall, this study contributes to knowledge about how Emotionality and Self-Regulation characteristics can organize in different patterns of individual differences in pre-adolescence. According with previous studies (e.g., Caspi, Roberts, & Shiner, 2005), the study underlined the usefulness of adopting a holistic approach to examining adolescents' patterns of functioning based on their temperamental characteristics. To our knowledge, this is one of the first study addressing specifically this point, that considered Negative Emotionality and Effortful Control in early adolescence, and the first study that addressed effects of adolescents' gender and culture on temperamental profiles. Overall, our findings corroborated the hypothesis of gender and cultural differences in adolescents' individual differences based on their temperamental patterns.

The study has some limitations. First of all, our study is cross-sectional, and we did not consider how those profiles can change overtime, as a part of normative development. Further studies would analyze the development of temperamental profiles during the transition from early to middle adolescence, that is a crucial period in which Negative Emotionality normatively tend to increase,

and Self-Regulation processes are important mediators of adolescents' well-being (e.g., Eisenberg et al.,2001; Muris, 2006; Oldehinkel et al., 2004; 2007). Second, we considered only mothers' report about temperamental dimensions of their adolescent sons and daughters. However, several studies suggested that during childhood the best way to assess children' temperamental characteristics is to consider their parents' perception (e.g., Rothbart & Bates, 2006), during adolescence it would probably be useful to consider also adolescents' self-reports of their Negative Emotionality and Effortful Control levels.

Despite these limitations, this contribution represents a novelty in the field of developmental and personality research, addressing the importance of adopting a person-centered point of view for examining relations between Negative Emotionality and Effortful Control in adolescence, and showing how these two temperamental dimensions work in concert to organize patterns of individual differences across cultures.

REFERENCES

Ahadi, S. A., Rothbart, M. K., & Ye, R. M. (1993). Child temperament in the U.S. and China: Similarities and differences. *European Journal of Personality, 7*, 359-378. DOI: 10.1002/per.2410070506

Allport, G. W. (1961). *Pattern and growth in personality*. New York: Holt.

Althoff, R. R., Ayer, L. A., Crehan, E. T., Rettew, D. C., Baer, J. R., & Hudziak, J. J. (2012). Temperamental profiles of dysregulated children. *Child Psychiatry & Human Development*, *43*(4), 511-522. DOI: 10.1007/s10578-012-0280-7

Alwin, D. F. (1994). Aging, personality, and social change: The stability of individual differences over the adult life span. In D. L. Featherman, R. M. Lerner, & M. Perlmutter (Eds.), *Life-span development and behavior. Life-span development and behavior,* Vol. 12, pp. 135-185). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

Asendorpf, J. B., & van Aken, M. A. (1999). Resilient, overcontrolled, and undercontrolled personality prototypes in childhood: Replicability, predictive power, and the trait-type Issue. *Journal of Personality and Social Psychology*, 77, 815-832. DOI: 10.1037/0022-3514.77.4.815

Asparouhov, T., & Muthén, B. (2013). Auxiliary variables in mixture modeling: 3-step approaches using Mplus. Mplus Web Notes: No. 15. *Retrievable from www. statmodel. com*.

Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: 3-step approaches using Mplus. Mplus Web Notes: No. 15. Version 8. *Retrievable from www. statmodel. com*.

Bates, J. E. (1987). Temperament in infancy. In JD Osofsky (Ed.), Wiley series on personality processes. *Handbook of infant development* (pp. 1101-1149). Oxford, England: John Wiley & Sons

Bergman, L. R., Magnusson, D., & El Khouri, B. M. (2003). *Studying individual development in an interindividual context: A person-oriented approach*. Psychology Press.

Block, J. H., Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.). *Development of cognition, affect, and social relations: The Minnesota symposia on child psychology* (Vol. 13, pp. 39-103). Hillsdale, NJ: Erlbaum.

Brewis, A., Schmidt, K. L., & Casas, C. A. S. (2003). Cross-cultural study of the childhood developmental trajectory of attention and impulse control. *International Journal of Behavioral Development*, *27*(2), 174-181. DOI: 10.1080/0165025024400173

Capaldi, D., & Rothbart, M. (1992). Development and validation of an early adolescent temperament measure. *Journal of Early Adolescence, 12*, 153–173. DOI: 10.1177/0272431692012002002

Capriola, N. N., Booker, J. A., & Ollendick, T. H. (2017). Profiles of Temperament among Youth with Specific Phobias: Implications for CBT Outcomes. *Journal of abnormal child psychology*, *45*(7), 1449-1459. DOI: 10.1007/s10802-016-0255-4

Casey, B. J., Giedd, J. N., & Thomas, K. M. (2000). Structural and functional brain development and its relation to cognitive development. *Biological psychology*, *54*(1-3), 241-257. DOI: 10.1016/S0301-0511(00)00058-2

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, *56*, 453-484. DOI: 10.1146/annurev.psych.55.090902.141913

Caspi, A., Harrington, H., Milne, B., Amell, J. W., Theodore, R. F., & Moffitt, T. E. (2003). Children's behavioral styles at age 3 are linked to their adult personality traits at age 26. *Journal of Personality, 71*, 495–513. DOI: 10.1111/1467-6494.7104001

Chen, X., & French, D. C. (2008). Children's social competence in cultural context. *Annual Review of Psychology, 59*, 591-616. DOI: 10.1146/annurev.psych.59.103006.093606

Chen, X., Hastings, P. D., Rubin, K. R , Chen, H., Cen, G., & Stewart, S. L. (1998). Child-rearing attitudes and behavioral inhibition in Chinese and Canadian toddlers: A cross-cultural study. *Developmental Psychology, 34*, 677-686. DOI: 10.1037/0012-1649.34.4.677

Chen, X., Yang, F., & Fu, R. (2012). Culture and temperament. In M. Zentner, & R. L. Shiner (Eds.), *Handbook of temperament* (pp. 462-478). New York: The Guildford Press

Collins, W. A., & Steinberg, L. (2006). Adolescent development in interpersonal context. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology, vol. 3: Social, emotional, and personality development* (6th ed., pp. 1003 – 1067). Hoboken, NJ: John Wiley & Sons. DOI: 10.1002/9780470147658.chpsy0316

De Bolle, M., & Tackett, J. L. (2013). Anchoring bullying and victimization in children within a Five-Factor Model-based person-centred framework. *European Journal of Personality*, *27*(3), 280-289. DOI: 10.1002/per.1901

Eid, M., Langeheine, R., & Diener, E. (2003). Comparing typological structures across cultures by multigroup latent class analysis: A primer. *Journal of Cross-Cultural Psychology*, *34*(2), 195-210. DOI: 10.1177/0022022102250427

Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual review of psychology*, *51*(1), 665-697. DOI: 10.1146/annurev.psych.51.1.665

Eisenberg, N., Fabes, R. A., & Murphy, B. C. (1996). Parents' reactions to children's negative emotions: Relations to children's social competence and comforting behavior. *Child development*, *67*(5), 2227-2247. DOI: 10.2307/1131620

Eisenberg, N., Guthrie, I. K., Fabes, R. A., Shepard, S., Losoya, S., Murphy, B. C., et al. (2000). Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. *Child Development, 71,* 1367−1382. DOI: 10.1111/1467-8624.00233

Eisenberg, N., & Morris, A. S. (2002). Children's emotion-related regulation. In R. V. Kail (Ed.), *Advances in child development and behavior,* Vol. 30, pp. 189-229). San Diego, CA, US: Academic Press. DOI: 10.1016/S0065-2407(02)80042-8

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reider, M., et al. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development, 72*, 1112–1134. DOI: 10.1111/1467-8624.00337

Eisenberg, N., Sadovsky, A., Spinrad, T. L., Fabes, R. A., Losoya, S. H., Valiente, C., ... & Shepard, S. A. (2005). The relations of problem behavior status to children's negative emotionality, effortful control, and

impulsivity: concurrent relations and prediction of change. *Developmental psychology*, *41*(1), 193. DOI: 10.1037/0012-1649.41.1.193

Ellis, L. K. (2002). *Individual differences and adolescent psychosocial development* (Doctoral dissertation, University of Oregon).

Ellis, L. K., & Rothbart, M. K. (2001, April). *Revision of the early Adolescent temperament questionnaire*. Paper presented at the 2001 meeting of the Society for Research in Child Development, Minneapolis, Minnesota.

Erkut, S. (2010). Developing multiple language versions of instruments for intercultural research. *Child Development Perspectives, 4*, 19–24. DOI: 10.1111/j.1750-8606.2009.00111.x

Evans, D. E., & Rothbart, M. K. (1999). *Relationships between self-report Temperament measures and personality*. Unpublished manuscript, University of Oregon.

Evans, D. E., & Rothbart, M. K. (2007). Developing a model for adult temperament. *Journal of Research in Personality*, *41*(4), 868-888. DOI: 10.1016/j.jrp.2006.11.002

Fowles, D. C. (1988). Psychophysiology and psychopathology: A motivational approach. *Psychophysiology, 25*, 373-392. DOI: 10.1111/j.1469-8986.1988.tb01873.x

Gartstein, M. A., Gonzalez, C., Carranza, J. A., Ahadi, S. A., Ye, R., Rothbart, M. K., & Yang, S. W. (2006). Studying cross-cultural differences in the development of infant temperament: People's Republic of China, the United States of America, and Spain. *Child Psychiatry and Human Development*, *37*(2), 145-161. DOI: 10.1007/s10578-006-0025-6

Gogtay, N., Giedd, J. N., Lusk, L., Hayashi, K. M., Greenstein, D., Vaituzis, A. C., Nugent III, T. F., Herman, D. H., Clasen, L. S., Toga, A. W., Rapoport, J. L., and Thompson, P. M. (2004). Dynamic mapping of human cortisol development during childhood through early adulthood. *Proceedings of the National Academy of Sciences of the United States of America, 101*, 8174–8179. DOI: 10.1073/pnas.0402680101

Goldsmith, H.H., Buss, A., Plomin, R., Rothbart, M.K., Thomas, A., Chess, S., Hinde, R.A., & McCall, R.B. (1987). Roundtable: What is temperament? *Child Development, 58*, 505–529. DOI: 10.2307/1130527

Goldsmith, H. H., Buss, K. A., & Lemery, K. S. (1997). Toddler and childhood temperament: Expanded content, stronger genetic evidence, new evidence for the importance of environment. *Developmental Psychology, 33*, 891–905. DOI: 10.1037/0012-1649.33.6.891

Gray, J. A. (1982). *The neuropsychology of anxiety*. *An enquiry into the functions of the septo-hippocampal system.* New York: Oxford University Press. DOI: 10.1017/S0140525X00013066

Hankin, B. L., Abramson, L. Y., Moffitt, T. E., Silva, P. A., McGee, R., & Angell, K. E. (1998) Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology, 107*, 128–140. DOI: 10.1037//0021-843X.107.1.128

Hofer, C., & Eisenberg, N. (2008). Emotion-related regulation: Biological and cultural bases. In M. Vandekerckhove, C. von Scheve, S. Ismer, S. Jung, & S. Kronast (Eds.), *Regulating emotions: Social necessity and biological inheritance* (pp. 61–82). Malden, MA: Blackwell Publishing. DOI: 10.1002/9781444301786.ch3

Kagan, J. (1989). *Unstable ideas: Temperament, cognition, and self*. Cambridge, MA: Harvard University Press.

Laible, D., Carlo, G., Panfile, T., Eye, J., & Parker, J. (2010). Negative emotionality and emotion regulation: A person-centered approach to predicting socioemotional adjustment in young adolescents. *Journal of Research in Personality*, *44*(5), 621-629. DOI: 10.1016/j.jrp.2010.08.003

Laible, D., Carlo, G., Murphy, T., Augustine, M., & Roesch, S. (2014). Predicting children's prosocial and co-operative behavior from their temperamental profiles: A person-centered approach. *Social Development*, *23*(4), 734-752. DOI: 10.1111/sode.12072

Lansford, J. E., Criss, M. M., Laird, R. D., Shaw, D. S., Pettit, G. S., Bates, J. E., & Dodge, K. A. (2011). Reciprocal relations between parents' physical discipline and children's externalizing behavior during middle childhood and adolescence. *Development and Psychopathology, 23*, 225–238. DOI: 10.1017/S0954579410000751

Lansford, J. E., Sharma, C., Malone, P. S., Woodlief, D., Dodge, K. A., Oburu, P., Pastorelli, C., Skinner, A. T., Sorbring, E., Tapanya, S., Uribe Tirado, L. M., Zelli, A., Al-Hassan, S. M., Alampay L. P., Bacchini, D., Bombi, A. S., Bornstein, M. H., Chang, L., Deater-Deckard, K., & Di Giunta, L. (2014). Corporal punishment, maternal warmth, and child adjustment: A longitudinal study in eight countries. *Journal of Clinical Child & Adolescent Psychology*, *43*(4), 670-685. DOI: 10.1080/15374416.2014.893518

Lanza, S. T., & Cooper, B. R. (2016). Latent class analysis for developmental research. *Child Development Perspectives*, *10*(1), 59-64. DOI: 10.1111/cdep.12163

Lengua, L. J., & Long, A. C. (2002). The role of emotionality and self-regulation in the appraisal-coping process: Tests of direct and moderating effects. *Applied Developmental Psychology, 23*, 471–493. DOI: 10.1016/S0193-3973(02)00129-6

Lonigan, C. J., & Phillips, B. M. (2001). Temperamental basis of anxiety disorders in children. In M. W. Vasey & M. R. Dadds (Eds.), *The development of anxiety* (pp. 60–91). New York: Oxford University Press.

Magnusson, D. (2003). The person approach: Concepts, measurement models, and research strategy. *New directions for child and adolescent development*, *2003*(101), 3-23. DOI: 10.1002/cd.79

Magnusson, D. (1988). *Individual development from an interactional perspective: A longitudinal study*. Lawrence Erlbaum Associates, Inc.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224-253. DOI: 10.1037/0033-295X.98.2.224

Maxwell, B. (1996). Translation and cultural adaptation of the survey instruments. In M. O. Martin, & D. L. Kelly (Eds.). *Third international mathematics and science study (TIMSS) technical report, volume I: Design and development*. Chestnut Hill, MA: Boston College.

McCrae, R., R., Costa Jr, P. T. (1996). Toward a new generation of personality theories: Theoretical contexts for the Five-Factor Model. In J. S. Wiggins (ed.), *The Five-Factor Model of Personality: Theoretical Perspectives* (pp. 51–87). New York: Guilford.

Meeus, W., Van de Schoot, R., Klimstra, T., & Branje, S. (2011). Personality types in adolescence: change and stability and links with adjustment and relationships: a five-wave longitudinal study. *Developmental Psychology*, 47, 1181-1195. DOI: 10.1037/a0023816

Muris, P. (2006). Freud was right… about the origins of abnormal behavior. *Journal of Child and Family Studies*, *15*(1), 1. DOI: 10.1007/s10826-005-9006-9

Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament in early adolescence: Relations to internalizing and externalizing problem behavior and "Big Three" personality factors. *Journal of adolescence*, *30*(6), 1035-1049. DOI: 10.1016/j.adolescence.2007.03.003

Muris, P., & Ollendick, T. (2005). The role of temperament in the etiology of child psychopathology. *Clinical Child and Family Psychology, 8*, 271–289. DOI: 10.1007/s10567-005-8809-y

Murphy, B. C., Eisenberg, N., Fabes, R. A., Shepard, S., & Guthrie, I. K. (1999). Consistency and change in children's emotionality and regulation: A longitudinal study. *Merrill-Palmer Quarterly, 45*, 413–444.

Muthén, L. K., & Muthén, B. O. (1998 - 2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén&Muthén.

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007) Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study. *Structural Equation Modeling: A Multidisciplinary Journal*, 14, 535-569. DOI: 10.1080/10705510701793320

Oakland, T., & Mata, A. (2007). Temperament styles of children from Costa Rica and the United States. *Journal of Psychological Type, 67*, 91–102

Oh, S., & Lewis, C. (2008). Korean preschoolers' advanced inhibitory control and its relation to other executive skills and mental state understanding. *Child Development*, *79*(1), 80-99. DOI: 10.1111/j.1467-8624.2007.01112.x

Oldehinkel, A. J., Hartman, C. A., De Winter, A. F., Veenstra, R., & Ormel, J. (2004). Temperament profiles associated with internalizing and externalizing problems in preadolescence. *Development and Psychopathology, 16*, 421–440. DOI: 10.1017/S0954579404044591

Oldehinkel, A. J., Hartman, C. A., Ferdinand, R. F., Verhulst, F. V., & Ormel, J. (2007). Effortful control as modifier of the association between negative emotionality and Adolescent's mental health problems. *Development and Psychopathology, 19*, 523–539. DOI: 10.1017/S0954579407070253

Panksepp, J. (1982). Toward a general psychobiological theory of emotions. *Behavioral and Brain Sciences, 5*, 407-467. DOI: 10.1017/S0140525X00012759

Posner, M. I., & Rothbart, M. K. (1992). Attentional mechanisms and conscious experience. In *The neuropsychology of consciousness*, pp. 91-111. DOI: 10.1016/B978-0-12-498045-7.50010-4

Posner, M. I., & Rothbart, M. K. (1998). Attention, self regulation and consciousness. *Philosophical Transactions of the Royal Society of London, B, 353*, 1915-1927. DOI: 10.1098/rstb.1998.0344

Posner, M. I., & Rothbart, M. K. (2000). Developing mechanisms of self-regulation. *Development and psychopathology*, *12*(3), 427-441. DOI: 10.1017/S0954579400003096

Putnam, S. P., Ellis, L. K., & Rothbart, M. K. (2001). The structure of temperament from infancy through adolescence. In A. Eliasz & A. Angleitner (Eds.), *Advances in research on temperament* (pp. 165–182). Lengerich, Germany: Pabst Science.

Rettew, D.C., Doyle, A., Althoff, R.R., et al. (2004, October) *Does fear of novelty in social and nonsocial domains exist together or apart? a latent class approach*. Paper presented at: 51st Annual Conference of the American Academy of Child and Adolescent Psychiatry; Washington, DC.

Rettew, D. C., Althoff, R. R., Dumenci, L., Ayer, L., & Hudziak, J. J. (2008). Latent profiles of temperament and their relations to psychopathology and wellness. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(3), 273-281. DOI: 10.1097/CHI.0b013e318160b403

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. *Psychological bulletin*, *126*(1), 3. DOI: 10.1037/0033-2909.126.1.3

Rothbart, M. K. (1998). Temperament and plasticity in childhood. D. M. Hann, L. C. Huffman, I. Lederhendler, & D. Meinecke, (Eds.), *Advancing research on developmental plasticity: Integrating the behavioral science and the neuroscience of mental health* (pp. 223-231). Washington D.C: U.S. Government Printing Office.

Rothbart, M. K. (2007). Temperament, development, and personality. *Current directions in psychological science*, *16*(4), 207-212. DOI: 10.1111/j.1467-8721.2007.00505.x

Rothbart, M. K., & Ahadi, S. A. (1994). Temperament and the development of personality. *Journal of abnormal psychology*, *103*(1), 55. DOI: 10.1037/0021-843X.103.1.55

Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: origins and outcomes. *Journal of personality and social psychology*, *78*(1), 122. DOI: 10.1037/0022-3514.78.1.122

Rothbart, M. K., & Bates, J.E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social emotional and personality development* (5th ed., pp. 105-176). New York: Wiley.

Rothbart, M.K., & Bates, J.E. (2006). Temperament. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology: Vol.3. Social, emotional, and personality development* (6th ed., pp. 99–166). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0303

Rothbart, M. K., Ahadi, S. A., Hershey, K., & Fisher, P. (2001). Investigations of temperament at 3 to 7 years: The children's behavior questionnaire. Child Development, 72, 1394–1408. DOI: 10.1111/1467-8624.00355

Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament. In M. E. Lamb & A. L. Brown (Eds.), *Advances in developmental psychology* (Vol. 1, pp. 37-86). Hillsdale, NJ: Erlbaum.

Rothbart, M. K., Derryberry, D., & Posner, M. I. (1994). A psychobiological approach to the development of temperament. In J. E. Bates & T. D. Wachs (Eds.), *Temperament: Individual differences at the interface of biology and behavior* (pp. 83-116). Washington, DC: American Psychological Association. DOI: 10.1037/10149-003

Rothbart, M. K., Derryberry, D., & Hershey, K. (2000). Stability of temperament in childhood: Laboratory infant assessment to parent report at seven years. In V. J. Molfese & D. L. Molfese (Eds.), *Temperament and personality development across the life span* (pp. 85-119). Hillsdale, NJ: Erlbaum.

Rothbart, M. K., & Putnam, S. P. (2002). Temperament and socialization. In L. Pulkkinen & A. Caspi (Eds.), *Paths to successful development* (pp. 19– 45). Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511489761.002

Rubin, K. H., Hemphill, S. A., Chen, X., Hastings, P., Sanson, A., Lo Coco, A., Zappulla, C., Chung, O. B., Park, S. Y., Doh, H. S., Chen, H., Sun, L, Yoon, C. H., Cui, L. (2006). A cross-cultural study of behavioral inhibition in toddlers: East–West–North–South. *International Journal of Behavioral Development*, *30*(3), 219-226. DOI: 10.1177/0165025406066723

Rutter, M., Caspi, A., & Moffitt, T. E. (2003). Using sex differences in psychopathology to study causal mechanisms: unifying issues and research strategies. *Journal of Child Psychology and Psychiatry*, *44*(8), 1092-1115. DOI: 10.1111/1469-7610.00194

Rydell, A. M., Berlin, L., & Bohlin, G. (2003). Emotionality, emotion regulation, and adaptation among 5- to 8-year-old children. *Emotion, 3*, 30– 47. DOI: 10.1037/1528-3542.3.1.30

Sabbagh, M. A., Xu, F., Carlson, S. M., Moses, L. J., & Lee, K. (2006). The development of executive functioning and theory of mind: A comparison of Chinese and US preschoolers. *Psychological science*, *17*(1), 74-81. DOI: 10.1111/j.1467-9280.2005.01667.x

Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype-environment effects. *Child Development, 54*, 242–435. DOI: 10.2307/1129703

Shiner, R. L. (1998). How shall we speak of children's personalities in middle childhood? A preliminary taxonomy. *Psychological bulletin*, *124*(3), 308. DOI: 10.1037/0033-2909.124.3.308

Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry*, *44*(1), 2-32. DOI: 10.1111/1469-7610.00101

Snyder, C. R., Higgins, R. L., & Stucky, R. J. (1983). *Excuses: Masquerades in search of grace* (No. 341). John Wiley & Sons.

Steinberg, L., & Morris, A. S. (2001) Adolescent Development. *Annual Review of Psychology*, 52, 83-110. DOI: 10.1146/annurev.psych.52.1.83

Stevenson, H. W., & Stigler, J. W. (1992). *The learning gap: Why our schools are failing and what we can learn from Japanese and Chinese education*. New York: Summit Books.

Thomas, A., & Chess, S. (1977). *Temperament and development*. Oxford, England: Brunner/Mazel.

Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political analysis*, *18*(4), 450-469. DOI: 10.1093/pan/mpq025

Vermunt, J. K., & Magidson, J. (2002). Latent class cluster analysis. *Applied latent class analysis*, *11*, 89-106.

Vervoort, L., Wolters, L. H., Hogendoorn, S. M., Prins, P. J., De Haan, E., Boer, F., & Hartman, C. A. (2011). Temperament, attentional processes, and anxiety: diverging links between adolescents with and without anxiety disorders? *Journal of Clinical Child & Adolescent Psychology*, *40*(1), 144-155. DOI: 10.1080/15374416.2011.533412

Wickrama, K. K., Lee, T. K., O'Neal, C. W., & Lorenz, F. O. (2016). *Higher-order growth curves and mixture modeling with Mplus: a practical guide*. Routledge.

Zahn-Waxler, C., Cole, P. M., & Barrett, K. C. (1991). Guilt and empathy: Sex differences and implications for the development of depression. In J. Garber & K. A. Dodge (Eds.), *Cambridge studies in social and emotional development. The development of emotion regulation and dysregulation* (pp. 243-272). New York, NY, US: Cambridge University Press. DOI: 10.1017/CBO9780511663963.012

CHAPTER IV

STUDY III

Anxiety and Affective Problems' Development during Adolescence: The role of Negative Emotionality and Self-Regulation in three Countries within a Person-Centered Approach

Abstract

During adolescence internalizing problems, such as anxiety or depression, tend to be frequently experienced, and tend to pervasively influence youths' development overtime (e.g., Cummings et al 2014; Zahn-Waxler et al., 2000). The interaction between Negative Emotionality and Self-regulation play an important role in the development of Internalizing problems (Eisenberg & Fabes, 1992; Eisenberg et al., 2001; Muris, Meesters, & Blijlevens, 2007; Rothbart & Bates, 2006). According with this theoretical framework, the aims of this study were (a) to identify developmental trends of Anxiety and Affective problems for boys and girls, from early to middle-adolescence in a cross-cultural sample, (b) examine the relations of early adolescents' temperamental profiles (based on sub-domains of Negative Emotionality and Effortful Control) to the developmental trajectories of Anxiety and Affective problems, controlling for adolescents' culture. We considered five hundred twenty-seven mothers-child dyads of three different countries (Italy, Colombia, and United States) in three different Waves (from 12 to 16 years). Unconditional multi-group Latent Growth Curve models showed that Anxiety and Affective problems increased overtime in girls but not in boys. Conditional Latent Growth Curve models showed that for both boys and girls the Over-reactive/disregulated profile was significantly and positively related to the Anxiety and to the Affective initial levels; in addition, this profile was negatively related to the Affective' rate of change. The Regulated profile was significantly and negatively related to the Affective Problems' Intercept only in girls. At least Colombian and Italian boys and girls showed higher initial levels of Anxiety Problems. The present study contributed to that body of research focused on the relation between temperamental profiles based on Negative Emotionality and Effortful Control and the development of Internalizing problems during adolescence. In addition, the study underlined the protective role of self-regulation: if youths are compromised only in the emotionality domain, their self-regulative capacities can protect them from the development of Anxiety and Affective Problems.

Keywords: Self-regulation; Emotionality; Anxiety; Depression.

INTRODUCTION

Developmental research underlined that during adolescence there is an increasing risk in experience internalizing (e.g., social withdrawal, psychosomatic reactions, anxiety, or depression) and externalizing (e.g., aggressive and rule breaking behavior) problems (e.g., Zahn- Waxler, Shirtcliff, & Marceau, 2008). In particular, internalizing problems, such as anxiety or depression, tend to be frequently experienced across adolescence and young adulthood, to co-occur, and overall tend to jeopardize adolescents' development overtime, because they are often associated with several mental health problems (e.g., Chavira et al., 2004; Cummings et al 2014; Weissman et al., 1999; Zahn-Waxler et al., 2000). A large body of research focused on how negative emotionality and self-regulation can predict Internalizing problems (e.g., Eisenberg & Morris, 2002; Rothbart & Bates, 2006; Zhou et al. 2007; Eisenberg et al., 2009). Despite those studies highlighted the importance to consider the interaction between negative emotionality and self-regulation in predicting the development of internalizing problems, to our knowledge, there are no studies focused specifically on adolescents' temperamental profiles (based on these two temperamental domains), and their links with anxiety and depression trajectories during adolescence. According with the Vulnerability model, moving in a Person-centered framework (see Chapter 1 for an exhaustive description), we aimed to analyze associations among temperamental profiles emerged from the study II (based on several sub-domains of Negative Emotionality and Self-Regulation) and the development of Internalizing problems (i.e., Anxiety, and Affective problems) separately in boys and girls, from early to middle adolescence, controlling for adolescents' culture.

Internalizing Problems: Anxiety and Depression

Internalizing problems can be defined as mood and emotional problems, focused on emotional components of sadness, guilt, and worries (Achenbach, 1991; Graber & Sontag, 2009). Anxiety and Depression (also defined Affective or Mood problems; Achenbach, 1991; Achenbach & Rescorla, 2007) are two of the major problems in this area, together with psychosomatic problems, specific phobias, panic disorder, dysthymia, and so on. Internalizing problems derives from a pervasive diysregulation of emotions that lead individuals to "internalize" negative emotions, such as guilt or fear, and to overestimate the meaning of those emotions, also in relational contexts (e.g., incapacity to distinguish the responsibility for one's own or others emotional states) (Graber & Sontag, 2009).
In this Chapter we will referred to the syndromical classification of Anxiety and Depressive problems, adopting a dimensional approach (Achenbach & Rescorla, 2007; Zahn-Waxler et al., 2000; Graber & Sontag, 2009), in order to capture their characteristic features in a non-clinical population of adolescents.

During adolescence, Anxiety and Depression tend to be frequently experienced, and they frequently co-occur (e.g., Chavira et al., 2004; Cummings et al., 2014; Weissman et al., 1999). For what concerns the prevalence of clinical Anxiety Problems in western countries, categorical diagnoses such as Generalized Anxiety Disorder and Social Phobias are frequent in pre-adolescents and adolescents (Bandelow & Michaelis, 2015; Kessler et al., 2012; Nagata, Suzuki, & Teo, 2015); in addition, Panic Disorder emerges during adolescence, probably also because it may be associated with puberty and physiological changes of this period (Kessler et al., 2012; Zahn-Waxler et al., 2000). As regards the prevalence of Affective Problems, rates of Major Depressive Disorder and Dysthymic Disorder are up to 8% during adolescence (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Lewinsohn, Clarke, Seeley & Rohnde, 1994; Kessler et al., 2012). Research showed that early-onset depression is strongly associated with more severe forms of depressive problems later (Avenevoli et al., 2015; Cummings et al., 2014). For what concerns the comorbidity between anxiety and depressive problems, during adolescence there is a great co-occurrence, also over the 70% (Karlsson et al., 2006; Zahn-Waxler et al., 2000).

The development of anxiety is a result of a complex interaction of biological, environmental, and cognitive factors. The "biased attention" (Beck & Clark, 1997) is one of the core aspects of this complex interaction; briefly, this mechanism can be described as the tendency to interpret ambiguous information as threatening, that in turn create cognitive distortions, and a subsequent process of over-activation. The social context also influences the development of anxiety, through experiences of socialization that make individual more sensitive to fear: for example, children and adolescents can "learn" anxiety from the relationships with caregivers (i.e., modeling, or specific discipline practices that emphasize frightening and dangerous aspects). Genetic influences also play a role, through heritable factors and genetic susceptibility that influence the expression of anxiety problems. In addition, physiological regulatory processes, such as the Behavioral Inhibition System (BIS; Gray, 1982; 1991), that activates in situations of novelty, punishment, intense stimulation, and evolutionarily prepared fear, can influence the emergence of anxiety; this process includes Attentional aspects of fear, and operates as a "stop" mechanism. Lastly, several temperamental characteristics, such as inhibited and withdrawn behaviors, as well as lower activity level, can make some individual particularly vulnerable to over-activation (Biuckians, Miklowitz, & Kim, 2006; Kagan et al., 1987; 1988).

The development of depression is also a result of a complex interaction between biological and psychological factors. Several factors involved in anxiety development are also involved in depression development (Zahn-Waxler et al., 2000). For example, the social context and the family relations are associated with adolescent depression: previous studies shown that insufficient warmth and support, as well as family conflicts, hostility and parental rejection, are associated with depression in pre-adolescence and adolescence (Castellani et al., 2014; McCauley, Pavidis, &

Kendall, 2001; Gruhn et al., 2016). As regards cognitive factors leading to depression, according with the "learned helplessness" model, youths learn to reply to environmental aversive and stressful contingencies giving up the situation; this in turn create cognitive distortions (i.e., negative schemas, biased attribution of failure, negative self-concepts), and a subsequent risk to experience stressful and challenging situation with depressive feelings (Hankin, Snyder, & Gulley, 2016; Rubenstein, Freed, Shapero, Fauber, & Alloy, 2016; Seligman, Abramson, Semmel & Von Baeyer, 1979; Seligman et al., 1984). Previous research attested the great influence of hereditable factors in the development of depression: youths with depressed parents showed concurrent increased risk for early-onset depressive problems (e.g., Birmaher et al., 1996; Gruhn et al., 2016). The hypothalamic-pituitary-adrenal (HPA) axis plays an important role in the development of both anxiety and depression (Akil et al., 1993; Rogeness, Cepeda, Macedo & Fischer, 1990), as well as the serotonin, noradrenergic, and GABAergic systems (Johnson & Lydiard, 1995).

Analyzing trajectories of Anxiety and Depression in a developmental perspective become crucial, because it can provide information about normative and non-normative pathways of development, taking into account reciprocal influences between individuals and environments. Understanding factors that can influence continuity and change in emotional and behavioral problems is a key point for understanding the development of these problems (Cicchetti, 1990). In fact, as anticipated in Chapter 1, it is important to identify pathways of normative emotional experiences in adolescence, derived from the specific developmental period that youths are facing, from those experiences that can lead to internalizing problems (Chicchetti & Cohen, 1995; Masten & Curtis, 2000).

In addition, it is important to consider Anxiety and Depressive problems separately, in order to capture the specificity of the two major internalizing problems, because, as highlighted by Zahn-Waxler and colleagues (Zahn-Waxler et al., 2000), if we considered anxiety and depression together into a single general construct, comparisons between these two different problems are not possible. Considering Anxiety and Depression separately can provide us also more information about their co-occurrence, their overlapping and their distinct characteristics. Analyzing the comorbidity of Anxiety and Depression during adolescence can be crucial for understanding also the severity of internalizing problems, and their trends overtime; previous evidences showed that if youths are involved in both anxiety and depressive symptoms, their discomfort would be more severe, and the course would be more demanding (e.g., Seligman & Ollendick, 1998).

Several cognitive and temperamental models tried to explain similarities between Anxiety and Depression. For example, following the tripartite model (Clark & Watson, 1991), both anxiety and depression are related to the negative affectivity dimension, while depression would be uniquely related to low levels of positive affectivity, and anxiety would be uniquely related to arousal activation. The model proposed by Rothbart and colleagues (e.g., Rothbart, Ahadi, & Evans, 2000)

suggested that depression would be related to self-perception of failure and loss, associated to the sub-domain of Sadness, while anxiety would be related to the anticipation of potential threatening or fearful situations, associated to the sub-domain of Fear (see Chapter 3 and the next section of this Chapter).

In general, analyzing the developmental pathways of anxiety and depression throughout adolescence is crucial to well understand concurrent and prospectively adjustment, because it is well established that persisting anxiety and depressive symptoms in early adolescence predict mental disorders in adolescence and adulthood (Chavira et al., 2004; Cummings et al 2014; Weissman et al., 1999; Ferdinand & Verhulst, 1995; Lewinsohn, Holm-Denoma, Small, Seeley & Joiner, 2008).

Gender and internalizing problems

When we consider Internalizing problems such as Anxiety or Depression, a crucial point is to take into account how adolescents' gender can influence the development of those problems. It is well established that during adolescence gender differences in anxiety and depressive symptoms markedly increase (Essau et al., 2010; McLean, Asnaani, Litz, & Hofmann, 2011; Nolen-Hoeksema & Hilt, 2013; Nolen-Hoeksema & Girgus, 1994). Adolescent girls become at higher risk to incur in a wide variety of Internalizing problems, such as Anxiety or Depression, and those gender differences tend to stabilize throughout the life course. Adolescent girls experience anxiety and depression twice than males, and also the co-occurrence of anxiety and depression is more frequent in girls compared with boys (Chaplin, Gillham, & Seligman, 2009; Kuehner, 2003; Lewinsohn, Rohde & Seeley, 1995; Zahn-Waxler et al., 2000). There are a variety of psychological and environmental factors that lead girls more prone to incur in anxiety and depressive problems than boys, which may represent also factors that contribute to crystalize this pattern of greater risk also in adulthood (Essau et al., 2010; Hankin et al., 1998; Hankin et al., 2016; McLean et al., 2011; Nolen-Hoeksema, Larson, & Grayson, 1999):

- *Dispositional characteristics*: some early constitutional characteristics may represent protective factors for behavioral problems (i.e., externalizing problems), but in turn can constitute risk factors leading to internalizing problems. For example, girls are characterized on average by a faster maturation in terms of regulatory capacities, ego-control, internalization of social conduct, empathic sensitivity, and capacity to interpret emotions (Zahn-Waxler et al., 2000). Previous studies found that girls are more likely to experience early fearfulness and worry, and that they are more behaviourally inhibited and shy than boys (Chaplin, Gillham, & Seligman, 2009). Girls are also more physiologically aroused than boys, more prone to internalize the distress, and with higher emotional responsiveness (Zahn-Waxler et al., 2000). At least, adolescent and adult females ruminate more than

males, and this can increase the risk for future anxiety or depressive problems (Nolen-Hoeksema, Larson, & Grayson, 1999; Zahn-Waxler et al., 2000).

- *Socialization*: the whole set of relational skills and capacities may contribute to internalizing problems. Beside the girls' capacity to be socialized, there are several social contexts that may increase their greater risk to develop anxiety or depressive symptoms. For example, if their family encourage sex-stereotyped activities, daughters may become more submissive, dependent, and compliant than sons (Hops, 1995; Zahn-Waxler et al., 2000). In addition, parents often reinforced shyness and dependency, they discourage exploration, and they demand to their daughters to acting in a more "mature way" than their sons (i.e., anticipating the consequences of their negative acts, being more prosocial, suppressing anger and negative emotions, etc.) (Zahn-Waxler et al., 2000).

Research with non-clinical sample of adolescents is fewer but growing. Empirical evidences suggest that during adolescence girls showed higher levels of anxiety and depressive symptoms that tend to slight increase throughout adolescence, and stabilize (especially for what concerns depression) in late adolescence (e.g., Dekker et al., 2007; Hale et al., 2008; van Oort et al., 2009; Ge et al., 2001; Hankin et al., 1998; Angold et al., 1998; Garrison et al., 1990).

Culture and internalizing problems

As elucidated in Chapter 1, it is important to consider the role of culture in adolescents' development. A limited but growing body of research underlines the role of ethnicity and culture in the development and in the maintenance of internalizing problems (e.g., Achenbach, Dumenci, & Rescorla, 2003; Crijnen, Achenbach, & Verhulst, 1997; Di Giunta et al., 2018; McLaughlin, Hilt, & Nolen-Hoeksema, 2007; Tick, Van Der Ende, & Verhulst, 2007). Culture (i.e., biological and value factors) can influence trajectories of maladjustment: the prevalence, the phenomenology, or the course of Anxiety and Depression can vary across cultures. In fact, internalizing problems are more frequent in some cultures than others: in general Hispanic countries (e.g., Puerto Rico or Jamaica) showed higher levels of internalizing problems, while United States showed the lower levels (e.g., Crijnen, Achenbach, & Verhulst, 1997; Tick, Van Der Ende, & Verhulst, 2007); however, in the last decades, some countries (i.e., American and North European, such as Sweden or Netherlands) showed an increasing trend for Internalizing problems (e.g., Achenbach, Dumenci, & Rescorla, 2003; Kosidou et al., 2010; Tick, Van Der Ende, & Verhulst, 2007). Girls are more prone than boys to incur in Internalizing problems across cultures (Crijnen, Achenbach, & Verhulst, 1997; Kleinman & Cohen, 1997), but the percentage of prevalence or the ratios between girls and boys can widely vary across cultures. For example, in China girls are so much involved in Internalizing problems, that being Anxious or Depressed it is considered a "normative" process for a girl, also for what concerns the more severe forms of depression (e.g., suicide attempt; Zahn-Waxler et al., 2000).

Those cultural variations can derive from different cultural norms about the regulation and the expression of emotions, the socialization rules, or the coping strategies (Markus & Kitayama, 1991; McCarty et al., 1999; Han, Leichtman, & Wang, 1998). More research is needed in this field, in order to well understand associations between adolescents' culture and the development of Anxiety and Depression.

Emotionality, Self-regulation and Internalizing Problems

According with the model proposed by Rothbart and colleagues (e.g., Rothbart & Bates, 2006; Rothbart, 2007), temperament represents the affective, activational, and attentional core of personality, and it is "limited to basic processes of reactivity and self-regulation, and do not include the specific content of thought" (Rothbart & Bates, 2006; p. 100). In this view, there are two core temperamental characteristics: *Emotionality*, which is related to the expression/inhibition of emotional reactions; *Self-regulation*, which is related to the flexible regulation of reactivity (Rothbart & Ahadi, 1994; Rothbart, Ahadi, & Evans, 2000; Rothbart & Bates, 2006). In the present contribution, as reported in Chapter 3, we focused on Negative Emotionality and Effortful Control. Negative Emotionality can be defined as the individual reactivity and proneness to experience a variety of negative emotions and feelings; Effortful Control represents the "voluntary" part of self-regulation, which refers to the capacity to regulate behavior and attention, as well as the ability to inhibit impulsive reactions and to regulate emotionality (Rothbart, 1998; Rothbart & Bates, 2006).

A large body of research focused on how these temperamental factors can predict maladjustment. In particular, for what concerns Negative Emotionality, the sub-domain of Anger/Frustration predispose individual to later externalizing problems but not to internalizing problems, or in some cases, only to depression; in contrast, the sub-domains of Fear and Sadness were associated with higher probabilities to incur in later internalizing problems, such as anxiety or depression (Rothbart & Bates, 1998; Eisenberg et al., 2001; Oldehinkel et al., 2004; Rydell, Berlin & Bholin, 2003; Blumberg & Izard, 1985). As regards Effortful Control, the sub-domain of Attention was associated with Internalizing problems; lacking in the sub-domain of Inhibitory Control were associated with Externalizing problems, whereas high levels of Inhibitory Control can predispose individual to later internalizing problems, due to an over-control or constrain of individual behavior (e.g., Eisenberg & Fabes, 1992; Eisenberg et al., 2001; Muris, 2006; Muris, Meesters, & Blijlevens, 2007). As highlighted by Hoyle (2010), those previous findings are quite mixed, and probably it can be partially explained by some methodological reasons. For example, studies used different assessments, such as composite scores (e.g., mother and child reports) versus observer or parent ratings, or they focused on different developmental periods (e.g., infancy versus later childhood) (e.g., Lengua, 2003; Eisenberg et al., 2001; Eggum et al., 2009).

Nonetheless, despite that earlier studies highlighted the role of Negative Emotionality in predicting children's and adolescents' maladjustment, current researchers agree with the general idea that, beyond the influences of Negative Emotionality, the Self-regulative part play also an important role (Posner & Rothbart, 2000; Muris, Meesters, & Blijlevens, 2007). As suggested by Muris (2006), one of the most popular current views is that "temperamental vulnerability to psychopathology is characterized by high levels of neuroticism (or Negative Emotionality, A/N) and low levels of effortful control" (Muris, 2006; p. 1410). However, some recent contributions underline the importance to consider the combination and the interaction between Negative Emotionality and Effortful Control in predicting maladjustment during adolescence, because in this period the interaction between these two temperamental factors is crucial for youths' positive development (Vervoort et al., 2011; Muris, 2006; Oldehinkel et al., 2007). Findings corroborate the combined predictive value of Negative Emotionality and Effortful Control in the development of internalizing problems: high Negative Emotionality associated with low Effortful Control predicted later higher internalizing problems, whereas high Negative Emotionality associated to average levels of Effortful Control predicted later average levels of internalizing problems in children and adolescents (e.g., Eisenberg & Morris, 2002; Rothbart & Bates, 2006; Zhou et al. 2007; Eisenberg et al., 2009; Laible et al, 2010; 2014; Eisenberg & Fabes 1992; 2006).

Therefore, it seems important to consider relations among Negative Emotionality, Effortful Control, and the development of Internalizing problems, according with a person-centered approach (see Chapter 1), in order to well understand how individual patterns of functioning based on these two temperamental factors can lead specifically to some kind of Internalizing problem. Nonetheless, as mentioned in Chapter 3, to our knowledge there are no studies focused specifically on adolescents' temperamental profiles (based on negative emotionality and effortful control) and on their relations with anxious and depressive trajectories during the transition from early to middle adolescence. Most of the existing studies focused on young childhood (e.g., Laible et al., 2010), or they focused on temperamental dimensions more related to biological and cognitive systems (e.g., Rettew et al., 2008).

The Present Study: Aims and Hypotheses

The general aim of the study is to analyze the specific links between temperamental profiles based on narrow dimension of Negative Emotionality and Self-Regulation, and the development of Internalizing problems (i.e., Anxiety, and Affective problems) separately in boys and girls, from early to middle adolescence, controlling for adolescents' culture. To our knowledge, there are no previous studies that have addressed these issues, therefore this study can be considered a novelty.

We first attempted to identify the normative developmental trends of Anxiety and Affective Problems in a sample of pre-adolescents of three different cultures (i.e., Italian, Colombian, and American), from 12 to 16 years old, using unconditional Latent Growth Curve Model (LGC; Curran, 2000; Duncan & Duncan, 2009; Wickrama et al., 2016), separately in boys and girls. According with previous studies, we considered Anxiety and Affective problems separately, in order to capture the specificity of these two internalizing problems. We expected to find the following results:

- Anxiety Problems: we hypothesized to find an increasing or a stable high trajectory of anxiety for girls, and a decreasing or a slight decreasing trajectory for boys, according with previous results (e.g., Achenbach & Rescorla, 2001; Hale et al., 2008; van Oort et al., 2009).
- Affective Problems: we hypothesized to find an increasing or a slight increasing trajectory of affective problems especially for girls, and a stable or a slight decreasing trajectory for boys, according with previous results (e.g. Achenbach & Rescorla, 2001; Dekker et al., 2007; Ge et al., 2001; Hankin et al., 1998; Angold et al., 1998; Garrison et al., 1990).

Second, we examined the effects of being in one of the temperamental profiles identified in the previous study (see Chapter 3), on the developmental trends of Anxiety and Affective Problems, separately in boys and girls, controlling for adolescents' culture, using conditional Latent Growth Curve Model approach. For the purposes of the present study, we excluded the Average profile because it represents the normative profile, and it could be the less informative in terms of longitudinal associations with Anxiety and Affective problems overtime. To our knowledge there are no studies focused specifically on the predictive value of adolescents' temperamental profiles (based on sub-domains of negative emotionality and effortful control) on the developmental trajectories of Anxiety and Affective problems during the transition from early to middle adolescence, therefore this part of the study could be considered as an exploration. However, consistent with previous studies that attested the combined predictive value of Negative Emotionality and Effortful Control in the development of Internalizing problems (e.g., Eisenberg & Fabes, 1992; Eisenberg et al., 2001; Muris, 2006; Muris, Meesters, & Blijlevens, 2007; Rothbart & Bates, 1998; Oldehinkel et al., 2004; Rydell, Berlin & Bholin, 2003; Blumberg & Izard, 1985), we expected to find the following results:

- The Regulated profile: for boys and girls, we hypothesized negative or non-significant associations with initial levels and change overtime for both Anxiety and Affective problems (Eisenberg et al., 2001; Muris, 2006; Oldehinkel et al., 2004).
- The Over-reactive/regulated profile: we hypothesized positive associations with initial levels and the hypothesized increasing trend of both Anxiety and Affective problems, especially for girls (e.g., Muris, 2006; Oldehinkel et al., 2004; Rothbart & Bates, 1998);

- The Over-reactive/disregulated profile: for girls, we hypothesized the strongest positive association with initial levels and the hypothesized increasing trend of both Anxiety and Affective problems; for boys, we hypothesized the strongest negative association with the hypothesized decreasing trend of both Anxiety and Affective problems (e.g., Muris, 2006; Muris, Meesters, & Blijlevens, 2007; Oldehinkel et al., 2004).

METHOD

Participants

Participants were drawn from a wider cross-cultural and longitudinal study entitled "Parenting, Adolescent Self-Regulation, and Risk-Taking Across Culture - PAC" (e.g., Lansford, 2011; Lansford et al., 2014). For a comprehensive description of this project, see the "Participants" section in Chapter 3.

For the present study, starting from the sample composed by 527 mother-child dyads used in the previous study (presented in Chapter 3), in this study we considered youths self-reports collected in the 4th, the 5th and the 7th Wave of the PAC project (reported in Table 1).

Table 1

Longitudinal design of the Parenting Across Cultures Project

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9
Mothers	X	X	X	**X**	X	X	X	X	X
Fathers	X	X	X		X	X	X	X	X
Youths	X	X	X	**X**	**X**	X	**X**	X	X
Child's Age	8	9	10	12	13	14	15	16	17

Note: Y = Wave; the X represents the data collection.

Bold indicates Waves selected for the present study.

Longitudinal data were available for 446[2] preadolescents (49.9% males, and 50.1% females) of the original 527 mother-child dyads. For a general description of the sample, see the "Participants" section in Chapter 3. In the first Wave of the present study, adolescents (49% males) averaged 12.62 (SD = 0.67) years old; in the second Wave of the study (Wave 5th of the PAC project), adolescents (49% males) averaged 13.75 (SD = .66) years old; in the last Wave of the study (Wave 7th of the PAC project), adolescents (50% males) averaged 16.06 (SD = .78) years old. Retention rate from the first Wave of the study to Wave 3 was 91%. Full information about the composition of the sample, separated for each culture, is reported in Table 2.

[2] One-way ANOVA showed that youths that did not provide a self-report did not significantly differ from their non-missing counterparts in the mean levels of most of the study variables, excepting for the Activation Control: participants of which we did not have a self-report showed significantly higher Activation Control ($F = 8.712$, $p = .003$; $M_{missing} = 3.88$; $M_{non\text{-}missing} = 3.61$).

Table 2

Descriptive statistics of the sample for each country

	Colombia	Italy	United States
Child' Gender	47% males; 53% females	48% males; 52% females	52% males; 48% females
Child' Age Wave 1	M_{age} = 12.53 (*SD* = 0.77)	M_{age} = 12.37 (*SD* = 0.62)	M_{age} = 12.82 (*SD* = 0.64)
Child' Age Wave 2	M_{age} = 13.65 (*SD* = 0.77)	M_{age} = 13.52 (*SD* = 0.60)	M_{age} = 13.94 (*SD* = 0.64)
Child' Age Wave 3	M_{age} = 16.12 (*SD* = 0.76)	M_{age} = 15.56 (*SD* = 0.62)	M_{age} = 16.47 (*SD* = 0.66)

Procedure

For an exhaustive description of the procedure used in the "Parenting, Adolescent Self-Regulation, and Risk-Taking Across Culture - PAC", see the "Procedure" section, in Chapter 3.

Measures

Preadolescents' gender was coded 1 for males and 2 for females. Adolescents' country of origin was originally coded 1 for Colombia, 2 for Italy, and 3 for United States, but for the purposes of the study we created three dummy variables, one for each country, coded 1 for the country of origin and 0 for other countries. Temperamental profiles emerged in the Study 2 from the mothers' report of their children temperamental sub-domain of Negative Emotionality and Effortful Control (see the "Measures" section in Chapter 3). The other measures used in this study are described below.

Anxiety and Affective Problems

To assess preadolescents' levels of Anxiety and Affective problems, we used self-reports of the two corresponding subscales (Anxiety Problems, and Affective problems) taken from the Youth Self-Report (YSR; Achenbach, 1991). For a general description of the questionnaire, see the "Measures" section in Chapter 2. For the PAC project, an "ad hoc" short version of the YSR was created, selecting from the original 112 items, a set of 53 items (the same procedure was applied for the Child Behavior Check-List – CBCL, that is the parent-report of the same instrument in the ASEBA system). Considering the two subscales of the present study, they were composed as follows:

- The sub-scale of Anxiety Problems was composed of 3 items l ("I am nervous or tense", "I am too fearful or anxious", and "I worry a lot");
- The sub-scale of Affective Problems was composed of 6 items (i.e., "I cry a lot", or "I am unhappy, sad, or depressed");

Previous studies have supported the psychometric proprieties of the instrument, also in the Italian context (i.e., reliability, factor structure and predictive values; Achenbach & Rescorla, 2001; Crijnen, Achenbach, & Verhulst, 1997; Frigerio et al., 2004). In our study, the Cronbach alpha

coefficients ranged from .71 (for Wave 2 Anxiety Problems) to .81 (for Wave 3 Affective Problems). For more information about reliability and descriptive statistics, see the paragraph "Preliminary Analysis" and the Table 3 in the section "Results".

Analytic Approach

We moved into the Latent Growth Curve analysis framework (LGC; Curran, 2000; Duncan & Duncan, 2009; Wickrama et al., 2016), using the M*plus* 7.1 statistical package (Muthén & Muthén, 2012), in order to identify adolescents' trajectories of Anxiety and Affective problems, the general trend as well as the trends for boys and girls from preadolescence to middle adolescence (from 12 to 16 years old), and to analyze the relations overtime between those trajectories and the temperamental profiles' membership (emerged in the previous study), controlling for adolescents' country of origin.

Those techniques (LGCMs), have several advantages, because combine elements of repeated measures with Multivariate Analysis of Variance (MANOVA), confirmatory factor analysis (CFA), and structural equation modeling (SEM): this approach, starting from the means of observed indicators, can estimate latent variables (i.e., the growth factors), taking into account inter-individual and intra-individual differences in change. The growth factors are: the Intercept (the initial level of the observed indicator); the Slope factor (the "rate of change" of the observed indicator over time, which represents the growth trend), which can assumes different and specific growth functions (i.e., linear, quadratic, cubic, etc.) that can be considered at the same time. Those growth factors represent one of the key advantages of this approach, because in the repeated measures analysis it was impossible to examine separately the initial level and the rate of change (Hale et al., 2008; Raudenbush & Bryk, 2002; Simons-Morton et al., 2004). The LGC approach offers the opportunity to add time-invariant (i.e., covariate that not changing overtime) or time-varying (i.e., covariates that changing overtime) covariates, in order to examine the effects of these covariates on the developmental trajectory, as well as to examine different developmental trajectories for different groups in a multi-group framework (e.g., examine trends overtime separately for boys and girls); moreover, within this approach it is possible to examine the adequacy of the model tested, considering the fit of the model (Curran, 2000; Wickrama et al., 2016; Simons-Morton et al., 2004).

For the purposes of the present study, we followed separately for each phenomenon (Anxiety Problems and Affective Problems) a procedure organized in two steps:

d) First step – Unconditional models for Latent Growth Curve Analysis: first of all, we examined the overall trajectory overtime for Anxiety and Affective, estimating three different models:

- 1. No Growth Model: a model in which we estimated only the intercept factor (i.e., the initial level at age 12), in which we assumed that there was no growth or change overtime in Anxiety and Affective Problems;
- 2. Linear Growth Model: a model in which we estimated the intercept factor, as well as the slope factor (i.e., the rate of change, from 13 to 16 years old), in which we assumed that there was a linear growth in Anxiety and Affective problems, that could be increasing or decreasing, but we specified a priori for each time point the parameters of the developmental trend (constant change overtime);
- 3. Non-linear Growth Model: a model in which we estimated the intercept and the slope factor for Anxiety and Affective Problems, but differently from the second model, we did not assume a priori any specified trajectory (in other words, we freely estimated one parameter of the developmental trend, and as a result those trends could be quadratic, cubic, or piecewise);

We used a nested model comparison test (the Chi-square difference test - $\Delta\chi^2$) to compare these three models, in order to identify the optimal growth function that best fits the data. After this preliminary comparison, we examined the trajectories overtime for Anxiety and Affective Problems, separately for boys and girls, using a multi-group LGC approach. We estimated a full-constrained model (a model in which we forced all the parameters to be equal across gender), and a full-unconstrained model (a model in which we freely estimated all the parameters across gender). If the chi-square difference was significant (suggesting that some parameters could differ across gender), starting from the linear full-constrained model, we released one parameter at time, comparing those partially constrained models with the full-unconstrained model each time, until the chi-square difference was no longer significant (suggesting that if we freely estimate that parameters, the chi square did not significantly increase), adopting a cutoff of $p < .01$ (Kline, 1998).

e) Second step – Conditional models for Latent Growth Curve Analysis: in this second step we estimated a set of multi-group models across gender, in which we considered adolescents' country of origin as a time-invariant covariate, and the temperamental profiles' membership emerged in Study 2 as predictors, in order to analyze the effects of culture and temperamental profiles on the initial level and the rate of change for Anxiety and Affective Problems. We followed the same procedure reported for the unconditional multigroup LGC models, estimating a full-constrained and a full-unconstrained, comparing those two models as well as the partially constrained using the nested model comparison;

For the whole procedure, we used a maximum-likelihood estimation of the parameters, with the following indices to evaluate the goodness of fit: χ^2 Likelihood Ratio Statistic, the Comparative-Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation

(RMSEA) with the 90% confidence interval, and the Standardized Root Mean Square Residual (SRMR) values lower than .08 (Kelloway, 1998). We accepted models with RMSEA < .07 and CFI and TLI > .90 (Kline, 2016).

RESULTS

Preliminary Analysis

Observed means and standard deviations, as well as the zero-order correlations for all the study variables are reported in Table 3.

Table 3

Correlations, Descriptive Statistic and Reliability of the Study 3 Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Ang_M W1 (1)	-										
Sad_M W1 (2)	.666***	-									
Att_M W1 (3)	-.332***	-.266***	-								
Act_M W1 (4)	-.234***	-.172***	.672***	-							
IC_M W1 (5)	-.539***	-.404***	.388***	.312***	-						
Anx_C W1 (6)	.426***	.536***	-.194***	-.088	-.238***	-					
Anx_C W2 (7)	.282***	.433***	-.079	-.046	-.196***	.711***	-				
Anx_C W3 (8)	.256***	.369***	-.023	.038	-.112*	.579***	.641***	-			
Aff_C W1 (9)	.371***	.472***	-.267***	-.218***	-.227***	.605***	.462***	.418***	-		
Aff_C W2 (10)	.287***	.426***	-.188***	-.153**	-.186***	.493***	.631***	.536***	.608***	-	
Aff_C W3 (11)	.262***	.369***	-.104*	-.042	-.067	.415***	.469***	.727***	.515***	.617***	-
Mean	2.619	2.017	3.649	3.437	3.632	1.231	1.222	1.307	.599	.578	.672
SD	.914	.787	.766	1.073	.973	.853	.864	.971	.519	.535	.639
Cronbach's Alpha	.876	.801	.713	.803	.565	.721	.715	.797	.728	.757	.821

Notes: Ang_M = Anger/Frustration Mother; Sad_M = Sadness/Depressive Mood Mother; Att_M = Attention; Act_M = Activation Control Mother; IC_M = Inhibitory Control Mother; Anx_C = Anxiety Problems Child; Aff_C = Affective Problems Child; T1 = Wave 1; T2 = Wave 2; T3; Wave 3; SD = Standard Deviation.

† $p \leq .060$ * $p < .050$, ** $p < .010$, *** $p < .001$.

As shown in Table 3, all the temperamental dimensions were significantly associated each other. For an extended discussion of those associations, see the "Preliminarily Analysis" section, in Chapter 3. As regards Anxiety Problems and Affective Problems, they are positively associated each other, both cross-sectionally and longitudinally. Specifically, Anxiety Problems W1 was significantly associated with Anxiety Problems T2 and Anxiety Problems W3, and Anxiety Problems W2 was significantly associated with Anxiety Problems W3; Affective Problems W1 was significantly associated with Affective Problems W2 and Affective Problems W3, and Affective Problems W3 was significantly associated with Affective problems W3. Those correlations

highlighted the stability overtime of those problems. For what concerns the longitudinal associations between Anxiety and Affective Problems, Anxiety Problems W1 was positively associated with Affective Problems W1, W2, and W3, as well as Anxiety Problems W2 was positively associated with Affective Problems W1, W2, and W3, and Anxiety Problems W3 with Affective Problems W1, W2, and W3.

As regards the associations between the temperamental dimensions and Anxiety and Affective Problems, Anger – Frustration and Sadness – Depressive Mood were positively associated with Anxiety and Affective Problems W1, Anxiety and Affective Problems W2, and Anxiety and Affective Problems W3. At least, for what concerns associations among the three components of Effortful Control with Anxiety and Affective Problems, Inhibitory Control was negatively associated with Anxiety Problems W1, W2, and W3, and also negatively associated with Affective Problems W1 , and W2; Attention was negatively associated only with Anxiety Problems W1, and with Affective Problems W1, W2, and W3; Activation Control was negatively associated only with the first two Waves of Affective Problems.

Unconditional models of Latent Growth Curve Analysis

Unconditional Latent Growth Curve Analysis (LGC; Curran, 2000; Duncan & Duncan, 2009; Wickrama et al., 2016) was applied in order to identify adolescents' trajectories of Anxiety Problems and Affective problems separately, from 12 to 16 years old, following the procedure reported in the section "Analytic Approach" (results are shown in Table 4 for Anxiety Problems and Table 5 for Affective Problems).

Table 4

Model fit statistics for the Latent Growth Curve unconditional models for Anxiety Problems.

	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	*MC*	χ^2 *diff*	Δ*df*	Δχ^2
Anxiety Unconditional											
1. No Growth	92.79	6	.000	.777	.889	.100	.180 (.149 - .214)				
2. Linear Growth	**13.68**	**3**	**.003**	**.973**	**.973**	**.043**	**.089 (.045 - .140)**	**1 vs 2**	**79.11**	**3**	**< .001**
3. No linear Growth	5.16	2	n.s.	.992	.988	.032	.060 (.000 - .125)	2 vs 3	8.52	1	.003

	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	*MC*	χ^2 *diff*	Δ*df*	Δχ^2
Multigroup Anxiety Unconditional											
4. Linear Constrained	106.94	12	.000	.731	.865	.190	.190 (.158 - .224)				
5. Linear Unconstrained	18.51	7	n.s.	.967	.972	.053	.087 (.039 - .136)	4 vs 5	88.43	5	< .001
6. Partially Constrained	**28.57**	**10**	**.001**	**.947**	**.968**	**.120**	**.092 (.053 - .133)**	**5 vs 6**	**10.06**	**3**	**n.s.**

Note: χ^2 = Chi-square Goodness of Fit; *df* = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residuals; RMSEA = Root Mean Square Error of Approximation; *MC* = Model Comparison; χ^2 *diff* = Chi-square difference test; Δ*df* = Δ degrees of freedom; Δχ^2 = Chi-square *p* value.

Table 5

Model fit statistics for the Latent Growth Curve unconditional models for Affective Problems.

	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	*MC*	χ^2 *diff*	Δ*df*	Δχ^2
Affective Unconditional											
1. No Growth	74.22	6	.000	.764	.882	.122	.160 (.128 - .193)				
2. Linear Growth	**7.37**	**3**	**n.s.**	**.985**	**.985**	**.030**	**.057 (.000 - .111)**	**1 vs 2**	**66.85**	**3**	**< .001**
3. No linear Growth	6.49	2	n.s.	.984	.977	.031	.071 (.014 - .135)	2 vs 3	0.874	1	n.s.

	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	*MC*	χ^2 *diff*	Δ*df*	Δχ^2
Multigroup Affective Unconditional											
4. Linear Constrained	111.75	12	.000	.585	.792	.254	.195 (.163 - .229)				
5. Linear Unconstrained	14.99	7	n.s.	.967	.971	.047	.072 (.018 - .123)	4 vs 5	96.75	5	< .001
6. Partially Constrained	**15.37**	**8**	**n.s.**	**.969**	**.977**	**.048**	**.065 (.000 - .113)**	**5 vs 6**	**0.37**	**1**	**n.s.**

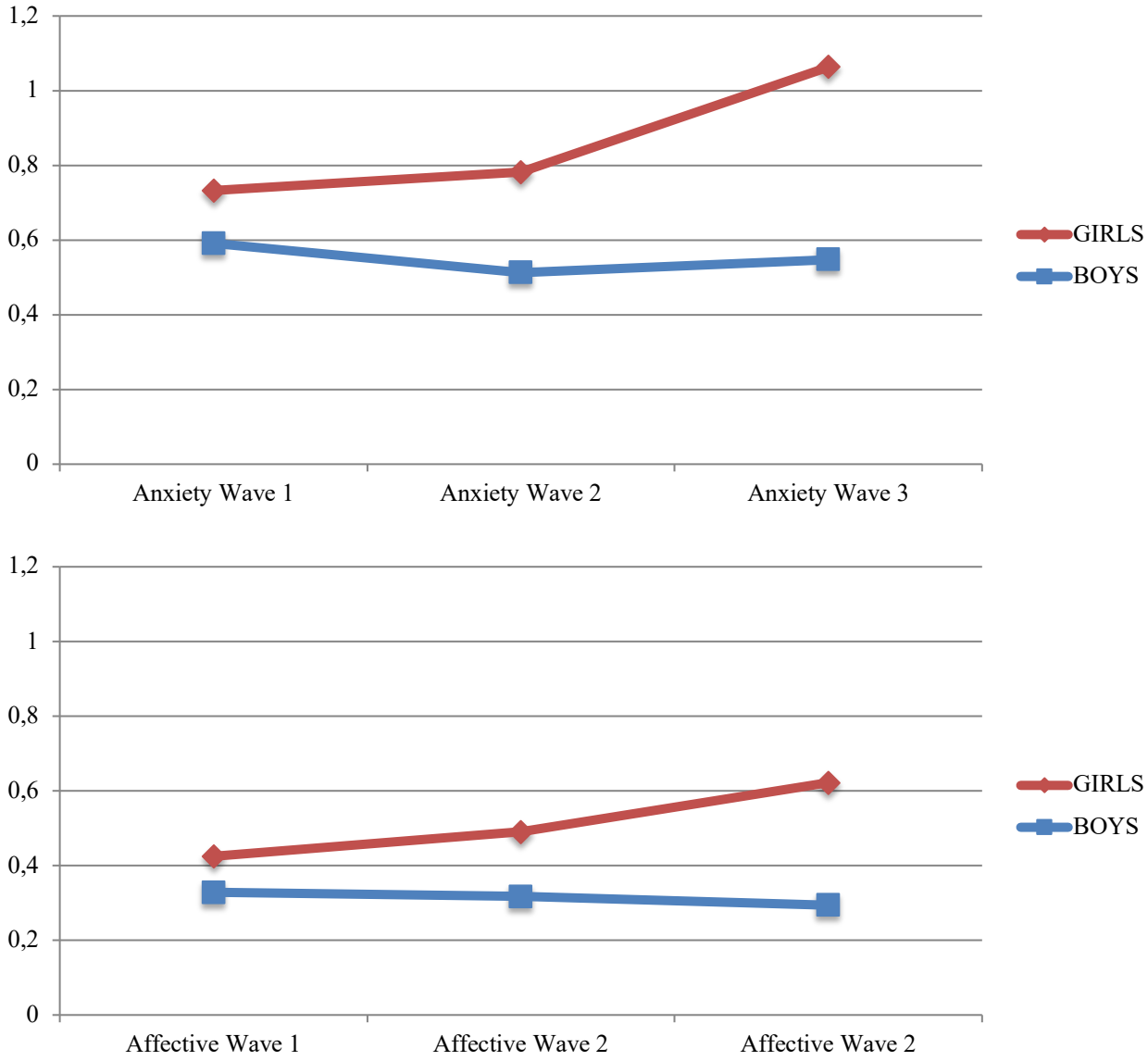
Note: χ^2 = Chi-square Goodness of Fit; *df* = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residuals; RMSEA = Root Mean Square Error of Approximation; *MC* = Model Comparison; χ^2 *diff* = Chi-square difference test; Δ*df* = Δ degrees of freedom; Δχ^2 = Chi-square *p* value.

Anxiety Problems. As possible to see in Table 4, we estimated the "No Growth" (Model 1), the "Linear" (Model 2) and the "No Linear Growth" (Model 3) unconditional models. The Chi-square difference test revealed that the optimal growth function that best fits our data was the Model 2 [χ^2 (3) 13.68, p = .003, RMSEA = .089 (.045 - .140), CFI = .973, TLI = .973, SRMR = .043]: the significant mean of the intercept (M = .635, p = .000) indicated that adolescents' showed a positive average starting point different than zero at age 12, and the significant variance of the intercept (I = .186, p = .000) showed that there was inter-individual variability around this mean. The mean of the slope was significant and positive (M = .051, p = .000), suggesting that Anxiety increased overtime; the significant variance of the slope (S = .018, p = .000) indicated that there was inter-individual variability also in growth overtime. Finally, the correlation between the intercept and the slope factors was not significant (r = -.010, p = .081), suggesting that change overtime in Anxiety was not significantly related to age 12 levels of Anxiety.

Regarding the multiple-group analysis across gender, the Chi-square difference test between the constrained (Model 4) and the unconstrained (Model 5) one was significant, suggesting that some parameters were not equal across gender. Following the modification indices, we released the means of the Intercept and the Slope: this partially constrained model (Model 6) fits our data [χ^2 (10) 28.57, p = .001, RMSEA = .092 (.053 - .133), CFI = .947, TLI = .968, SRMR = .120], and the comparison with the Model 5 was not significant (suggesting that if we if we freely estimated these two parameters, the chi square did not significantly increase). The significant mean of the intercept for both boys and girls (M_b = .565 and M_g = .708, p < .001) indicated that adolescents', especially if they were girls, showed a positive average starting point different than zero at age 12, and the significant variance of the intercept (I_b = .183 and I_g = .183, p < .001) showed that there was inter-individual variability around this mean in boys and girls. The mean of the slope was significant and positive only for girls (M_b = -.011, p = n.s., and M_g = .114, p < .001), suggesting that Anxiety increased overtime in girls but not in boys; the significant variance of the slope (S_b = .015 and S_g = .015, p < .001) indicated that there was inter-individual variability also in growth overtime for boys and girls. Finally, the correlation between the intercept and the slope factors was significant and negative for both boys and girls (r_b = -.015 and r_g = -.015, p < .001), suggesting that change overtime in Anxiety was significantly related to age 12 levels of Anxiety. In Figure 1 are reported the developmental trajectories for Anxiety Problems, separately for boys and girls.

Figure 1

Graphical representation of Anxiety Problems' and Affective Problems' developmental trajectories, separately for boys and girls



Note: W1 = Wave 1; W2 = Wave 2; W3 = Wave 3.

Affective Problems. As possible to see in Table 5, we estimated the "No Growth" (Model 1), the "Linear" (Model 2) and the "No Linear Growth" (Model 3) unconditional models. The Chi-square difference test revealed that the optimal growth function that best fits our data was the Model 2 [χ^2 (3) 7.37, p = n.s., RMSEA = .057 (.000 - .111), CFI = .985, TLI = .985, SRMR = .030]: the significant mean of the intercept (M = .374, p < .001) indicated that adolescents' showed a positive average starting point different than zero at age 12, and the significant variance of the intercept (I = .068, p < .001) showed that there was inter-individual variability around this mean. The mean of the slope was significant and positive (M = .027, p < .001), suggesting that Affective Problems slightly increased overtime; the significant variance of the slope (S = .009, p < .001) indicated that there was

a slight inter-individual variability also in growth overtime. Finally, the correlation between the intercept and the slope factors was not significant (r = -.001, p = .781), suggesting that changes overtime in Affective levels were not significantly related to age 12 levels of Affective Problems.

Regarding the multiple-group analysis across gender, the Chi-square difference test between the constrained (Model 4) and the unconstrained (Model 5) one was significant, suggesting that some parameters were not equal across gender. Following the modification indices, we released the means of the Intercept and the Slope, as well as the variances of the Intercept and the Slope: this partially constrained model (Model 6) fits our data [χ^2 (8) 15.37, p = n.s., RMSEA = .065 (.000 - .113), CFI = .969, TLI = .977, SRMR = .048], and the comparison with the Model 5 was not significant (suggesting that if we if we freely estimated the four parameters, the chi square did not significantly increase). The significant mean of the intercept for both boys and girls (M_b = .329 and M_g = .425, p < .001) indicated that adolescents showed a positive average starting point different than zero at age 12, and the significant variance of the intercept (I_b = .045 and I_g = .086, p < .001) showed that there was inter-individual variability around this mean in boys and girls. The mean of the slope was significant and positive only for girls (M_b = -.012, p > .05, and M_g = .066, p < .001), suggesting that Affective Problems slightly increased overtime in girls but not in boys; the significant variance of the slope only for girls (S_b = .002, p > .05 and S_g = .012, p < .001) indicated that there was inter-individual variability also in growth overtime for girls but not for boys. Finally, the correlation between the intercept and the slope factors was not significant for both boys and girls (r_b = -.002 and r_g = -.002, p > .05), suggesting that change overtime in Affective Problems was not significantly related to age 12 levels of Affective Problems. In Figure 1 are reported the developmental trajectories for Affective Problems, separately for boys and girls.

Conditional models of Latent Growth Curve Analysis

Conditional Latent Growth Curve Analysis (LGC; Curran, 2000; Duncan & Duncan, 2009; Wickrama et al., 2016) was applied order to analyze the effects of culture and temperamental profiles emerged in Study 2 on the initial level (12 years old) and the rate of change (from 12 to 16 years old) of adolescents' Anxiety and Affective Problems trajectories. A set of multi-group models across gender was estimated, in which we considered adolescents' country of origin as a time-invariant covariate, and the temperamental profiles' membership as predictors. Due to the nature of our covariate and predictors, for what concerns the country of origin, we considered two dummy variables (one for Colombia and one for Italy), compared with the reference country (the United States).

Table 6

Model fit statistics for the Latent Growth Curve conditional models for Anxiety Problems.

	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	*MC*	χ^2 *diff*	Δ*df*	$\Delta\chi^2$
Multigroup Anxiety Conditional											
7. Linear Constrained	188.40	46	.000	.676	.747	.129	.109 (.093 - .126)				
8. Linear Unconstrained	54.76	21	.000	.923	.868	.047	.079 (.053 - .104)	7 vs 8	133.64	25	< .001
9. Partially Constrained	**92.28**	**42**	**.000**	**.886**	**.902**	**.102**	**.068 (.049 - .087)**	**8 vs 9**	**37.51**	**21**	**n.s.**

Table 7

Model fit statistics for the Latent Growth Curve conditional models for Affective Problems.

	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	*MC*	χ^2 *diff*	Δ*df*	$\Delta\chi^2$
Multigroup Affective Conditional											
10. Linear Constrained	165.11	45	.000	.581	.665	.137	.101 (.085 - .118)				
11. Linear Unconstrained	36.46	21	.019	.946	.908	.050	.053 (.021 - .081)	10vs11	128.65	24	< .001
12. Partially Constrained	**61.74**	**40**	**.015**	**.924**	**.932**	**.088**	**.046 (.020 - .067)**	**11vs12**	**25.28**	**19**	**n.s.**

Note: χ^2 = Chi-square Goodness of Fit; *df* = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residuals; RMSEA = Root Mean Square Error of Approximation; *MC* = Model Comparison; χ^2 *diff* = Chi-square difference test; Δ*df* = Δ degrees of freedom; $\Delta\chi^2$ = Chi-square *p* value.

For what concerns the predictors, we considered three continuous variables that represent conditional probabilities for each individual of being in each of the three profiles. We excluded from our model the Average profile, following the same reasoning exposed in the "Results" section in Chapter 2 (results are shown in Table 6 for Anxiety Problems and Table 7 for Affective Problems). Preliminarily, we ran a set of models in which we freely estimated effects for each of the country covariate on the Intercept and Slope, in order to analyze the specific associations of each culture on the initial level and the rate of change. However, after we realized that if we constrained those paths to be equal each other, the chi-square did not significantly increase, in our final set of models we fixed those paths to be equal, in order to have more parsimonious models.

Anxiety Problems

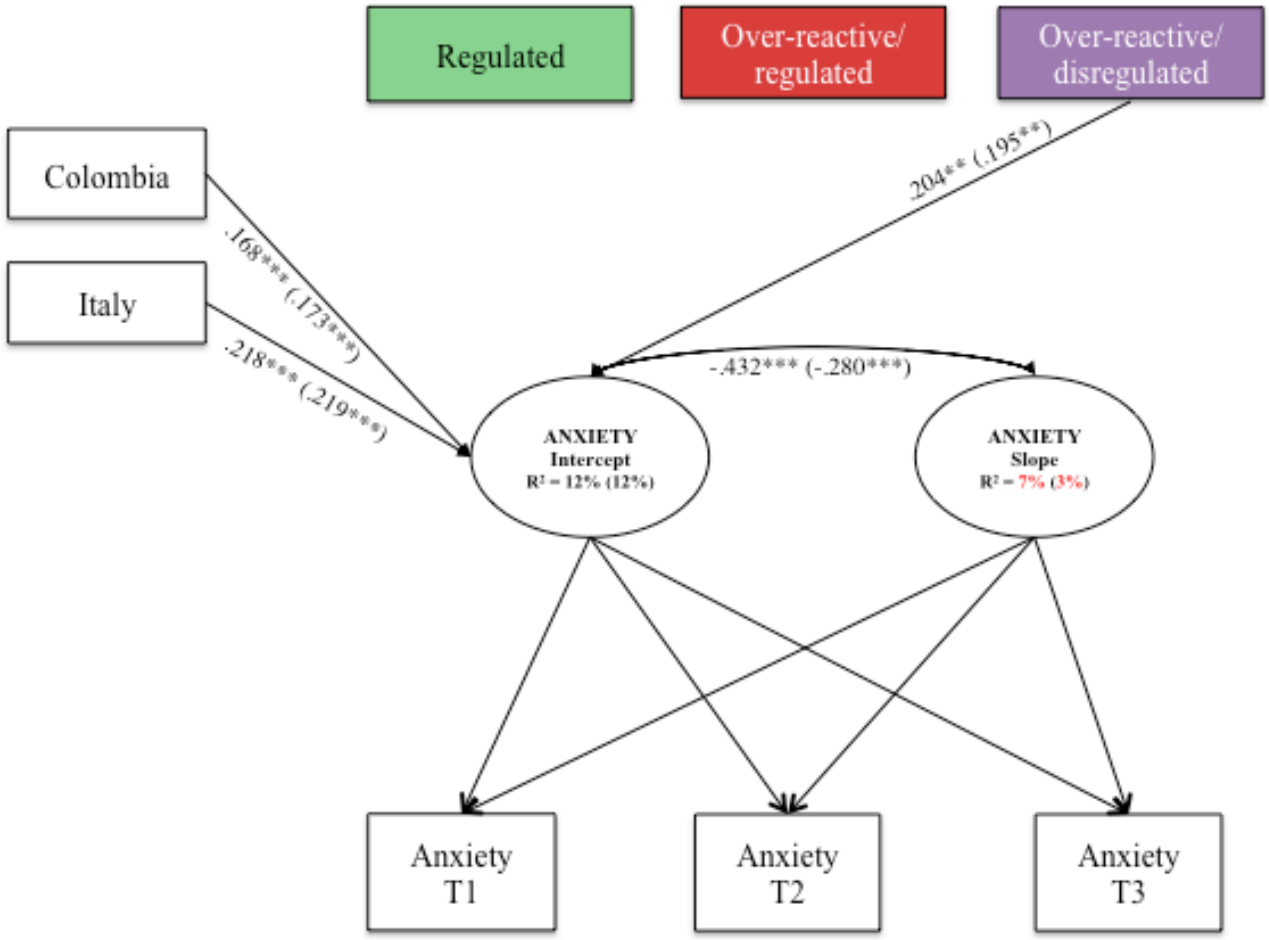
As shown in Table 6, the Chi-square difference test between the constrained (Model 7) and the unconstrained (Model 8) one was significant, suggesting that equality of all parameters did not hold across gender. Following the modification indices, we released the means of the Intercept and the Slope, as well as the variances of the Slope, and the correlation between the probability of being Regulated with the probability of being Over-reactive/regulated: this partially constrained model (Model 9) fits our data [χ^2 (42) 92.28, $p < .001$, RMSEA = .068 (.049 - .087), CFI = .886, TLI = .902, SRMR = .102], and the comparison with the Model 8 was not significant (suggesting that if we if we freely estimated these four parameters, the chi square did not significantly increase). Figure 2 shows the significant paths (standardized coefficients) of the final model.

The correlation between the Intercept and the Slope was significant and negative for both boys and girls (r_b = -.432 and r_g = -.280, $p < .001$), suggesting that change overtime in Anxiety Problems were significantly related to age 12 levels of Anxiety Problems in boys and girls: adolescents showing higher levels of Anxiety Problems at age 12 showed greater decrease of Anxiety overtime than adolescents showing less Anxiety Problems at age 12. For what concerns the predictors, for both boys and girls only the Over-reactive/disregulated profile was significantly and positively related to the Anxiety Problems' Intercept at age 12, indicating that, independently from the gender, if adolescents showed higher probabilities of being in this profile, they showed higher initial levels of Anxiety Problems (respectively, β_b = .204 and β_g = .195, $p < .01$). As regards the covariates, both countries were significantly and positively associated with the Anxiety Problems' Intercept at age 12, indicating that, comparing with the American youths, both Colombian and Italian boys and girls showed higher initial levels of Anxiety Problems (respectively, β_b = .168 and β_g = .173, $p < .001$ for Colombia; β_b = .218 and β_g = .219, $p < .001$ for Italy). Overall, the model explains a significant percentage of variance for the Intercept factor (respectively, boys: 12%, and girls: 12%) and for the observed variables (respectively, Anxiety Problems W1: 64%, 64%; Anxiety Problems W2: 61%,

63%; Anxiety Problems W3: 62%, 73%), whereas the percentage of variance explained for the Slope factor was not significant (respectively, boys: 7%, and girls: 3%).

Figure 2

Conditional Latent Growth Curve Model involving covariates and predictors for Anxiety Problems.



Note: $^{+}$ $p \leq .06$ * $p < .05$, ** $p < .01$, *** $p < .001$.

Coefficients are standardized; non-significant paths are not shown. The first values refer to boys, the second values refer to girls. Correlations among covariates and predictors were estimated but not depicted. For the R^2 values, black numbers represent significant values, while red numbers represent non-significant values.

Affective Problems

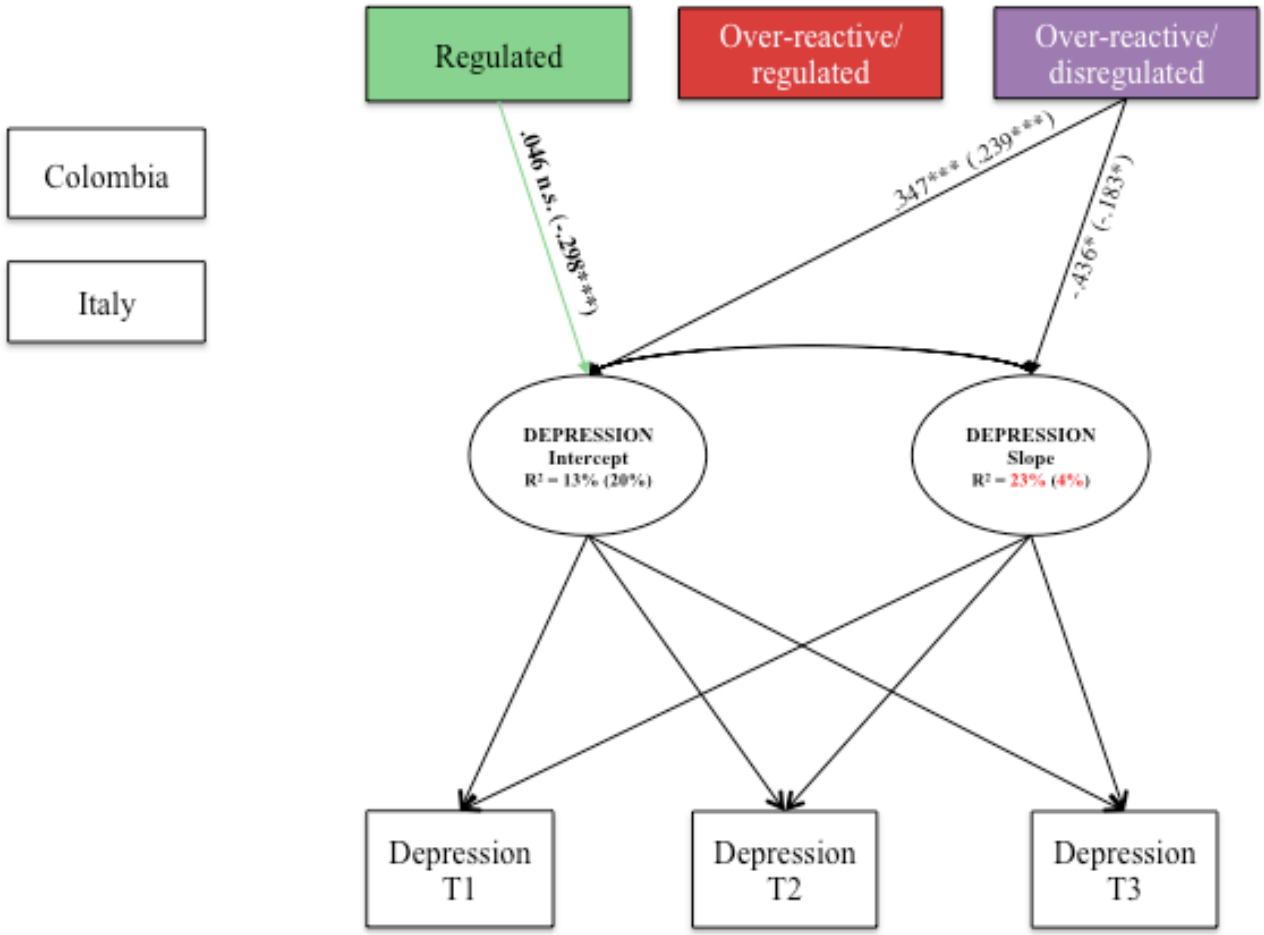
As shown in Table 7, the Chi-square difference test between the constrained (Model 10) and the unconstrained (Model 11) one was significant: we released the means of the Intercept and the Slope, as well as the variances of the Intercept and the Slope, and the path between the probability of being Regulated and the Intercept: this partially constrained model (Model 12) fits our data [χ^2

(40) 61.74, $p < .05$, RMSEA = .046 (.020 - .067), CFI = .924, TLI = .932, SRMR = .088], and the comparison with the Model 11 was not significant. Figure 3 shows the significant paths (standardized coefficients) of the final model.

The correlation between the Intercept and the Slope was not significant for both boys and girls, suggesting that change overtime in Affective Problems were not significantly related to age 12 levels of Affective Problems. For what concerns the predictors, for both boys and girls the Over-reactive/disregulated profile was significantly and positively related to the Affective Problems' Intercept at age 12, indicating that, if boys or girls showed higher probabilities of being in this profile, they showed higher initial levels of Affective Problems (respectively, $\beta_b = .347$ and $\beta_g = .239$, $p < .01$). The Over-reactive/disregulated profile was significantly and negatively related also to the Affective Problems' Slope in boys and girls, indicating that adolescents showing higher probabilities of being in this profile, they showed lower increase overtime of Affective Problems (respectively, $\beta_b = -.436$ and $\beta_g = -.183$, $p < .05$). At least, the Regulated profile was significantly and negatively related to the Affective Problems' Intercept only in girls, indicating that, if youths were girls and showing higher probabilities of being Regulated, they showed lower initial levels of Affective Problems (respectively, $\beta_b = .046$, p = n.s., and $\beta_g = -.298$, $p < .01$). As regards the covariates, both countries were not significantly associated with the Intercept at age 12, or with the rate of change of Affective Problems. Overall, the model explains a significant percentage of variance for the Intercept factor (respectively, boys: 13%, and girls: 20%) and for the observed variables (respectively, Affective Problems W1: 42%, 58%; Affective Problems W2: 41%, 60%; Affective Problems W3: 45%; 74%), whereas the percentage of variance explained for the Slope factor was not significant (respectively, boys: 23%, and girls: 4%).

Figure 3

Conditional Latent Growth Curve Model involving covariates and predictors for Affective Problems.



Note: $^{+}$ $p \leq .06$ * $p < .05$, ** $p < .01$, *** $p < .001$.

Coefficients are standardized; non-significant paths are not shown. The first values refer to boys, the second values refer to girls. Correlations among covariates and predictors were estimated but not depicted. For the R^2 values, black numbers represent significant values, while red numbers represent non-significant values.

DISCUSSION

This contribution can be considered a progress in the field of the study focused on the continuity/discontinuity between temperamental characteristics, such as Negative Emotionality and Self-Regulation, and cross-cultural developmental pathways of emotional problems during adolescence. The aims of the study were to identify the normative developmental trends of adolescent boys and girls for Anxiety and Affective Problems, and to analyze how patterns of individual differences based on narrow sub-domains of Negative Emotionality and Effortful Control may influence those developmental trends, in a cross-cultural sample, controlling for adolescents' culture. This contribution corroborated previous findings (e.g., Angold et al., 1998; Dekker et al., 2007; Garrison et al., 1990; Ge et al., 2001; Hale et al., 2008; Hankin et al., 1998; van Oort et al., 2009) by obtaining increasing trends for Anxiety and Affective Problems in girls, and low-stable trends in boys. In addition, this contribution confirmed the presence of specific associations between specific temperamental profiles and adolescents' normative trends of Anxiety and Affective Problems overtime, controlling for adolescents' cultures. In this sense, findings are new and, some of them also unexpected. Lastly, the study emphasized the importance to examine continuity and discontinuity of adolescents' developmental pathways, especially for what concerns the development of emotional problems.

The normative development of Anxiety and Affective Problems across adolescence

For what concerns the normative developmental trends of Anxiety and Affective Problems in boys and girls, according with previous studies (e.g., Angold et al., 1998; Dekker et al., 2007; Garrison et al., 1990; Ge et al., 2001; Hale et al., 2008; Hankin et al., 1998; van Oort et al., 2009), we confirmed the presence of two different trends in boys and girls: from early to middle adolescence. In particular, girls at age 12 showed higher Anxiety and Depressive problems than boys, and their symptoms tended to further increase over the course of adolescence, especially for what concerns the Anxiety problems. Indeed, boys maintained substantially stable levels of Anxiety and Depressive Problems overtime. Finally, we found that, in boys and girls Anxiety Problems increased especially for those adolescents who reported fewer symptoms at age 12, whereas change in Depressive symptoms was not related to their initial levels.

Overall, our findings supported the importance to analyze the developmental trajectories of Anxiety and Affective Problems, and to investigate those pathways of normative emotional problems during the transition from early to middle adolescence separately for boys and girls. In fact, previous research underlined that in western countries, developmental trends of emotional problems showed different trajectories overtime for boys and girls, and attested the increasing risk during

adolescence, especially for girls, to incur in emotional problems, such as Anxiety or Affective Problems (e.g., Zahn-Waxler, Shirtcliff & Marceau, 2008; Chavira et al., 2004; Cummings et al., 2014; Lewinson et al., 1993; Nolen-Hoeksema & Girgus, 1994). Whereas, there are no gender differences during childhood, adolescence is the crucial developmental period in which those differences emerge, and tend to crystalize from later adolescence to young adulthood (e.g., Zahn-Waxler et al., 2000). According with previous research (e.g., Angold et al., 1998; Garrison et al., 1990; Ge et al., 2001; Hale et al., 2008; Hankin et al., 1998; van Oort et al., 2009), in our study girls showed higher levels of Anxiety and Affective problems than boys in early adolescence, and increasing trajectories of those internalizing problems from early to middle adolescence. In contrast, boys tend to remain stable low overtime. These results highlighted the greater vulnerability for girls to incur in anxiety and depressive problems during adolescence, that in turn may contribute to settle their specific vulnerability to internalizing problems throughout their life course (Hankin et al., 1998; Nolen-Hoeksema, Larson, & Grayson, 1999). In general girls showed higher emotional responsiveness, arousal, capacity to interpret emotions, and they are more prone to internalize emotional experiences, especially if negative, such as fear or worry (e.g., Nolen-Hoeksema, Larson, & Grayson, 1999; Chaplin, Gillham & Seligman, 2009; Zahn-Waxler et al., 2000). We reasoned that, those characteristics, together with the specific relational abilities of adolescent girls (i.e., on average, they tend to be shier, more empathic, more dependent, and more compliant), may contribute to increase their risk to experience more anxiety and depressive symptoms than boys.

Temperamental Profiles and the development of Anxiety and Affective Problems

As regards the associations between the temperamental profiles (identified in Study II) and the normative trends of Anxiety and Affective Problems during adolescence, we supported the presence of different relations between specific temperamental patterns and the development of Anxiety and Depressive Problems overtime, that were partially unexpected.

In particular, for what concerns trends of Anxiety Problems in boys and girls, we found that adolescents (boys and girls) with higher probabilities of being Over-reactive/disregulated reported higher levels of Anxiety at 12 years old; contrarily to our expectations, adolescents with higher probabilities of being Regulated or Over-reactive/regulated were not significantly associated with the Anxiety Problems' trends. In addition, being Regulated, Over-reactive/regulated, or Over-reactive/disregulated, was not associated with change overtime in Anxiety. Lastly, as regards adolescents' culture, we found that Colombian and Italian boys and girls, compared with their American counterpart, showed higher initial levels of Anxiety at the age of 12. In other words, being in a specific temperamental profile could not influence the normative trend of Anxiety during adolescence; in this case, there is discontinuity between temperamental characteristics and the developmental trends of Anxiety during adolescence.

As regards the associations between temperamental profiles and the trajectories of Affective Problems during adolescence, we found that adolescent girls with higher probabilities of being Regulated showed lower levels of Affective Problems at 12 years old; contrarily to our hypotheses, we did not find any significant association between higher probabilities of being Over-reactive/regulated and the trajectories of Depressive problems in boys and girls; for what concerns the Over-reactive/disregulated, we found that higher probabilities of being in this profile were associated with higher levels of Affective at age 12 both in boys and girls. Partially surprising, we found that adolescents that are more likely to be Over-reactive/disregulated showed lower rate of change of Affective Problems from 12 to 16. Lastly, as regards adolescents' culture, contrary to findings concerning Anxiety Problems and to our expectations, in this case we did not find significant associations with the normative trends of Affective and the culture of origin, suggesting that the trends overtime of Affective Problems were not affected by adolescents' culture. In other words, whereas being Regulated could be a protective factor for girls, adolescents (boys and girls) that showed higher probabilities of being in the most compromised profile, were characterized by high levels of Affective Problems in early adolescence, but overtime they tend to move away from the normative trends of Depression (i.e., girls tend to show less increase, and boys tend to show a less stable trend).

Overall, the present contribution supported the importance to consider the combined effects of Emotionality and Self-Regulation in predicting developmental pathways during adolescence, emphasizing the crucial role that different patterns of Negative Emotionality and Effortful Control can have in the modulation of youths' emotional experience (Oldehinkel et al., 2007; Muris, 2006; Muris et al., 2007). In addition, the present contribution supported the importance to consider Anxiety and Affective Problems separately, in order to analyze their specific developmental pathways, as well as, their different associations with patterns of Negative Emotionality and Effortful Control (Zahn-Waxler et al., 2000; Seligman & Ollendick, 1998). This study attested also the usefulness of adopting a person-centered approach in analyzing those relations, and provides support for the vulnerability model (e.g., Caspi & Shiner, 2006; Shiner & Caspi, 2003; Tackett, 2006), underlined the presence of specific relation between different patterns of temperamental characteristics and adolescents' trajectories of emotional problems, such as Anxiety and Affective Problems.

In particular, as regards the Regulated profile, our results showed that adolescent girls with higher probabilities of being in this profile showed lower Affective Problems at age 12, whereas we did not find significant associations with the Anxiety trends. As expected, being Regulated could be considered a protective factor for girls, especially for what concerns Affective Problems in early adolescence. Indeed, the Regulated profile is a well-adapted profile, characterized by the combination of low Negative Emotionality and high Effortful Control: adolescents with this profile

are capable to regulate their behaviors and their emotions, and they rarely experience negative emotions, such as anger or sadness. We reasoned that, the absence of associations among the Regulated profile, the initial levels of Anxiety Problems, and the developmental trends of Anxiety and Affective Problems, could be a result of several factors that operate concurrently. Overall, according with previous findings (e.g., Eisenberg & Morris, 2002; Rydell, Berlin, & Bohlin, 2003; Oldehinkel et al., 2004), their adequate self-regulative abilities (i.e., high levels of Effortful Control) together with their scarce negative feelings (i.e., low Negative Emotionality) tend to be related to successful developmental pathways, and probably these adolescents could be not involved in emotional or behavioral problems during their development. For what concerns Anxiety Problems, Regulated adolescents were not associated with the initial levels and the developmental trends of these symptoms probably because there are other crucial individual differences that could be mainly involved with this emotional problem, considered in this developmental period. In other words, aspects related to specific impairments in emotional regulation (as for the Over-reactive/dysregulated profile) could be strongly related to Anxiety problems during adolescence. In fact, Emotionality and Self-regulation, that are temperamental individual characteristics, could start to affect Anxiety in childhood (e.g., Eisenberg et al., 2009), and probably the effects of a pattern characterized by adequate self-regulation and low negative emotions on the development of Anxiety symptoms are more powerful earlier in life.

For what concerns the Over-reactive/regulated profile, contrarily to our expectations, our findings did not support any association between this profile and the normative developmental trends of Anxiety and Affective Problems in boys and girls. This profile is characterized by a specific impairment in the emotional area, because those adolescents tend to experience frequently negative emotions, but, on the other hand, they show adequate self-regulative skills. Previous studies attested the key role of self-regulative skills, that become extremely relevant during adolescence, when youths tend to experience frequently negative emotions (e.g., Eisenberg et al., 2000; Rothbart & Bates, 2006; Oldehinkel et al., 2007). In this view, the absence of associations between this temperamental profile and the increasing trend of anxiety and depression in girls could be read in light of the protective role that Self-regulative abilities may have in the development of emotional problems (e.g., Lengua, West, & Sandler, 1998; Wachs & Bates, 2001; Oldehinkel et al., 2007). These boys and girls possess adequate abilities to regulate their emotional experiences and reactions despite they frequently tend to experience negative emotions and feelings, so those abilities may affect their trends of emotional problems overtime, by reducing the negative cumulative effect of negative emotionality. In this sense, our findings supported previous research (e.g. Muris, Meesters, & Blijevens, 2007; Oldehinkel et al., 2004; 2007) that attested the crucial role of the interaction between Emotionality and Self-regulative abilities in predicting adjustment, especially during adolescence. We have also to recognize that, for girls, trends of Anxiety and Affective Problems

normatively increase from early to middle adolescence, whereas trends of Anxiety and Affective Problems for boys tend to remain quite stable overtime (e.g., Angold et al., 1998; Garrison et al., 1990; Ge et al., 2001; Hale et al., 2008; Hankin et al., 1998; van Oort et al., 2009). Therefore, it is reasonable to hypothesize that girls and boys who showed higher probabilities of being Over-reactive/regulated, may follow a developmental trajectory of Internalizing problems that overlap in some way with the identified trajectories. Further studies should clarify this point, in order to verify this hypothesis, and to well understand the specific mechanisms underlining the relations among Self-Regulation, Negative Emotionality and the development of Internalizing problems in adolescent characterized by this temperamental pattern.

As regards the Over-reactive/disregulated profile, that could be considered the most maladjusted profile in terms of its temperamental characteristics, adolescent boys and girls that showed higher probabilities of being in this profile showed higher levels of Anxiety and Affective Problems in early adolescence, but overtime they showed negative associations with the normative trends of Affective Problems. In other words, during the transition from early to middle adolescence, girls tend to increase less in Affective Problems, whereas boys tend to be less stable overtime. As previously mentioned, the Over-reactive/disregulated is the most maladaptive profile, with a pervasive impairment both in the emotional and in the self-regulation area: these adolescents have scarce capacities to regulate their behaviors and their emotions, and they tend to experience frequently negative emotions and feelings, such as anger, frustration, or sadness. Longitudinally, adolescents with this temperamental pattern showed associations only with the development of Depressive symptoms, whereas they are not associated with the normative trends of Anxiety. We reasoned that this result could be understood taking into account that adolescence is a crucial period, in which a lot of individual-environment transactions can occur (e.g., Caspi & Roberts, 1990; 2001). In this view, this pattern of associations can be read in light of a hypothesized mechanism of discontinuity in developmental pathways of emotional problems, related to the specific period that adolescents are facing with, during which youths may be more sensitive to change. In particular, if we consider that during adolescence girls tend to experience higher Anxiety and Affective Problems, and we consider the transition from early to middle adolescence an **expected** transition (Caspi & Roberts, 1990; 2001; Stewart, Sokol, Healy, & Chester, 1986), this transition could buffer change in their personality as well as in their developmental pathways, even if we consider unsuccessful pathways, according with the discontinuity mechanisms (Cicchetti, 1993; Cicchetti & Rogosh, 2002; Masten & Curtis, 2000). In other words, despite their scarce abilities to manage their emotional experiences and reactions, and their great tendency to experience negative emotions in early adolescence, youths with an Over-reactive/disregulated profile could take advantages from other individual characteristics in order to rearrange their pathways in a positive way. Further studies should investigate this point, focusing on other possible

individual characteristics or mechanisms that can influence or moderate the association between adolescents' temperamental patterns and the development of emotional problems overtime.

Finally, as regards the role of culture, our findings supported the role of adolescents' culture only for what concerns the development of Anxiety Problems. In particular, our results attested that adolescent boys and girls from Italy and Colombia showed higher levels of Anxiety in early adolescence than their American counterparts, whereas the developmental trends of Anxiety or Depression were not affected by the culture. This result is in line with previous research that attested the presence of higher levels of internalizing problems in Hispanic countries, and lower levels of emotional problems in the United States, despite some recent studies highlighted an increase in internalizing problems in US (e.g., Crijnen, Achenbach, & Verhulst, 1997; Tick, Van Der Ende, & Verhulst, 2007; Achenbach, Dumenci, & Rescorla, 2003). However, due to the great historical variability of emotional problems, recent studies underlined the importance to examine internalizing problems in the current cultural contexts, in order to analyze the present developmental trajectories (e.g., Achenbach, Dumenci, & Rescorla, 2003; Di Giunta et al., 2018). We reasoned that, for what concerns the developmental trends of Depressive symptoms, nowadays there could be other mechanisms and individual characteristics that can moderate adolescents' depressive trend, such as, for example, their social and family contexts, as well as their socio-economic status (e.g. Avenevoli et al., 2015; Gilman, Kawachi, Fitzmaurice, & Buka, 2002). Researchers emphasized the importance to consider the role of culture in individual development. In fact, previous studies attested that in general cultural norms and social values may have an impact in how adolescents face with their development, and they can influence the development of emotional and behavioral problems (e.g., Di Giunta et al., 2018; Lansford et al., 2018; Tick, Van Der Ende, & Verhulst, 2007). In addition, the expression of temperamental characteristics can vary across cultures (e.g., Chen, Yang, & Fu, 2012). Therefore, it is crucial to consider the role of adolescents' culture in the development of emotional problems overtime, as well as the effects that culture may have on the relation between adolescents' temperamental profiles and their developmental pathways. In this field, our study can be considered a first preliminary step, because, to our knowledge, there are no previous studies focusing on the relations between temperamental profiles and the development of internalizing problems in a cross-cultural sample of adolescents, despite our findings supported the role of culture only for what concerns Anxiety in early adolescence. Further studies should clarify how individuals' culture can influence their emotional experience, and how can affect the associations between patterns of individual differences and the development of emotional problems.

CONCLUSIONS

Overall, the present contribution corroborated previous findings by identifying different developmental trends of Anxiety and Affective problems in boys and girls, from early to middle adolescence. According with previous studies (e.g., Dekker et al., 2007; Hale et al., 2008; van Oort et al., 2009; Ge et al., 2001; Hankin et al., 1998; Angold et al., 1998; Garrison et al., 1990), overtime internalizing problems increased for girls, but not for boys. In addition, the study contributed to that body of research focused on the relations between temperamental profiles based on Negative Emotionality and Effortful Control and the development of Internalizing problems during adolescence, within a person-centered approach, providing empirical support for the vulnerability model (e.g., Caspi & Shiner, 2006; Shiner & Caspi, 2003; Tackett, 2006). To our knowledge, this is the first study addressed in particular those associations in the transition from early to middle adolescence, within this theoretical framework, controlling for adolescents' culture, considering separately the development of Anxiety and Affective Problems. Thus, the study underlines the protective role of self-regulation skills, especially during adolescence (e.g., Oldehinkel et al., 2005; 2007, Muris, 2006): if youths are compromised only in the temperamental domain of emotionality, their self-regulative capacities can protect them from the possibility to show higher trends of Anxiety and Affective Problems.

Despite its key strengths, the study has some limitations. First of all, we considered adolescents' culture only as a covariate, and we did not provide support for other hypotheses, although this aim was only explorative; further studies should analyze in deep the direct effects of individuals' culture on the relations between temperamental patterns and the development of emotional problems. Second, we considered only adolescents' self-report of their Anxiety and Affective Problems. Previous research underlined the usefulness of self-reports for assessing internalizing problems, especially during adolescence, because youths' autonomy increases and adolescents are less inclined to discuss emotional and behavioral problems with their parents (e.g., Sourander, Helstelä, & Helenius, 1999; Achenbach, McConaughy, & Howeli, 1987). However, it is important to consider information provided both by adolescents themselves and by their parents, in order to collect different aspects of the same emotional or behavioral issue in adolescence (e.g., Sourander, Helstelä, & Helenius, 1999; Achenbach, McConaughy, & Howeli, 1987; Seiffge-Krenke & Kollmar, 1998; Rey, Schrader, & Morris-Yates, 1992).

Despite those limitation, this contribution represents a novelty in the field of developmental and personality research, and a step forward to the study presented in Chapter III, emphasizing the importance of adopting a person-centered approach in order to examine relations between patterns of individual differences based on Negative Emotionality and Effortful Control in adolescence, and how these patterns can affect the development of some Internalizing problems across cultures, such as Anxiety or Affective Problems, during the transition from early to middle adolescence.

REFERENCES

Achenbach T. M., (1991) Integrative guide for the 1991 CBCL/4-18, YSR and TRF profiles. Burlington: Department of Psychiatry, University of Vermont

Achenbach, T. M., Dumenci, L., & Rescorla, L. A. (2003). Are American children's problems still getting worse? A 23-year comparison. *Journal of Abnormal Child Psychology*, *31*(1), 1-11. DOI: 10.1023/A:1021700430364

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: implications of cross-informant correlations for situational specificity. *Psychological bulletin*, *101*(2), 213. DOI: 10.1037/0033-2909.101.2.213

Achenbach, T.M., & Rescorla, L.A. (2001). Manual for the ASEBA School-Age Forms & Profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Achenbach, T. M., & Rescorla, L. (2007). *Multicultural understanding of child and adolescent psychopathology: Implications for mental health assessment*. Guilford Press.

Akil, H., Haskett, R. F., Young, E. A., Grunhaus, L., Kotun, J., Weinberg, V., Greden, J., & Watson, S. J. (1993). Multiple HPA profiles in endogenous depression: effect of age and sex on cortisol and beta-endorphin. *Biological Psychiatry*, *33*(2), 73-85. DOI: 10.1016/0006-3223(93)90305-W

Angold, A., Costello, E. J., & Worthman, C. M. (1998). Puberty and depression: The roles of age, pubertal status and pubertal timing. *Psychological Medicine, 28*, 51–61. DOI: 10.1017/S003329179700593X

Avenevoli, S., Swendsen, J., He, J. P., Burstein, M., & Merikangas, K. R. (2015). Major depression in the National Comorbidity Survey–Adolescent Supplement: prevalence, correlates, and treatment. *Journal of the American Academy of Child & Adolescent Psychiatry*, *54*(1), 37-44. DOI: 10.1016/j.jaac.2014.10.010

Bandelow, B., & Michaelis, S. (2015). Epidemiology of anxiety disorders in the 21st century. *Dialogues in clinical neuroscience*, *17*(3), 327.

Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour research and therapy*, *35*(1), 49-58. DOI: 10.1016/S0005-7967(96)00069-1

Birmaher, B., Ryan, N. D., Williamson, D. E., Brent, D. A., Kaufman, J., Dahl, R. E., Perel, J., & Nelson, B. (1996). Childhood and adolescent depression: a review of the past 10 years. Part I. *Journal of the American Academy of Child & Adolescent Psychiatry*, *35*(11), 1427-1439. DOI: 10.1097/00004583-199611000-00011

Biuckians, A., Miklowitz, D. J., & Kim, E. Y. (2006). Behavioral activation, inhibition and mood symptoms in early-onset bipolar disorder. *Journal of affective disorders*, *97*(1-3), 71-6. DOI: 10.1016/j.jad.2006.07.005

Blumberg, S., & Izard, C. E. (1985). Affective and cognitive characteristics of depression in 10- and 11-year-old children. *Journal of Personality and Social Psychology, 49*, 194–202. DOI: 10.1037//0022-3514.49.1.194

Caspi, A., & Roberts, B. W., (1990). Personality continuity and change across the life course. In *Handbook of personality: Theory and research*, *2*, 300-326.

Caspi, A., & Roberts, B. W. (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry*, *12*(2), 49-66. DOI: 10.1207/S15327965PLI1202_01

Caspi, A., & Shiner, R. L. (2006) Personality development. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of Child Psychology: Vol. 3. Social, emotional, and personality development* (6 ed). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0306

Castellani, V., Pastorelli, C., Eisenberg, N., Gerbino, M., Di Giunta, L., Ceravolo, R., & Milioni, M. (2014). Hostile, aggressive family conflict trajectories during the transition to adulthood: Associations with adolescent Big Five and emerging adulthood adjustment problems. *Journal of Adolescence*, *37*(5), 647-658. DOI: 10.1016/j.adolescence.2013.12.002

Chaplin, T. M., Gillham, J. E., & Seligman, M. E. (2009). Gender, anxiety, and depressive symptoms: A longitudinal study of early adolescents. *The Journal of early adolescence*, *29*(2), 307-327. DOI: 10.1177/0272431608320125

Chavira, D. A., Stein, M. B., Bailey, K., & Stein, M. T. (2004). Comorbidity of generalized social anxiety disorder and depression in a pediatric primary care sample. *Journal of affective disorders*, *80*(2-3), 163-171. DOI: 10.1016/S0165-0327(03)00103-4

Cicchetti, D. (1990). An historical perspective on the discipline of developmental psychopathology. In J. Rolf, A. Masten, D. Cicchetti, K. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 2–28). New York: Cambridge University Press. DOI: 10.1017/CBO9780511752872.003

Cicchetti, D. (1993). Developmental psychopathology: Reactions, reflections, projections. *Developmental review*, *13*(4), 471-502. DOI: 10.1006/drev.1993.1021

Cicchetti, D., & Cohen, D. (1995). Perspectives on developmental psychopathology. In D. Cicchetti & D. Cohen (Eds.), Developmental Psychopathology: Vol. 1. Theory and methods (pp. 3–20). New York: Wiley.

Cicchetti, D., & Rogosch, F. A. (2002). A developmental psychopathology perspective on adolescence. *Journal of consulting and clinical psychology*, *70*(1), 6. DOI: 10.1037/0022-006X.70.1.6

Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *Journal of abnormal psychology*, *100*(3), 316-336. DOI: 10.1037//0021-843X.100.3.316

Crijnen, A. A. M., Achenbach, T. M., & Verhulst, F. C. (1997) Comparisons of Problems Reported by Parents of Children in 12 Cultures: Total Problems, Externalizing, and Internalizing. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 1269-1277. DOI: 10.1097/00004583-199709000-00020

Cummings, C. M., Caporino, N. E., & Kendall, P. C. (2014). Comorbidity of anxiety and depression in children and adolescents: 20 years after. *Psychological bulletin*, *140*(3), 816-845. DOI: 10.1037/a0034733

Curran, P. J. (2000). A latent curve framework for the study of developmental trajectories in adolescent substance use. In J. S. Rose, L. Chassin, C. C. Presson, & S. J. Sherman (Eds.), *Multivariate applications*

in substance use research: New methods for new questions (pp. 1-42). Mahwah, NJ US: Lawrence Erlbaum Associates Publishers.

Dekker, M. C., Ferdinand, R. F., Van Lang, N. D., Bongers, I. L., Van Der Ende, J., & Verhulst, F. C. (2007). Developmental trajectories of depressive symptoms from early childhood to late adolescence: gender differences and adult outcome. *Journal of Child Psychology and Psychiatry*, *48*(7), 657-666. DOI: 10.1111/j.1469-7610.2007.01742.x

Di Giunta, L., Iselin, A. R., Lansford, J. E., Eisenberg, N., Lunetti, C., Thartori, E., Basili, E., Pastorelli, C., Bacchini, D., Uribe Tirado, L. M., & Gerbino, M. (2018). Parents' and early adolescents' self-efficacy about anger regulation and early adolescents' internalizing and externalizing problems: A longitudinal study in three countries. *Journal of adolescence*, *64*, 124-135. DOI: 10.1016/j.adolescence.2018.01.009

Duncan, T. E., & Duncan, S. C. (2009). The ABC's of LGM: an introductory guide to latent variable growth curve modeling. *Social and personality psychology compass*, *3*(6), 979-991. DOI: 10.1111/j.1751-9004.2009.00224.x

Eggum, N. D., Eisenberg, N., Spinrad, T. L., Valiente, C., Edwards, A., Kupfer, A. S., & Reiser, M. (2009). Predictors of withdrawal: Possible precursors of avoidant personality disorder. *Development and Psychopathology*, *21*(3), 815-838. DOI: 10.1017/S0954579409000443

Eisenberg, N., & Fabes, R. A. (1992). Emotion regulation and the development of social competence. In M. S. Clark (Ed.), *Review of personality and social psychology: Vol. 14. Emotion and social behavior* (pp. 119–150). Newbury Park, CA: Sage.

Eisenberg, N., & Fabes, R. A. (2006). Emotion Regulation and Children's Socioemotional Competence. In L. Balter & C. S. Tamis-LeMonda (Eds.), *Child psychology: A handbook of contemporary issues* (pp. 357-381). New York, NY, US: Psychology Press.

Eisenberg, N., Guthrie, I. K., Fabes, R. A., Shepard, S., Losoya, S., Murphy, B. C., et al. (2000). Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. *Child Development, 71,* 1367−1382. DOI: 10.1111/1467-8624.00233

Eisenberg, N., & Morris, A. S. (2002). Children's emotion-related regulation. In R. V. Kail (Ed.), *Advances in child development and behavior,* Vol. 30, pp. 189-229). San Diego, CA, US: Academic Press. DOI: 10.1016/S0065-2407(02)80042-8

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reider, M., et al. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development, 72*, 1112–1134. DOI: 10.1111/1467-8624.00337

Eisenberg, N., Valiente, C., Spinrad, T. L., Cumberland, A., Liew, J., Reiser, M., Zhou, Q., & Losoya, S. H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental psychology*, *45*(4), 988. DOI: 10.1037/a0016213

Essau, C. A., Lewinsohn, P. M., Seeley, J. R., & Sasagawa, S. (2010). Gender differences in the developmental course of depression. *Journal of affective disorders*, *127*(1-3), 185-190. DOI: 10.1016/j.jad.2010.05.016

Ferdinand, R.F., & Verhulst, F.C. (1995). Psychopathology from adolescence into young adulthood: An 8-year follow-up study. *American Journal of Psychiatry, 152*, 1586–1594. DOI: 10.1176/ajp.152.11.1586

Frigerio, A., Cattaneo, C., Cataldo, M. G., Schiatti, A., Molteni, M., & Battaglia, M. (2004). Behavioral and Emotional Problems Among Italian Children and Adolescents Ages 4 to 18 Years as Reported by Parents and Teachers. *European Journal of Psychological Assessment*, 20, 124-133. DOI: 10.1027/1015-5759.20.2.124

Garrison, C. Z., Jackson, K. L., Marsteller, F., McKeown, R., & Addy, C. (1990). A longitudinal study of depressive symptomatology in young adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *29*(4), 581-585. DOI: 10.1097/00004583-199007000-00011

Ge, X., Conger, R. D., & Elder, G. H., Jr. (2001). Pubertal transition, stressful life events, and the emergence of gender differences in adolescent depressive symptoms. *Developmental Psychology, 37*(3), 404-417. DOI: 10.1037/0012-1649.37.3.404

Gilman, S. E., Kawachi, I., Fitzmaurice, G. M., & Buka, S. L. (2002). Socioeconomic status in childhood and the lifetime risk of major depression. *International journal of epidemiology, 31(2*), 359-367. DOI: 10.1093/ije/31.2.359

Graber, J. A., & Sontag, L. M. (2009) Internalizing Problems During Adolescence. In Lerner R. M., & Steinberg L. (Eds.) *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development*, Hoboken: Wiley. DOI: 10.1002/9780470479193.adlpsy001020

Gray, J. A. (1982). *The neuropsychology of anxiety*. *An enquiry into the functions of the septo-hippocampal system.* New York: Oxford University Press. DOI: 10.1017/S0140525X00013066

Gray, J. A. (1991). Neural systems, emotion, and personality. In J. Madden IV (Ed.), *Neurobiology of learning, emotion, and affect*. New York: Oxford University Press.

Gruhn, M. A., Dunbar, J. P., Watson, K. H., Reising, M. M., McKee, L., Forehand, R., ... & Compas, B. E. (2016). Testing specificity among parents' depressive symptoms, parenting, and child internalizing and externalizing symptoms. *Journal of Family Psychology*, *30*(3), 309. DOI: 10.1037/fam0000183

Hale III, W. W., Raaijmakers, Q., Muris, P., & Meeus, W. (2008). Developmental trajectories of adolescent anxiety disorder symptoms: A 5-year prospective community study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(5), 556-564. DOI: 10.1097/CHI.0b013e3181676583

Han, J. J., Leichtman, M. D., & Wang, Q. (1998). Autobiographical memory in Korean, Chinese, and American children. *Developmental psychology*, *34*(4), 701. DOI: 10.1037/0012-1649.34.4.701

Hankin, B. L., Abramson, L. Y., Moffitt, T. E., Silva, P. A., McGee, R., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology, 107*, 128–140. DOI: 10.1037//0021-843X.107.1.128

Hankin, B. L., Snyder, H. R., & Gulley, L. D. (2016). *Cognitive Risks in Developmental Psychopathology. Developmental Psychopathology, 1–74.* DOI: 10.1002/9781119125556.devpsy308

Hops, H. (1995). Age-and gender-specific effects of parental depression: A commentary. *Developmental Psychology*, *31*(3), 428-431. DOI: 10.1037/0012-1649.31.3.428

Hoyle, R. H. (Ed.). (2010). *Handbook of personality and self-regulation*. John Wiley & Sons. DOI: 10.1002/9781444318111

Johnson, M. R., & Lydiard, R. B. (1995). The neurobiology of anxiety disorders. *Psychiatric Clinics of North America*, *18*(4), 681-725. DOI: 10.1016/S0193-953X(18)30019-4

Kagan, J., Reznick, J. S., & Snidman, N. (1987). The physiology and psychology of behavioral inhibition in children. *Child Development, 58*, 1459–1473. DOI: 10.2307/1130685

Kagan, J., Reznick, J. S., Snidman, N., Gibbons, J., & Johnson, M. O. (1988). Childhood derivatives of inhibition and lack of inhibition to the unfamiliar. *Child Development, 59*, 1580–1589. DOI: 10.2307/1130672

Karlsson, L., Pelkonen, M., Ruuttu, T., Kiviruusu, O., Heilä, H., Holi, M., Kettunen K., Tuisku, V., Tuulio-Henriksson, A., Törrönen, J., & Marttunen, M. (2006). Current comorbidity among consecutive adolescent psychiatric outpatients with DSM-IV mood disorders. *European child & adolescent psychiatry*, *15*(4), 220. DOI: 10.1007/s00787-006-0526-7

Kelloway, E. K. (1998). *Using LISREL for structural equation modeling: A researcher's guide*. Sage.

Kessler, R. C., Avenevoli, S., Costello, E. J., Georgiades, K., Green, J. G., Gruber, M. J., ... & Sampson, N. A. (2012). Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the National Comorbidity Survey Replication Adolescent Supplement. *Archives of general psychiatry*, *69*(4), 372-380. DOI: 10.1001/archgenpsychiatry.2011.160

Kleinman, A., & Cohen, A. (1997). Psychiatry's global challenge. *Scientific American*, *276*(3), 86-89. DOI: 10.1038/scientificamerican0397-86

Kline, R.B. (1998). *Principles and practices of structural equation modeling*. New York: Guilford Press.

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). New York: Guilford Press.

Kosidou, K., Magnusson, C., Mittendorfer-Rutz, E., Hallqvist, J., Hellner Gumpert, C., Idrizbegovic, S., Dal, H., & Dalman, C. (2010). Recent time trends in levels of self-reported anxiety, mental health service use and suicidal behaviour in Stockholm. *Acta Psychiatrica Scandinavica*, *122*(1), 47-55. DOI: 10.1111/j.1600-0447.2009.01487.x

Kuehner, C. (2003). Gender differences in unipolar depression: an update of epidemiological findings and possible explanations. *Acta Psychiatrica Scandinavica*, *108*(3), 163-174. DOI: 10.1034/j.1600-0447.2003.00204.x

Laible, D., Carlo, G., Panfile, T., Eye, J., & Parker, J. (2010). Negative emotionality and emotion regulation: A person-centered approach to predicting socioemotional adjustment in young adolescents. *Journal of Research in Personality*, *44*(5), 621-629. DOI: 10.1016/j.jrp.2010.08.003

Laible, D., Carlo, G., Murphy, T., Augustine, M., & Roesch, S. (2014). Predicting children's prosocial and co-operative behavior from their temperamental profiles: A person-centered approach. *Social Development*, *23*(4), 734-752. DOI: 10.1111/sode.12072

Lansford, J. E., Criss, M. M., Laird, R. D., Shaw, D. S., Pettit, G. S., Bates, J. E., & Dodge, K. A. (2011). Reciprocal relations between parents' physical discipline and children's externalizing behavior during

middle childhood and adolescence. *Development and Psychopathology, 23*, 225–238. DOI: 10.1017/S0954579410000751

Lansford, J. E., Sharma, C., Malone, P. S., Woodlief, D., Dodge, K. A., Oburu, P., Pastorelli, C., Skinner, A. T., Sorbring, E., Tapanya, S., Uribe Tirado, L. M., Zelli, A., Al-Hassan, S. M., Alampay L. P., Bacchini, D., Bombi, A. S., Bornstein, M. H., Chang, L., Deater-Deckard, K., & Di Giunta, L. (2014). Corporal punishment, maternal warmth, and child adjustment: A longitudinal study in eight countries. *Journal of Clinical Child & Adolescent Psychology*, *43*(4), 670-685. DOI: 10.1080/15374416.2014.893518

Lengua, L. J. (2003). Associations among emotionality, self-regulation, adjustment problems and positive adjustment in middle childhood. *Journal of Applied Developmental Psychology, 24*, 595–618. DOI: 10.1016/j.appdev.2003.08.002

Lengua, L. J., West, S. G., & Sandler, I. N. (1998). Temperament as a predictor of symptomatology in children: Addressing contamination of measures. *Child Development, 69*, 164–181. DOI: 10.1111/j.1467-8624.1998.tb06141.x

Lewinsohn, P. M., Clarke, G. N., Seeley, J. R., & Rohde, P. (1994). Major depression in community adolescents: age at onset, episode duration, and time to recurrence. *Journal of the American Academy of Child & Adolescent Psychiatry*, *33*(6), 809-818. DOI: 10.1097/00004583-199407000-00006

Lewinsohn, P. M., Holm-Denoma, J. M., Small, J. W., Seeley, J. R., & Joiner Jr, T. E. (2008). Separation anxiety disorder in childhood as a risk factor for future mental illness. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(5), 548-555. DOI: 10.1097/CHI.0b013e31816765e7

Lewinsohn, P. M., Rohde, P., & Seeley, J. R. (1995). Adolescent psychopathology: III. The clinical consequences of comorbidity. *Journal of the American Academy of Child & Adolescent Psychiatry*, *34*(4), 510-519. DOI: 10.1097/00004583-199504000-00018

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological review*, *98*(2), 224. DOI: 10.1037/0033-295X.98.2.224

Masten, A. S., & Curtis, W. J. (2000). Integrating competence and psychopathology: Pathways toward a comprehensive science of adaptation in development. *Development and psychopathology*, *12*(3), 529-550. DOI: 10.1017/S095457940000314X

McCarty, C. A., Weisz, J. R., Wanitromanee, K., Eastman, K. L., Suwanlert, S., Chaiyasit, W., & Band, E. B. (1999). Culture, coping, and context: Primary and secondary control among Thai and American youth. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, *40*(5), 809-818. DOI: 10.1111/1469-7610.00496

McCauley, E., Pavlidis, K., & Kendall, K. (2001). Developmental precursors of depression: The child and the social environment. *The depressed child and adolescent*, *2*, 46-78.

McLaughlin, K. A., Hilt, L. M., & Nolen-Hoeksema, S. (2007). Racial/ethnic differences in internalizing and externalizing symptoms in adolescents. *Journal of abnormal child psychology*, *35*(5), 801-816. DOI: 10.1007/s10802-007-9128-1

McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *Journal of psychiatric research*, *45*(8), 1027-1035. DOI: 10.1016/j.jpsychires.2011.03.006

Muris, P. (2006). Freud was right… about the origins of abnormal behavior. *Journal of Child and Family Studies*, *15*(1), 1. DOI: 10.1007/s10826-005-9006-9

Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament in early adolescence: Relations to internalizing and externalizing problem behavior and "Big Three" personality factors. *Journal of adolescence*, *30*(6), 1035-1049. DOI: 10.1016/j.adolescence.2007.03.003

Muthén, L. K., & Muthén, B. O. (1998 - 2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén&Muthén.

Nagata, T., Suzuki, F., & Teo, A. R. (2015). Generalized social anxiety disorder: A still-neglected anxiety disorder 3 decades since Liebowitz's review. *Psychiatry and clinical neurosciences*, *69*(12), 724-740. DOI: 10.1111/pcn.12327

Nolen-Hoeksema, S., & Hilt, L. M. (2013). The emergence of gender differences in depression in adolescence. In *Handbook of depression in adolescents* (pp. 127-152). Routledge.

Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological bulletin*, *115*(3), 424. DOI: 10.1037/0033-2909.115.3.424

Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of personality and social psychology*, *77*(5), 1061. DOI: 10.1037/0022-3514.77.5.1061

Oldehinkel, A. J., Hartman, C. A., De Winter, A. F., Veenstra, R., & Ormel, J. (2004). Temperament profiles associated with internalizing and externalizing problems in preadolescence. *Development and Psychopathology, 16*, 421–440. DOI: 10.1017/S0954579404044591

Oldehinkel, A. J., Hartman, C. A., Ferdinand, R. F., Verhulst, F. V., & Ormel, J. (2007). Effortful control as modifier of the association between negative emotionality and Adolescent's mental health problems. *Development and Psychopathology, 19*, 523–539. DOI: 10.1017/S0954579407070253

Posner, M. I., & Rothbart, M. K. (2000). Developing mechanisms of self-regulation. *Development and psychopathology*, *12*(3), 427-441. DOI: 10.1017/S0954579400003096

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Sage.

Rettew, D. C., Althoff, R. R., Dumenci, L., Ayer, L., & Hudziak, J. J. (2008). Latent profiles of temperament and their relations to psychopathology and wellness. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(3), 273-281. DOI: 10.1097/CHI.0b013e318160b403

Rey, J. M., Schrader, E., & Morris-Yates, A. (1992). Parent-child agreement on children's behaviours reported by the Child Behaviour Checklist (CBCL). *Journal of adolescence*, *15*(3), 219. DOI: 10.1016/0140-1971(92)90026-2

Rogeness, G. A., Cepeda, C., Macedo, C. A., Fisher, C., & Harris, W. R. (1990). Differences in heart rate and blood pressure in children with conduct disorder, major depression, and separation anxiety. *Psychiatry Research*, *33*(2), 199-206. DOI: 10.1016/0165-1781(90)90074-F

Rothbart, M. K. (1998). Temperament and plasticity in childhood. D. M. Hann, L. C. Huffman, I. Lederhendler, & D. Meinecke, (Eds.), *Advancing research on developmental plasticity: Integrating the*

behavioral science and the neuroscience of mental health (pp. 223-231). Washington D.C: U.S. Government Printing Office.

Rothbart, M. K. (2007). Temperament, development, and personality. *Current directions in psychological science*, *16*(4), 207-212. DOI: 10.1111/j.1467-8721.2007.00505.x

Rothbart, M. K., & Ahadi, S. A. (1994). Temperament and the development of personality. *Journal of abnormal psychology*, *103*(1), 55. DOI: 10.1037/0021-843X.103.1.55

Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: origins and outcomes. *Journal of personality and social psychology*, *78*(1), 122. DOI: 10.1037/0022-3514.78.1.122

Rothbart, M. K., & Bates, J.E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social emotional and personality development* (5th ed., pp. 105-176). New York: Wiley.

Rothbart, M.K., & Bates, J.E. (2006). Temperament. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology: Vol.3. Social, emotional, and personality development* (6th ed., pp. 99–166). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0303

Rydell, A. M., Berlin, L., & Bohlin, G. (2003). Emotionality, emotion regulation, and adaptation among 5- to 8-year-old children. *Emotion, 3*, 30– 47. DOI: 10.1037/1528-3542.3.1.30

Rubenstein, L. M., Freed, R. D., Shapero, B. G., Fauber, R. L., & Alloy, L. B. (2016). Cognitive attributions in depression: Bridging the gap between research and clinical practice. *Journal of psychotherapy integration, 26(2),* 103. DOI: 10.1037/int0000030

Seiffge-Krenke, I., & Kollmar, F. (1998). Discrepancies between mothers' and fathers' perceptions of sons' and daughters' problem behaviour: A longitudinal analysis of parent–adolescent agreement on internalising and externalising problem behaviour. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, *39*(5), 687-697. DOI: 10.1017/S0021963098002492

Seligman, M. E., Abramson, L. Y., Semmel, A., & Von Baeyer, C. (1979). Depressive attributional style. *Journal of abnormal psychology*, *88*(3), 242. DOI: 10.1037/0021-843X.88.3.242

Seligman, M. E., Kaslow, N. J., Alloy, L. B., Peterson, C., Tanenbaum, R. L., & Abramson, L. Y. (1984). Attributional style and depressive symptoms among children. *Journal of abnormal psychology*, *93*(2), 235. DOI: 10.1037/0021-843X.93.2.235

Seligman, L. D., & Ollendick, T. H. (1998). Comorbidity of anxiety and depression in children and adolescents: An integrative review. *Clinical Child and Family Psychology Review*, *1*(2), 125-144. DOI: 10.1023/A:1021887712873

Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry*, *44*(1), 2-32. DOI: 10.1111/1469-7610.00101

Simons-Morton, B., Chen, R., Abroms, L., & Haynie, D. L. (2004). Latent growth curve analyses of peer and parent influences on smoking progression among early adolescents. *Health Psychology*, *23*(6), 612. DOI: 10.1037/0278-6133.23.6.612

Sourander, A., Helstelä, L., & Helenius, H. (1999). Parent–adolescent agreement on emotional and behavioral problems. *Social Psychiatry and Psychiatric Epidemiology, 34*, 657– 663. DOI: 10.1007/s001270050189

Stewart, A. J., Sokol, M., Healy, J. M., & Chester, N. L. (1986). Longitudinal studies of psychological consequences of life changes in children and adults. *Journal of personality and Social Psychology*, *50*(1), 143. DOI: 10.1037/0022-3514.50.1.143

Tackett, J. L. (2006). Evaluating models of the personality–psychopathology relationship in children and adolescents. *Clinical Psychology Review*, 26, 584–599. DOI: 10.1016/j.cpr.2006.04.003

Tick, N. T., Van Der Ende, J., & Verhulst, F. C. (2007). Twenty-year trends in emotional and behavioral problems in Dutch children in a changing society. *Acta Psychiatrica Scandinavica, 116*, 473–482. DOI: 10.1111/j.1600-0447.2007.01068.x

Van Oort, F. V. A., Greaves-Lord, K., Verhulst, F. C., Ormel, J., & Huizink, A. C. (2009). The developmental course of anxiety symptoms during adolescence: The TRAILS study. *Journal of Child Psychology and Psychiatry*, *50*(10), 1209-1217. DOI: 10.1111/j.1469-7610.2009.02092.x

Vervoort, L., Wolters, L. H., Hogendoorn, S. M., Prins, P. J., De Haan, E., Boer, F., & Hartman, C. A. (2011). Temperament, attentional processes, and anxiety: diverging links between adolescents with and without anxiety disorders? *Journal of Clinical Child & Adolescent Psychology*, *40*(1), 144-155. DOI: 10.1080/15374416.2011.533412

Wachs, T. D., & Bates, J. E. (2001). Temperament. In G. Bremmer & A. Foge (Eds.)., *Blackwell handbook of infant development* (pp. 465–502). Malden, MA: Blackwell.

Weissman, M. M., Wolk, S., Goldstein, R. B., Moreau, D., Adams, P., Greenwald, S., Klier, C. M., Ryan, N. D., Dahl, R. E., & Wickramaratne, P. (1999). Depressed adolescents grown up. *Jama*, *281*(18), 1707-1713. DOI: 10.1001/jama.281.18.1707

Wickrama, K. K., Lee, T. K., O'Neal, C. W., & Lorenz, F. O. (2016). *Higher-order growth curves and mixture modeling with Mplus: a practical guide*. Routledge.

Zahn–Waxler, C., Klimes–Dougan, B., & Slattery, M. J. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and psychopathology*, *12*(3), 443-466. DOI: 10.1017/S0954579400003102

Zahn-Waxler, C., Shirtcliff, E. A., & Marceau, K. (2008). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology*, 4, 275-303. DOI: 10.1146/annurev.clinpsy.3.022806.091358

Zhou, Q., Hofer, C., Eisenberg, N., Reiser, M., Spinrad, T. L., & Fabes, R. A. (2007). The developmental trajectories of attention focusing, attentional and behavioral persistence, and externalizing problems during school-age years. *Developmental psychology*, *43*(2), 369-385. DOI: 10.1037/0012-1649.43.2.369

CHAPTER V

GENERAL CONCLUSIONS

The present dissertation aimed to analyze young adolescents' individual differences on several domains of global functioning, based on adolescents' personality and temperamental characteristics, and their links to emotional and behavioral problems, during the transition from early to middle adolescence. We conceived personality and temperamental characteristics according to the theoretical model proposed by Caspi and colleagues (e.g., Caspi & Roberts, 2001; Caspi, Roberts, & Shiner, 2005), which considers temperament and personality as two interconnected facets of individual differences. In this view, in the First Study we focused on broader characteristics of individual differences of personality, according to the Big Five Model (Caprara et al., 1993; Digman, 1990; 1997; McCrae & Costa, 1995), whereas in the Second and in the Third Study we focused on two more specific facets of individual functioning, that are the temperamental dimensions of Negative Emotionality and Self-Regulation (e.g., Evans & Rothbart, 2007; Rothbart, 2007). Following this reasoning and considering the associations between individual differences and adjustment over the course of adolescence, in the First study we focused on several behavioral and emotional problems, such as Internalizing (i.e., Withdrawn, Somatic Complaints, and Anxious/depressed) and Externalizing problems (i.e., Aggressive Behavior, and Rule Breaking Behavior). We adopted one of the most accredited assessment method (e.g., Achenbach et al., 2016), in order to capture the associations between broad adolescents' differences based on their personality characteristics and the development of broader emotional and behavioral problems (Cicchetti & Rogosh, 2002). Finally, considering our findings on temperamental profiles, that underlined the variety and the importance of adolescents' emotional experience, in the Third Study we focused on two emotional problems, such as Affective and Anxiety problems (e.g., Achenbach & Rescorla, 2001), in order to examine the specific relations between the temperamental profiles emerged in the Second Study, and the developmental trends of those two Internalizing symptoms across adolescence.

In particular:

- In the first Study (**Chapter II**), we considered more in general the relationships between individual differences and maladjustment from early to middle adolescence, examining patterns of individual differences based on adolescents' personality characteristics, and their links to emotional and behavioral problems in middle adolescence. We first identified four personality profiles in pre-adolescence (i.e., Resilient, Moderate, Undercontrolled, and Vulnerable); secondly, we analyzed the predicting value of adolescents' personality profiles for different indicators of internalizing and externalizing problems in middle adolescence

(three years later); in addition, we explored the moderating role of gender in these associations.

- In the second Study (**Chapter III**), we focused specifically on patterns of individual differences based on several domains of Emotionality and Self-Regulation, according with previous studies that supported their crucial role during adolescence. In particular, we identified patterns of temperamental profiles among early adolescents of three different cultures, based on narrow dimensions of Negative Emotionality and Effortful Control (i.e., Regulated, Average, Over-reactive/Regulated, and Over-reactive/Dysregulated); in addition, we explored the effects of adolescents' gender and culture in the identification of these patterns.

- Lastly, in the third Study (**Chapter IV**), we focused specifically on emotional problems, analyzing the associations between patterns emerged in the previous study and the development overtime of Internalizing problems. In particular, we examined the specific links between temperamental profiles and the development of Anxiety and Affective Problems, separately in boys and girls, from early to middle adolescence, controlling for adolescents' culture.

Overall, the present dissertation contributes to knowledge in the field of personality and developmental psychology, focused on the links between individual differences and maladjustment across adolescence.

Firstly, the contribution addressed the importance to consider individual differences in a holistic way, by adopting a person-centered approach (e.g., Caspi, Robets, & Shiner, 2005; Magnusson, 2003), in order to take into account individual differences in human development, and how those individual differences could be related to different developmental pathways, emphasizing the continuum between adjustment and maladjustment overtime (Asendorpf, 2003). According to this approach, individual functioning is considered as a "sum" of different characteristics that operate in concert to produce different behaviors; moreover, it is possible to organize individual functioning into several specific patterns (Asendorpf, 2003; 2006; Block, 1971; Magnusson, 2003). In this view, the present dissertation can be considered a step forward in the field of typological research that originates from the pioneer work conducted by Block and Block (1980). Starting from this first study, a growing body of research focused on the possibility to replicate their findings, both in personality studies (e.g., Asendorpf & Van Aken, 1999; De Bolle & Tackett, 2013; Meeus et al., 2011), and in temperamental studies (e.g., Caspi et al., 2003; Laible et al., 2010). In Chapter 2 we focused on former studies, whereas in Chapter III the focus was on the latter. As regards the study

reported in Chapter 2, our findings corroborated previous research (e.g., De Clerq et al., 2012; Xie et al., 2016), because we confirmed the structure of personality based on four different profiles (i.e., Resilient, Moderate, Undercontrolled, and Vulnerable), with different configuration of characteristics in terms of personality traits, and different levels of adjustment based on their specific patterns. More specific, we confirmed the presence of a Resilient profile, that could be considered as a well-adjusted profile; a Moderate profile, that could be considered a normative profile, with average personality characteristics; an Undercontrolled profile, with a specific impairment for what concerns self-regulation and reactivity; and a Vulnerable profile, that could be considered the most maladjusted profile. To our knowledge, this is one of the first studies that identified four personality profiles within early adolescents in Italy (e.g., Barbaranelli, 2002; Steca, Alessandri, Vecchio & Caprara, 2007). For what concerns the study reported in Chapter 3, as previously mentioned, we focused on several individual characteristics that during adolescence play a crucial role in youths' development, such as Emotionality and Self-Regulative abilities (e.g., Muris et al., 2007; Oldehinkel et al., 2007). This study can be considered a step forward in the field of developmental research, because we corroborated the key role of the interaction between Negative Emotionality and Self-Regulation during adolescence, according with previous research (e.g., Muris, 2006; Muris et al., 2007; Oldehinkel et al., 2004; 2007). In fact, our findings confirmed the presence of different patterns of individual differences in early adolescence, based on these temperamental dimensions, in three different cultures, although the effects of adolescents' gender and culture (i.e., Regulated, Average, Over-reactive/Regulated, and Over-reactive/Dysregulated). More specific, we confirmed the presence of a Regulated profile, an adjusted profile with adequate self-regulative abilities and low negative emotions; an Average profile, that could be considered a normative profile, with average negative emotionality and average self-regulation; an Over-reactive/Regulated profile, with a specific impairment in the emotional area, because it was characterized by high experiences of negative emotions together with adequate self-regulative abilities; and an Over-reactive/Dysregulated profile, the most maladjusted one, characterized by high negative emotions and feelings and lack in their self-regulative abilities. In addition, we found that American youths tend to be Regulated or Average, according with previous research (e.g., Ahadi et al., 1993; Brewis, Schmidt & Casas, 2003; Oakland and Mata, 2007; Rothbart, Ahadi, & Evans, 2000; Rubin et al., 2006). Findings emerged in this study emphasized the importance to consider how Emotionality and Self-Regulation can organize together in specific patterns of individual functioning, taking into account the role of culture. To our knowledge, this is one of the first study that considers Negative Emotionality and Effortful Control in early adolescence (e.g., Laible et al., 2010), and the first study that addressed effects of adolescents' gender and culture on temperamental profiles.

Secondly, the present dissertation supported the vulnerability/predisposition model (Tackett, 2006), that can be considered a theoretical framework for understanding how adolescents' personality and temperamental characteristics can influence the development of emotional and behavioral problems during adolescence, according with a developmental perspective in which we considered relations between personality and adjustment (e.g., Caspi & Shiner, 2006; Cicchetti & Rogosh, 2002; Shiner & Caspi, 2003; Tackett, 2006). In particular, findings emerged from the study presented in Chapter II, according with previous research (e.g., De Clerq et al., 2012), addressed the presence of specific relationships among patterns of personality characteristics in early adolescence and emotional and behavioral problems in middle adolescence (after three years). In particular, we confirmed that different personality profiles differentially and uniquely predict different later internalizing and externalizing problems: the Resilient profile reported high adjustment overtime, the Undercontrolled profile predicted high externalizing problems, whereas the Vulnerable profile predicted high internalizing problems in middle adolescence. To our knowledge, this is the first study addressed the unique prediction of later internalizing and externalizing problems at the same time, controlling for the stability of these problems. Findings derived from the study showed in Chapter IV corroborated previous research (e.g., Garrison et al., 1990; Hale et al., 2008; Hankin et al., 1998) focused on the identification of developmental trends of specific Internalizing problems, by identifying different trajectories of Anxiety and Affective Problems from early to middle adolescence, differently in boys and girls. In particular, we found an increasing trend of Anxiety and Depression for girls, and a stable low trend of Anxiety and Depression for boys, from early to late adolescence. In addition, the study reported in Chapter IV supported the importance of consider the combined effect of Emotionality and Self-regulation in adolescence, as well as the key role of the Self-regulative characteristics, in predicting different developmental pathways, that are influenced by specific temperamental patterns. More specific, for what concerns the relationships between the temperamental profiles emerged in the Second Study, and the developmental trends of Anxiety and Depression in adolescent boys and girls, we found that the Regulated profile predicted low Depression at age 12; the Over-reactive/Regulated profile was not associated with the development of Anxiety and Depression; the Over-reactive/Dysregulated profile predicted high Anxiety and Depression in early adolescence, and low change in their levels of Depression over the course of adolescence. In addition, adolescents from Colombia and Italy showed higher Anxiety in early adolescence. This last study represents a novelty in the field of developmental and personality research, because to our knowledge, this is the first study in the field of cross-cultural research, that focused on the relations between temperamental characteristics and the development of emotional problems, adopting a person-centered approach.

Limitations and future directions

Despite the great strengths of this dissertation, emphasized in the previous section of this Chapter, the contribution has some limitations.

First, in the studies I and II we did not adopt a multi-informant perspective, so it is possible that our findings regarding these two studies were partially affected by some method effect. In fact, in the First Study we considered only adolescents' reports about their personality characteristics, as well as their self-evaluation of their Internalizing and Externalizing problems. Similarly, in the Second Study we considered only mothers' evaluation of emotionality and self-regulation of their adolescent sons and daughters. However, for what concerns adolescents' personality and temperamental characteristics, previous research suggested that, despite during childhood it is important to take into account parents' perception about children' characteristics, during adolescence it is crucial to consider youths' self-evaluation about their own personality and temperamental characteristics (e.g., Rothbart & Bates, 2006). In this view, further studies should consider early adolescents' evaluation about their own Negative Emotionality and Self-regulation, in order to compare the structure of temperamental patterns based on parents' and early adolescents' reports. As regards adolescents' emotional and behavioral problems, that in the present dissertation were collected through adolescents' self-evaluations in all the three studies, despite previous studies attested the accuracy of considering self-evaluations about their internalizing symptoms, such as anxiety or depression, especially during adolescence because youths' autonomy increases and adolescents are less inclined to discuss emotional and behavioral problems with their parents (e.g., Ormel et al., 2005; Sourander, Helstelä, & Helenius, 1999), a large body of research attested the importance of considering other reports, such as parents' or teachers' report, for what concerns adolescents' externalizing and behavioral symptoms, such as aggressive or antisocial behaviors (e.g., De Los Reyes et al., 2015). Thus, further studies should adopt a multi-informant approach, in order to clarify deeply the relationships between adolescents' personality and temperamental profiles and the development of emotional and/or behavioral problems across adolescence (e.g., De Clercq et al., 2012; Noordhof, Oldehinkel, Verhulst, & Ormel, 2008).

Second, the identification of patterns of individual differences based on adolescents' personality and temperamental characteristics were cross-sectional, and we did not consider how personality and temperamental profiles can change overtime, as a part of normative development. To our knowledge, there are only few previous studies that have addressed specifically this issue with personality profiles (e.g., Meeus et al., 2010; Leikas & Salmela-Aro, 2014), and there are no previous studies addressing this issue with temperamental patterns. However, previous research emphasized the importance to consider individual characteristics based on personality and temperament in a holistic way, in order to consider how these characteristics can work together in predicting adjustment overtime (e.g., Meeus et al., 2001; Muris, 2006; Asendorpf, 2003). In

particular, researchers underlined the key role that patterns of individual characteristics can have during adolescence, that is a crucial period, in which personality characteristics such as self-regulation and emotional reactiveness (i.e., Neuroticism, Conscientiousness, Effortful Control, Emotionality, and Extraversion) can impact effectively on adolescents' development (Eisenberg et al., 2001; Muris et al., 2007; Steinberg & Morris, 2001). Thus, an additional step forward in the future could be the analysis of how these profiles can change over the course of adolescence, in order to identify several hypothesized specific trends of change, and to focus on mechanisms of continuity and change in personality over the life course (e.g. Meeus et al., 2010).

For what concerns the studies II and III, we considered adolescents' culture only as a covariate, because in this regards our work was only explorative. Our findings supported the role of adolescents' culture, not in the development of specific Internalizing problems, but especially in the formation of temperamental patterns. In fact, we attested that American adolescents, compared with Colombian and Italian adolescents, show more abilities to manage and regulate their behaviors and their emotions, and they tend to experience few negative emotions. Despite several previous studies attested a similar pattern of functioning between Emotionality and Self-regulation in the Western cultures (e.g., Hoefer and Eisenberg, 2008), our findings supported the role of culture as an "antecedent" of the expression of adolescents' temperamental characteristics, according with the theoretical approach proposed by Chen and colleagues (Chen, Yang, & Fu, 2012). Future research should analyze deeply the direct effects of culture on adolescents' temperamental patterns, as well as the relations between adolescents' temperamental profiles and the development of emotional problems, in order to clarify mechanism through which culture can influence individual differences over the course of life.

Practical implications and applications

Overall, findings emerged from the present dissertation underlined the importance to consider individual differences in personality and temperamental characteristics in early adolescence, that is a period particularly relevant for youths, because of many challenges and demands that they encounter. In addition, during this period, the emergence of emotional and behavioral problems frequently increase, and the contribution highlighted the importance to consider how patterns of individual differences can influence developmental patterns of youths.

There are several implication and possible applications of this dissertation. For one, this contribution underlined some important consequences in the field of clinical developmental psychology. In particular, our findings highlight the importance to consider adolescents' personality and temperamental characteristics in the development of psychopathologies, and in the developmental pathways concerning the origins, the progression, and the resolution of adaptive and

maladaptive emotional and behavioral patterns across adolescence. According with previous research (e.g., Cicchetti & Rogosh, 2002; Steinberg, 2002), one of the crucial point for understanding the developmental processes that underlie the emergence of emotional and behavioral difficulties and symptoms, is to consider the development as a continuous process, from the adaptive to the maladaptive pole. In this sense, it is important to consider the normative developmental trends of emotional and behavioral changes, and to take into account, beyond these trends, also adolescents' characteristics. The present dissertation suggests several mechanisms underlying the adaptation/maladaptation of youths across their lives, such as specific patterns of functioning that can lead some adolescents more prone to incur in behavioral or emotional problems. In sum, findings derived from this contribution could be helpful in the psychological care, treatment and support of young people, because they underline the relationships between adolescents' dispositions and their emotions and behaviors. In particular, considering the main role that adolescents' self-regulative abilities have in the development of emotional and/or behavioral problems, our findings emphasizing the importance of considering the domain of emotion regulation as a focal part of the prevention and promotion interventions, during adolescence but also with children.

Therefore, those findings can be helpful in preventing problematic youth developmental pathways. In particular, considering all the interventions aimed to contrast juvenile maladjustment, those applications should orient their actions not only to prevent youths' maladjustment, but they should focus also in promoting adolescents' resources, such as emotional abilities and skills, that can help youths in facing with their critical period. In addition, those interventions should take into account the normativeness of certain developmental trajectories, in order to help adolescents in dealing with their difficulties.

Lastly, as highlighted by some recent research (e.g., Cummings et al., 2014), addressing the mechanisms that can lead some adolescents' characteristics as protective or risk factors for specific impairments, and, more important, consider the overall individual functioning as a result of different characteristics that operate in concert, could help in reducing the impact of emotional and behavioral problems on adolescents themselves. In this view, again, adopting a holistic approach to consider individual global functioning represent a core aspect for understand and for assess behaviors and emotions.

REFERENCES

Ahadi, S. A., Rothbart, M. K., & Ye, R. M. (1993). Child temperament in the U.S. and China: Similarities and differences. *European Journal of Personality, 7*, 359-378. DOI: 10.1002/per.2410070506

Achenbach, T.M., & Rescorla, L.A. (2001). Manual for the ASEBA School-Age Forms & Profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Achenbach, T. M., Ivanova, M. Y., Rescorla, L. A., Turner, L. V., & Althoff, R. R. (2016). Internalizing/externalizing problems: Review and recommendations for clinical and research applications. *Journal of the American Academy of Child & Adolescent Psychiatry*, 55, 647-656. DOI: 10.1016/j.jaac.2016.05.012

Asendorpf, J. B. (2003). Head-to-head comparison of the predictive validity of personality types and dimensions. *European Journal of Personality*, *17*(5), 327-346. DOI: 10.1002/per.492

Asendorpf, J. B. (2006) Typeness of Personality Profiles: A Continuous Person-Centred Approach to Personality Data. *European Journal of Personality*, 23, 83-106. DOI: 10.1002/per.575

Asendorpf, J. B., & van Aken, M. A. (1999). Resilient, overcontrolled, and undercontrolled personality prototypes in childhood: Replicability, predictive power, and the trait-type Issue. *Journal of Personality and Social Psychology*, 77, 815-832. DOI: 10.1037/0022-3514.77.4.815

Barbaranelli, C. (2002). Evaluating cluster analysis solutions: An application to the Italian NEO Personality Inventory. *European Journal of Personality*, *16*(S1), S43-S55. DOI: 10.1002/per.449

Block, J. (1971). *Lives through time*. Berkeley: Psychology Press.

Block, J. H., Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.). *Development of cognition, affect, and social relations: The Minnesota symposia on child psychology* (Vol. 13, pp. 39-103). Hillsdale, NJ: Erlbaum.

Brewis, A., Schmidt, K. L., & Casas, C. A. S. (2003). Cross-cultural study of the childhood developmental trajectory of attention and impulse control. *International Journal of Behavioral Development*, *27*(2), 174-181. DOI: 10.1080/0165025024400173

Caprara, G. V., Barbaranelli, C., Borgogni, L., & Perugini, M. (1993). The "Big Five Questionnaire": A new questionnaire to assess the five-factor model. *Personality and individual Differences*, *15*(3), 281-288. DOI: 10.1016/0191-8869(93)90218-R

Caspi, A., & Roberts, B. W. (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry*, *12*(2), 49-66. DOI: 10.1207/S15327965PLI1202_01

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, *56*, 453-484. DOI: 10.1146/annurev.psych.55.090902.141913

Caspi, A., Harrington, H., Milne, B., Amell, J. W., Theodore, R. F., & Moffitt, T. E. (2003). Children's behavioral styles at age 3 are linked to their adult personality traits at age 26. *Journal of Personality, 71*, 495–513. DOI: 10.1111/1467-6494.7104001

Caspi, A., & Shiner, R. L. (2006) Personality development. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of Child Psychology: Vol. 3. Social, emotional, and personality development* (6 ed). New York: Wiley. DOI: 10.1002/9780470147658.chpsy0306

Cicchetti, D., & Rogosch, F. A. (2002). A developmental psychopathology perspective on adolescence. *Journal of consulting and clinical psychology*, *70*(1), 6. DOI: 10.1037/0022-006X.70.1.6

Cummings, C. M., Caporino, N. E., & Kendall, P. C. (2014). Comorbidity of anxiety and depression in children and adolescents: 20 years after. *Psychological bulletin*, *140*(3), 816-845. DOI: 10.1037/a0034733

De Bolle, M., & Tackett, J. L. (2013). Anchoring bullying and victimization in children within a Five-Factor Model-based person-centred framework. *European Journal of Personality*, *27*(3), 280-289. DOI: 10.1002/per.1901

De Clercq, B., Rettew, D., Althoff, R. R., & De Bolle, M. (2012). Childhood personality types: vulnerability and adaptation over time. *Journal of Child Psychology and Psychiatry*, 53, 716-722. DOI: 10.1111/j.1469-7610.2011.02512.x

De Los Reyes, A., Augenstein, T. M., Wang, M., Thomas, S. A., Drabick, D. A., Burgers, D. E., & Rabinowitz, J. (2015). The validity of the multi-informant approach to assessing child and adolescent mental health. *Psychological Bulletin*, *141*(4), 858. DOI: 10.1037/a0038498

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual review of psychology*, *41*(1), 417-440. DOI: 10.1146/annurev.ps.41.020190.002221

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of personality and social psychology*, *73*(6), 1246. DOI: 10.1037/0022-3514.73.6.1246

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reider, M., et al. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development, 72*, 1112–1134. DOI: 10.1111/1467-8624.00337

Garrison, C. Z., Jackson, K. L., Marsteller, F., McKeown, R., & Addy, C. (1990). A longitudinal study of depressive symptomatology in young adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *29*(4), 581-585. DOI: 10.1097/00004583-199007000-00011

Hale III, W. W., Raaijmakers, Q., Muris, P., & Meeus, W. (2008). Developmental trajectories of adolescent anxiety disorder symptoms: A 5-year prospective community study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(5), 556-564. DOI: 10.1097/CHI.0b013e3181676583

Hankin, B. L., Abramson, L. Y., Moffitt, T. E., Silva, P. A., McGee, R., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology, 107*, 128–140. DOI: 10.1037//0021-843X.107.1.128

Hofer, C., & Eisenberg, N. (2008). Emotion-related regulation: Biological and cultural bases. In M. Vandekerckhove, C. von Scheve, S. Ismer, S. Jung, & S. Kronast (Eds.), *Regulating emotions: Social necessity and biological inheritance* (pp. 61–82). Malden, MA: Blackwell Publishing. DOI: 10.1002/9781444301786.ch3

Laible, D., Carlo, G., Panfile, T., Eye, J., & Parker, J. (2010). Negative emotionality and emotion regulation: A person-centered approach to predicting socioemotional adjustment in young adolescents. *Journal of Research in Personality*, *44*(5), 621-629. DOI: 10.1016/j.jrp.2010.08.003

Leikas, S., & Salmela-Aro, K. (2014). Personality types during transition to young adulthood: how are they related to life situation and well-being?. *Journal of adolescence*, *37*(5), 753-762. DOI: 10.1016/j.adolescence.2014.01.003

Magnusson, D. (2003). The person appoach: Concepts, measurement models, and research strategy. *New directions for child and adolescent development*, *2003*(101), 3-23. DOI: 10.1002/cd.79

McCrae, R., R., Costa Jr, P. T. (1995). Domains and Facets: Hierarchical Personality Assessment Using the Revised NEO Personality Inventory. *Journal of Personality Assessment*, 64, 21-50. DOI: 10.1207/s15327752jpa6401_2

Meeus, W., Van de Schoot, R., Klimstra, T., & Branje, S. (2011). Personality types in adolescence: change and stability and links with adjustment and relationships: a five-wave longitudinal study. *Developmental Psychology*, 47, 1181-1195. DOI: 10.1037/a0023816

Muris, P. (2006). Freud was right… about the origins of abnormal behavior. *Journal of Child and Family Studies*, *15*(1), 1. DOI: 10.1007/s10826-005-9006-9

Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament in early adolescence: Relations to internalizing and externalizing problem behavior and "Big Three" personality factors. *Journal of adolescence*, *30*(6), 1035-1049. DOI: 10.1016/j.adolescence.2007.03.003

Oakland, T., & Mata, A. (2007). Temperament styles of children from Costa Rica and the United States. *Journal of Psychological Type, 67*, 91–102

Oldehinkel, A. J., Hartman, C. A., De Winter, A. F., Veenstra, R., & Ormel, J. (2004). Temperament profiles associated with internalizing and externalizing problems in preadolescence. *Development and Psychopathology, 16*, 421–440. DOI: 10.1017/S0954579404044591

Oldehinkel, A. J., Hartman, C. A., Ferdinand, R. F., Verhulst, F. V., & Ormel, J. (2007). Effortful control as modifier of the association between negative emotionality and Adolescent's mental health problems. *Development and Psychopathology, 19*, 523–539. DOI: 10.1017/S0954579407070253

Ormel, J., Oldehinkel, A. J., Ferdinand, R. F., Hartman, C. A., De Winter, A. F., Veenstra, R., Vollebergh, W., Minderaa, R. B., Buitelaar, J. K., & Verhulst, F. C. (2005). Internalizing and externalizing problems in adolescence: general and dimension-specific effects of familial loadings and preadolescent temperament traits. *Psychological Medicine*, *35*(12), 1825-1835. DOI: 10.1017/S003329170500582

Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: origins and outcomes. *Journal of personality and social psychology*, *78*(1), 122. DOI: 10.1037/0022-3514.78.1.122

Rubin, K. H., Hemphill, S. A., Chen, X., Hastings, P., Sanson, A., Lo Coco, A., Zappulla, C., Chung, O. B., Park, S. Y., Doh, H. S., Chen, H., Sun, L, Yoon, C. H., Cui, L. (2006). A cross-cultural study of behavioral inhibition in toddlers: East–West–North–South. *International Journal of Behavioral Development*, *30*(3), 219-226. DOI: 10.1177/0165025406066723

Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry*, *44*(1), 2-32. DOI: 10.1111/1469-7610.00101

Steca, P., Alessandri, G., Vecchio, G. M., Caprara, G. V. (2007). Being a successful adolescent at school and with peers. The discriminative power of a typological approach. *Emotional and Behavioural Difficulties, 12:2*, 147 – 162. DOI: 10.1016/j.paid.2009.11.016

Steinberg, L. (2002). Clinical adolescent psychology: What it is, and what it needs to be. *Journal of Consulting and Clinical Psychology*, *70*(1), 124. DOI: 10.1037//0022-006X.70.1.124

Steinberg, L., & Morris, A. S. (2001) Adolescent Development. *Annual Review of Psychology*, 52, 83-110. DOI: 10.1146/annurev.psych.52.1.83

Sourander, A., Helstelä, L., & Helenius, H. (1999). Parent–adolescent agreement on emotional and behavioral problems. *Social Psychiatry and Psychiatric Epidemiology, 34*, 657– 663. DOI: 10.1007/s001270050189

Tackett, J. L. (2006). Evaluating models of the personality–psychopathology relationship in children and adolescents. *Clinical Psychology Review*, 26, 584–599. DOI: 10.1016/j.cpr.2006.04.003

Xie, X., Chen, W., Lei, L., Xing, C., & Zhang, Y. (2016) The relationship between personality types and prosocial behavior and aggression in Chinese adolescents. *Personality and Individual Differences*, 95, 56-61. DOI: 10.1016/j.paid.2016.02.002