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Childhood antecedents of Agreeableness: A longitudinal study from preschool to late adolescence.

Silje Baardstu^{1*}, Evalill B. Karevold¹, Tilmann von Soest^{1,2}

¹Department of Psychology, University of Oslo, Norway

²Department of Child Development and Mental Health, Norwegian Institute of Public Health

Author Note

*Corresponding author Silje Baardstu at: Department of Psychology, University of Oslo, P.O. Box 1094 Blindern, 0317 Oslo, Norway.

Email address: silje.bardstu@psykologi.uio.no

1. Introduction

Agreeableness is commonly defined as behavioral tendencies reflecting prosocial motivation, orientation, and social responsiveness (Graziano & Eisenberg, 1997; Tobin, Graziano, Vanman, & Tassinary, 2000). In particular, it involves the regulation of emotions in interpersonal contexts (Caspi & Shiner, 2006), and is considerably linked with the psychosocial system of “belonging” that facilitates formation of close bonds and assures social support (Fleeson & Jayawickreme, 2015; Nikitin & Freund, 2008, 2015). Hence, compared to the other four dimensions in the Five Factor taxonomy, the agreeableness factor is the most associated with interpersonal relationships, reflecting individual variations in communion and prosocial tendencies ranging from warmth and affiliation to hostility and antagonism (Graziano & Eisenberg, 1997; Shiner & Masten, 2008). However, of all the Big Five personality dimensions, next to the openness factor, agreeableness is probably still the least investigated trait with respect to both theory and developmental antecedents (Graziano & Tobin, 2002). Whereas the majority of the Big Five personality traits have relatively clear counterparts in the temperament literature (extraversion/surgency/sociability, emotional stability/neuroticism/negative emotionality, conscientiousness/effortful control, respectively), less is known about the temperamental equivalents and early manifestations of the agreeableness factor, mainly because this dimension traditionally has been left out of most taxonomies of child personality (Laursen, Pulkkinen, & Adams, 2002; Mervielde & Asendorpf, 2000). Although recent investigations have demonstrated that an agreeableness-like dimension can be found in middle and late childhood (e.g., De Pauw, Mervielde, & Van Leeuwen, 2009; Measelle, John, Ablow, Cowan, & Cowan, 2005; Mervielde & De Fruyt, 2002), there is scarce knowledge about the developmental antecedents of agreeableness in the toddler and preschool years. However, emerging evidence and theoretical accounts have indicated that adult agreeableness might have its origins in emotional and behavioral

regulation as indicated by child cooperation, persistence, self-control, and expressed affect (Ahadi & Rothbart, 1994; Caspi, 1998; Caspi & Silva, 1995; Laursen et al., 2002).

The current study aims to increase our knowledge about early childhood precursors of agreeableness, mainly by assessing the role of emotional and behavioral regulation from early childhood and onwards for the development of this particular trait. Given that the agreeableness factor is assumed to be the most malleable of the Big Five traits and most susceptible to change in light of environmental inputs (Bergeman et al., 1993; Graziano, 1994; Graziano & Eisenberg, 1997), a further aim was to examine how parents and parental behavior – one of the most important contextual factors in childhood – moderate pathways from early behavioral tendencies in preschool to agreeableness in adolescence. To our knowledge, our study is the first to examine how parenting behaviors moderate developmental processes concerning agreeableness. Because few studies have examined precursors of this trait from early childhood and onward, the present study provides novel information about personality development by examining potential predictors of agreeableness from as early as age 1 1/2.

Knowledge about developmental origins of agreeableness is important as empirical evidence implicates agreeableness in individual adjustment. On one side, high levels of agreeableness have been found to significantly predict positive outcomes within several developmental domains, pertaining to school and career performance, social relations, longevity, and health (e.g., Hampson, Goldberg, Vogt, & Dubanoski, 2007; Jensen-Campbell, Gleason, Adams, & Malcolm, 2003; Kokko & Pulkkinen, 2000). On the other side, low agreeableness is considered a risk factor for the development of adjustment problems (Tackett, 2006), and is associated with increased prevalence of externalizing problems and personality disorders (De Fruyt & De Clercq, 2013; Ehrler, Evans, & McGhee, 1999; Krueger, Caspi, Moffitt, Silva, & McGee, 1996). As such, studying early indices of

(dis)agreeableness can provide insight into the etiology of externalizing problems as well as personality disorders, which in turn could facilitate efforts to develop preventive actions at early stages in development.

1.1. Manifestations of agreeableness in preschool years

Theories on personality development in childhood and adolescence suggest that individuals start out with biologically based individual differences in reactivity and regulation of emotions and behavior, which become elaborated into more differentiated personality traits with increasing age (Rothbart, 2007; Shiner & Caspi, 2003). These early behavioral and emotional regulation tendencies thus represent the core around which subsequent personality dimensions develop. Research supports this by indicating that agreeableness-related characteristics emerge as genetically-influenced regulatory dispositions early in development. For instance, children are found to exhibit moderately stable prosocial tendencies by the age of 3 (Knafo & Plomin, 2006a, 2006b). Similarly, children vary in their displays of both physical and relational aggression towards others already during the preschool years (Crick, Ostrov, Appleyard, Jansen, & Casas, 2004; Tremblay & Nagin, 2005). Given that prosocial, hostile, and aggressive tendencies are central features of the agreeableness dimension, these findings imply that at least some aspects of this Big Five dimension are present early in life. Along with this notion, there has been a consensus view that low levels of agreeableness are related to what has been termed “childhood difficultness” (see, Graziano, 1994; Graziano & Eisenberg, 1997; Graziano & Tobin, 2009). Thus, one of our primary goals was to examine this particular assumption of links between high difficultness in preschool and low agreeableness in adolescence.

The term “difficult” was first introduced by Thomas and Chess (1977), and this concept has been the subject of much debate. Some have argued that “difficultness” is similar to temperamental emotionality (Rothbart & Bates, 1998; Sanson & Prior, 1998). Others have

argued that childhood difficultness represents a more general disposition than emotionality, in terms of comprising multiple aspects from several temperament dimensions including manifestations of uncooperativeness, high reactivity, tractability, impulsivity, anger proneness, negative emotionality, and poor self-control (Bates, 1980; Graziano, 1994; Kochanska & Kim, 2013; Lee & Bates, 1985; Maziade, Cote, Boutin, Bernier, & Thivierge, 1987). Our perspective of the difficultness term is in line with this latter notion of difficultness as a more global disposition. It thereby represents a broad set of age-specific behaviors that are indicative of disagreeable and under-regulated tendencies in early childhood that parents often find challenging. The behavioral tendencies comprised within our difficultness term largely resembles characteristics listed under the childhood personality factor Benevolence of the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999; Mervielde & De Fruyt, 2002). The Benevolence factor is the childhood dimension most aligned with adult agreeableness trait, involving aspects of low irritability and dominance, and high compliance (see, Mervielde & De Fruyt, 1999; Mervielde & De Fruyt, 2002). As is the case with the Benevolence dimension, our difficultness concept holds manageability of the child from the perspective of parents as one of the most central aspects, which also is in line with Thomas and Chess' use of the concept.

So far, only two studies have provided indications that indices of childhood difficultness in the preschool years are precursors of agreeable-like characteristics later in development. Longitudinal investigations by Caspi and colleagues (Caspi et al., 2003; Caspi & Silva, 1995) have demonstrated that children who displayed under-regulated behavioral tendencies at age 3 (e.g., difficulty sitting still, rough and uncontrolled in their behavior, labile in their emotional responses, and short attention span), were more likely to display aggressive, impulsive, hostile, and interpersonal alienation tendencies as adults than more well-regulated children. Similarly, characteristics representative of low agreeableness in middle childhood

(i.e., high aggression, and low compliance and self-control), have been found to distinguish high-agreeable adults from low-agreeable adults (Laursen et al., 2002). In light of this, we hypothesized that childhood difficultness in preschool would act as a precursor of agreeableness in adolescence.

1.2. The mediating role of regulation on the difficultness – agreeableness link

The concepts of difficultness and agreeableness are both related to regulatory abilities. Difficultness encompasses behavioral problems indicative of emotional and behavioral regulation as indicated by low self-control, cooperation, and persistence, and high expressed affect in childhood (Ahadi & Rothbart, 1994; Bates, 1986). Similarly, theoretical accounts have consistently listed regulation of emotion and behavior as core aspects of the agreeableness dimension (Ahadi & Rothbart, 1994; Caspi & Shiner, 2006; Denissen, van Aken, Penke, & Wood, 2013; Hennecke, Bleidorn, Denissen, & Wood, 2014; Shiner & DeYoung, 2013). This theoretical assumption has received substantial empirical support. For instance, agreeableness has been concurrently associated with self-regulatory abilities and internal locus of control among preschoolers, adolescents (Abe, 2005; Abe & Izard, 1999), and adults (Jensen-Campbell et al., 2002). More specifically, individuals at the high end of agreeableness are found to be more adept at controlling immediate and short-term impulses and emotional pressures than their less-agreeable peers (Tobin & Graziano, 2006). In contrast, individuals at the low end of agreeableness often display behavior problems as well as interpersonal difficulties (see, Laursen & Richmond, 2013, for an overview), which in turn are suggestive of emotional and behavioral regulation deficiencies.

Signs of individual variability in self-regulation can be detected as early as within the first six months of development (Calkins, Dedmon, Gill, Lomax, & Johnson, 2002), and there is a high degree of stability in such regulatory capacities over time (Gerrard, Anastopoulos, Calkins, & Shelton, 2000). Research has demonstrated that children with poor emotional and

behavioral control early in development also tend to have greater difficulties with modulating and inhibiting inappropriate responses and behaviors in the interaction with others later in development, as well as being more defiant and less compliant to maternal requests, than their more regulated counterparts (Calkins & Dedmon, 2000; Wang, Chassin, Eisenberg, & Spinrad, 2015). Thus, regulatory skills seem to be important for children's developing agreeableness, given that these skills facilitate development of appropriate prosocial behaviors (Eisenberg et al., 1996; Eisenberg et al., 1995; Rothbart, Ahadi, & Hershey, 1994; Rubin, Coplan, Fox, & Calkins, 1995), and given that prosocial behaviors are central features of the agreeableness dimension (Graziano & Eisenberg, 1997). Hence, we expect that regulation might act as the underlying mechanism through which childhood difficultness is linked to agreeableness. Accordingly, the current study aimed to examine whether poor self-regulatory capacities in late childhood (age 12.5) would mediate the hypothesized link between high difficultness in preschool and low agreeableness in adolescence.

Although we use childhood difficultness as the predictor and emotion regulation in late childhood as the mediator in this study, it is important to have in mind the likely mutually reinforcing relationship between regulation and difficultness over time. On one side, early appearing individual variation in regulatory capacities is likely to precede and account for individual variation in difficultness-related behavior manifested in the toddler and preschool years. On the other hand, individual variation in difficultness-related behavior is likely to exacerbate and precede emotional and behavioral regulation in late childhood. As such, regulatory skills emerging from infancy and onward might entail accumulative and enduring effects on children's personality development, and particularly with respect to the agreeableness dimension.

1.3. The role of parenting behaviors for agreeableness

Generally, parents' behaviors towards their offspring have been acknowledged as the most important environmental influence for children in their first years of living (Bretherton, 2005; Fraley, Roisman, & Haltigan, 2013; Spinrad et al., 2012; Wang, Christ, Mills-Koonce, Garrett-Peters, & Cox, 2013). For instance, parenting has shown to be an important predictor of children's development of self-regulatory capacities (Lengua, Honorado, & Bush, 2007). As such, parenting may also be of particular importance for the development of personality traits, including agreeableness.

Parenting is often divided into the two relatively broad dimensions of positive parenting (e.g., warmth, responsiveness, reasoning), and negative parenting (e.g., over-reactivity, punishment) (Paterson & Sanson, 1999; Putnam, Sanson, & Rothbart, 2005). Positive parenting behaviors entail mutual affection and care between children and parents, and involve explanations of reasons for rules and limitations (Paterson & Sanson, 1999; Robinson, Mandlco, Olsen, & Hart, 1995). Punitive practices involve tendencies to respond with frustration, anger, and removal of privileges to children's negative behaviors (Arnold, O'Leary, Wolff, & Acker, 1993). Theories on parenting generally state that parents exert influence on child development by providing the child with internal working models of behavior that children internalize and subsequently generalize to other social settings (Ainsworth & Bowlby, 1991; Bowlby, 1969). As such, positive parenting may facilitate children's development of emotional and behavioral regulation through parental modeling effects of appropriate social conduct (e.g., Baumrind, 1978; Daniel, Madigan, & Jenkins, 2015; Grusec & Davidov, 2010; Kochanska, Murray, & Harlan, 2000; Kochanska, Philibert, & Barry, 2009). Similarly, modeling effects of negative parenting might result in internalized patterns of hostile social interaction, and may impede the development of children's regulatory skills and social adjustment (e.g., Baumrind, 1989; Prior, Smart, Sanson, & Oberklaid, 1993).

Theoretical accounts of maladaptive development have highlighted the role of child temperament factors and their interactions with qualities of the social environment. For example, Thomas and Chess (1977) emphasized the importance of goodness of fit between a child's temperament dispositions and the expectations and resources of the child's surroundings in child–environment interactions. From this perspective, environmental demands and expectations that are in discord with the child's capacities and inherent dispositions might result in unfavorable psychological development and functioning (Lerner & Lerner, 1983). The goodness-of-fit perspective has received empirical support by research consistently showing parenting behaviors to interact with early dispositions to shape the course and trajectories of child development (for a review, see Shiner, 2006). For instance, “difficult” children who are met with maternal responsiveness rather than harshness, are found to become more compliant and display less externalizing behaviors than difficult children with more unresponsive mothers (Kochanska & Kim, 2013). On the other hand, parent-child interactions are generally found to be more challenging and coercive in nature when children are perceived to be more difficult (Saarni, 2006). The combination of children's difficult behavioral dispositions with negative parenting responses might thus entail increased risk for children's later behavior and interpersonal problems, whereas positive parenting practices have the means to buffer such detrimental pathways (e.g., Bates & Pettit, 2007; Kim & Kochanska, 2012; Kochanska & Kim, 2013; Thomas & Chess, 1977). To our knowledge, few previous studies have investigated the role of parenting practices on agreeableness development from childhood to adolescence. Hence, another aim of this study was to examine the potential moderating effects of parenting behaviors on the path from child difficultness in early childhood to self-regulation in late childhood, and on the path from childhood difficultness to agreeableness in adolescence.

In addition to exerting direct moderating effects on child development, parenting behaviors might also have implicit effects on children's emerging personality in terms of moderating indirect developmental paths. Research involving moderated mediation analyses has illustrated how mediation effects might exist under some conditions but not others. That is, indirect effects might depend on different levels of a moderator variable. For instance, a study examining the mediating effects of peer victimization on the relationship between fearful temperament and child anxiety showed that this indirect effect was significant only at low levels of nurturing parenting, but that high levels of nurturing parenting could buffer the negative outcomes of this indirect effect (Affrunti, Geronimi, & Woodruff-Borden, 2014). Similarly, it is plausible to assume that the mediating effect of regulatory capacities on the path between difficultness and agreeableness might depend on various levels of positive and negative parenting behaviors.

To our knowledge, only one previous study has examined personality development in childhood from such a conditional process perspective. A study examining the prospective links between temperamental fearfulness at age 2 and social withdrawal at age 5 showed that protective parenting mediated this link, but that the mediation effect only held at high levels of maternal vigilance (Kiel & Buss, 2011). Thus, a final aim of our study was to examine if the indirect effect of childhood difficultness on adolescent agreeableness through regulation in late childhood would hold under some parenting conditions but not others.

1.4. The present study

Based on the existing literature, our goal was to examine factors involved in the development of agreeableness. First, we hypothesized that low levels of childhood difficultness in the preschool years would be a significant precursor to high agreeableness in adolescence (H1). Second, we anticipated that difficultness in the preschool years would be positively related to regulation deficiencies in middle childhood, and that such regulatory

deficiencies would be negatively related to agreeableness. Moreover, we hypothesized that emotional and behavioral regulation in late childhood would account for the relationship between childhood difficultness and adolescent agreeableness (H2). Third, we hypothesized that parenting behaviors would moderate the relationship between difficultness in preschool age and agreeableness in adolescence, as well as the longitudinal relationship between difficultness and emotion regulation in late childhood (H3). More specifically, we hypothesized that the relation between childhood difficultness and agreeableness in adolescence would be weaker as mothers displayed higher levels of positive parenting behaviors (e.g., warmth, reasoning), and stronger with higher levels of maternal punitive practices. Similarly, we hypothesized that the relation between childhood difficultness and emotion regulation in late childhood would be weaker as mothers displayed higher levels of positive parenting and stronger with increased levels of maternal punishment. Finally, we hypothesized that the longitudinal indirect path from difficultness to agreeableness, through self-regulation, would depend upon conditional values of the various parenting behaviors (H4). More specifically, we expected that high levels on the positive parenting dimensions reasoning and warmth would act as buffers and thus reduce the negative effects of difficultness on low agreeableness via poor regulation. In a similar vein, we expected that negative parenting practices as represented by high levels of punishment could aggravate the difficultness–low agreeableness association.

2. Methods

2.1. Participants and procedure

In this study, we use data from the Tracking Opportunities and Problems (TOPP) Study from the Norwegian Institute of Public Health involving 8 waves of data collection from the children were aged 1.5 years to 18.5 years. All families from 19 health care areas in eastern Norway that visited a public health clinic in 1993 for the scheduled 18 month

vaccination visit were invited to complete a questionnaire about the child's emotional and social development and their social and local environment. The families who responded at the initial data collection received a similar questionnaire when the children were 2.5 years, 4.5 years, 8.5 years, 12.5 years, 14.5 years, 16.5 years and 18.5 years old. Health care workers administered the questionnaires at ages 1.5 to 4.5 years. At subsequent waves, questionnaires for parents and children were sent by mail. Mothers reported on their children on all waves and children provided self-report from age 12.5 and onward. Of the 1,081 eligible families, 965 (89%) participated at baseline. The participation figures for mothers at the subsequent waves were as follows; age 2.5: n=804 (86% of those participating at the first data collection); age 4.5: n=760 (81%); age 8.5: n= 535 (57%); age 12.5: n=610 (65%); age 14.5: n = 474 (52%); age 16.5: n= 421 (46%); age 18.5: n= 522 (57%). Participation among adolescents were; at age 12.5: n=566 (61%); age 14.5: 458 (50%); age 16.5: 375 (41%); age 18.5: 538 (44%). Data from age 1.5 to age 12.5, and at age 16.5 will be used in this study, insofar as the outcome variable was measured at age 16.5, but not at age 18.5. The 19 health care areas were chosen on the basis of being overall representative of the diversity of social environments in Norway: 28% of the families lived in large cities, 55% lived in densely populated areas, and 17% lived in rural areas. The sample was predominantly ethnic Norwegian families from the middle class. Sex of children was evenly divided (boys: N = 474, girls: N = 486 at age 1.5). Maternal age ranged from 19 to 46 years at the first data collection, with a mean of 30 years (SD = 4.7). Of all mothers, 23.6% had 11 years schooling or less, 46.8% had between 12 and 15 years of schooling, and 27.1% had a college or university education of 4 years or more. In all, 53.5% of the mothers worked full time outside the home, and 75.1% reported that they were doing well economically.

2.2. Measures

Child difficultness was measured by 6 items from the Behavioral Check List (BCL; Richman & Graham, 1971) at the first three data waves (age 1.5, 2.5 and 4.5 years). In general, the BCL measures problems related to the child's behavior and adjustment to family life, and it is used to indicate the level of challenge and degree of manageability that children present to their parents. The scale captures poor attentional and regulatory capacity as well as oppositional, non-compliant, irritable, and overactive behaviors. The mothers were asked to choose which description, out of three options, that best described their child over the past 4 weeks. For instance, the response options for one of the items assessed ranged from “The child is usually happy and content” to “The child is often irritable and upset”. Each item was rated from 0 (*no difficulties*) to 2 (*definitive difficulties*) and mean scores were computed. The BCL has been shown to be a valid and reliable instrument for detecting behavior difficulties on the basis of parental information about home behavior (McGuire & Richman, 1986b). α coefficients were .48, .53, and .48 at age 1.5, 2.5, and 4.5, respectively. The difficultness scale is a formative index, comprising many different behavioural categories. Hence, although the internal reliability of the difficultness measures are rather low, such a multifaceted index would not be expected to demonstrate high levels of internal consistency, given the diversity of aspects that are covered.

Emotional and behavioral regulation was assessed at age 12.5 by two measures. *Self-control* was measured by the 6-item Self-Control subscale of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), using a 4-point response scale ranging from 1 = *Never* to 4 = *Very often*. The SSRS Self-control scale is indicative of regulatory social skills and measures behaviors that emerge in challenging social situations and interactions, including the extent to which children are able to inhibit negative and angry responses in conflictual situations with parents and peers, and whether they are able to apply polite and socially

appropriate responses when they interact with others. Sample items of the self-control scale include “I disagree with adults without fighting or arguing”, and “I control my temper when other people are angry with me”. *Temperamental reactivity* was measured by the 5-item Reactivity subscale of the School-Age Temperament Inventory (SATI; McClowry, 1995), using response options ranging from 1 = *Not typical* to 5 = *Very typical*. The Reactivity scale measures the intensity and frequency to which children express negative affect in social settings and interactions, including the extent to which they respond with anger and frustration when they face challenging situations or critique (McClowry, Halverson, & Sanson, 2003). Sample items include “I respond intensely to disapproval”, and “when angry, I yell or snap at others”. Previous research has yielded satisfactory reliability estimates for the SSRS, the SATI, and their sub-scales (Fagan & Fantuzzo, 1999; McClowry et al., 2003). In this study, Cronbach’s α for self-control and reactivity were .70 and .60, respectively.

Parenting practices were measured at age 8.5 by the subscales Reasoning, Warmth, and Punishment from the Child Rearing Questionnaire (CRQ; Paterson & Sanson, 1999). The Warmth and Reasoning subscales included ten items each, whereas the Punishment subscale was measured by five items, with response options ranging from 1 = *Never* to 5 = *Always*. The Reasoning dimension reflects parents’ tendency to explain and discuss with their children reasons for rules and limitations (e.g., “I explain to my child the consequences of his/her behavior”), whereas the Warmth dimension reflects positive emotional tone in parent-child interactions and parental affection and care (e.g., “I often hug or embrace my child for no particular reason”). The Punishment dimension reflects the degree to which parents expect their children to be compliant as well as the extent to which parents respond to disobedience and non-compliance with punitive practices (e.g., “I remove privileges when the child misbehaves”). All parenting subscales have well-established psychometric properties and have previously shown to have satisfactory reliability (Locke & Prinz, 2002; Paterson &

Sanson, 1999). Cronbach's α for Reasoning, Warmth, and Punishment were .70, .81, and .61, respectively.

Agreeableness among adolescents was measured at age 16.5 by the 9-item Agreeableness scale from the Big Five Inventory (John & Srivastava, 1999). The BFI Agreeableness scale comprises items consisting of short phrases based on adjectives associated with this personality factor, for instance, "is helpful and unselfish with others". The scale is indicative of compliant, altruistic, polite, and considerate behavioral tendencies and predispositions. The adolescents rated the degree to which they agreed or disagreed with each of the statements on a Likert scale ranging from 1 = *Disagree strongly* to 7 = *Agree strongly*. The BFI scale has previously yielded satisfactory psychometric properties with respect to factor structure, validity, and reliability (Jensen-Campbell, Knack, Waldrip, & Campbell, 2007; Rammstedt & John, 2007). Internal consistency for the agreeableness scale was satisfactory ($\alpha = .75$).

Covariates included child gender and socioeconomic status (SES). SES was a composite of mother's education level and the family's financial status. Because the association between parenting and child personality may be due to the genetic similarity of parent and offspring (Scarr, 1992), we also included mother's self-reported agreeableness scores as a covariate. We thus ensured that associations between child personality factors and parenting not just reflected underlying genetic factors influencing the behavior of both parents and children (Putnam et al., 2005). Mother's agreeableness was measured when their children were 16.5 years by the 9 item Agreeableness scale from the BFI (John & Srivastava, 1999). Internal consistency for mother's agreeableness was $\alpha = .78$.

2.3. Statistical analyses

Analyses in the framework of structural equation modeling were conducted, using the statistical program Mplus version 7.3 (Muthén & Muthén, 2012). Robust maximum likelihood

estimations were employed to account for non-normality. Missing data was handled by the full information maximum likelihood procedure. We tested our hypotheses in several steps. In all analyses we applied the bootstrapping method (N = 5,000) with bias corrected confidence intervals reported as recommended by Hayes (2009, 2015).

First, we examined the direct association between childhood difficultness in the preschool years and agreeableness (H1) by using path analyses. Second, we examined two separate mediation models with two indicators of self-regulation (temperamental reactivity and self-control, respectively) as putative mediators (H2), again applying path analyses. Mediation was primarily tested by estimating the indirect paths and its confidence intervals between childhood difficultness and agreeableness, by using bootstrapping (Hayes, 2009). We also report results following Baron and Kenny's (1986) classical steps for assessing mediation, because this approach is considered to provide instructive additional information for the interpretation of mediation (von Soest & Hagtvet, 2011). Third, we tested whether parenting moderated associations of childhood difficultness with agreeableness (H3). For this purpose, childhood difficulties, an indicator of parenting, and the product term of these variables were included simultaneously as predictors of agreeableness in a path-analytical framework. The same procedure was applied to test other interaction effects. As recommended, we mean centered the predictor and moderator variables (Hayes & Preacher, 2013). Significant moderation effects were presented graphically based on the regression equations of the interaction, as suggested by Aiken and West (1991). Fourth, moderated mediation models were tested (H4), otherwise referred to as conditional process modelling (Hayes, 2013). Moderated mediation occurs when the strength of an indirect effect depends on the level of a moderator (Preacher, Rucker, & Hayes, 2007). We applied the path analytic framework for estimating effects in models that include both moderation and mediation as described by Hayes (2015).

We evaluated model fit by the Satorra-Bentler scaled chi-square (Bryant & Satorra, 2012; Satorra & Bentler, 1994), the Root Mean Square Error of Approximation (RMSEA), and the comparative fit index (CFI). CFI values of at least .95 and RMSEA values of .06 or less are indicative of good fit (Hu & Bentler, 1999).

3. Results

3.1. Descriptive statistics

Table 1 presents descriptive statistics and intercorrelations for all variables. The table shows no significant relationships between childhood difficultness at age 1.5 and agreeableness at age 16.5, whereas childhood difficultness at age 2.5 and age 4.5 were significantly negatively associated with agreeableness ($r = -.10$, and $-.14$, respectively, $p < .05$). Temperamental reactivity at age 12.5 was positively associated with childhood difficultness at all three time points, whereas self-control at age 12.5 was only related to childhood difficultness at 4.5 years ($r = -.10$, $p < .05$), but not at 2.5 and 1.5 years. Moreover, agreeableness at age 16.5 was negatively related to temperamental reactivity at age 12.5 ($r = -.26$, $p < .01$) and positively related to self-control at age 12.5 ($r = .24$, $p < .01$). Self-control and temperamental reactivity at age 12.5 were negatively associated ($r = -.34$, $p < .01$). Furthermore, childhood difficultness and temperamental reactivity were positively related with punitive practices and negatively related with positive parenting behaviors at age 8.5. Indicators of social competence (self-control) at age 12.5 were positively associated with parental reasoning ($r = .10$, $p < .05$), but not with warmth or punishment at age 8.5. None of the three parenting dimensions were significantly correlated with children's agreeableness.

3.2. Tests of direct and mediating effects

Path analyses were conducted to examine whether difficultness in preschool years was a significant predictor of agreeableness (H1). As indicated by path c in Figure 1, results revealed that difficultness at 4.5 years was significantly related to agreeableness at 16.5 years,

$\beta = -.12$, [95% CI; -0.24, -0.02], controlling for gender, SES, and mother's agreeableness. However, difficultness at 1.5 and 2.5 years were not significantly related to agreeableness ($p > .05$; not shown in Figure 1). We only included the difficultness measure at age 4.5 in the subsequent analyses, insofar as the links between agreeableness and difficultness at age 1.5 and age 2.5 were deemed non/significant.

Having established the total effect of the predictor on agreeableness (the c path) we proceeded with the remaining traditional steps for mediation analyses (Baron & Kenny, 1986), by estimating the paths between predictor and mediator (path a), and between mediator and outcome while simultaneously controlling for childhood difficultness (path b). Controlling for mother's agreeableness, gender, and SES, the analyses revealed that childhood difficultness at age 4.5 was significantly related to the mediators self-control at age 12.5, $\beta = -.11$, [95% CI; -0.20, -0.01], and temperamental reactivity at age 12.5, $\beta = .20$ [95% CI; 0.11, 0.28]. Controlling for difficultness at age 4.5 along with mother agreeableness, gender and SES, analyses revealed that both self-control, $\beta = .23$, [95% CI; 0.17, 0.48], and reactivity, $\beta = -.25$, [95% CI; -0.50, -0.17] at 12.5 years were found to be significantly related to agreeableness at age 16.5.

As a final test of mediation, we assessed the indirect effects and its confidence intervals from childhood difficultness to agreeableness through self-control and temperamental reactivity, respectively (H2), using bootstrapping. Results showed a significant indirect relationship from childhood difficultness via reactivity to agreeableness ($\beta = -.05$, [95% CI; -0.08, -0.02]; see Figure 1, Model A), whereas childhood difficultness at 4.5 years was no longer significantly related to agreeableness at 16.5 years ($\beta = -.08$, $p > .05$). In Model B, self-control at 12.5 years was also found to mediate the relationship between difficultness and agreeableness (indirect effect: $\beta = -.03$, [95% CI; -0.05, -0.001]; see Figure 1, Model B).

In this model, however, difficultness remained a significant predictor of agreeableness ($\beta = -.10, p < .05$) even when self-control was included in the analyses.

3.3. Testing moderation effects of parenting on each of the paths

In a next step, we performed several moderation analyses. In these analyses, the predictor and potential moderator variable were included in path analyses as predictors together with their interaction term to predict the outcome. With respect to agreeableness, none of the parenting dimensions reasoning, warmth, or punishment at age 8.5 significantly moderated the relationship between the difficultness at age 4.5 and agreeableness at age 16.5 (all $p > .05$).

When examining potential moderator effects of the relationship between difficultness and reactivity, no significant interaction effects were found for parental warmth and reasoning; however, parental punishment at age 8.5 was found to significantly moderate the relationship between difficultness and temperamental reactivity; $\beta = .10, [95\% \text{ CI}; 0.01, 0.86]$. This moderating effect is depicted in Figure 2.

As displayed in Figure 2, the size of the association between childhood difficultness and temperamental reactivity varied according to different levels of punitive parenting. That is, the effect of difficultness on reactivity was significant at high levels of punitive parenting but not at low levels of punitive parenting.

Finally, none of the three parenting factors were found to moderate the relationship between difficultness at 4.5 years and self-control at 12.5 years ($p > .05$).

3.4. Tests of moderated mediation

Insofar as mediation effects of temperamental reactivity and self-control on the relationship between childhood difficultness and agreeableness were established in the previous steps, we proceeded to test whether the strength of the indirect effects could be conditional on the value of parenting behaviors. Although most of the moderation effects in

the previous step were deemed non-significant, this does not automatically entail that the impact of parenting on the indirect effect is non-existent (Hayes, 2015). Accordingly, a more formalized test of moderated mediation was performed.

Figure 3 depicts a path diagram representing the moderated mediation model in its statistical form. As shown in the Figure, the indirect effect of the predictor (X) on the outcome variable (Y) through the mediator (M) is a linear function of the moderator (W). The weight for the moderator in this function, a_3b_1 , represents the index of moderated mediation for this model. More specifically, this index is formed by multiplying the regression coefficients corresponding to the a_3 and b_1 paths seen in Figure 3. Thus, we created the moderated mediation index (Index MMa_3b_1) by quantifying the relationship between the moderator and the size of the indirect effect. The moderated mediation index reflects the change in the indirect effect for a unit change in the moderator. If this index is significant (i.e., the 95% CI's do not include zero), then this indicates that the indirect effect depends on conditional values of the moderator.

We estimated several moderated mediation models involving each of the three parenting behaviors on each of the two mediation models. In all models we controlled for the covariates gender, mother's agreeableness, and SES. Results are presented in Table 2 which presents the estimates and confidence intervals for the model parameters involving the direct, indirect, as well as the moderated and moderated mediation estimates for the variables difficulty at 4.5 years (X), parenting practices at 8.5 years (W), regulation at 12.5 years (M), and agreeableness at 16.5 years (Y). With respect to the indirect effect from difficulty to agreeableness through the mediator self-control, no moderated mediation effect of parenting factors were found, hence, we do not report on these non-significant estimates in the table.

As Model 1 and Model 2 in Table 2 show, parental warmth and reasoning at age 8.5 were not found to significantly moderate the indirect path from difficultness in preschool to agreeableness in adolescence through reactivity in late childhood, in that the confidence intervals for the moderated mediation indexes for each of these two models included zero. As Model 3 in Table 2 shows, maternal punishment was the only variable that significantly moderated the indirect effect between difficultness and agreeableness through temperamental reactivity, insofar as the confidence interval of this particular index did not include zero (Moderated Mediation Index = $-.12$, 95% CI; $-0.32, -0.01$). More specifically, the indirect effect of temperamental reactivity in the relation between childhood difficultness and agreeableness in adolescence was significant only at high levels of punitive parenting. Hence, results showed that the indirect effect of difficultness on agreeableness through reactivity in our sample depended on specific levels of negative parenting behaviors.

To obtain more knowledge about the nature of the moderated mediation effect of parental punishment on the indirect path from difficultness to Agreeableness via reactivity, we proceeded with follow-up analyses by estimating the moderated mediation effect at different values of the moderator (i.e., at mean, ± 1 and 2 standard deviations). Results in Table 3 show that the relation between childhood difficultness and agreeableness through temperamental reactivity was significant only when mothers reported average or high levels of punishment (i.e., at the mean value or 1 or 2 standard deviations above the mean). However, for parents with low levels of punishment (i.e., minus 1 and 2 standard deviations below the mean), no such mediation effect was found, as the indirect effect was not significant (i.e., the 95% CI included 0). In other words, the mediation depended on high levels of maternal punitive practices.

4. Discussion

In this study, our main goals were to assess the relationship between childhood difficultness in preschool years and agreeableness in adolescence, how this relationship was mediated through social regulation mechanisms in middle childhood, and if parenting behaviors would moderate these indirect and direct paths. We found support for most of our hypotheses. Our first hypothesis, that agreeableness is predicted by individual differences in difficultness in early childhood was partially supported, in that indices of child difficultness at 4.5 years, but not at 1.5 and 2.5 years, were found to significantly predict agreeableness in adolescence. Moreover, we found support for our second hypothesis, in that both temperamental reactivity and self-control mediated the difficultness-agreeableness link. However, concerning the third hypothesis, we only found support for one moderation effect in that punitive parenting behaviors were found to affect the path between preschool difficultness and temperamental reactivity in late childhood. More specifically, the path from difficultness at age 4.5 to temperamental reactivity at age 12.5 only held at high levels of punitive parenting but not at low levels. None of the parenting dimensions were found to moderate the path between preschool difficultness and self-control in late childhood or between preschool difficultness and agreeableness in adolescence. Concerning hypothesis 4, punitive parenting behaviors did not only moderate the difficultness-reactivity path, but was further found to moderate the overall indirect path from preschool difficultness via regulatory capacities in late childhood to agreeableness in adolescence. More specifically, this indirect effect was significant only when levels of maternal punishment were moderate to high. We elaborate on our results and their potential implications in the next sections.

4.1. Childhood precursors of agreeableness

Our finding that difficultness at 4.5 years was a significant predecessor of agreeableness is in accordance with our expectations, as well as with the consensus view, that agreeableness is preceded by challenging child characteristics (Graziano, 1994). This result is

in line with previous findings indicating that aggressive, irritable, non-compliant, and out of control behaviors in childhood are significant precursors of low-agreeable tendencies in adulthood (Caspi et al., 2003; Caspi & Silva, 1995; Laursen et al., 2002). Our result thus provides evidence that children's early-emerging behavioral styles to some degree predict personality in adolescence.

Although the longitudinal associations reported in our study are small in size, they are nevertheless striking in that they span across 13 years. The results from our study affirm previous studies by supporting the assumption that disagreeable tendencies seem to partially emerge from poor emotional and behavioral regulation, which are manifested in childhood as unmanageable, non-compliant, irritable, moody, and impulsive characteristics (see also, Caspi, 1998; Rothbart & Ahadi, 1994).

We did not find any significant relationships between agreeableness and childhood difficulty prior to age 4. One possible explanation of these non-findings may be related to the notion that several problem behaviors are developmentally normative before the age of 3 due to general socio-cognitive immaturity (Buss & Plomin, 1984; Mathiesen & Sanson, 2000; McGuire & Richman, 1986a). More specifically, it might be difficult to separate inherent disagreeable tendencies from normative processes this early in development. Nevertheless, the stability of child difficulty was found to be substantial from age 1.5 to age 4.5, indicating that there is some degree of continuity over time for challenging child behaviors during the earliest years. This, in turn, might indicate that early signs of trait agreeableness are actually present even at the earliest stages of development, although we failed to find such long-term links in our sample.

4.2. The mediating role of emotional and behavioral regulation

Our second hypothesis, that emotional and behavioral regulation in late childhood would mediate the difficulty-agreeableness path was supported in that both temperamental

reactivity and social self-control skills were found to account for the childhood difficultness-adolescence agreeableness link. These results are in line with previous research linking self-control mechanisms with emotion regulation and emotion expressivity (e.g., Kochanska et al., 2000; Vroman & Durbin, 2015). They are also supporting previous findings demonstrating concurrent as well as predictive associations between regulation and agreeableness (Laursen et al., 2002; Sneed, 2002). Moreover, our results adhere to theoretical frameworks postulating that self-regulation capacities are representative of a temperament system that emerges during the first years of life, that becomes increasingly coherent over time, and which ultimately evolves into personality characteristics (Ahadi & Rothbart, 1994; Kochanska et al., 2000; Kochanska, Murray, Jacques, Koenig, & Vandegest, 1996; Rothbart & Bates, 1998; Shiner & Caspi, 2003). They could also be suggestive of the presence of elaborative developmental processes at work over time (see Patterson, Reid, & Dishion, 1998). Thus, our results point to continuity in personality over time. Our findings thereby add to the existing literature on personality development by implying that self-regulation in childhood might constitute an important driving mechanism behind the development of agreeableness.

Our analyses showed significant relations between childhood difficultness in preschool years and the measures of emotional and behavioral regulation in late childhood. This was no surprise, given that these three concepts all include behavioral tendencies representative of a more general, underlying regulatory capacity. However, the relations were rather modest in nature, which could indicate that dispositional regulation is not very stable during the childhood years. The modest relations could also indicate a conceptual distinction between these three measures of regulation. Whereas the reactivity and self-control measures at age 12.5 represent more narrow and fine-tuned regulation capacities that specifically pertain to interpersonal contexts, the difficultness measure is more global in scope and refer more generally to indices of behavioral problems in childhood by comprising a broader set of

behaviors, including activity level and concentration. As such, these three measures representative of behavioral and emotional regulation are not entirely overlapping concepts. However, obtaining complete conceptual overlap in the quest for identifying and measuring one and the same latent disposition during the childhood and adolescent years is a challenging task due to children's accelerating social, physical, and cognitive development with increasing age (see De Pauw & Mervielde, 2010; De Pauw et al., 2009).

4.3. Parenting as moderator of direct developmental paths

Our third hypothesis concerning moderating effects of parenting behaviors on personality development was only supported to some degree. None of the parenting behaviors showed any main effects on agreeableness, or any moderating effects on the path between difficultness and agreeableness. Such observations are in line with findings in the clinical literature demonstrating that temperament characteristics in childhood might exert direct effects on subsequent internalizing and externalizing problems, irrespective of parenting practices (Affrunti et al., 2014; O'Connor & Dvorak, 2001). On the other hand, these results are contrary to findings demonstrating that phenotypic stability of agreeableness is accounted for by environmental effects (Spengler, Gottschling, & Spinath, 2012).

By examining moderator effects on the path from difficultness to temperamental reactivity and self-control, we found one significant moderation effect in that parental punishment significantly moderated the difficultness-reactivity path. More specifically, our results indicated that childhood difficultness at age 4.5 was related to higher levels of temperamental reactivity at age 12.5, but that this was only the case for difficult children whose parents exhibited negative parenting practices. Low levels of parental punishment, however, seemed to buffer the path to reactivity among difficult children. These findings are in line with previous findings in the clinical literature which has reported significant moderating effects of parenting practices on developmental paths from negative behavioral

tendencies in childhood to externalizing behavior problems (e.g., Van Leeuwen, Mervielde, Braet, & Bosmans, 2004). Our results are also supporting goodness-of-fit models and cascade models which highlight the importance of considering compatibility between children and their social environment in predicting developmental outcomes (Lerner & Lerner, 1983; Patterson et al., 1998; Thomas & Chess, 1977).

4.4. Parenting as moderators of indirect developmental paths

The moderating effect of parental punishment on the relationship between difficultness and reactivity was further found to extend into our conditional indirect effect models. More specifically, our results showed that the indirect effect from difficultness to agreeableness through temperamental reactivity only held for children whose parents employed average to high levels of negative parenting practices. This is suggestive of a process in which non-compliant, impulsive, and highly reactive children might respond to parental coercive behavior in more antagonistic ways than other children (Belsky, Hsieh, & Crnic, 1998). Children who are met with coercive and aversive parenting behaviors, perhaps in terms of anger and yelling, may thereby come to adopt and internalize a hostile, antagonistic, and under-regulated interpersonal style, that in turn might maintain and even exacerbate such unfriendly behavioral tendencies which ultimately might manifest as low agreeableness.

These findings suggest that parent behaviors and child contributions to development of agreeableness are somehow interdependent, and are suggestive of the presence of both child-driven elicitation processes, as well as parent-driven shaping process. Such parent-child processes might also have clinical implications; children with difficult temperaments, and poor regulation skills who have parents that manage to refrain from applying harsh disciplinary practices might be less likely to develop disagreeableness tendencies as well as externalizing behavior problems later in development (see Duncombe, Havighurst, Holland, & Frankling, 2012; Havighurst, Harley, & Prior, 2004; Havighurst et al., 2012). As such, our

results suggest that preventive action should be aimed at parenting practices early in development. However, it is worth mentioning that effects of parenting were rather modest in nature compared to the effects of child factors, indicating that parenting effects might solely represent one of an infinite list of environmental factors that could potentially affect the ebb and flow of personality development, stability, and change over time (Lewis, 2001).

Contrary to our expectations, none of the positive parenting practices were found to buffer the negative indirect effects from preschool difficultness to adolescence agreeableness. This was somehow surprising, in that a large body of research has generally pointed to the stronger role of positive parenting versus negative parenting practices in fostering children's development of prosocial behavior (e.g., Hastings, McShane, Parker, & Ladha, 2007). Yet, not all parenting practices might always exert pronounced effects, even in the case of moderated relationships (see, O'Connor & Dvorak, 2001). For instance, clinical studies have demonstrated that positive parenting have little to no impact on paths to externalizing problems among low-agreeable children, but that negative parenting practices may have detrimental effects on low-agreeable children in terms of elevated externalizing problems (Van Leeuwen et al., 2004). In similar terms, we found that positive parenting had no effect in terms of redirecting negative indirect paths from difficultness to disagreeableness, but that negative parenting behaviors might exacerbate a negative path with respect to development of agreeableness.

4.5. Limitations

Our longitudinal study entails several advantages with respect to assessing personality development. First, our data material comprises measurements from as early as 1.5 years and spans across 15 years. Second, the relatively large sample size enables adequate statistical power in our analyses. Third, our study included both mother reports on child behavior and self-reports from children in adolescence. We thereby avoided that relationships were

spurious due to shared method variance. Despite these advantages, our study has some limitations. The low Cronbach α of the difficultness measures could pose a problem. Their mean inter-item correlations were relatively low spread, however, ranging from .13 to .16. Regarding that only one item covered each behavioural category of the global index of difficult tendencies, these levels of the inter-item correlations may be seen as acceptable. However, the implication of such low internal consistency may entail that the relations between the variables are under-estimated. Besides, few items might limit generalization attempts, and also limit the possibility of an examination of convergent and discriminant validity. At the early ages of 1.5, 2.5 and 4.5 it would be preferable to apply a more unidimensional measure of under-regulated and (dis)agreeable tendencies. Hence, a measure with enough items representing a more fine-tuned regulation term reflective of the adult agreeableness dimension at the various ages could shed light on more specific precursors of agreeableness. A related limitation is that the longitudinal pathway to agreeableness from preschool to adolescence is based on different, though conceptually related measures. Our measures are nonetheless developmentally appropriate and age-specific.

As with any longitudinal investigation, our study was affected by attrition. However, models were estimated by using the full information maximum likelihood estimator, which allows for the inclusion of participants' partial longitudinal data.

Finally, despite using longitudinal data and controlling for relevant covariates, the results of this study may not be interpreted in causal terms, as our study is non-experimental in nature. Unmeasured covariates may thus be alternative explanations of the longitudinal associations found in this study.

6. Conclusion

Our study contributes to enhanced knowledge concerning the antecedents of agreeableness in several respects. First, we demonstrate that precursors of adolescent

agreeableness are apparent already early in life. This is in line with studies which have documented considerable continuity of personality across longer periods of time (see, Caspi & Roberts, 2001). Second, we show that links between early behavioral tendencies and personality traits are mediated by conceptually related behavioral characteristics in late childhood. In essence, our study points to the presence of personality coherence over time, insofar as all the child variables involved at different developmental periods were found to necessitate the workings of regulatory mechanisms. Although our study illustrates that there is some degree of continuity over time, our results also indicate that personality, and particularly regulatory capacities, show less stability during the childhood years than at later ages (see Roberts & DelVecchio, 2000; Soto & Tackett, 2015). Third, we demonstrated that parenting factors can impose specific, although not necessarily direct effects, on personality development, in terms of moderating otherwise predestined negative pathways from childhood through adolescence. Hence, our results contribute to the literature on personality development by not only supporting the hypothesis that agreeableness is preceded by childhood difficultness and regulation problems, but also by showing that this might only be the case under conditions of negative parental practices. Our study thereby demonstrates the importance of examining personality development within a broader and ecological scope in terms of incorporating both internal as well as external factors in analyses, at least with respect to the agreeableness dimension. However, future studies should investigate whether other positive parental practices besides the warm and reasoning dimensions might have moderating impact on personality development from early childhood through adolescence. Other studies should also examine whether it is possible to predict adolescent and adult agreeableness from individual differences measured before the age of 4. Another important venture for future research is to address the question of whether the agreeableness factor comprises opposite bipolar terms on a single continuum, or if the two poles should rather be

understood as separate systems with different antecedents and developmental trajectories (Graziano, 1994).

The current study underscores the importance of studying personality development in terms of mediational mechanisms, as well as conditional processes. Future studies should aspire to specify conceptual models that include both indirect as well as conditional indirect effects. Such knowledge could lead to greater predictive power and enhanced specificity with respect to developmental antecedents and mechanisms behind the development of Agreeableness.

References

- Abe, J. A. A. (2005). The predictive validity of the Five-Factor Model of personality with preschool age children: A nine year follow-up study. *Journal of Research in Personality, 39*, 423-442. doi:10.1016/j.jrp.2004.05.002
- Abe, J. A. A., & Izard, C. E. (1999). A longitudinal study of emotion expression and personality relations in early development. *Journal of Personality and Social Psychology, 77*, 566-577. doi:10.1037/0022-3514.77.3.566
- Affrunti, N. W., Geronimi, E. M. C., & Woodruff-Borden, J. (2014). Temperament, peer victimization, and nurturing parenting in child anxiety: A moderated mediation model. *Child Psychiatry and Human Development, 45*, 483-492. doi:10.1007/s10578-013-0418-2
- Ahadi, S. A., & Rothbart, M. K. (1994). Temperament, development, and the Big Five. In C. F. Halverson, G. A. Kohnstamm & R. P. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood* (pp. 189- 207). Hillsdale: NJ: Lawrence.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. London: Sage.
- Ainsworth, M. S., & Bowlby, J. (1991). An ethological approach to personality development. *American Psychologist, 46*, 333-341. doi:10.1037/0003-066X.46.4.333
- Arnold, D. S., O'Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment, 5*, 137-144. doi:10.1037/1040-3590.5.2.137
- Bates, J. E. (1980). The concept of difficult temperament *Merrill-Palmer Quarterly of Behavior and Development, 26*, 299-319. doi:10.2307/23084040
- Bates, J. E. (1986). The measurement of temperament. In R. Plomin & J. Dunn (Eds.), *The study of temperament: Changes, continuities and challenges* (pp. 1-12). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Bates, J. E., & Pettit, G. S. (2007). Temperament, Parenting, and Socialization. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research* (pp. 153-177). New York, NY, US: Guilford Press.
- Baumrind, D. (1978). Parental disciplinary patterns and social competence in children. *Youth & Society, 9*, 239-267. doi:10.1177/0044118x7800900302
- Baumrind, D. (1989). Rearing competent children. In W. Damon (Ed.), *Child development today and tomorrow* (pp. 349-378). San Francisco, CA, US: Jossey-Bass.
- Belsky, J., Hsieh, K.-H., & Crnic, K. (1998). Mothering, fathering, and infant negativity as antecedents of boys' externalizing problems and inhibition at age 3 years: Differential susceptibility to rearing experience? *Development and Psychopathology, 10*, 301-319. doi:doi:null
- Bergeman, C. S., Chlpuer, H. M., Plomin, R., Pedersen, N. L., McClearn, G. E., Nesselroade, J. R., . . . McCrae, R. R. (1993). Genetic and environmental effects on openness to experience, agreeableness, and conscientiousness: An adoption/twin study. *Journal of Personality, 61*, 159-179. doi:10.1111/j.1467-6494.1993.tb01030.x
- Bowlby, J. (1969). *Attachment and loss : 1 : Attachment*. New York: Basic Books.
- Bretherton, I. (2005). In pursuit of the internal working model construct and its relevance to attachment relationships. In K. E. Grossmann, K. Grossmann & E. Waters (Eds.), *Attachment from infancy to adulthood: The major longitudinal studies* (pp. 13-47). New York, NY, US: Guilford Publications.
- Bryant, F. B., & Satorra, A. (2012). Principles and practice of scaled difference chi-square testing. *Structural Equation Modeling: A Multidisciplinary Journal, 19*, 372-398. doi:10.1080/10705511.2012.687671
- Buss, A. H., & Plomin, R. (1984). *Temperament: Early developing personality traits*. Hillsdale, NJ: Erlbaum.

- Calkins, S. D., & Dedmon, S. E. (2000). Physiological and behavioral regulation in two-year-old children with aggressive/destructive behavior problems. *Journal of Abnormal Child Psychology*, *28*, 103-118. doi:10.1023/A:1005112912906
- Calkins, S. D., Dedmon, S. E., Gill, K. L., Lomax, L. E., & Johnson, L. M. (2002). Frustration in infancy: Implications for emotion regulation, physiological processes, and temperament. *Infancy*, *3*, 175-197. doi:10.1207/S15327078IN0302_4
- Caspi, A. (1998). Personality development across the life course. In W. Damon (Ed.), *Handbook of child psychology, 5th ed.: Vol 3. Social, emotional, and personality development* (pp. 311-388). Hoboken, NJ, US: John Wiley & Sons Inc.
- Caspi, A., Harrington, H. L., 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*, 495-514. doi:10.1111/1467-6494.7104001
- Caspi, A., & Roberts, B. W. (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry*, *12*, 49-66. doi:10.1207/S15327965pli1202_01
- Caspi, A., & Shiner, R. L. (2006). Personality development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology. Social, emotional, and personality development*. (6 ed., Vol. 3, pp. 300-365). New York: Wiley.
- Caspi, A., & Silva, P. A. (1995). Temperamental qualities at age three predict personality traits in young adulthood: longitudinal evidence from a birth cohort. *Child Development*, *66*, 486-498. doi:10.1111/j.1467-8624.1995.tb00885.x
- Crick, N. R., Ostrov, J. M., Appleyard, K., Jansen, E. A., & Casas, J. F. (2004). Relational aggression in early childhood: "You can't come to my birthday party unless...". In M. Putallaz & K. L. Bierman (Eds.), *Aggression, antisocial behavior, and violence among girls. A developmental perspective* (pp. 71-89). New York: Guilford Press.
- Daniel, E., Madigan, S., & Jenkins, J. (2015). Paternal and maternal warmth and the development of prosociality among preschoolers. *Journal of Family Psychology*, No Pagination Specified. doi:10.1037/fam0000120
- De Fruyt, F., & De Clercq, B. (2013). Childhood antecedents of personality disorder: A five-factor model perspective. In T. A. Widiger & P. T. J. Costa (Eds.), *Personality disorders and the five-factor model of personality (3rd ed.)* (pp. 43-60). Washington, DC, US: American Psychological Association.
- De Pauw, S. S. W., & Mervielde, I. (2010). Temperament, personality and developmental psychopathology: A review based on the conceptual dimensions underlying childhood traits. *Child Psychiatry and Human Development*, *41*, 313-329. doi:10.1007/s10578-009-0171-8
- De Pauw, S. S. W., Mervielde, I., & Van Leeuwen, K. G. (2009). How are traits related to problem behavior in preschoolers? Similarities and contrasts between temperament and personality. *Journal of Abnormal Child Psychology*, *37*, 309-325. doi:10.1007/s10802-008-9290-0
- Denissen, J. J. A., van Aken, M. A. G., Penke, L., & Wood, D. (2013). Self-regulation underlies temperament and personality: An integrative developmental framework. *Child Development Perspectives*, *7*, 255-260. doi:10.1111/cdep.12050
- Duncombe, M. E., Havighurst, S. S., Holland, K. A., & Frankling, E. J. (2012). The contribution of parenting practices and parent emotion factors in children at risk for disruptive behavior disorders. *Child Psychiatry & Human Development*, *43*, 715-733. doi:10.1007/s10578-012-0290-5
- Ehrler, D. J., Evans, J. G., & McGhee, R. L. (1999). Extending Big-Five theory into childhood: A preliminary investigation into the relationship between Big-Five personality traits and behavior problems in children. *Psychology in the Schools*, *36*, 451-458. doi:10.1002/(SICI)1520-6807(199911)36:6<451::AID-PITS1>3.0.CO;2-E
- Eisenberg, N., Fabes, R. A., Karbon, M., Murphy, B. C., Wosinski, M., Polazzi, L., . . . Juhnke, C. (1996). The relations of children's dispositional prosocial behavior to emotionality, regulation, and social functioning. *Child Development*, *67*, 974-992. doi:10.1111/j.1467-8624.1996.tb01777.x

- Eisenberg, N., Fabes, R. A., Murphy, B. C., Maszk, P., Smith, M., & Karbon, M. (1995). The role of emotionality and regulation in children's social functioning: A longitudinal study. *Child development, 66*, 1360-1384.
- Fagan, J., & Fantuzzo, J. W. (1999). Multirater congruence on the social skills rating system: mother, father, and teacher assessments of urban head start children's social competencies. *Early Childhood Research Quarterly, 14*, 229-242. doi:10.1016/S0885-2006(99)00010-1
- Fleeson, W., & Jayawickreme, E. (2015). Whole Trait Theory. *Journal of Research in Personality, 56*, 82-92. doi:10.1016/j.jrp.2014.10.009
- Fraley, R. C., Roisman, G. I., & Haltigan, J. D. (2013). The legacy of early experiences in development: Formalizing alternative models of how early experiences are carried forward over time. *Developmental Psychology, 49*, 109-126. doi:10.1037/a0027852
- Gerrard, L., Anastopoulos, A. D., Calkins, S. D., & Shelton, T. L. (2000). *ADHD symptoms and attachment security in young children*.
- Graziano, W. G. (1994). The development of agreeableness as a dimension of personality. In C. F. Halverson, G. A. Kohnstamm & R. P. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood* (pp. 339-354). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Graziano, W. G., & Eisenberg, N. (1997). Agreeableness: A dimension of personality. In R. Hogan, J. A. Johnson & S. R. Briggs (Eds.), *Handbook of personality psychology* (pp. 795-824). San Diego, CA: Academic Press.
- Graziano, W. G., & Tobin, R. M. (2002). Agreeableness: Dimension of personality or social desirability artifact? *Journal of Personality, 70*, 695-728. doi:10.1111/1467-6494.05021
- Graziano, W. G., & Tobin, R. M. (2009). Agreeableness. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 46-61). New York, NY, US: Guilford Press.
- Gresham, F. M., & Elliott, S. N. (1990). *Social skills rating system: Manual*. Circle Pines, MN: American Guidance Service.
- Grusec, J. E., & Davidov, M. (2010). Integrating different perspectives on socialization theory and research: A domain-specific approach. *Child Development, 81*, 687-709. doi:10.1111/j.1467-8624.2010.01426.x
- Hampson, S. E., Goldberg, L. R., Vogt, T. M., & Dubanoski, J. P. (2007). Mechanisms by which childhood personality traits influence adult health status: Educational attainment and healthy behaviors. *Health Psychology, 26*, 121-125. doi:10.1037/0278-6133.26.1.121
- Hastings, P. D., McShane, K. E., Parker, R., & Ladha, F. (2007). Ready to make nice: Parental socialization of young sons' and daughters' prosocial behaviors with peers. *The Journal of Genetic Psychology, 168*, 177-200. doi:10.3200/GNTP.168.2.177-200
- Havighurst, S. S., Harley, A. E., & Prior, M. (2004). Building preschool children's emotional competence: A parenting program. *Early Education and Development, 15*, 423-448. doi:10.1207/s15566935eed1504_5
- Havighurst, S. S., Wilson, K. R., Harley, A. E., Kehoe, C., Efron, D., & Prior, M. R. (2012). "Tuning into Kids": Reducing young children's behavior problems using an emotion coaching parenting program. *Child Psychiatry & Human Development, 44*, 247-264. doi:10.1007/s10578-012-0322-1
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408-420. doi:10.1080/03637750903310360
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.
- Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate Behavioral Research, 50*, 1-22. doi:10.1080/00273171.2014.962683
- Hayes, A. F., & Preacher, K. J. (2013). Conditional process modeling: Using structural equation modeling to examine contingent causal processes. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (2 ed., Vol. 2, pp. 217-264). Greenwich, CT: Information Age.

- Hennecke, M., Bleidorn, W., Denissen, J. J. A., & Wood, D. (2014). A three-part framework for self-regulated personality development across adulthood. *European Journal of Personality, 28*, 289-299. doi:10.1002/per.1945
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55. doi:10.1080/10705519909540118
- Jensen-Campbell, L. A., Gleason, K. A., Adams, R., & Malcolm, K. T. (2003). Interpersonal conflict, agreeableness, and personality development. *Journal of Personality, 71*, 1059-1086. doi:10.1111/1467-6494.7106007
- Jensen-Campbell, L. A., Knack, J. M., Waldrip, A. M., & Campbell, S. D. (2007). Do Big Five personality traits associated with self-control influence the regulation of anger and aggression? *Journal of Research in Personality, 41*, 403-424. doi:10.1016/j.jrp.2006.05.001
- Jensen-Campbell, L. A., Rosselli, M., Workman, K. A., Santisi, M., Rios, J. D., & Bojan, D. (2002). Agreeableness, conscientiousness, and effortful control processes. *Journal of Research in Personality, 36*, 476-489. doi:10.1016/S0092-6566(02)00004-1
- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102-138). New York: Guilford.
- Kiel, E. J., & Buss, K. A. (2011). Prospective relations among fearful temperament, protective parenting, and social withdrawal: The role of maternal accuracy in a moderated mediation framework. *Journal of Abnormal Child Psychology, 39*, 953-966. doi:10.1007/s10802-011-9516-4
- Kim, S., & Kochanska, G. (2012). Child temperament moderates effects of parent-child mutuality on self-regulation: A relationship-based path for emotionally negative infants. *Child Development, 83*, 1275-1289. doi:10.1111/j.1467-8624.2012.01778.x
- Knafo, A., & Plomin, R. (2006a). Parental discipline and affection and children's prosocial behavior: Genetic and environmental links. *Journal of Personality and Social Psychology, 90*, 147-164. doi:10.1037/0022-3514.90.1.147
- Knafo, A., & Plomin, R. (2006b). Prosocial behavior from early to middle childhood: Genetic and environmental influences on stability and change. *Developmental Psychology, 42*, 771-786. doi:10.1037/0012-1649.42.5.771
- Kochanska, G., & Kim, S. (2013). Difficult temperament moderates links between maternal responsiveness and children's compliance and behavior problems in low-income families. *Journal of Child Psychology and Psychiatry, 54*, 323-332. doi:10.1111/jcpp.12002
- Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology, 36*, 220-232. doi:10.1037/0012-1649.36.2.220
- Kochanska, G., Murray, K. T., Jacques, T. Y., Koenig, A. L., & Vandegest, K. A. (1996). Inhibitory control in young children and its role in emerging internalization. *Child Development, 67*, 490-507. doi:10.1111/j.1467-8624.1996.tb01747.x
- Kochanska, G., Philibert, R., A., & Barry, R. A. (2009). Interplay of genes and early mother-child relationship in the development of self-regulation from toddler to preschool age. *Journal of Child Psychology and Psychiatry, 50*, 1331-1338. doi:10.1111/j.1469-7610.2008.02050.x
- Kokko, K., & Pulkkinen, L. (2000). Aggression in childhood and long-term unemployment in adulthood: A cycle of maladaptation and some protective factors. *Developmental Psychology, 36*, 463-472. doi:10.1037/0012-1649.36.4.463
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multitrait-multidiagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology, 105*, 299-312. doi:10.1037/0021-843X.105.3.299
- Laursen, B., Pulkkinen, L., & Adams, R. (2002). The antecedents and correlates of agreeableness in adulthood. *Developmental Psychology, 38*, 591-603. doi:10.1037/0012-1649.38.4.591

- Laursen, B., & Richmond, A. (2013). Relationships: Commentary: Personality, relationships, and behavior problems: It's hard to be disagreeable. *Journal of Personality Disorders, 28*, 143-150. doi:10.1521/pedi.2014.28.1.143
- Lee, C. L., & Bates, J. E. (1985). Mother-child interaction at age two years and perceived difficult temperament. *Child Development, 56*, 1314-1325.
- Lengua, L. J., Honorado, E., & Bush, N. R. (2007). Contextual risk and parenting as predictors of effortful control and social competence in preschool children. *Journal of Applied Developmental Psychology, 28*, 40-55. doi:10.1016/j.appdev.2006.10.001
- Lerner, R. M., & Lerner, J. (1983). Temperament and adaptation across life: Theoretical and empirical issues. In P. B. Baltes & O. G. Brim (Eds.), *Life-span development and behavior*. (Vol. 5, pp. 197-231). New York: Academic Press.
- Lewis, M. (2001). Issues in the study of personality development. *Psychological Inquiry, 12*, 67-83. doi:10.1207/s15327965pli1202_02
- Locke, L. M., & Prinz, R. J. (2002). Measurement of parental discipline and nurturance. *Clinical Psychology Review, 22*, 895-929. doi:10.1016/S0272-7358(02)00133-2
- Mathiesen, K. S., & Sanson, A. (2000). Dimensions of early childhood behavior problems: Stability and predictors of change from 18 to 30 months. *Journal of Abnormal Child Psychology, 28*, 15-31. doi:10.1023/A:1005165916906
- Maziade, M., Cote, R., Boutin, P., Bernier, H., & Thivierge, J. (1987). Temperament and intellectual development: a longitudinal study from infancy to four years. *American Journal of Psychiatry, 144*, 144-150. doi:10.1176/ajp.144.2.144
- McClowry, S. G. (1995). The development of the School-Age Temperament Inventory. *Merrill-Palmer Quarterly (1982-), 41*, 271-285. doi:10.2307/23087890
- McClowry, S. G., Halverson, C. F., & Sanson, A. (2003). A re-examination of the validity and reliability of the school-age temperament inventory. *Nursing Research, 52*, 176-182.
- McGuire, J., & Richman, N. (1986a). The prevalence of behavioural problems in three types of preschool group. *Journal of Child Psychology and Psychiatry, 27*, 455-472. doi:10.1111/j.1469-7610.1986.tb00634.x
- McGuire, J., & Richman, N. (1986b). Screening for behaviour problems in nurseries: The reliability and validity of the preschool behaviour checklist. *Journal of Child Psychology and Psychiatry, 27*, 7-32. doi:10.1111/j.1469-7610.1986.tb00618.x
- Measelle, J. R., John, O. P., Ablow, J. C., Cowan, P. A., & Cowan, C. P. (2005). Can children provide coherent, stable, and valid self-reports on the Big Five dimensions? A longitudinal study from ages 5 to 7. *Journal of Personality and Social Psychology, 89*, 90-106. doi:10.1037/0022-3514.89.1.90
- Mervielde, I., & Asendorpf, J. B. (2000). Variable-centered and person-centered approaches to childhood personality. In S. E. Hampson (Ed.), *Advances in personality psychology* (Vol. 1, pp. 37-76). Philadelphia, PA: Taylor & Francis.
- Mervielde, I., & De Fruyt, F. (1999). *Construction of the Hierarchical Personality Inventory for Children (HiPIC)*. Paper presented at the Personality psychology in Europe. Proceedings of the Eight European Conference on Personality Psychology, Tilburg.
- Mervielde, I., & De Fruyt, F. (2002). Assessing children's traits with the Hierarchical Personality Inventory for children. In B. de Raad & M. Perugini (Eds.), *Big Five Assessment* (pp. 127-146). Gottingen: Hogrefe & Huber Publishers.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Nikitin, J., & Freund, A. M. (2008). The role of social approach and avoidance motives for subjective well-being and the successful transition to adulthood. *Applied Psychology, 57*, 90-111. doi:10.1111/j.1464-0597.2008.00356.x
- Nikitin, J., & Freund, A. M. (2015). The indirect nature of social motives: The relation of social approach and avoidance motives with likeability via Extraversion and Agreeableness. *Journal of Personality, 83*, 97-105. doi:10.1111/jopy.12086

- O'Connor, B. P., & Dvorak, T. (2001). Conditional associations between parental behavior and adolescent problems: A search for personality– environment interactions. *Journal of Research in Personality, 35*, 1-26. doi:10.1006/jrpe.2000.2295
- Paterson, G., & Sanson, A. (1999). The association of behavioural adjustment to temperament, parenting and family characteristics among 5-year-old children. *Social Development, 8*, 293-309. doi:10.1111/1467-9507.00097
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1998). Antisocial boys. In J. M. Jenkins, K. Oatley & N. L. Stein (Eds.), *Human emotions: A reader* (pp. 330-336). Malden, MA: Blackwell.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*, 185-227. doi:10.1080/00273170701341316
- Prior, M., Smart, D., Sanson, A. N. N., & Oberklaid, F. (1993). Sex differences in psychological adjustment from infancy to 8 years. *Journal of the American Academy of Child & Adolescent Psychiatry, 32*, 291-305. doi:10.1097/00004583-199303000-00009
- Putnam, S. P., Sanson, A. V., & Rothbart, M. K. (2005). Child temperament and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting. Volume I: Children and Parenting* (Vol. 1, pp. 255-277). New Jersey: Lawrence Erlbaum Associates.
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*, 203-212. doi:10.1016/j.jrp.2006.02.001
- Richman, N., & Graham, P. J. (1971). A behavioural screening questionnaire for use with three-year-old-children. Preliminary findings. *Journal of Child Psychology and Psychiatry, 12*, 5-33. doi:10.1111/j.1469-7610.1971.tb01047.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*, 3-25. doi:10.1037/0033-2909.126.1.3
- Robinson, C. C., Mandleco, B., Olsen, S. F., & Hart, C. H. (1995). Authoritative, authoritarian, and permissive parenting practices: Development of a new measure. *Psychological Reports, 77*, 819-830. doi:10.2466/pr0.1995.77.3.819
- Rothbart, M. K. (2007). Temperament, development, and personality. *Current Directions in Psychological Science, 16*, 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*, 55-66. doi:10.1037/0021-843X.103.1.55
- Rothbart, M. K., Ahadi, S. A., & Hershey, K. L. (1994). Temperament and social behavior in childhood. *Merrill-Palmer Quarterly (1982-), 40*, 21-39. doi:10.2307/23087906
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology: Social, emotional and personality development*. (5th ed., Vol. 3, pp. 105-176). New York: Wiley.
- Rubin, K. H., Coplan, R. J., Fox, N. A., & Calkins, S. D. (1995). Emotionality, emotion regulation, and preschoolers' social adaptation. *Development and Psychopathology, 7*, 49-62.
- Saarni, C. (2006). Emotion regulation and personality development in childhood. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of personality development* (pp. 245-262). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Sanson, A., & Prior, M. (1998). Temperamental and behavioural precursors to oppositional defiant disorder and conduct disorder. In H. C. Quay & A. E. Hogan (Eds.), *Handbook of disruptive behaviour disorders*. (pp. 397-417). New York: Plenum Press.
- Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye & C. C. Clogg (Eds.), *Latent variable analysis: Applications in developmental research* (pp. 399-419). Newbury Park, CA: Sage.
- Scarr, S. (1992). Developmental theories for the 1990s: Development and individual differences. *Child development, 63*, 1-19.

- Shiner, R. L. (2006). Temperament and personality in childhood. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of personality development* (pp. 213-230). New Jersey: Lawrence Erlbaum Associates, Publishers.
- Shiner, R. L., & Caspi, A. (2003). Personality differences in childhood and adolescence: measurement, development, and consequences. *Journal of Child Psychology and Psychiatry, 44*, 2-32. doi:10.1111/1469-7610.00101
- Shiner, R. L., & DeYoung, C. G. (2013). The structure of temperament and personality traits: A developmental perspective. In P. D. Zelazo (Ed.), *The Oxford Handbook of Developmental Psychology, Vol. 2: Self and Other* (Vol. 2, pp. 113-141). Oxford, New York: Oxford University Press.
- Shiner, R. L., & Masten, A. S. (2008). Personality in childhood: A bridge from early temperament to adult outcomes. *International Journal of Developmental Science, 2*, 158-175. doi:10.3233/DEV-2008-21210
- Sneed, C. D. (2002). Correlates and implications for agreeableness in children. *The Journal of Psychology, 136*, 59-67. doi:10.1080/00223980209604138
- Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence. Structure, development, and outcomes. *Current Directions in Psychological Science, 24*, 358-362. doi:10.1177/0963721415589345
- Spengler, M., Gottschling, J., & Spinath, F. M. (2012). Personality in childhood – A longitudinal behavior genetic approach. *Personality and Individual Differences, 53*, 411-416. doi:10.1016/j.paid.2012.01.019
- Spinrad, T. L., Eisenberg, N., Silva, K. M., Eggum, N. D., Reiser, M., Edwards, A., . . . Gaertner, B. M. (2012). Longitudinal relations among maternal behaviors, effortful control and young children's committed compliance. *Developmental Psychology, 48*, 552-566. doi:10.1037/a0025898
- 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
- Thomas, A., & Chess, S. (1977). *Temperament and development*. Oxford, England: Brunner/Mazel.
- Tobin, R. M., & Graziano, W. G. (2006). Development of regulatory processes through adolescence. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of personality development* (pp. 263-284). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Tobin, R. M., Graziano, W. G., Vanman, E. J., & Tassinari, L. G. (2000). Personality, emotional experience, and efforts to control emotions. *Journal of Personality and Social Psychology, 79*, 656-669. doi:10.1037/0022-3514.79.4.656
- Tremblay, R. E., & Nagin, D. S. (2005). The developmental origins of physical aggression in humans. In R. E. Tremblay, W. W. Hartup & J. Archer (Eds.), *Developmental origins of aggression* (pp. 83-106). New York: Guilford.
- Van Leeuwen, K. G., Mervielde, I., Braet, C., & Bosmans, G. (2004). Child personality and parental behavior as moderators of problem behavior: Variable- and person-centered approaches. *Developmental Psychology, 40*, 1028-1046. doi:10.1037/0012-1649.40.6.1028
- von Soest, T., & Hagtvet, K. A. (2011). Mediation analysis in a latent growth curve modeling framework. *Structural Equation Modeling: A Multidisciplinary Journal, 18*, 289-314. doi:10.1080/10705511.2011.557344
- Vroman, L. N., & Durbin, C. E. (2015). High effortful control is associated with reduced emotional expressiveness in young children. *Journal of Research in Personality, 58*, 46-54. doi:10.1016/j.jrp.2015.06.006
- Wang, F. L., Chassin, L., Eisenberg, N., & Spinrad, T. L. (2015). Effortful Control Predicts Adolescent Antisocial-Aggressive Behaviors and Depressive Symptoms: Co-Occurrence and Moderation by Impulsivity. *Child Dev, 86*, 1812-1829. doi:10.1111/cdev.12406
- Wang, F. L., Christ, S. L., Mills-Koonce, W. R., Garrett-Peters, P., & Cox, M. J. (2013). Association between maternal sensitivity and externalizing behavior from preschool to preadolescence. *Journal of Applied Developmental Psychology, 34*, 89-100. doi:10.1016/j.appdev.2012.11.003

Table 1
Intercorrelations and descriptive statistics

Variable	1	2	3	4	5	6	7	8	9	10	11	N	M	SD
1 Difficultness age 1.5												937	0.65	.28
2 Difficultness age 2.5	.47**											781	0.62	.29
3 Difficultness age 4.5	.39**	.53**										732	0.56	.30
4 Reasoning age 8.5	-.05	-.11*	-.14**									529	4.14	.42
5 Warmth age 8.5	-.02	-.06	-.10*	.56**								529	4.43	.39
6 Punishment age 8.5	.16**	.20**	.23**	-.28**	-.12**							528	2.27	.55
7 Self-control age 12.5	-.03	-.09*	-.10*	.10*	.08	-.05						559	3.76	.61
8 Reactivity age 12.5	.09*	.13**	.20**	-.07	-.02	.11*	-.34**					560	2.46	.65
9 Agreeableness age 16.5	.005	-.10*	-.14*	.03	.07	-.001	.24**	-.26**				369	5.17	.83
10 Socioeconomic status	-.14**	-.13**	-.12**	.06	.006	-.14**	.06	-.18**	.10*			925	6.62	1.59
11 Mothers' Agreeableness	-.11*	-.05	-.10	.18**	.18**	-.12*	.15**	-.09	.13*	.03		419	5.61	.72
12 Gender	-.02	.05	-.002	-.008	.03	-.11**	.01	.05	-.03	-.03	-.03	965		

Note. * = p < .05, ** = p < .01

Table 2

Regression coefficients and 95% confidence intervals (CI) for moderated mediation models including difficultness at 4.5, parenting at age 8.5, regulation at age 12.5 , and agreeableness at age 16.5

		Reactivity t5 (M)				Agreeableness t7 (Y)		
		b	β	95 % CI		b	β	95 % CI
Model 1: Moderated Mediation effects of Parental Reasoning								
Difficultness age 4.5 (X)	a_1	.50	.19***	0.29, 0.73	c'	-.28	-.08.	-0.67, 0.11
Reactivity age 12.5 (M)					b_1	-.30	-.30***	-0.46, -0.14
Reasoning age 8.5 (W)	a_2	-.06	-.04	-0.18, 0.07	c_2	.09	.05	-0.18, 0.35
Reasoning X Diff (XW)	a_3	.09	.01	-0.38, 0.55	c_3	-1.08	-.15	-2.10, 0.15
Moderated Mediation Index					a_3b_1	-0.03		-0.19, 0.11
Model 2: Moderated Mediation effects of Parental Warmth								
Difficultness age 4.5 (X)	a_1	.51	.20***	0.29, 0.73	c'	-.24	-.07	-0.64, 0.13
Reactivity age 12.5 (M)					b_1	-.29	-.22***	-0.45, -0.12
Warmth age 8.5 (W)	a_2	-.02	-.01	-0.16, 0.12	c_2	.24	.12	-0.04, 0.49
Warm X Diff (XW)	a_3	.44	.07	-0.11, 0.96	c_3	-.71	-.09	-1.76, 0.44
Moderated Mediation Index					a_3b_1	-.13		-0.35, 0.01
Model 3: Moderated Mediation effects of Parental Punishment								
Difficultness age 4.5 (X)	a_1	.47	.18***	0.25, 0.71	c'	-.37	-.11	-0.76, 0.01
Reactivity age 12.5 (M)					b_1	-.31	-.23***	-0.47, -0.14
Punishment age 8.5 (W)	a_2	.06	.05	-0.05, 0.16	c_2	.21	.15	-0.00, 0.37
Punish X Diff (XW)	a_3	.41	.09	-0.02, 0.84	c_3	-.47	-.08	-1.17, 0.23
Moderated Mediation Index					a_3b_1	-.12*		-0.32, -0.01

Note. Predictor and moderator variables are mean centered; * $p < .05$, ** $p < .01$, *** $p < .001$, All analyses controlled for gender, SES, and mother’s agreeableness. Significant moderated mediation index in bold.

Table 3

Moderated mediation effect at specific conditional values of parental punishment ($N = 939$)

Specific conditional values of parental punishment	Moderated Mediation Index (a_3b_1)	95 % CI
+2 standard deviations above the mean	-.30	-0.56, -0.12
+1 standard deviation above the mean	-.22	-0.41, -0.10
Mean	-.14	-0.27, -0.06
-1 standard deviation below the mean	-.07	-0.21, 0.05
-2 standard deviations below the mean	.01	-0.17, 0.24

Note. Variables are mean centered.

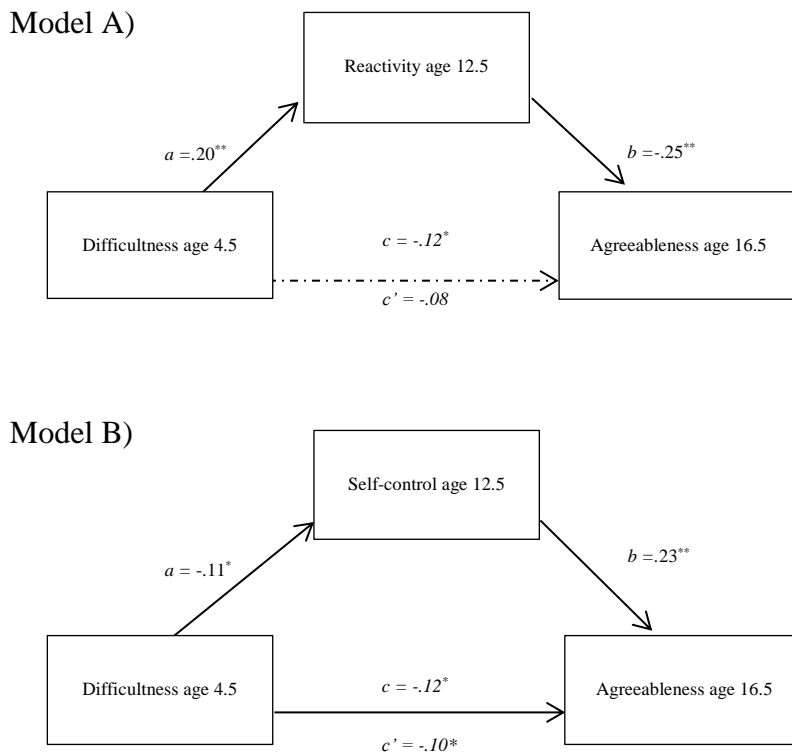


Figure 1

Path models with temperamental reactivity (Model A) and self-control (Model B) at 12.5 years as mediators of the association of child difficultness at age 4.5 with agreeableness at age 16.5. Mediators and dependent variable are controlled for mother's agreeableness, gender and SES (not depicted in the figures). Standardized regression coefficients are reported. c = total effect ($c' + a \times b$), c' = direct effect ($c - a \times b$); $*p < .05$, $**p < .01$.

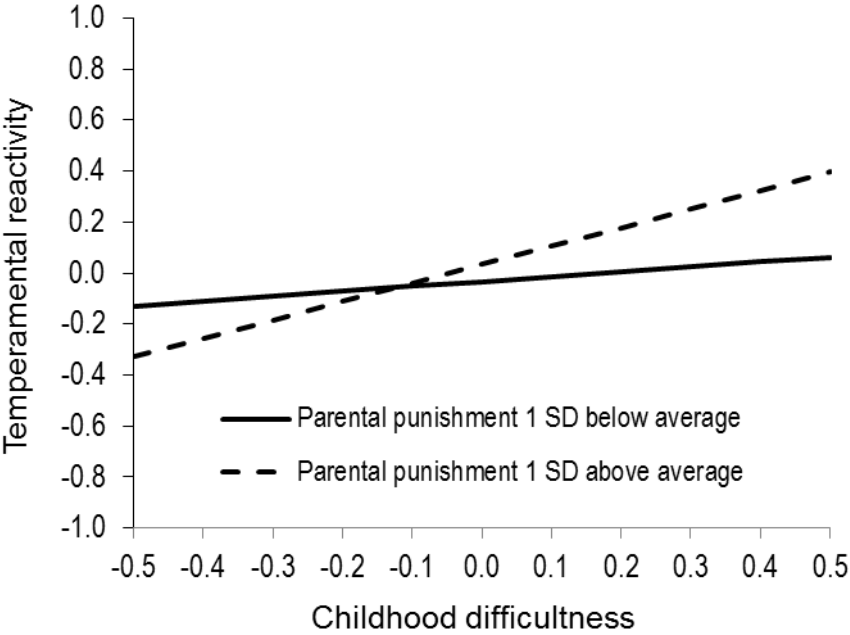


Figure 2. Moderator effects of parental punishment on the relationship between difficulty at 4.5 years and reactivity at 12.5 years. Variables are mean-centered. Slope representing parental punishment at 1 SD above average is significant ($p < .01$).

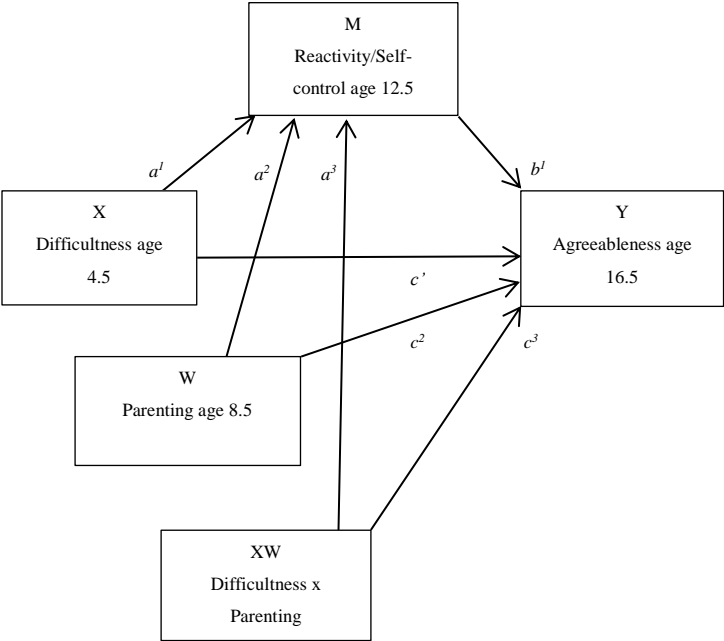


Figure 3.
A visual representation of the moderated mediation in its statistical form as estimated in the current study.