

Negative Controlling Parenting and Child Personality as Modifiers of Psychosocial  
Development in Youth with Autism Spectrum Disorder: A 9-Year Longitudinal Study at the  
Level of Within-Person Change

Lana E. De Clercq

Ghent University

Lisa M. Dieleman

Ghent University

Jolene Van der Kaap-Deerder

Ghent University

Bart Soenens

Ghent University

Peter Prinzie

Erasmus University Rotterdam

Sarah S. W. De Pauw

Ghent University

## Author Note

Lana E. De Clercq, Department of Special Needs Education, Ghent University, Ghent, Belgium.

Lisa M. Dieleman, Department of Developmental, Personality and Social Psychology, Ghent University, Ghent, Belgium

Jolene Van der Kaap-Deerder, Department of Developmental, Personality and Social Psychology, Ghent University, Ghent, Belgium

Bart Soenens, Department of Developmental, Personality and Social Psychology, Ghent University, Ghent, Belgium

Peter Prinzie, Erasmus School of Social and Behavioral Sciences, Erasmus University Rotterdam, Rotterdam, The Netherlands

Sarah S. W. De Pauw, Department of Special Needs Education, Ghent University, Ghent, Belgium.

The authors have previously published on this dataset (De Pauw et al. 2011; Dieleman et al. 2017). However, this is the first paper that (a) maps out intra-individual changes in parenting and psychosocial functioning and (b) examines the personality-parenting interplay on psychosocial development in the context of autism.

This research was supported by a BOF Starting Grant BOFSTA2017004601, by Grant GV/B-202 from the Marguerite-Marie Delacroix Support Fund and Grants FWO 12B4614N and 11X6516N from the Fund for Scientific Research Flanders.

Correspondence concerning this article should be addressed to Lana De Clercq, Department of Special Needs Education, Ghent University, Begijnhoflaan 464, 9000 Ghent, Belgium.

Contact: Lana.DeClercq@ugent.be, +32 (0)9 331 03 12.

### Abstract

This nine-year longitudinal study addresses the joint contribution of parent-rated negative controlling parenting and child personality on psychosocial outcomes in 141 families of children with autism spectrum disorder (83% boys, mean age Time 1= 10.1). Latent change modeling revealed substantial variation in within-person change in parenting and psychosocial outcomes across a six- and a three-year-interval. Over time, negative controlling parenting and child personality were consistently related to externalizing problems, whereas personality was differentially related to internalizing problems and psychosocial strengths. Three personality-by-parenting interactions were significant, suggesting that more mature personality traits function as protective factors against unfavorable effects of controlling parenting. Overall, this study identified both parenting and child personality as important modifiers of developmental outcomes in youth with autism.

*Keywords:* autism spectrum disorder, parenting, personality, psychosocial functioning, within-person level

The past decades have witnessed an increasing interest in studying psychosocial development in youth with Autism Spectrum Disorder (ASD) across adolescence and emerging adulthood. Developmental changes in this age period have mainly been studied in two areas of research. Studies inquiring ASD core symptoms have documented a general, yet modest improvement in social communication and adaptation across adolescence (Gray et al. 2012; McGovern and Sigman 2005; Taylor and Seltzer 2010; Woodman et al. 2015). Studies focusing on the associated and behavioral features, on the other hand, suggest that youth with ASD tend to struggle more than youth without ASD with the developmental tasks of this age period, characterized by increasing demands of mature roles and responsibilities (McCauley et al. 2019). Importantly, these studies emphasized remarkable behavioral heterogeneity in psychosocial developmental outcomes in this age period, both *across* and *within* samples of youth with ASD.

To better comprehend this wide variation in the psychosocial development of children with ASD, Chetcuti et al. (2019) recently advocated that researchers should go beyond the inquiry of ‘ASD-specific sources’. In particular, they nominated parenting factors and child personality differences as potential ‘transdiagnostic’ or ‘non-syndrome-specific’ factors, standing poised to provide a richer understanding of heterogeneity in ASD. Their suggestion is consistent with the *Modifier Model of Autism* (Mundy et al. 2007; McCauley et al. 2019). This model postulates that the large heterogeneity within the behavioral phenotype of children and adolescents with ASD arises from at least two sources: *syndrome-specific Initial Causal Processes* (ICPs) and *non-syndrome-specific Modifier Processes* (MPs). According to this model, varied constellations of genetic and neurodevelopmental ICPs contribute to differences in ASD expression at different ages. In addition to these more biological etiological interactions, this model proposes that processes *not specific* to the biological etiology of ASD may also be considered as important non-etiological moderators

of the course and outcome of ASD across youth. Specifically, this model identifies both *parenting* and *personality trait variation* as two non-syndrome-specific moderators that may contribute to a better understanding of the wide heterogeneity in ASD.

The current study builds upon these theoretical suggestions in four important ways. First, this study focuses on *negative controlling parenting* as a first potential transdiagnostic contextual influence on the psychosocial development of adolescents with ASD. In the broader developmental literature, many studies demonstrated that negative controlling parenting behaviors, such as overreactivity, coercive or harsh discipline, or psychological control, are systematically related to behavioral and/or emotional problems (Pinquart 2017b, 2017a; Soenens et al. 2019). To date, a handful of studies observed cross-sectional associations between parent-rated negative controlling parenting and behavioral problems in samples of youth with ASD (Ventola et al. 2017; Boonen et al. 2014; De Clercq et al. 2019; O’Nions et al. 2019). Also, a few short-term longitudinal studies supported these associations in the context of ASD. For example, Lindsey et al. (2020) demonstrated that parent-rated negative parenting predicted unique variance in child externalizing and internalizing behaviors one year later. Similar results were found by Bader and Barry (2014), showing that higher levels of parental criticism, rated in parents’ five-minute speech samples, predicted higher levels of child externalizing behaviors two years later. Additionally, a series of studies following 170 families of adolescents and adults with ASD (aged 11-44 years) showed that higher levels of maternal criticism towards their child with ASD, again rated in parents’ five-minute speech samples, were bidirectionally related to elevated internalizing, externalizing and asocial behavioral problems across an 18-month interval (Greenberg et al. 2006) and even a seven-year interval (Baker et al. 2011). Similarly, Dieleman et al. (2017) retrieved bidirectional associations between questionnaire-rated negative controlling parenting and externalizing problems across a nine-year interval. However, the statistical approach used in

these longitudinal studies (i.e., regressions and cross-lagged panel models) focused on rank-order changes in adolescents' adjustment rather than on within-person change. Thus, it remains to be examined whether within-family fluctuations in negative controlling parenting also relate to within-person fluctuations in (mal)adjustment in youth with ASD.

Second, this study considers the role of *personality variation* as a second potential transdiagnostic factor. In non-ASD populations, individual differences in personality, i.e. constitutionally-based tendencies in thoughts, behaviors, and emotions that surface early in life and are relatively stable across situations and time (Caspi and Shiner 2006), are well-studied contributors to social development. In autism, however, research is more limited and confined to cross-sectional evidence. To date, three studies demonstrated similar relations between personality dimensions on the one hand, and adjustment difficulties on the other, across youth with and without ASD, using both parent- and self-ratings (De Pauw et al. 2011; Burrows et al. 2016; Schwartz et al. 2009). Overall, these studies uncovered that - for youth with and without autism alike -, children with lower scores on Emotional Stability and Extraversion had more internalizing problems, whereas children with lower scores on Benevolence and Conscientiousness had more externalizing problems. No study to date, however, evaluated the longitudinal associations of these personality traits on changes in psychosocial outcomes in ASD. Also, the impact of child personality on more adaptive behavioral outcomes, such as psychosocial strengths (e.g., showing positive interactions and family involvement), has not been studied.

Third, this study goes beyond the search for additive effects, by also evaluating the influence of the personality by parenting interplay on psychosocial outcomes. Specifically, we address whether the influence of parenting in youth with ASD varies as a function of children's unique personality traits. Previous research in neurotypical and clinical populations other than autism demonstrated that individual trait differences can affect a child's

vulnerability to negative environmental influences (Kiff et al. 2011; Mabbe et al. 2019; Lengua et al. 2019). More specifically, research suggested that especially children with more challenging personality traits, such as lower Emotional Stability/higher Negative Affect, lower Benevolence, lower Conscientiousness/Effortful Control, are particularly vulnerable to develop behavioral problems when also exposed to negative controlling parenting (Bates and Pettit 2015; Kiff et al. 2011; Van Leeuwen et al. 2007). To our knowledge, however, no research addressed personality by parenting interactions in the prediction of social development outcomes in the context of ASD to date.

Finally, this study examines the unique and interactive roles of both parenting and child personality in psychosocial adjustment in youth with ASD, at the level of intra-individual change by using latent change modeling (LCM). An examination of processes at this level of within-person change is important because this type of change is most salient and personally meaningful to individuals. Also, prevention and intervention efforts are predominantly targeting this level of change (Keijsers et al. 2016).

In sum, the present study aims to achieve a more comprehensive account of the contribution of negative controlling parenting and child personality to psychosocial outcomes in youth with autism. As a first research aim, we will explore continuity and change in internalizing and externalizing behaviors, psychosocial strengths and negative controlling parenting across a nine-year interval. As a second research aim, we investigate the additive and interactive effects of negative controlling parenting and child personality on behavioral problems and psychosocial strengths of youth with ASD. Given that personality factors are by definition characterized by substantial continuity and long-term stability (Caspi and Shiner 2006), only baseline assessments of personality are included in these analyses.

## **Methods**

### ***Participants***

Parents of 141 children with ASD reported on their family background, their child personality, behavioral problems, psychosocial strengths and their own parenting behavior, as part of a long-term longitudinal study on psychosocial development of youth with ASD (Dieleman et al. 2017; De Pauw et al. 2011). At Time 1 (T1), children with ASD were on average 10.1 years old ( $SD = 2.4$ , range = 5.1–16.2), at Time 2 (T2) the mean age was 16.0 years ( $SD = 2.3$ , range = 11.6–22.6) and at Time 3 (T3), the mean age was 19.0 years ( $SD = 2.3$ , range = 14.4–23.9). The mean time interval between T1 and T2 was 6.18 years ( $SD = .38$ , range = 5.51–7.01) and 2.70 years between T2 and T3 ( $SD = .09$ , range = 2.17–3.00). The children and adolescents were predominantly male (83.0%). The majority of the children with ASD (53.90% at T1) were reported to have one or several comorbid diagnoses, of which ADHD (19.1%), motor disorder (15.6%), language development disorder (10.6%) were most prevalent. 75.2% of the parents ( $n = 106$ ) also reported on their child's intellectual functioning, indicating that 9.2% of the children had an intellectual disability ( $IQ < 70$ ). Informants were mainly mothers (98.6% at T1) with an average age of 39.9 years ( $SD = 4.9$ ) at T1. The majority of parents were married (80.7% at T1) and employed (75.7% of mothers and 90.7% of fathers at T1). At T1, 87.9% of the participating families reported that their child or family received some kind of counseling or treatment, of which home counseling (24.3%), support from a functional rehabilitation center (9.3%) or integrated education support (7.1%) were most frequently reported. At T2 and T3, respectively 59.8% and 56.9% of the families reported to still receive one or more of these services. Table 1 presents demographic characteristics. The study received ethical approval from the Institutional Review Board of the host University and all participants filled out an informed consent at each assessment.

### *Procedure*



Seventy-five percent of the parents were recruited through the registries of four care centers providing home support and counseling to families of persons with ASD (based on DSM-IV-TR criteria) in Flanders, Belgium. Other participants were addressed through teachers and announcements on websites regarding ASD. Kruskal-Wallis tests revealed no differences in study variables according to the recruitment strategy (all  $ps > .05$ ). Primary inclusion criteria for the participants were: the child (a) had received a formal diagnosis of autistic disorder, Asperger syndrome or pervasive developmental disorder not otherwise specified based on DSM-IV-TR or ICD-10 criteria and (b) was at least four years old. The ASD diagnosis was verified by a written parent report and confirmed by verbal communication with a research assistant. Parents also clarified when and by whom the formal ASD diagnosis was made. To evaluate associations over time, we only included the 141 families who participated at least two out of three times. Mann-Whitney tests revealed no significant differences between participants who participated once ( $n = 69$ ) and participants who participated two ( $n = 70$ ) or three times ( $n = 71$ ) in terms of demographic characteristics and study variables (all  $ps > .05$ ).

### *Measures*

***Child behavior problems.*** At each of the three assessment points, parents rated their child's emotional and behavioral problems using the Dutch version of the parent-report Child Behavior Checklist 4/18 (CBCL; Achenbach 1991) on a three-point Likert scale ranging from (0) *not at all* to (2) *clearly or often*. These items were clustered into two broadband factors: internalizing problems (32 items, comprising anxious/depressive behavior, withdrawn/depressive behavior, and somatic complaints) and externalizing problems (33 items, comprising delinquent behavior and aggressive behavior). Parents also completed this questionnaire at T3, as this study aims to examine longitudinal relations in this construct and previous studies confirmed the applicability of this instrument in adolescents and young

adults with ASD (Holtmann et al. 2007). Raw scores were used in all analyses, except to examine clinical levels of behavioral problems where raw scores were converted into T-scores. Clinical scores (T-scores above 63) were calculated based on American norms for the CBCL 4/18 (Achenbach, 1991) to optimize comparability with previous research. Cronbach  $\alpha$ 's ranged from .87 (internalizing problems at T1) to .93 (externalizing problems at T3).

***Child psychosocial strengths.*** At T2 and T3, parents rated their child's positive emotions, behaviors and life aspects on the Behavioral and Emotional Rating Scale (BERS-2; Epstein et al. 2004). The questionnaire comprises 43 items rated on a 5-point Likert scale, ranging from (1) *completely not true* to (5) *completely true*. The items were clustered into three subscales: interpersonal strengths (15 items; e.g., "*Accepts responsibility for his/her behavior*"), family involvement (10 items; e.g., "*Shows a sense of commitment towards the family*") and intrapersonal-affective strengths (18 items; e.g., "*Accepts closeness and intimacy from others*"). Even though this instrument has not been used in autism research before, it has been used in diverse other clinical samples (including Down syndrome; Dieleman et al. 2018b). Cronbach  $\alpha$ 's ranged from .78 (intrapersonal-affective strengths at T2) to .89 (interpersonal strengths at T3).

***Negative controlling parenting.*** At each assessment point, parents completed the negative control scale from the Parental Behavior Scale (PBS; Van Leeuwen and Vermulst 2004). This scale taps into punitive parenting (6 items, e.g., "If my child contradicts, lies or argues, I give him/her a punishment") and harsh punishment (5 items, e.g., "I hit my child if he/she does not keep to what has been agreed"). These 11 items were rated on a 5-point Likert scale, ranging from (1) *never* to (5) *always*. The PBS has been recently validated in parents of children and adolescents with ASD (Lambrechts et al. 2011; Maljaars et al. 2014; van Esch et al. 2018). In this study, Cronbach  $\alpha$ 's ranged from .79 (T1 and T3) to .81 (T2).

***Child Personality.*** At T1 and T2, parents rated their child's personality using the Hierarchical Personality Inventory for Children (HiPIC; Mervielde and De Fruyt 2002), an empirically derived questionnaire in the lexical tradition based on an extensive analysis of parental free descriptions of their child. Parents indicated how characteristic 144 statements were for their child on a 5-point Likert scale, ranging from (1) *hardly characteristic* to (5) *very characteristic*. The 144 items represent 18 underlying facets, which can be grouped into five higher-order factors: *Emotional Stability* is represented by the facets of Anxiety (reversed) and Self-Confidence; *Benevolence* includes the facets Altruism, Dominance, Egocentrism, Compliance and Irritability; *Conscientiousness* is represented by the facets Concentration, Perseverance, Orderliness and Achievement Motivation; *Imagination* encompasses the facets Creativity, Intellect and Curiosity; and *Extraversion* includes the facets Energy, Expressivity, Optimism and Shyness. Cronbach  $\alpha$ 's ranged from .83 (Imagination at T1) to .93 (Benevolence at T2).

### ***Data Analysis***

Latent change models (LCMs) were used to model change at the within-person level (i.e., within a family unit) in parenting and psychosocial outcomes across a nine-year interval. LCMs use latent variables for intercepts (i.e., level) and slopes (i.e., change over time) to estimate within-person change between two adjacent assessment points. Between-person differences in within-person change are indicated by variance in the slope (Beyers and Goossens 2008). We tested these models using Mplus8.3 (Muthén and Muthén 1998–2012) with robust maximum likelihood as estimator since missing data were missing completely at random (Little's missing completely at random test:  $\chi^2(229) = 228.46, p = .50$ ) (Usami et al. 2019). Model fit was evaluated according to fit criteria suggested by Hu and Bentler (1999), with an acceptable fit being indicated by Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) of 0.08 or below, and

Comparative Fit Index (CFI) of 0.90 or above (Kline 2005).

Change in the study variables was modeled in two separate models, from T1-to-T2 (first time period) and from T2-to-T3 (second time period). The decision to separate these periods (rather than to model change across three assessment points simultaneously) was motivated by two arguments. First, the interval between the assessment moments varied, with T1-to-T2 spanning six years and with T2-to-T3 spanning three years. Second, the nature of the transition from T1-to-T2 might be qualitatively different from the nature of the transition from T2-to-T3.

The measurement model described the latent level and change factors for each latent variable. Because behavior problems, psychosocial strengths, and child personality were measured as multidimensional constructs, the corresponding subscales were used as indicators for their latent factors (i.e., the internal-consistency approach; Kishton and Widaman 1994). Regarding children's psychosocial strengths, we used the family involvement, interpersonal, and intrapersonal-affective strengths subscales as three indicators for their latent factor. The 18 facets of the HiPIC were used as indicators of the five higher-order latent factors. Negative controlling parenting is regarded as a unidimensional construct, so we employed the recommended item-to-construct balance method (Landis et al. 2000), where stronger loading items were combined with weaker loading items, resulting in two parcels. The measurement model for each study variable showed adequate fit with an average fit of  $RMSEA = 0.06$ ,  $CFI = 0.94$  and  $SRMR = 0.08$ .

Next, the measurement models were supplemented with a structural model that specified how these level and change factors were interrelated. Within these models, the level of, and change in, the outcome variable was predicted simultaneously by the level of, and change in, negative controlling parenting and by one personality domain. Ten models were tested in the first time period (i.e., five personality domains and two outcome variables), and

fifteen models in the second time period (i.e., five personality domains and three outcome variables, including psychosocial strengths) (Figure 1). To counteract multiple testing, we only focus on findings that remained significant after Bonferonni correction ( $p < .002$ ).

Furthermore, we added the interaction term between the personality dimension and negative controlling parenting in separate analyses to examine the moderating role of child personality in effects of negative controlling parenting on behavioral outcomes. For probing interactions, we followed the Johnson-Neyman technique, which allows to indicate the specific value along the continuum of the personality trait at which the relation between parenting and child behavior was significant (i.e., regions of significance; Del Giudice 2017). For reasons of parsimony, the interaction effects are not presented in Figure 1, but significant interactions were visually illustrated using plots in SPSS 26.0 (IBM Corporation, Armonk, NY, USA).

## Results

### *Preliminary Analyses*

Means, standard deviations, minimum and maximum scores, and correlations between the study variables are presented in Table 2. Based on the American norms for the CBCL 4/18 (Achenbach 1991), 69.6 % (T1), 44.8% (T2) and 41.8% (T3) of the children exhibited clinical levels for internalizing problems, while 61.6% (T1), 35.5% (T2), and 21.1% (T3) of the children scored in the clinical range for externalizing problems.

Before the main analyses, we examined relations between several demographic characteristics (i.e., child age, child gender, the child's intellectual functioning, and parental age) and the variables of interest. Correlational analyses indicated that children's age related to less externalizing problems at T1 ( $r = -.22, p = .01$ ). At T2, child age related to less externalizing problems ( $r = -.36, p < .001$ ), less internalizing problems ( $r = -.22, p = .03$ ), more psychosocial strengths ( $r = .25, p = .02$ ) and less negative controlling parenting ( $r = -$

.24,  $p = .02$ ). Parents of older children also perceived their children to be lower in Extraversion ( $r = -.17$ ,  $p = .04$  at T1), higher in Benevolence ( $r = .24$ ,  $p = .02$  at T2) and Conscientiousness ( $r = .21$ ,  $p = .02$  at T2). Gender differences were only found for internalizing problems and personality. Girls scored significantly higher on internalizing problems ( $U = 339.50$ ,  $z = -2.44$ ,  $p = .02$  at T2;  $U = 462.00$ ,  $z = -3.83$ ,  $p < .001$  at T3) and lower on Emotional Stability ( $U = 913.00$ ,  $z = -2.65$ ,  $p = .01$  at T1;  $U = 533.00$ ,  $z = -3.72$ ,  $p < .001$  at T3), whereas boys had higher scores for Imagination ( $U = 954.00$ ,  $z = -2.42$ ,  $p = .02$  at T1;  $U = 300.00$ ,  $z = -2.89$ ,  $p < .01$  at T2) and Extraversion ( $U = 997.50$ ,  $z = -2.18$ ,  $p = .03$  at T1). We observed no significant differences in children's psychosocial functioning, nor in negative controlling parenting between children with an intellectual disability ( $IQ < 70$ ) compared to children with no intellectual disability ( $IQ > 70$ ) (all  $ps > .05$ ). Only Imagination at T1, which includes the facet 'Intellect', was significantly higher in children without an intellectual disability compared to children with an intellectual disability ( $F(1,95) = 15.05$ ,  $p < .001$ ). Higher parental age related significantly to less externalizing problems in the child ( $r = -.27$ ,  $p < .01$  at T1) and less negative controlling parenting ( $r = -.20$ ,  $p = .04$  at T3). In each LCM, we controlled for child age, child gender and parental age.

### *Main analyses*

#### ***Research Question 1: Do internalizing and externalizing behaviors, psychosocial strengths and parenting change across time?***

Univariate LCMs were estimated to investigate mean-level change and variability in change in internalizing and externalizing behavior, psychosocial strengths and negative controlling parenting. Results indicated that from T1-to-T2, mean levels of internalizing problems increased significantly, whereas externalizing problems decreased. Notably, from T2-to-T3, mean levels of behavioral problems remained stable but children's psychosocial strengths increased. Surprisingly, there were no mean-level changes across time in negative

controlling parenting. Interestingly, the results indicated significant variances in the slope for all latent variables, suggesting substantial between-person differences in how child behavior and parenting changed over time. An overview of the parameter estimates and fit indices for each study variable is provided in Table 3. All univariate LCMs fitted the data well with the average fit being RMSEA = 0.06, CFI = 0.98 and SRMR = 0.05.

***Research Question 2: What are the additive and interactive effects of negative controlling parenting and child personality on behavioral outcomes?***

Main effects of negative controlling parenting and child personality on internalizing and externalizing problems, and psychosocial strengths are shown in Figure 1. The findings demonstrated no significant associations between the level of negative controlling parenting and the level of internalizing problems, nor the level of psychosocial strengths. Nevertheless, the level of negative controlling parenting was positively associated with the level of externalizing problems (in 4 out of 10 models). No significant effect was found at the level of within-person change, suggesting that change in negative controlling parenting did not systematically relate to an increase or decrease in either behavioral problems or psychosocial strengths.

Across both time periods, low Emotional Stability and low Extraversion related significantly to the level of internalizing problems (in 4 out of 4 models). A first significant effect was found at the level of within-person change, where more Extraversion related to a decrease in internalizing problems during the first time period. Across both time periods, low Emotional Stability and low Benevolence yielded a significant association with the level of externalizing problems (in 4 out of 4 models). Additionally, low Conscientiousness (in the first time period) and high Extraversion (in the second time period) related significantly to the level of externalizing problems. No further significant effects were found at the level of within-person change.

Benevolence, Extraversion and Imagination related positively to the level of psychosocial strengths in the second time period (in 3 out of 3 models). Moreover, a second significant effect emerged at the level of within-person change, as high Benevolence related to an increase in psychosocial strengths in the second time period.

**The Moderating Role of Child Personality.** Three interaction effects (out of 25 tested interactions) were significant, demonstrating that the relation between the level of negative controlling parenting and the level of externalizing behavior was significant for children with less adaptive personality traits at T2, yet not significant for children with more adaptive personality traits at T2. These effects were not found in the first time period, with personality at T1 as a predictor. More specifically, children with lower scores on Emotional Stability ( $t(93) = -1.93, p = .04, b = -4.71$ ), Benevolence ( $t(93) = -3.05, p < .01, b = -0.33$ ), and Conscientiousness at T2 ( $t(93) = -2.13, p = .04, b = -0.31$ ) showed elevated levels of externalizing problems when exposed to negative controlling parenting. Furthermore, the Johnson-Neyman technique indicated the specific value along the continuum of the personality trait at which the relation between parenting and child behavior was significant. This technique demonstrated that the relation between the level of negative controlling parenting and the level of externalizing problems was significant for children with a score lower than 3.45 on Emotional Stability (81.4% of the children), a score lower than 3.03 on Benevolence (48.5% of the children), or a score lower than 3.13 on Conscientiousness (63.9% of the children), but not for children with higher scores on these personality domains (Figure 2).

## Discussion

Scholars increasingly advocated that researchers should go beyond the inquiry of ASD-specific sources of heterogeneity and investigate ‘non-syndrome-specific’ factors to better understand the diverse behavioral presentations and developmental outcomes in youth



with ASD (McCauley et al. 2019; Mundy et al. 2007; Chetcuti et al. 2019). In particular, theorists increasingly nominated child personality and parenting as two potential ‘spearhead’ transdiagnostic factors. Yet, to date, only a handful of studies empirically evaluated the impact of personality or parenting variability to (mal)adjustment in children with autism. These few studies have now uncovered important, yet mainly cross-sectional, relations between *either* personality *or* parenting and psychosocial development in youth with autism. To our knowledge, this study is one of the first to address the *joint* value of child personality and parenting in relation to behavioral problems as well as psychosocial strengths in youth with ASD from a nine-year longitudinal perspective.

The transition to adolescence and emerging adulthood can be considered as a pivotal period of change for all children, and it can be particularly challenging for youth with ASD since adolescence is characterized by an increased emphasis on social interactions, changes in demands, and challenges to establish and maintain peer relationships (McCauley et al. 2019). However, as only limited longer-term longitudinal research on the psychosocial development of adolescents with ASD is available (McGovern and Sigman 2005; Greenberg et al. 2006; Woodman et al. 2015; Gray et al. 2012; Taylor and Seltzer 2010), this study provides unique longitudinal information on continuity and change across a nine-year interval. Given that the three assessment points were six and three years apart, we adopted a LCM approach, allowing a unique examination of processes at the level of within-person change.

***Change in children’s psychosocial functioning and stability in negative controlling parenting***

The first aim of this study was to explore continuity and change in internalizing and externalizing behaviors, psychosocial strengths, and negative controlling parenting across three assessment points, spanning a nine-year interval. Concerning emotional and behavioral problems, our findings indicated that at all assessment points, youth with ASD demonstrated

elevated levels of both internalizing and externalizing problems, yet large standard deviations indicated large variability at all three assessment points. Univariate LCMs indicated a significant mean-level increase in internalizing problems and a significant mean-level decrease in externalizing problems during the first time period, and no significant change thereafter. To our knowledge, no study so far reported on intra-individual changes in behavioral problems in youth with ASD administered with the Child Behavior Checklist (Achenbach 1991). On the one hand, these findings corroborate research in neurotypical populations, indicating that internalizing problems, associated with issues on self-esteem and body image, usually tend to peak during puberty and the transition period from grade to middle school (Robins and Trzesniewski 2005). On the other hand, these findings are not in line with longitudinal studies among youth with ASD, demonstrating a general pattern of improvement in maladaptive behaviors (Woodman et al. 2015; Gray et al. 2012). However, these studies relied on broad age ranges and used other instruments and analytical methods to assess change in child behavior, which hampers comparability between study findings.

At the second and third assessment point, we also administered psychosocial strengths using the Behavioral and Emotion Rating Scale (Epstein et al. 2004) to attain a more balanced perspective of children's adjustment. LCM indicated that psychosocial strengths showed a significant, yet modest increase in the second time period. To the best of our knowledge, no study reported on the intra-individual change in psychosocial strengths in youth with ASD yet. Perhaps, this increase in strengths might be intertwined with the small body of literature uncovering modest improvements in social communication and adaptation across adolescence and young adulthood (Gray et al. 2012; McGovern and Sigman 2005; Taylor and Seltzer 2010; Woodman et al. 2015).

With regards to negative controlling parenting, descriptives showed a slight decline across the three measurements, but LCMs did not retrieve significant decreases in negative

controlling parenting at the level of within-person change. This finding is somewhat surprising as the broader developmental literature demonstrated that negative controlling parenting slightly declines across adolescence and emerging adulthood (Desjardins and Leadbeater 2016). Nonetheless, this finding collaborated previous short-term longitudinal studies (of one-two years) in parents of children with ASD, demonstrating that indicators of negative controlling parenting (i.e., expressed emotion) showed considerable stability when assessed with repeated measurements (Greenberg, et al., 2006; Bader and Barry, 2014). The relatively high stability in negative controlling parenting behavior among parents of youth with ASD might relate to the high prevalence of challenging behaviors in these youth. Hypothetically, parents might remain inclined to use more punitive disciplining techniques as an attempt to keep on top of the aggressive or oppositional behavior of their child across time. Nonetheless, further investigations are needed to replicate this finding and to further unravel reasons for the relatively high stability in negative controlling parenting in youth with ASD. Notwithstanding this high degree of mean-level stability in negative parental control, there was substantial variation in within-person change in both negative parental control and child behavior. These findings suggest that both parents and children differ in the degree to which their use of negative control or their psychosocial functioning change across time.

***Effects of negative controlling parenting and child personality on psychosocial problems and strengths***

The second and most important aim of this study was to address the additive and interactive effects of negative controlling parenting and child personality on psychosocial problems and strengths of youth with ASD. Findings showed that both parenting behavior and personality variation uniquely related to children with ASD's behavioral problems as well as their psychosocial strengths, generally following the relations that are well-documented in the broader developmental literature. This provides support for theoretical

claims that the personality by parenting interplay is vital for the psychosocial development of *all* children, including those with ASD (Chetcuti et al. 2019; Mundy et al. 2007; McCauley et al. 2019). Three important findings require further discussion.

### *Effects of negative controlling parenting*

First, this study adds empirical support that negative controlling parenting, with high levels of punitive and harsh disciplining, relates to higher levels of externalizing problems in youth with ASD. As such, this association supports previous cross-sectional (Ventola et al. 2017; Boonen et al. 2014; Maljaars et al. 2014; De Clercq et al. 2019; Bader et al. 2014) and longitudinal work (Greenberg et al. 2006; Lindsey et al. 2020; Bader and Barry 2014) demonstrating the positive association between negative controlling parenting and maladaptive behaviors in children with ASD. However, the LCMs used in this study did not allow us to address the direction of effects. As relations between child and parenting behavior showed to be fundamentally transactional in neurotypical and ASD-populations (Dieleman et al. 2017; Taraban and Shaw 2018), this finding might also suggest that parents of children with more externalizing behaviors tend to rely on more controlling parenting behaviors as a response to those behaviors.

Notably, this study did not find a significant association between negative controlling parenting and internalizing problems in youth with ASD, which corroborates previous findings in families with children with ASD (e.g., Boonen et al. 2014), but contrasts findings in neurotypical populations (Pinquart 2017b). This lack of relation might be due to the use of parent-report for both constructs, as internalizing problems often remain less noticed by parents (van de Looij-Jansen et al. 2010). Also, there is some evidence that other parenting variables, such as psychological controlling parenting or conditional parental regard, may be more strongly related to internalizing problems than negative controlling parenting. These more subtle and covert types of parental control may create more inner conflicts and distress

(Soenens and Vansteenkiste 2010) than the blunt and overt type of negative control measured in this study. Surprisingly, the present study also found no significant associations between changes in negative controlling parenting and changes in internalizing or externalizing behaviors. This may be related to the relatively long time intervals between measurements. Possibly, more associations at the level of change could have been detected when shorter time intervals (such as six months or a year) were used. This idea was supported in a two-year longitudinal study, where higher levels of parental criticism in parents' five-minute speech samples, predicted an increase in child externalizing behaviors two years later (using hierarchical regression analyses) (Bader and Barry 2014).

### *Effects of child personality*

Second, our study is one of the first to empirically uncover that child personality is differentially related to both negative and positive behavioral outcomes across a nine-year interval. Notably, this study retrieved similar associations as in youth without ASD (De Pauw and Mervielde 2010): lower scores on Emotional Stability and – to a lesser extent – lower scores on Extraversion were associated with internalizing problems whereas lower scores on Emotional Stability as well as Benevolence were consistently associated with externalizing problems across the two time periods. Hence, these results corroborate that personality variation can be regarded as a 'transdiagnostic' or 'non-syndrome-specific' modifier (Chetcuti et al. 2019; Mundy et al. 2007). Additionally, we found two time-specific associations. In line with research in neurotypical populations, we found that lower scores on Conscientiousness related to more externalizing problems (De Pauw and Mervielde 2010; Mervielde et al. 2006), but only in the first time period, and that higher scores on Extraversion related to higher levels of child externalizing problems (Prinzle et al. 2010), yet this effect was only significant in the second time period. Furthermore, the documented trait-adjustment relations not only provided tools for identifying children with ASD at risk for

developing behavioral problems, but also identified several ‘resilience processes’. More specifically, higher scores on Benevolence, Imagination, and Extraversion were significantly related to higher levels of psychosocial strengths in children with ASD. High Benevolence and Extraversion have been previously related to more adaptive outcomes, such as health and well-being, in non-ASD populations (Hill and Roberts 2016), but the association with Imagination might be more autism-specific. This finding suggests that children with ASD who have a more vivid imagination or present more curiosity and creativity, are rated with more psychosocial strengths. Perhaps, these children immerse themselves more strongly in their worlds of experience, and their interpersonal relationships, which may lead to the development of stronger affective and interpersonal skills. Two time-specific significant associations were found between child personality and change in the outcome variable. Lower scores on Extraversion at T1 related to an increase in internalizing problems in the first time period, whereas higher scores on Benevolence at T2 were associated with an increase in psychosocial strengths in the second time period. The case of Extraversion illustrates how fine-grained trait information might be useful to further detect and describe different trajectories of children with ASD across different time points. Higher scores on Extraversion at a mean age of 10 related to less internalizing problems and even a decrease in these problems during the first time period. Higher scores on Extraversion at a mean age of 16 associated with less internalizing and more psychosocial strengths at a mean age of 19, yet it also related to more externalizing problems. Although the content-overlap between child personality and behavioral problems has been extensively discussed in previous research (Shiner and Caspi 2003), findings generally support the idea that child personality and behavioral problems are conceptually more different than alike (Prinzle et al. 2005; De Pauw et al. 2009). Moreover, our own findings demonstrated a number of unique associations between personality and emotional or behavioral problems not previously documented in

neurotypical populations. If associations between these constructs would be driven entirely by item-overlap, such unique associations would be unlikely to occur. For example, the significant associations with Imagination provide unique information which might be ASD-specific, and previously well-documented associations between Benevolence and externalizing behavior among studies with neurotypical populations (e.g., Prinzie et al. 2010) were not observed.

### ***Personality by parenting interplay***

Third, three interesting interaction effects were significant in this study, indicating that more mature personality traits (i.e, high Emotional Stability, Benevolence or Conscientiousness) might function as protective factors against externalizing problems in the presence of negative controlling parenting. On the one hand, the number of significant interactions (3 out of 25 tested interactions) is limited and the effect did not replicate across time. Therefore, the protective role of these personality traits should be considered as relatively modest and further replication is warranted. However, on the other hand, three effects proved to be significant despite the limited sample size and therefore limited power. Intriguingly, these interactions corroborate previous research in non-ASD populations, uncovering that effects of controlling parenting are less pronounced among children who are rated as more resilient or agreeable in personality (Mabbe et al. 2016; Meunier et al. 2011; Van Leeuwen et al. 2004). These findings might suggest that children with ASD with higher scores on these traits have more abilities to cope more effectively with an environment that is experienced as controlling or pressuring. Alternatively, it is also possible that these children might have more positive interactions with others that further diminishes the unfavorable effect of negative controlling parenting (Prinzie et al. 2003) or they might be less likely to interpret a potentially controlling environment as intrusive or pressuring (Mabbe et al. 2016).

### ***Practical Implications***

Several findings of this study have practical implications. First, the longitudinal associations between negative controlling parenting and externalizing problems, emphasize that parenting remains an important influence throughout the life of youth with ASD. Therefore, family interventions may more closely attend to processes of punitive discipline and may focus to support parents engage in parenting practices that are related to more adaptive child outcomes, such as being responsive and autonomy-supportive towards their child (De Clercq et al. 2019).

Second, this study showed that certain personality traits render children with ASD either more vulnerable or more resilient to developing behavioral problems. As the current diagnostic classification system is less focused on individual differences among individuals with ASD (Beauchaine 2003), applying a non-pathologizing language to talk about individual differences, captured by personality traits, might be especially valuable. Interventions might, for example, specifically target personality characteristics that are related to psychosocial strengths in children (i.e., high Benevolence, Extraversion and Imagination) in order to recognize and reinforce them. Moreover, it might be more stimulating and energizing for parents to recognize and acknowledge positive child characteristics and behaviors, instead of focusing on decreasing behavioral problems.

Third, the three significant personality-by-parenting interactions suggest that some children are more prone to react with externalizing problems when confronted with negative controlling parenting based upon their more ‘challenging’ personality make-up. A better understanding of this interplay can help parents, relatives and care providers respond more sensitively to a child’s individuality in order to avoid externalizing behaviors. Consequently, research and practice could further reflect on accommodating interventions and parental strategies to the unique strengths and challenges in each individual’s personality. Eventually,



attuning to a child's unique personality can result in a better goodness-of-fit and hence better behavioral outcomes and higher quality parent-child relationships (Stoltz et al. 2013).

### *Limitations and Directions for Future Research*

First, the generalizability of the present findings is limited by the sample characteristics. This study only relied on parent-reports, which might increase the likelihood of finding significant results due to rater bias (Bauer et al. 2013). For example, it is possible that some parents generally appraise their child's behavior and their own parenting more positively (or more negatively), even when children objectively have more positive (or negative) characteristics. Also, parents were mainly recruited from autism-service centers. Therefore, we were not able to examine whether participating families, encountered more challenges in parenting and child behavior than parents who received no parental guidance or support. Although we controlled for child age in the analyses, we acknowledge that the children's age range was rather broad and overlapped between time periods. Therefore, we could not formulate time-specific findings related to children's developmental phases. Future research should include multiple informants such as mothers, fathers and other important caregivers, and should also apply more diverse recruitment strategies to reach a more heterogeneous group of parents. Such a more heterogeneous sample may also allow to examine with greater precision the moderating role of socio-demographic variables, including the role of socio-economic status.

Second, the generalizability of the findings is also limited by the specific choice of parenting, personality, and (mal)adjustment instruments. Future research could benefit from applying alternative measures and assessment methods (e.g. observational designs; Taraban and Shaw 2018). Further work could also map a broader spectrum of parenting behaviors, including both dysfunctional as well as more constructive parenting practices. Attention to more positive parenting behaviors, such as autonomy-supportive and responsive parenting, is

especially welcome in future research, as it seems plausible that positive parenting might play a more prominent role in fostering positive outcomes rather than protecting against maladaptive outcomes (Vansteenkiste and Ryan 2013). This idea was recently supported by a cross-sectional multi-group study, where higher levels of both responsive and autonomy-supportive parenting related significantly to more psychosocial strengths in children with and without special needs, including youth with ASD (De Clercq et al. 2019).

Third, it is important to further examine the impact of other factors that may influence the association between parenting behavior and psychosocial functioning in families with ASD. Both child (e.g., ASD symptom severity, intellectual functioning), as well as parental factors (e.g., personality, feelings of need frustration or parenting stress, social support, marital relationship quality), might be plausible mediators in the relation between parenting and child behavior (e.g., Hayes and Watson 2013; Dieleman et al. 2018a). Future research should especially address possible confounding in the conceptualization and measurement of child personality and the severity of core and noncore/associated ASD features more thoroughly (Chetcuti et al. 2019).

Finally, we fully acknowledge the transactional and complex interplay between the child (i.e., personality) and its environment (i.e., parenting) in the social development of youth with ASD (e.g., Van den Akker et al. 2013; Van Heel et al. 2019). The choice for LCM in this study did not allow to address transactional processes fully, yet this choice was motivated by the restricted sample size and the inclusion of only three measurement occasions. Ideally, new prospective longitudinal studies including larger sample sizes, additional informants, and more measurement occasions can further disentangle the complex transactional nature of the interplay between parenting and personality traits across development in youth with ASD.

## **Conclusion**

This study showed that both negative controlling parenting and child personality are related to the psychosocial development of youth with ASD in unique and interactive ways. Across a nine-year interval, negative controlling parenting, low Emotional Stability, and Benevolence consistently related to higher levels of externalizing problems, whereas low Emotional Stability and Extraversion were associated with higher levels of internalizing problems. Additionally, higher scores on Benevolence, Imagination or Extraversion related to higher levels of psychosocial strengths in the second time period. A limited set of personality by parenting interactions provided evidence for buffering effects. In the presence of negative controlling parenting, higher scores on Emotional Stability, Benevolence, and Conscientiousness were identified as protective factors against externalizing problems.

**Table 1** Descriptive data on the participating children and their parents in the study

	T1 ( <i>n</i> = 140)		T2 ( <i>n</i> = 97)		T3 ( <i>n</i> = 116)	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Type of education child						
Kindergarten	6	4.3	0	0.0	0	0.0
Regular primary education	60	42.9	3	3.1	0	0.0
Special primary education	37	26.4	11	11.3	1	0.8
Regular secondary education	23	16.4	38	39.2	35	30.2
Special secondary education	7	5.0	32	33.0	30	25.9
Higher education	0	0.0	7	7.2	20	17.2
Other	7	5.0	6	6.2	14	12.1
Living situation child <sup>1</sup>						
At home with parent(s)	-	-	75	77.3	91	78.4
During week at boarding school, weekend at home	-	-	16	16.5	2	1.7
During week in dorms, weekend at home	-	-	3	3.1	11	9.5
Living independently	-	-	0	0.0	4	3.4
Living in an institution <sup>2</sup>	-	-	0	0.0	3	2.6
Other	-	-	3	3.1	5	4.3
Nationality parents (mother/father) <sup>3</sup>						
Belgian	126/124	90.0/88.6	-	-	-	-
Other European nationality	13/10	9.3/7.1	-	-	-	-
Non-European	0/1	0.0/0.7	-	-	-	-
Missing	1/5	0.7/3.6	-	-	-	-
Education level parents (mother/father) <sup>3</sup>						
Primary school	3/7	2.1/5.0	-	-	-	-
Secondary school	57/62	40.7/44.3	-	-	-	-
Higher education (college or university)	74/57	52.9/40.7	-	-	-	-
Missing	6/14	4.3/10.0	-	-	-	-

*Note.* T1, Time 1; T2, Time 2; T3, Time 3. <sup>1</sup> Only measured at T2 and T3. <sup>2</sup> The child lives permanently or two-thirds of the time in an institution. <sup>3</sup> Only measured at T1

**Table 2** Means, standard deviations, minimum and maximum scores, and correlations between the study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
T1																					
1. Internalizing																					
2. Externalizing	.38***																				
3. Negative control	.05	.27**																			
4. Emotional Stability	-.70***	-.17*	.09																		
5. Benevolence	-.25**	-.76***	-.12	.18*																	
6. Conscientiousness	.08	-.23**	-.21*	-.17*	.19*																
7. Imagination	.05	.19*	-.02	-.01	-.11	.11															
8. Extraversion	-.31***	.37***	.08	.32***	-.19*	-.12	.45***														
T2																					
9. Internalizing	.48***	.27**	.11	.40***	-.22*	.16	-.10	-.09													
10. Externalizing	.13	.72**	.25*	.04	-.58***	-.18	.07	.38***	.46***												
11. Strengths	-.01	-.32**	-.23*	.04	.34***	.30**	.20*	.04	-.27**	-.53***											
12. Negative control	.07	.39***	.53***	-.12	-.22*	-.16	-.11	.12	.15	.46***	-.33***										
13. Emotional Stability	-.40***	-.31**	-.10	-.51***	.31**	-.18	.06	.05	-.67***	-.33**	.16	-.11									
14. Benevolence	-.04	-.64***	-.14	.08	.72***	.16	-.07	-.28**	-.19	-.77***	.61***	-.43***	.19								
15. Conscientiousness	.17	-.25*	-.25*	.20	.19	.71***	-.04	-.27**	.13	-.34***	.54***	-.35***	-.17	.36***							
16. Imagination	.04	.09	-.25*	.09	-.08	.21*	.59***	.25*	-.15	-.10	.45***	-.17	.01	.11	.26*						
17. Extraversion	-.27**	.27**	-.13	-.26**	-.14	.01	.17	.55***	-.32**	.25*	.26**	.04	.18	-.18	-.03	.42***					
T3																					
18. Internalizing	.54***	.16	.13	.36***	-.07	.21*	.11	-.20*	.75***	.37**	-.15	.14	-.53***	-.06	.19	-.13	-.30*				
19. Externalizing	.22*	.55***	.22*	.09	-.44***	-.05	.10	.26**	.35**	.82***	-.45***	.48***	.24*	-.57***	-.36**	-.03	.33**	.37***			
20. Strengths	-.18	-.35***	-.17	-.04	.37***	.18	-.15	-.07	-.21	-.37**	.69***	-.28*	.15	.43***	.44***	.23	.18	-.35***	-.45***		
21. Negative control	.05	.40***	.52***	.03	-.27**	-.16	-.11	-.04	.21	.36**	-.12	.73***	-.20	-.20	-.15	-.04	-.01	.08	.34***	-.21*	
Mean <sup>1</sup>	16.70	18.58	2.30	2.67	2.91	2.74	2.89	2.77	13.31	11.51	130.43	2.05	2.69	3.05	2.91	2.94	2.78	12.52	8.33	139.53	1.76
SD	9.33	10.24	0.47	0.76	0.64	0.60	0.68	0.64	10.30	10.30	24.14	0.54	0.76	0.64	0.69	0.62	0.56	10.34	9.10	25.83	0.51
Minimum	0.00	0.00	1.00	1.63	1.23	1.09	1.38	1.50	0.00	0.00	70.00	1.00	1.13	1.50	1.38	1.42	1.38	0.00	0.00	43.00	1.00
Maximum	46.0	49.0	3.50	4.94	4.20	4.31	4.54	4.63	53.00	46.00	192.00	3.45	4.44	4.55	4.88	4.33	4.38	49.00	61.00	199.00	3.18

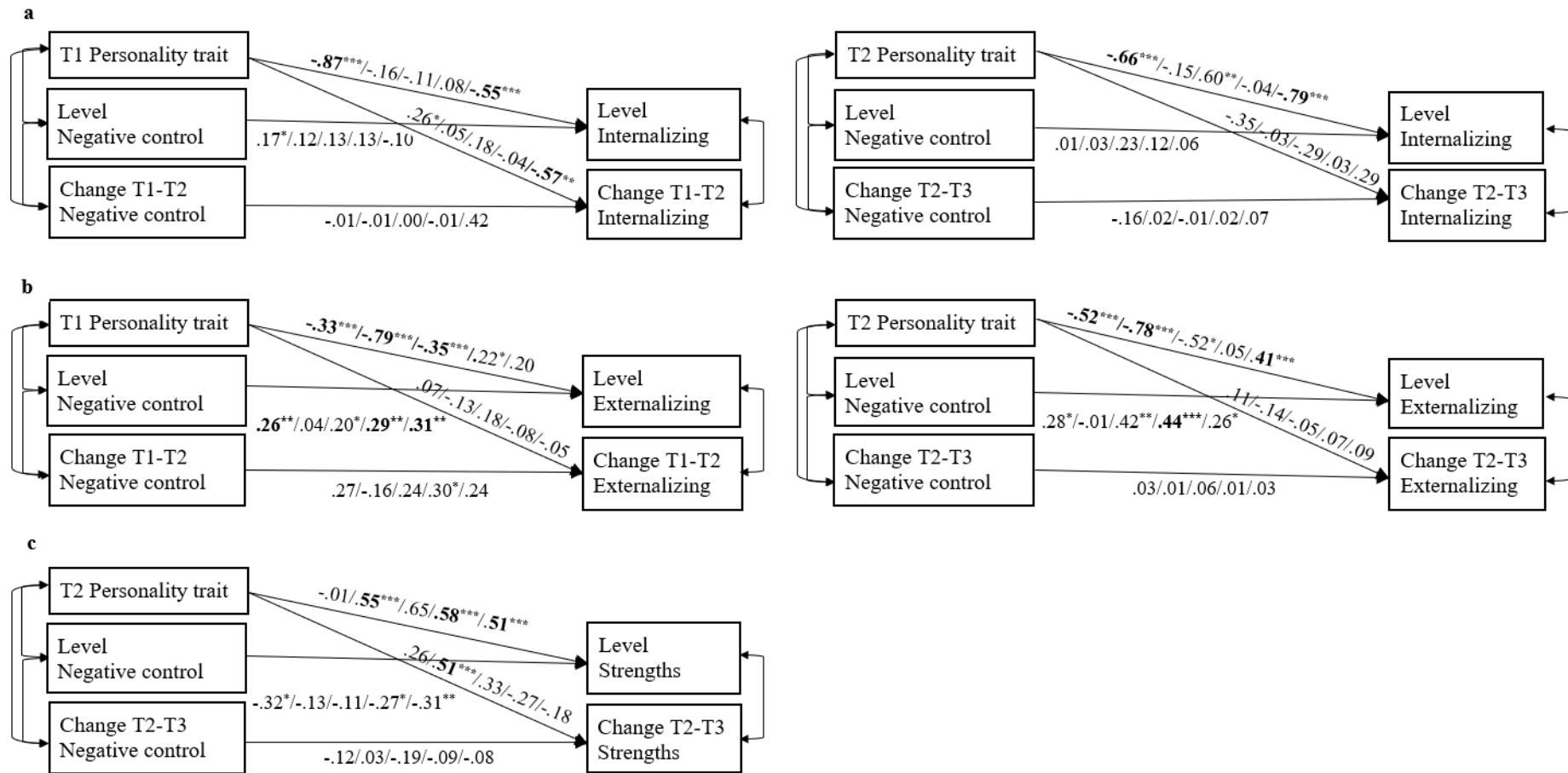
Note. T1, Time 1; T2, Time 2; T3, Time 3. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ . <sup>1</sup> To enhance comparability with previous studies, we reported raw scores for the CBCL (Achenbach 1991) and BERS-2 (Epstein 2004) and mean scores for the Parental Behavior Scale (Van Leeuwen and Vermulst 2004) and HiPIC (Mervielde and De Fruyt 2002).

**Table 3** Parameter estimates and fit indices of the univariate latent change model

	Parameter estimates						Fit indices		
	Level		Change T1 to T2		Change T2 to T3		RMSEA	CFI	SRMR
	<i>M</i>	<i>s</i> <sup>2</sup>	<i>M</i>	<i>s</i> <sup>2</sup>	<i>M</i>	<i>s</i> <sup>2</sup>			
Internalizing problems	2.55 ***	0.97 ***	1.14 **	0.87 ***	-0.73	0.99 ***	0.06	0.96	0.09
Externalizing problems	4.01 ***	0.93 ***	-2.51 **	0.80 ***	-0.83	0.93 ***	0.08	0.97	0.06
Psychosocial strengths <sup>1</sup>	4.84 ***	0.90 ***	-	-	1.75 *	0.94 ***	0.08	0.95	0.06
Negative control	6.76 ***	0.98 ***	-0.78	0.90 ***	-1.15	0.96 ***	0.06	0.98	0.03

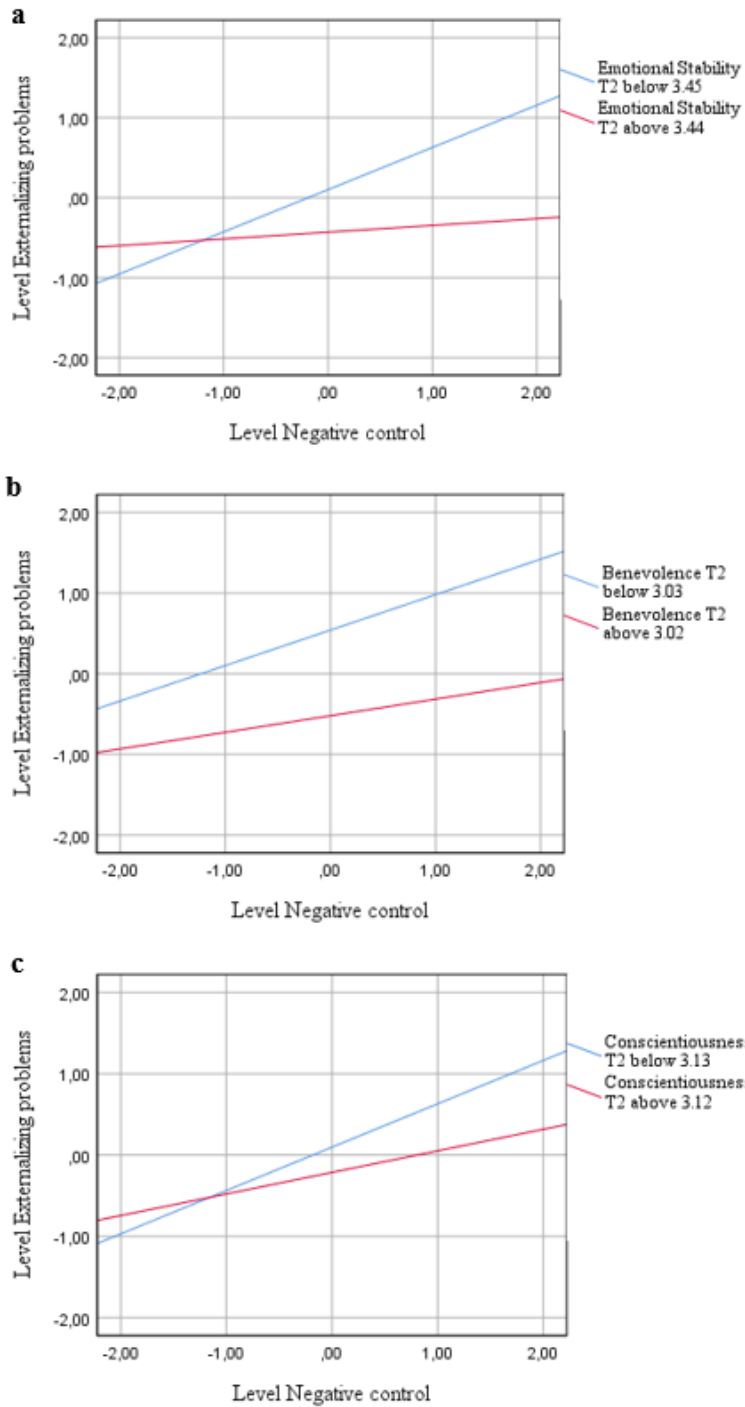
*Note.* T1, Time 1; T2, Time 2; T3, Time 3. *RMSEA* root mean square error of approximation, *CFI* comparative fit index, *SRMR* standardized root mean square residual. <sup>1</sup>The BERS-2 was not assessed at T1. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

**Fig. 1** Latent Change Model on the relation between negative controlling parenting and child behavior (**a** Internalizing problems, **b** Externalizing problems, and **c** Psychosocial strengths) for the first (T1-T2) and second time period (T2-T3)



*Note.* Path coefficients refer to the models including the following personality traits: Emotional Stability/ Benevolence/ Conscientiousness/ Imagination/ Extraversion. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ . Coefficients in bold remain significant after Bonferonni correction ( $p < .002$ )

**Fig. 2** Interaction between child personality at T2 (**a** Emotional Stability, **b** Benevolence, and **c** Conscientiousness) and the level of negative controlling parenting on the level of externalizing problems





## References

- Achenbach, T. M. (1991). Manual for Child Behavior Checklist/4–18 and 1991 profile. In Burlington, VT: University of Vermont, Department of Psychiatry.
- Bader, S. H., & Barry, T. D. (2014). A Longitudinal Examination of the Relation Between Parental Expressed Emotion and Externalizing Behaviors in Children and Adolescents with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 44(11), 2820-2831, doi:10.1007/s10803-014-2142-6.
- Bader, S. H., Barry, T. D., & Hann, J. A. H. (2014). The Relation Between Parental Expressed Emotion and Externalizing Behaviors in Children and Adolescents With an Autism Spectrum Disorder. *Focus on Autism and Other Developmental Disabilities*, 30(1), 23-34, doi:10.1177/1088357614523065.
- Baker, J. K., Smith, L. E., Greenberg, J. S., Seltzer, M. M., & Taylor, J. L. (2011). Change in maternal criticism and behavior problems in adolescents and adults with autism across a 7-year period. *Journal of Abnormal Psychology*, 120(2), 465-475, doi:10.1037/a0021900.
- Bates, J. E., & Pettit, G. S. (2015). Temperament, parenting, and social development. In *Handbook of socialization: Theory and research, 2nd ed.* (pp. 372-397). New York, NY, US: Guilford Press.
- Bauer, D. J., Howard, A. L., Baldasaro, R. E., Curran, P. J., Hussong, A. M., Chassin, L., et al. (2013). A trifactor model for integrating ratings across multiple informants. *Psychological Methods*, 18(4), 475-493, doi:10.1037/a0032475.
- Beauchaine, T. P. (2003). Taxometrics and developmental psychopathology. *Development and Psychopathology*, 15(3), 501-527, doi:10.1017/S0954579403000270.
- Beyers, W., & Goossens, L. (2008). Dynamics of perceived parenting and identity formation in late adolescence. *Journal of adolescence*, 31(2), 165-184, doi:10.1016/j.adolescence.2007.04.003.
- Boonen, H., Maljaars, J., Lambrechts, G., Zink, I., G., V. L. K., & Noens, I. (2014). Behavior problems among school-aged children with autism spectrum disorder: Associations with children's communication difficulties and parenting behaviors. *Research in Autism Spectrum Disorders*(8), 716-725.
- Burrows, C. A., Usher, L. V., Schwartz, C. B., Mundy, P. C., & Henderson, H. A. (2016). Supporting the Spectrum Hypothesis: Self-Reported Temperament in Children and Adolescents with High Functioning Autism. *Journal of Autism and Developmental Disorders*, 46(4), 1184-1195, doi:10.1007/s10803-015-2653-9.
- Caspi, A., & Shiner, R. L. (2006). Personality development. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology* (6th ed., Vol. 3. Social, emotional, and personality development, pp. 300–364). New York: Wiley.
- Chetcuti, L., Uljarevic, M., & Hudry, K. (2019). Editorial Perspective: Furthering research on temperament in autism spectrum disorder. *Journal of child psychology and psychiatry, and allied disciplines*, 60(2), 225-228, doi:10.1111/jcpp.12957.
- De Clercq, L., Van der Kaap-Deeder, J., Dieleman, L. M., Soenens, B., Prinzie, P., & De Pauw, S. S. W. (2019). Parenting and Psychosocial Development in Youth with and without Autism Spectrum Disorder, Cerebral Palsy, and Down Syndrome: a Cross-Disability Comparison. *Advances in Neurodevelopmental Disorders*, 3(2), 220-234, doi:10.1007/s41252-019-00112-2.

- 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 & Human Development, 41*(3), 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*(3), 309-325, doi:10.1007/s10802-008-9290-0.
- De Pauw, S. S. W., Mervielde, I., Van Leeuwen, K. G., & De Clercq, B. (2011). How temperament and personality contribute to the maladjustment of children with autism. *Journal of Autism and Developmental Disorders, 41*(2), 196-212, doi:10.1007/s10803-010-1043-6.
- Del Giudice, M. (2017). Statistical tests of differential susceptibility: Performance, limitations, and improvements. *Development and Psychopathology, 29*(4), 1267-1278, doi:10.1017/S0954579416001292.
- Desjardins, T., & Leadbeater, B. J. (2016). Changes in Parental Emotional Support and Psychological Control in Early Adulthood: Direct and Indirect Associations With Educational and Occupational Adjustment. *Emerging Adulthood, 5*(3), 177-190, doi:10.1177/2167696816666974.
- Dieleman, L. M., De Pauw, S. S. W., Soenens, B., Beyers, W., & Prinzie, P. (2017). Examining bidirectional relationships between parenting and child maladjustment in youth with autism spectrum disorder: A 9-year longitudinal study. *Development and Psychopathology, 29*(4), 1199-1213, doi:10.1017/s0954579416001243.
- Dieleman, L. M., De Pauw, S. S. W., Soenens, B., Mabbe, E., Campbell, R., & Prinzie, P. (2018a). Relations between problem behaviors, perceived symptom severity and parenting in adolescents and emerging adults with ASD: The mediating role of parental psychological need frustration. *Research in Developmental Disabilities, 73*, 21-30, doi:10.1016/j.ridd.2017.12.012.
- Dieleman, L. M., De Pauw, S. S. W., Soenens, B., Van Hove, G., & Prinzie, P. (2018b). Behavioral Problems and Psychosocial Strengths: Unique Factors Contributing to the Behavioral Profile of Youth With Down Syndrome. *American Journal on Intellectual and Developmental Disabilities, 123*(3), 212-227, doi:10.1352/1944-7558-123.3.212.
- Epstein, M. H. (2004). *Behavioral and Emotional Rating Scale-2nd Edition. A strenghts-based approach to assessment*. Austin: PRO-ED.
- Epstein, M. H., Mooney, P., Ryser, G., & Pierce, C. D. (2004). Validity and Reliability of the Behavioral and Emotional Rating Scale (2nd Edition): Youth Rating Scale. *Research on Social Work Practice, 14*(5), 358-367, doi:10.1177/1049731504265832.
- Gray, K., Keating, C., Taffe, J., Brereton, A., Einfeld, S., & Tonge, B. (2012). Trajectory of behavior and emotional problems in autism. *American journal on intellectual and developmental disabilities, 117*(2), 121-133, doi:10.1352/1944-7588-117-2.121.
- Greenberg, J. S., Seltzer, M. M., Hong, J., & Orsmond, G. I. (2006). Bidirectional Effects of Expressed Emotion and Behavior Problems and Symptoms in Adolescents and Adults With Autism. *American Journal on Mental Retardation, 111*(4), 229-249.
- Hayes, S. A., & Watson, S. L. (2013). The impact of parenting stress: a meta-analysis of studies comparing the experience of parenting stress in parents of children with and without autism spectrum disorder. *Journal of Autism and Developmental Disorders, 43*(3), 629-642, doi:10.1007/s10803-012-1604-y.

- Hill, P. L., & Roberts, B. W. (2016). Personality and health: Reviewing recent research and setting a directive for the future. In *Handbook of the Psychology of Aging* (pp. 205-218): Academic Press.
- Holtmann, M., Bölte, S., & Poustka, F. (2007). Autism spectrum disorders: sex differences in autistic behaviour domains and coexisting psychopathology. *Developmental Medicine & Child Neurology*, *49*(5), 361-366, doi:10.1111/j.1469-8749.2007.00361.x.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *1*(6), 1-55.
- Keijsers, L., Voelkle, M. C., Maciejewski, D., Branje, S., Koot, H., Hiemstra, M., et al. (2016). What drives developmental change in adolescent disclosure and maternal knowledge? Heterogeneity in within-family processes. *Developmental psychology*, *52*(12), 2057-2070, doi:10.1037/dev0000220.
- Kiff, C. J., Lengua, L. J., & Zalewski, M. (2011). Nature and nurturing: parenting in the context of child temperament. *Clinical child and family psychology review*, *14*(3), 251-301, doi:10.1007/s10567-011-0093-4.
- Kishton, J. M., & Widaman, K. F. (1994). Unidimensional Versus Domain Representative Parceling of Questionnaire Items: An Empirical Example. *Educational and Psychological Measurement*, *54*(3), 757-765, doi:10.1177/0013164494054003022.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Lambrechts, G., Van Leeuwen, K. G., Boonen, H., Maes, B., & Noens, I. (2011). Parenting behaviour among parents of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *5*(3), 1143-1152, doi:<https://doi.org/10.1016/j.rasd.2010.12.011>.
- Landis, R. S., Beal, D. J., & Tesluk, P. E. (2000). A Comparison of Approaches to Forming Composite Measures in Structural Equation Models. *Organizational Research Methods*, *3*(2), 186-207, doi:10.1177/109442810032003.
- Lengua, L. J., Gartstein, M. A., & Prinzie, P. (2019). Temperament and personality development in the family: interactions and transactions with parenting from infancy through adolescence. In D. P. McAdams, R. L. Shiner, & J. L. Tackett (Eds.), *Handbook of personality development* (pp. 201-220). New York: Guilford Press.
- Lindsey, R. A., Saltness, S. R., Lau, A. F., & Barry, T. D. (2020). A longitudinal examination of interactions between autism symptom severity and parenting behaviors in predicting change in child behavior problems. *Research in Autism Spectrum Disorders*, *70*, 101469, doi:<https://doi.org/10.1016/j.rasd.2019.101469>.
- Mabbe, E., Soenens, B., Vansteenkiste, M., & Van Leeuwen, K. G. (2016). Do Personality Traits Moderate Relations Between Psychologically Controlling Parenting and Problem Behavior in Adolescents? *Journal of Personality*, *84*(3), 381-392, doi:10.1111/jopy.12166.
- Mabbe, E., Vansteenkiste, M., Brenning, K., De Pauw, S. S. W., Beyers, W., & Soenens, B. (2019). The moderating role of adolescent personality in associations between psychologically controlling parenting and problem behaviors: A longitudinal examination at the level of within-person change. *Developmental psychology*, *55*(12), 2665-2677, doi:10.1037/dev0000802.
- Maljaars, J., Boonen, H., Lambrechts, G., Van Leeuwen, K. G., & Noens, I. (2014). Maternal parenting behavior and child behavior problems in families of children and

- adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 44(3), 501-512, doi:10.1007/s10803-013-1894-8.
- McCauley, J. B., Mundy, P., & Solomon, M. (2019). Parenting and autism spectrum disorder. In M. H. Bornstein (Ed.), *Handbook of parenting* (3rd ed., Vol. I: Children and Parenting). New York: Routledge.
- McGovern, C. W., & Sigman, M. (2005). Continuity and change from early childhood to adolescence in autism. *Journal of child psychology and psychiatry, and allied disciplines*, 46(4), 401-408, doi:10.1111/j.1469-7610.2004.00361.x.
- Mervielde, I., De Clercq, B., De Fruyt, F., & Van Leeuwen, K. (2006). Temperament and personality as broad-spectrum antecedents of psychopathology in childhood and adolescence. In T. A. Widiger, E. Simonsen, P. J. Sirovatka, & D. A. Regier (Eds.), *Dimensional models of personality disorders. Refining the research agenda for DSM-V* (pp. 85–109). Washington, DC: American Psychiatric Association.
- Mervielde, I., & De Fruyt, F. (2002). Assessing children's traits with the Hierarchical Personality Inventory for Children. In B. D. Raad, & M. Perugini (Eds.), *Big five assessment* (pp. 129-146). Seattle: Hogrefe & Huber Publishers.
- Meunier, J. C., Roskam, I., Stievenart, M., van de Moortele, G., Browne, D. T., & Kumar, A. (2011). Externalizing behavior trajectories: The role of parenting, sibling relationships and child personality. *Journal of Applied Developmental Psychology*, 32(1), 20-33, doi:10.1016/j.appdev.2010.09.006.
- Mundy, P. C., Henderson, H. A., Inge, A. P., & Coman, D. C. (2007). The Modifier Model of Autism and Social Development in Higher Functioning Children. *Research and practice for persons with severe disabilities : the journal of TASH*, 32(2), 124-139, doi:10.2511/rpsd.32.2.124.
- Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles: CA: Muthén & Muthén.
- O'Nions, E., Ceulemans, E., Happé, F., Benson, P., Evers, K., & Noens, I. (2019). Parenting Strategies Used by Parents of Children with ASD: Differential Links with Child Problem Behaviour. *Journal of Autism and Developmental Disorders*, doi:10.1007/s10803-019-04219-2.
- Pinquart, M. (2017a). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental psychology*, 53(5), 873-932, doi:10.1037/dev0000295.
- Pinquart, M. (2017b). Associations of Parenting Dimensions and Styles with Internalizing Symptoms in Children and Adolescents: A Meta-Analysis. *Marriage & Family Review*, 53(7), 613-640, doi:10.1080/01494929.2016.1247761.
- Prinzle, P., Onghena, P., & Hellinckx, W. (2005). Parent and Child Personality Traits and Children's Externalizing Problem Behavior From Age 4 to 9 Years: A Cohort-Sequential Latent Growth Curve Analysis. *Merrill-Palmer Quarterly*, 51(3), 335-366.
- Prinzle, P., Onghena, P., Hellinckx, W., Grietens, H., Ghesquière, P., & Colpin, H. (2003). The additive and interactive effects of parenting and children's personality on externalizing behaviour. *European Journal of Personality*, 17(2), 95-117, doi:10.1002/per.467.
- Prinzle, P., van der Sluis, C. M., de Haan, A. D., & Deković, M. (2010). The mediational role of parenting on the longitudinal relation between child personality and externalizing behavior. *Journal of Personality*, 78(4), 1301-1323.

- Robins, R. W., & Trzesniewski, K. H. (2005). Self-Esteem Development Across the Lifespan. *Current Directions in Psychological Science, 14*(3), 158-162, doi:10.1111/j.0963-7214.2005.00353.x.
- Schwartz, C. B., Henderson, H. A., Inge, A. P., Zahka, N. E., Coman, D. C., Kojkowski, N. M., et al. (2009). Temperament as a predictor of symptomatology and adaptive functioning in adolescents with high-functioning autism. *Journal of Autism and Developmental Disorders, 39*(6), 842-855, doi:10.1007/s10803-009-0690-y.
- Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: measurement, development, and consequences. *Journal of Child Psychology and Psychiatry, 44*(1), 2-32, doi:10.1111/1469-7610.00101.
- Soenens, B., & Vansteenkiste, M. (2010). A theoretical upgrade of the concept of parental psychological control: Proposing new insights on the basis of self-determination theory. *Developmental Review, 30*(1), 74-99, doi:10.1016/j.dr.2009.11.001.
- Soenens, B., Vansteenkiste, M., & Beyers, W. (2019). Parenting adolescents. In M. H. Bornstein (Ed.), *Handbook of parenting* (3rd ed., Vol. 1: children and parenting, pp. 101–167). New York: Routledge.
- Stoltz, S., Prinzie, P., De Haan, A., Londen, M., De Castro, B. O., & Deković, M. (2013). Child personality as moderator of outcome in a school-based intervention for preventing externalising behaviour. *European Journal of Personality*(27), 271-279.
- Taraban, L., & Shaw, D. S. (2018). Parenting in context: Revisiting Belsky's classic process of parenting model in early childhood. *Developmental Review, 48*, 55-81, doi:<https://doi.org/10.1016/j.dr.2018.03.006>.
- Taylor, J. L., & Seltzer, M. M. (2010). Changes in the Autism Behavioral Phenotype During the Transition to Adulthood. *Journal of Autism and Developmental Disorders, 40*(12), 1431-1446, doi:10.1007/s10803-010-1005-z.
- Usami, S., Murayama, K., & Hamaker, E. L. (2019). A unified framework of longitudinal models to examine reciprocal relations. *Psychological Methods, 24*(5), 637-657, doi:10.1037/met0000210.
- van de Looij-Jansen, P. M., Jansen, W., de Wilde, E. J., Donker, M. C. H., & Verhulst, F. C. (2010). Discrepancies Between Parent-Child Reports of Internalizing Problems Among Preadolescent Children: Relationships with Gender, Ethnic Background, and Future Internalizing Problems. *The Journal of Early Adolescence, 31*(3), 443-462, doi:10.1177/0272431610366243.
- Van den Akker, A. L., Prinzie, P., Deković, M., De Haan, A. D., Asscher, J. J., & Widiger, T. (2013). The development of personality extremity from childhood to adolescence: Relations to internalizing and externalizing problems. *Journal of Personality and Social Psychology, 105*(6), 1038-1048, doi:10.1037/a0034441.
- van Esch, L., Vanmarcke, S., Ceulemans, E., Van Leeuwen, K., & Noens, I. (2018). Parenting adolescents with ASD: A multimethod study. *Autism Research, 11*(7), 1000-1010, doi:10.1002/aur.1956.
- Van Heel, M., Bijttebier, P., Colpin, H., Goossens, L., Van Den Noortgate, W., Verschueren, K., et al. (2019). Investigating the interplay between adolescent personality, parental control, and externalizing problem behavior across adolescence. *Journal of Research in Personality, 81*, 176-186, doi:<https://doi.org/10.1016/j.jrp.2019.06.005>.
- 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(6), 1028-1046, doi:10.1037/0012-1649.40.6.1028.
- Van Leeuwen, K. G., Mervielde, I., De Clercq, B., & De Fruyt, F. (2007). Extending the Spectrum Idea: Child Personality, Parenting and Psychopathology. *European Journal of Personality*, 21(1), 63-89, doi:10.1002/per.598.
- Van Leeuwen, K. G., & Vermulst, A. A. (2004). Some psychometric properties of the Ghent Parental Behavior Scale. *European Journal of Psychological Assessment*(20), 283–298.
- Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration*, 23(3), 263-280, doi:10.1037/a0032359.
- Ventola, P., Lei, J., Paisley, C., Lebowitz, E., & Silverman, W. (2017). Parenting a Child with ASD: Comparison of Parenting Style Between ASD, Anxiety, and Typical Development. *Journal of Autism and Developmental Disorders*, 47(9), 2873-2884, doi:10.1007/s10803-017-3210-5.
- Woodman, A. C., Smith, L. E., Greenberg, J. S., & Mailick, M. R. (2015). Change in Autism Symptoms and Maladaptive Behaviors in Adolescence and Adulthood: The Role of Positive Family Processes. *Journal of Autism and Developmental Disorders*, 45(1), 111-126, doi:10.1007/s10803-014-2199-2.