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ORIGINAL PAPER

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

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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 three-year-interval. Over time, negative controlling parenting and child personality were consistently related to externalizing problems, whereas child personality was differentially related to internalizing problems and psychosocial strengths. Three personality-by-parenting interactions were significant, suggesting that children with less mature personality traits show more externalizing behaviors in the presence of controlling parenting. 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. Studies focusing on the development of ASD core symptoms in this age period documented a general, yet modest, improvement in social communication and adaptation across adolescence (e.g., McGovern and Sigman 2005; Taylor and Seltzer 2010; Gray et al. 2012; Woodman et al. 2015). However, adolescence is quite a challenging period for youth with ASD, even more than is the case for their peers without ASD. During adolescence, the increasing emphasis on social interactions outside the family, including peer relationships, accentuates the social problems and challenges of youth with ASD. Also, the demands for increasingly mature roles and responsibilities might be more difficult to accommodate for youth with ASD (e.g., 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

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.

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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 over reactivity, coercive or harsh discipline, or psychological control, are systematically related to behavioral and/or emotional problems (Pinquart 2017a, b; 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. One criticism sometimes levelled against research on trait-psychopathology associations is that there is conceptual confounding between child personality and behavior problems as well as a risk for item-overlap in the assessment of both types of constructs (Rothbart and Bates 2006; De Pauw et al. 2009). Some conceptual overlap between these constructs is theoretically to be expected because personality contributes to the development of behavior problems (Bates 1990). However, findings indicated that the amount of item contamination is rather limited and that child personality and behavioral problems are conceptually more different than alike (Prinzie et al. 2005; De Pauw et al. 2009; Lengua et al. 1998).

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 by using latent change modeling (LCM). This technique allows to model change at the within-person level (i.e., the level of a family unit), which is important because this type of change is most salient and personally meaningful to families. Also, prevention and intervention efforts predominantly target 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 were reported to have one or more comorbid diagnoses (53.90% at T1), 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 12.3% ($n = 13$) of these 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

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

	T1 ($n = 140$)		T2 ($n = 97$)		T3 ($n = 116$)	
	N	%	*N*	%	*N*	%
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[a]						
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[b]	–	–	0	0.0	3	2.6
Other	–	–	3	3.1	5	4.3
Nationality parents (mother/father)[c]						
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)[3]						
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	–	–	–	–

T1 time 1, *T2* time 2, *T3* time 3

[a]Only measured at T2 and T3

[b]The child lives permanently or two-thirds of the time in an institution

[c]Only measured at T1

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 α'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 five-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 α'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 five-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 α'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 five-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 (reversed), Egocentrism (reversed), Compliance and Irritability (reversed); *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 (reversed). Cronbach α's ranged from .83 (Imagination at T1) to .93 (Benevolence at T2).

Autism Severity

Parents rated their child's ASD symptom severity on the Social Communication Questionnaire Current Version (SCQ-Current; Rutter et al. 2003; Warreyn et al. 2004) at T1 and the Social Responsiveness Scale (SRS) (Constantino and Gruber 2005; Roeyers et al. 2011) at T2 and T3. The SCQ consists of 40 yes-or-no questions and covers symptoms (as displayed within the past three months) in the domains of language/communication, social functioning, and repetitive/stereotyped behaviors. The SRS consists of 65 items on a four-point Likert scale ranging from (1) *not true* to (4) *almost always true,* where parents reported on their child's ASD symptoms (i.e., social awareness, social information processing, capacity for reciprocal social communication, social anxiety/avoidance, and autistic preoccupations) displayed over the past six months. Parents rated the SCQ at T1 (2005–2006) because at that time there was no validated Dutch version of the SRS available. The Cronbach α was .82 for the SCQ, .95 for the SRS at T2, and .93 for the SRS at T3.

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 Mplus 8.3 (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: χ^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, initial levels of, and change in, the outcome variables were predicted simultaneously by initial levels 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) (Fig. 1). To counteract multiple testing, we only focus on findings that remained significant after Bonferroni 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 Fig. 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.

Prior to the main analyses, we examined relations between several demographic characteristics (i.e., child age, child gender, the child's intellectual functioning, ASD symptom severity, and parental age) and the variables of interest. Correlational analyses indicated that children's age related to fewer externalizing problems at T1 ($r = -.22$, $p = .01$). At T2, child age related to fewer internalizing problems ($r = -.22$, $p = .03$), fewer externalizing problems ($r = -.36$, $p < .001$), 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 higher in Benevolence ($r = .24$, $p = .02$ at T2) and Conscientiousness ($r = .21$, $p = .02$ at T2), and lower in Extraversion ($r = -.17$, $p = .04$ at T1). 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 ($F(1,95) = 15.05$, $p < .001$).

To examine the role of ASD symptom severity, we used the SCQ total score at T1 and only the SRS total score at T2 in further analyses, given the high correlation between the SRS total score at T2 and T3 ($r = .75$, $p < .001$). These indicators of ASD symptom severity correlated significantly with each other (r SCQ_{T1}—$SRS_{T2} = .45$, $p < .001$) and with the variables of interest. Specifically, the SCQ total score at T1 related significantly to more internalizing problems at T1 ($r = .19$, $p = .03$), more externalizing problems at T1 ($r = .19$, $p = .02$), fewer psychosocial strengths at T2 ($r = -.39$, $p < .001$) and T3 ($r = -.26$, $p = .01$), less Benevolence at T2 ($r = -.23$, $p = .02$), and less Extraversion at T1 ($r = -.18$, $p = .03$). The SRS total score at T2 significantly correlated with internalizing problems at T2 ($r = .44$, $p < .001$) and T3 ($r = .37$, $p < .01$), externalizing problems at T1 ($r = .38$, $p < .001$), T2 ($r = .57$, $p < .001$) and T3 ($r = .45$, $p < .001$), psychosocial strengths at T2 ($r = -.62$, $p < .001$) and T3 ($r = -.48$, $p < .001$), negative controlling parenting at T2 ($r = .33$, $p < .01$) and T3 ($r = .30$, $p = .01$), Emotional Stability at T2 ($r = -.28$, $p = .01$) and T3 ($r = -.26$, $p = .03$), Benevolence at T1 ($r = -.35$, $p < .01$), T2 ($r = -.52$, $p < .001$) and T3 ($r = -.45$, $p < .001$), Conscientiousness at T1 ($r = -.28$, $p = .01$), T2 ($r = -.31$, $p < .01$) and T3 ($r = -.23$, $p = .04$), and Imagination at T1 ($r = -.22$, $p = .03$), T2 ($r = -.39$, $p < .001$) and T3 ($r = -.27$, $p = .02$). Higher parental age related significantly to fewer 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, ASD symptom severity, and parental age. We included the SCQ

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. Int.																					
2. Ext.	.38***																				
3. Neg.	.05	.27**																			
4. Emo.	− .70***	− .17*	.09																		
5. Ben.	− .25**	− .76***	− .12	.18*																	
6. Con.	.08	− .23**	− .21*	− .17*	.19*																
7. Ima.	.05	.19*	− .02	− .01	− .11	.11															
8. Extr.	− .31***	.37***	.08	.32***	− .19*	− .12	.45***														
T2																					
9. Int.	.48***	.27**	.11	.40***	− .22*	.16	− .10	− .09													
10. Ext.	.13	.72**	.25*	.04	− .58***	− .18	.07	.38***	.46***												
11. Str.	− .01	− .32**	− .23*	.04	.34**	.30**	.20*	.04	− .27**	− .53***											
12. Neg.	.07	.39***	.53***	− .12	− .22*	− .16	− .11	.12	.15	.46***	− .33***										
13. Emo.	− .40***	− .31**	− .10	− .51***	.31**	− .18	.06	.05	− .67***	− .33**	.16	− .11									
14. Ben.	− .04	− .64***	− .14	.08	.72***	.16	− .07	− .28**	− .19	− .77***	.61***	− .43***	.19								
15. Con.	.17	− .25*	− .25*	.20	.19	.71***	− .04	− .27**	.13	− .34***	.54***	− .35***	− .17	.36***							
16. Ima.	.04	.09	− .25*	.09	− .08	.21*	.59***	.25*	− .15	− .10	.45***	− .17	.01	.11	.26*						
17. Extr.	− .27**	.27**	− .13	− .26**	− .14	.01	.17	.55***	− .32**	.25*	.26**	.04	.18	− .18	− .03	.42***					
T3																					
18. Int.	.54***	.16	.13	.36***	− .07	.21*	.11	− .20*	.75***	.37**	− .15	.14	− .53***	− .06	.19	− .13	− .30*				
19. Ext.	.22*	.55***	.22*	.09	− .44***	− .05	.10	.26**	.35**	.82***	− .45***	.48***	.24*	− .57***	− .36*	− .03	.33**	.37***			
20. Str.	− .18	− .35***	− .17	− .04	.37***	.18	− .15	− .07	− .21	− .37**	.69**	− .28*	.15	.43***	.44***	.23	.18	− .35***	− .45***		
21. Neg.	.05	.40***	.52***	.03	− .27**	− .16	− .11	− .04	.21	.36*	− .12	.73***	− .20	− .20	− .15	− .04	− .01	.08	.34***	− .21*	
Mean[a]	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

T1 time 1, *T2* time 2, *T3* time 3, *Int.* Internalizing problems, *Ext.* Externalizing problems, *Neg.* Negative Control, *Emo.* Emotional Stability, *Ben.* Benevolence, *Con.* Conscientiousness, *Ima.* Imagination, *Extr.* Extraversion, *Str.* Strengths

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

[a]To enhance comparability with previous studies, we reported raw scores for the CBCL (Achenbach 1991) and BERS− 2 (Epstein et al. 2004) and mean scores for the Parental Behavior Scale (Van Leeuwen and Vermulst 2004) and HiPIC (Mervielde and De Fruyt 2002; Gray et al. 2012)

total score at T1 as a covariate in the univariate LCM and the LCMs concerning the first time period and the SRS total score at T2 was included as a covariate in the LCMs concerning the second time period.

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 remained stable, whereas externalizing problems decreased. Notably, from T2-to-T3, mean levels of behavioral problems remained stable but children's psychosocial strengths increased. 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 Fig. 1. The findings demonstrated no significant associations between initial levels of negative controlling parenting and initial levels of internalizing problems or psychosocial strengths. Nevertheless, initial levels of negative controlling parenting were positively associated with initial levels of externalizing problems (in 3 out of 5 models examining T1-to-T2, and 1 out of 5 models examining T2-to-T3). There were no significant associations between the slopes, suggesting that change in negative controlling parenting did not systematically relate to an increase or decrease in emotional or behavioral problems or psychosocial strengths.

Across both time periods, low Emotional Stability and low Extraversion related significantly to higher initial levels of internalizing problems (in 2 out of 2 models examining T1-to-T2, and 2 out of 2 models examining T2-to-T3). In addition, Extraversion was related negatively to the change factor (T1-T2) of internalizing problems, indicating that higher Extraversion related to a decrease in internalizing problems during the first time period. Across both time periods, low Emotional Stability, low Benevolence, and high Extraversion yielded a significant association with higher initial levels of externalizing problems (in 3 out of 3 models examining T1-to-T2, and 3 out of 3 models examining T2-to-T3). Additionally, low Conscientiousness related significantly to initial levels of externalizing problems in the first time period. No further significant effects were found concerning change in the outcome factor.

Benevolence and Extraversion related positively to initial levels of psychosocial strengths in the second time period (in 2 out of 2 models examining T2-to-T3). Moreover, a second significant effect emerged concerning change in the outcome factor, 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 initial levels of negative controlling parenting and initial levels of externalizing behavior were 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 ($t(93) = -1.57$, $p = .02$, $b = -.39$), Benevolence ($t(93) = -3.03$, $p < .01$, $b = -0.33$), and Conscientiousness at T2 ($t(93) = -2.18$, $p = .04$, $b = -0.36$) showed elevated initial 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 initial levels of negative controlling parenting and initial levels of externalizing problems was significant for children with a score lower than 3.28 on Emotional Stability (74.2% of the children), a score lower than 3.02 on Benevolence (48.5% of the children), or a score lower than 3.07 on Conscientiousness (60.3% of the children), but not for children with higher scores on these personality domains (Fig. 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

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

	Parameter estimates								
	Level		Change T1 to T2		Change T2 to T3		Fit indices		
	M	s^2	*M*	s^2	*M*	s^2	RMSEA	CFI	SRMR
Internalizing problems	2.98**	0.82***	0.12	0.81***	−0.42	0.99***	0.05	0.93	0.07
Externalizing problems	3.58***	0.90***	−2.19*	0.83***	−0.46	0.91***	0.08	0.96	0.06
Psychosocial strengths[a]	4.43***	0.77***	–	–	2.42*	0.88***	0.07	0.92	0.07
Negative control	3.32***	0.96***	−1.65	0.84***	−1.37	0.96***	0.05	0.98	0.03

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

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

[a]The BERS-2 was not assessed at T1

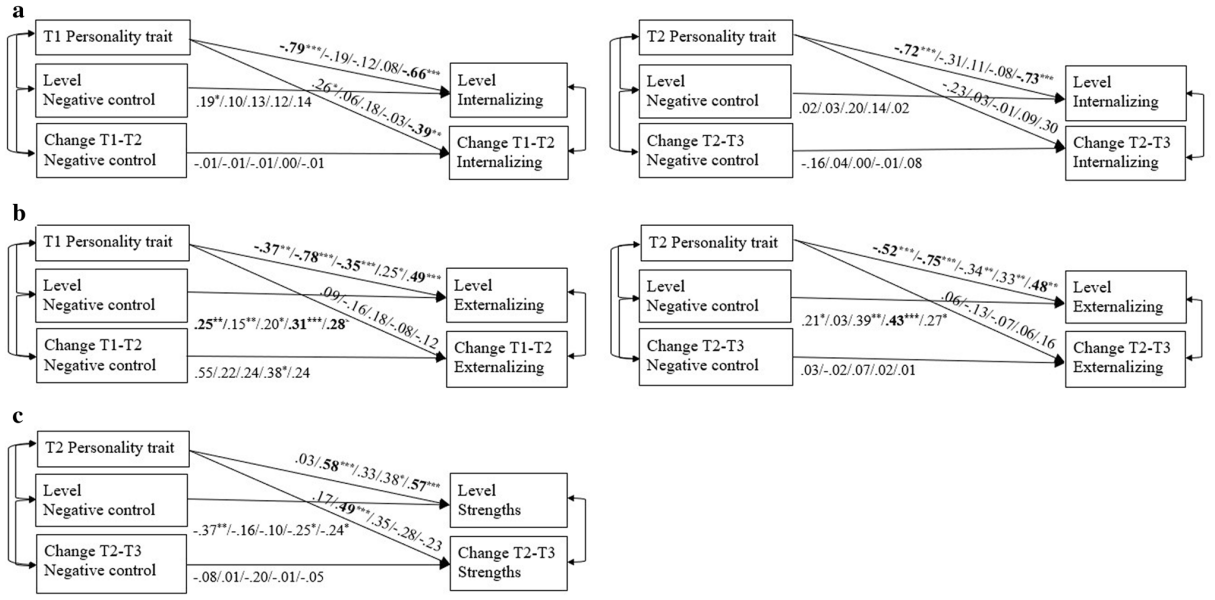

Fig. 1 Latent change model on the relation between negative controlling parenting and child behavior (**a** internalizing problems, **b** externalizing problems, and **c** psychosocial strengths) for the first (T1–T2) and second time period (T2–T3). Path coefficients refer to the models including the following personality traits: Emotional Stability/ Benevolence/ Conscientiousness/ Imagination/ Extraversion. ***$p < .001$, **$p < .01$, *$p < .05$. Coefficients in bold remain significant after Bonferroni correction ($p < .002$)

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 ASD. 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 within-person processes.

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, a large percentage of youth with ASD demonstrated clinically significant levels of both internalizing and externalizing problems. Yet, large standard deviations indicated large variability at all three assessment points. Univariate LCMs indicated no significant mean-level change in internalizing problems, yet a significant mean-level decrease in externalizing problems during the first time period. Although several studies examined within-person change in behavioral or emotional problems among youth with ASD (Taylor and Seltzer 2011; Woodman et al. 2015; Gray et al. 2012), no study to date evaluated this research question applying the Child Behavior Checklist (Achenbach 1991; Achenbach and Rescorla 2001). The stability of clinically significant levels of internalizing problems corroborates research in neurotypical and ASD-populations, indicating that many youth struggle with feelings of anxiety, uncertainty, or low self-worth throughout puberty (Robins and Trzesniewski 2005; McCauley et al. 2019). The decrease in externalizing problems during the first time period is 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; Taylor and Seltzer 2010). 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 points, we also evaluated psychosocial strengths using the Behavioral and Emotion Rating Scale (Epstein et al. 2004) to attain a more balanced perspective of children's adjustment. The univariate 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. This increase in strengths is consistent 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).

Regarding negative controlling parenting, the univariate LCM showed a slight decline across the three measurements, but these within-person decreases were not significant. This finding is somewhat surprising as the broader developmental literature demonstrated that negative controlling parenting declines across adolescence and emerging adulthood (Desjardins and Leadbeater 2016). Nonetheless, this finding corroborates 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). 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 positive associations between negative controlling parenting and maladaptive behaviors in children with ASD. However,

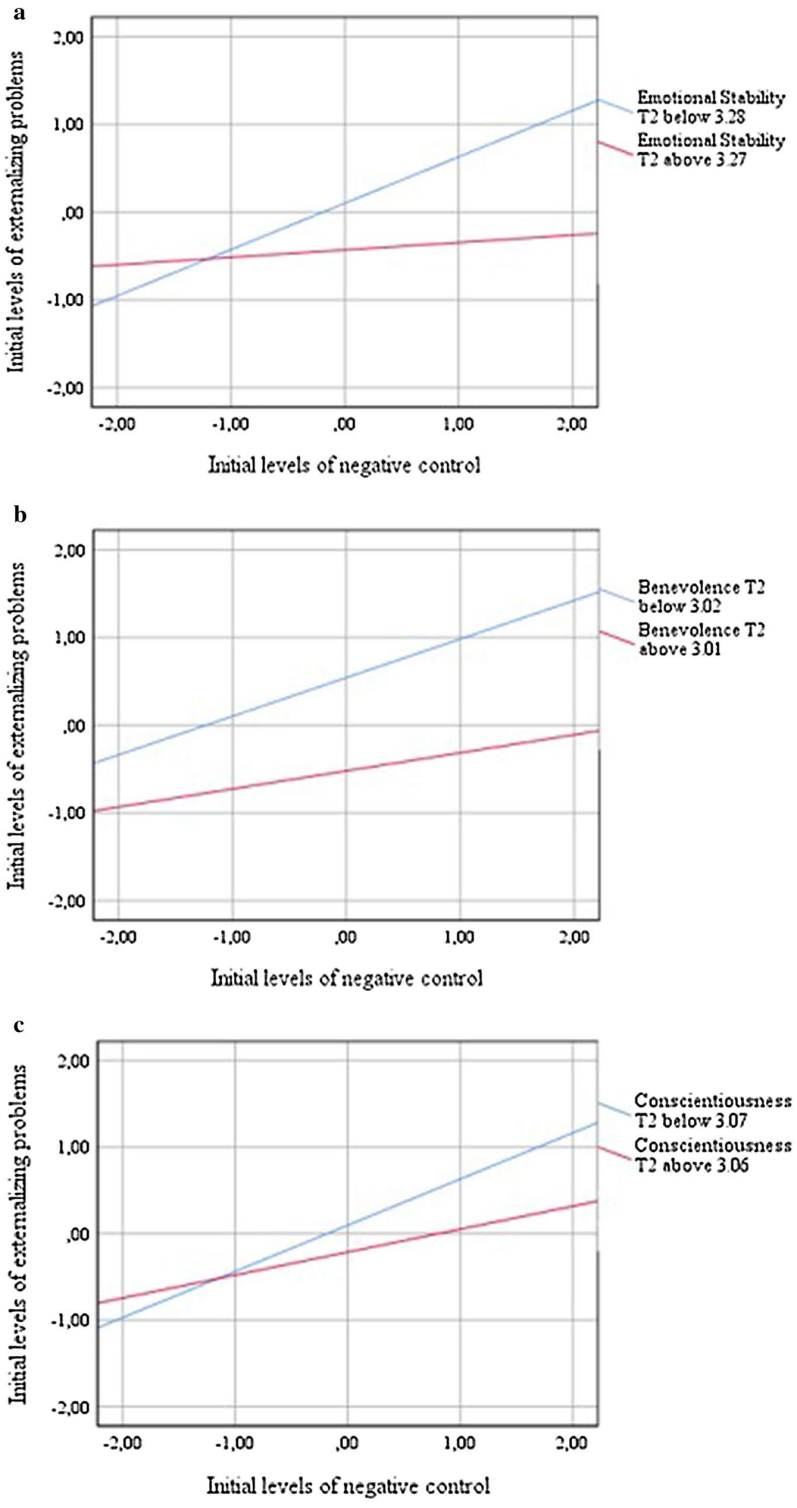

Fig. 2 Interaction between child personality at T2 (**a** Emotional Stability, **b** Benevolence, and **c** Conscientiousness) and initial levels of negative controlling parenting on initial levels of externalizing problems

it is important to note that the LCMs used in this study could not address the direction of effects. As relations between child and parenting behavior are fundamentally transactional in neurotypical and ASD-populations (Dieleman et al. 2017; Taraban and Shaw 2018), this finding also suggests 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 reveal 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 psychologically 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 could have been detected when shorter time intervals were used, for instance on an annual, monthly, or even daily basis (Dieleman et al. 2019; Mabbe et al. 2018). This idea was supported in a two-year longitudinal study in children with ASD, 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). Future research should study these relationships over different time intervals, including shorter intervals.

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 among youth with ASD across a nine-year interval. Notably, this study revealed similar associations as in youth without ASD (De Pauw and Mervielde 2010; Prinzie et al. 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 and Benevolence, and higher scores on Extraversion 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 one time-specific association. 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. 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 and Extraversion were significantly related to higher levels of psychosocial strengths in children with ASD. These findings corroborate previous findings in non-ASD populations where high Benevolence and Extraversion related to more adaptive outcomes, such as health and well-being (Hill and Roberts 2016). 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 fewer internalizing problems and even a decrease in these problems during the first time period, but also to more externalizing problems. Higher scores on Extraversion at a mean age of 16 were associated with fewer internalizing problems and more psychosocial strengths at a mean age of 19, yet 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 (Prinzie 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 between Extraversion and more externalizing problems, on the one hand, but also the associations between Extraversion and fewer internalizing problems and more psychosocial strengths, on the other hand, provide unique information that might be ASD-specific.

Personality-by-Parenting Interplay

Third, three interesting interaction effects were significant in this study, indicating that children with less mature personality traits (i.e., low Emotional Stability, Benevolence, or Conscientiousness) show more externalizing problem behaviors in the presence of negative controlling parenting compared to children with higher scores on these personality traits. 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 moderating role of these personality traits should be considered as relatively modest and further replication is warranted. However, on the other hand, these three effects proved to be significant despite the limited sample size (and corresponding limited power). Intriguingly, these interactions corroborate previous research in non-ASD populations, uncovering that effects of controlling parenting are more pronounced among children who are rated as less resilient or less 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 lower scores on these traits have fewer abilities to cope effectively with an environment that is experienced as controlling or pressuring. Another interpretation here is that for these children, parents are more likely to address high levels of externalizing problems with controlling parenting as they have more concern about their child and feel a stronger need to control their child's behavior. Alternatively, it is also possible that children with higher scores on these traits have more positive interactions with others that further diminishes the unfavorable effect of negative controlling parenting (Prinzie et al. 2003) or these children 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 positive associations between negative controlling parenting and externalizing problems in the two time periods highlight the important role of parenting in the life of youth with ASD. Therefore, family interventions could aim to support parents to engage in parenting practices that are related to more adaptive child outcomes, such as autonomy-supportive behavior and responsiveness (De Clercq et al. 2019; Allen et al. 2019; Joussemet et al. 2018) and to avoid controlling practices when confronted with externalizing child behaviors.

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 child personality plays a moderating role in the relation between parenting behaviors and child psychosocial functioning. A better understanding of this complex and transactional interplay can help parents, relatives, and care providers to acknowledge the role of a child's individuality in how children respond to or interpret certain parenting 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, some parents may 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, low Benevolence, and high Extraversion 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 moderator effects, where children with lower scores on Emotional Stability, Benevolence, or Conscientiousness showed more externalizing behaviors in the presence of negative controlling parenting.

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