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ORIGINAL PAPER

Maternal Parenting Behavior and Child Behavior Problems in Families of Children and Adolescents with Autism Spectrum Disorder

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Abstract Parents of a child with autism spectrum disorder (ASD) face specific challenges in parenting, but concrete parenting behavior has never been properly investigated in these families. This exploratory questionnaire study compared parenting behaviors among mothers of children and adolescents with ASD ($n = 552$) and without ASD ($n = 437$) and examined associations between child behavior problems and parenting behavior. Results showed that mothers of children with ASD reported significantly lower scores on Rules and Discipline and higher scores on Positive Parenting, Stimulating the Development, and Adapting the Environment. Age was differently related to parenting behavior in the ASD versus control group. Furthermore, distinctive correlation patterns between parenting behavior and externalizing or internalizing behavior problems were found for both groups.

Keywords Parenting behavior · Autism spectrum disorder · Externalizing behavior problems · Internalizing behavior problems

Introduction

Parents of a child with autism spectrum disorder (ASD) are confronted with specific challenges in raising their child. These challenges are partly due to the core behavioral characteristics of children with ASD. The features of ASD are impairments in social interaction and communication along with restricted, repetitive, and stereotyped patterns of behavior, interests, and activities (APA 2000). The manifestation of symptoms varies widely, depending on several factors such as age and level of functioning (Shattuck et al. 2007). Impairments in communication and social interaction clearly complicate the relation between parents and children (Seltzer et al. 2001). Moreover, children with ASD are at increased risk of developing additional externalizing and internalizing behavior problems compared to children without ASD (Kanne and Mazurek 2011). The goals of the present exploratory study are to examine parenting behavior among mothers of a child with ASD compared to mothers of a child without ASD across childhood and adolescence and to explore whether there is a relation between parenting behavior and child behavior problems.

The focus of this study is on the concrete, behavioral aspects of parenting. Concrete observable parenting behavior can be distinguished from parenting styles or dimensions. A parenting style can be defined as the global family climate and is thought to be built from the combination of two or more dimensions. A broad parenting dimension comprises more specific, elementary parenting behaviors (Van Leeuwen et al. 2004). The most commonly identified dimensions of parenting are parental support or warmth and parental control (Barber et al. 2005). Parental support refers to the affective component of the parent–child relationship indicated by parenting behaviors such as acceptance, positive affect, and involvement (Cummings et al. 2000). Parental control can be subdivided into behavioral and psychological control. Behavioral control concerns attempts to control, manage, and regulate child behavior through monitoring and limit setting (Steinberg 1990). Psychological control

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encompasses a more intrusive type of control by psychological means such as love withdrawal or guilt induction (Barber et al. 2005). Recently, autonomy support is often mentioned as an additional dimension of parenting. Giving choices or allowing child input into rule making are examples of parenting behaviors which belong to this dimension (Soenens et al. 2007). In the past, parenting styles were the centre of attention in the vast majority of parenting studies. However, this approach has an important disadvantage in that the contribution of individual parenting dimensions and associated parenting behaviors cannot be isolated. Currently, research on separate dimensions and parenting behaviors is favored above parenting style approaches (Barber et al. 2005).

Parenting behavior can function as a risk factor, but also as a protective factor in the development of behavior problems in children (Patterson et al. 1992). Theoretical models suggest a reciprocal relationship in which child behaviors actively shape parenting behaviors as well as the other way around (Berg-Nielsen et al. 2002; Burke et al. 2008). Several studies have indicated that specific parenting behaviors, such as inconsistent or harsh discipline strategies (Kawabata et al. 2011; Weiss et al. 1992), love withdrawal or guilt induction (Barber et al. 2005; Finkenauer et al. 2005), or limited positive involvement (Caron et al. 2006) are risk factors for the development and maintenance of externalizing problems in children. Whereas a relatively large body of literature considered the relation between parenting and externalizing behavior problems, only little research focused on the relation with internalizing problems. Some studies observed a relation between internalizing problems and excessive parental control (Caron et al. 2006; Wood et al. 2003) or love withdrawal (Barber et al. 2005). Positive parenting behavior, e.g., positive affect, parental sensitivity, or acceptance, may protect children from developing negative behavior outcomes (Barber et al. 2005; Finkenauer et al. 2005; Kawabata et al. 2011). One of the main theoretical mechanisms underlying the association between parenting behaviors and externalizing behavior problems is the coercion theory (Patterson 1982; Patterson et al. 1992). The central idea is that in a coercive cycle, aversive child behaviors reciprocally influence parenting behavior, in which negative reinforcement results in maintenance of undesirable behaviors in both child and parent (Reid et al. 2002).

Currently, there is only little research focusing on concrete parenting behavior in families of a child with ASD, probably because of sensitivity to inaccurate, psychogenic theories about the origin of the disorder and the accompanying legacy of blaming the parents (Seltzer et al. 2001; Siller and Sigman 2002). However, parents raising a child with ASD have to deal with challenges that are not shared by parents of typically developing children. Because of the heterogeneity of the disorder and alteration of problems at different ages, an overwhelming volume of information is available for parents. Many parents have problems with assessing its relevance and applicability to their own children (Whitaker 2002). Families that include a child with ASD are confronted with extraordinary demands on their time and energy (Barbaresi et al. 2006). It often takes a great effort to help a child with ASD acquiring specific skills. From a family genetic point of view, they may also face the challenge of raising multiple children with ASD, as there is a higher recurrence risk for siblings of children with ASD compared to the general population (Ozonoff et al. 2011), in combination with an elevated risk of having communicative and social difficulties themselves or their spouse (Bernier et al. 2012; Ruser et al. 2007). So far, most research on parenting in families of a child diagnosed with ASD has been focusing on cognitive and affective components of parenting, including parenting stress and coping strategies. Relatively little is known about parenting behaviors that are exhibited by parents of children with ASD, and whether these parenting behaviors differ from those of parents in the general population (Osborne and Reed 2010). A recent explorative study by Lambrechts et al. (2011) showed that parents of a child with ASD (8–18 years old) reported that they use less punishment and more explicitly stimulate their child's development and adapt the environment in comparison with parents of a child without ASD.

As children grow older, they develop additional skills and greater independence, requiring changes in parenting behavior in response. During adolescence, important cognitive, biological, and social changes occur. Peers become more and more important as a source for adjustment (Laible et al. 2000). As a result, the relationship between parents and children changes during this stage (Collins 1990). However, children with ASD are expected to be dependent on environmental support for longer and requiring qualitatively and quantitatively different support from typically developing children (Seltzer et al. 2001). It is not clear how parenting behaviors in case of ASD change over time as no studies have examined parenting across childhood and adolescence. Several studies showed a modest decrease of autism symptoms from childhood to adolescence (McGovern and Sigman 2005; Shattuck et al. 2007), but improvement is often limited to one domain and seldom leads to levels of functioning in the normal range (Seltzer et al. 2004). Also an overall decline in externalizing and internalizing behavior problems is mentioned, although levels of behavior problems remained high during adolescence and improvement was not seen in all adolescents with ASD (Gray et al. 2012). By contrast, there is evidence of an increase in parental stress during adolescence (Seltzer et al. 2001).

Children with ASD have a greater risk for developing psychopathology and behavior problems compared to children without ASD. According to a study of Simonoff

et al. (2008), about 70 % of the children with ASD have an additional DSM-IV diagnosis, e.g., ADHD, anxiety disorder, or OCD. Besides the higher levels of psychopathology, internalizing and externalizing behavior problems are also more prevalent in children with ASD (Kanne and Mazurek 2011; Mazurek and Kanne 2010). The consequences of the presence of behavior problems in ASD are substantial. Behavior problems interfere with day-to-day functioning and restrict access to or minimize opportunities in educational, vocational, and community settings (Sturmey et al. 2008; Taylor and Seltzer 2011). Behavior problems can form an important source of stress for parents (Estes et al. 2009), often even more than the core ASD symptoms (Tomanik et al. 2004), especially in case of externalizing behavior problems (Lecavalier et al. 2006). Higher levels of parenting stress possibly reduce the parents' ability to accommodate and respond adequately to their children's behavior (Osborne and Reed 2010). Problem behavior can serve different functions, such as getting attention, avoiding or escaping nonpreferred or difficult demands, or getting a desirable object or activity (O'Neill et al. 1997). Despite the large empirical body of literature on the presence and function of behavior problems or challenging behavior in autism spectrum disorders, little attention has been given to family processes involved in the development and maintenance of such difficulties. An observational study of Lucyshyn et al. (2004) showed that coercive family processes also exist in families of young children with developmental disabilities (ASD and/or intellectual disability) and behavior problems. Both attention-driven and escape-driven coercive processes were observed in which parents submitted to their child's problem behavior. These findings were replicated in an intervention study which also demonstrated possibilities to reshape these coercive processes into constructive processes (Lucyshyn et al. 2007).

Although autism spectrum disorders have a neuro-biological basis, there is some evidence that variations in parenting behavior may have an effect on the subsequent development of children with ASD (Siller and Sigman 2002). It is important to study the relationship between different aspects of parenting behavior and child characteristics in order to improve parent-focused interventions and possible long-term outcomes (Wachtel and Carter 2008). The first objective of this study is to explore differences in parenting behavior among mothers of children with ASD or without ASD in association with the child's age. It is expected that both similarities and differences are present in general parenting behavior between mothers of a child with or without ASD, and that mothers of a child with ASD show more ASD-adapted parenting behavior in stimulating the development of their child and adapting the environment compared to parents of a child without ASD (Lambrechts et al. 2011). No studies have explicitly explored parenting behavior in relation to the child's age. The second objective is to examine whether and how maternal parenting behavior is related to the child's externalizing and internalizing behavior problems. The questionnaire used to measure parenting behaviors was developed within the social learning framework on the relationship between anti-social behavior and parenting behaviors (Patterson et al. 1992). Based on a study by Van Leeuwen et al. (2004) in a general population sample and the study of Lucyshyn et al. (2004) in children with developmental disabilities, we hypothesize the strength of the link between general parenting behaviors and externalizing behavior to be higher than for internalizing behavior, because of the theoretical and empirical underpinnings of the parenting questionnaire.

Methods

Participants

A total of 989 families from a Dutch-speaking context (Flemish part of Belgium and the Netherlands) participated in this study. Families of a child with ASD ($n = 552$) were compared with a control group of families with a child without (suspected) ASD ($n = 437$). Parents indicated on a questionnaire whether their child had received a clinical ASD diagnosis based on DSM-IV-TR criteria for Autistic Disorder, Asperger syndrome, or PDD-NOS by qualified professionals. Information regarding year and site of diagnosis was available. A large part of the participating families were member of a parent association for children with ASD. Other families were recruited through special schools where a formal DSM-classification by an interdisciplinary team is a condition for admittance. Eight children with suspected ASD without formal diagnosis were excluded from both the experimental and the control group. The control group consisted of children without ASD diagnosis. Some children in the ASD and control group had an (additional) diagnosis, such as ADHD or dyslexia. Children with intellectual disability (IQ < 70) were excluded from this study. In both groups, children were between 6 and 18 years old. Table 1 shows the demographic characteristics of the samples.

Of the mothers, the majority was married or cohabiting with a partner. The remaining was divorced, widowed, separated, or single. The level of education was generally high, with more than half of the mothers having graduated from university (bachelor's or master's degree).

The ASD and control group differed on child characteristics as shown in Table 1. Age and gender were covaried in subsequent analyses when they correlated significantly with the dependent variable.

Table 1 Demographic characteristics of the ASD and control group

	Control ($n = 437$)	ASD ($n = 552$)	Test statistic	p
Mother characteristics				
Education level				
No college	46 %	42 %	$X^2_{(1)} = 2.36$	.12
Completed college	54 %	58 %		
Marital status				
Single-parent	14 %	15 %	$X^2_{(1)} = .26$	.61
Two parents	86 %	85 %		
Family characteristics				
No of children				
Range	1–6	1–7		
M (SD)	2.4 (.8)	2.4 (.9)	$t_{(987)} = -.25$	.80
Child characteristics				
Age				
Range	6–18	6–18	$t_{(987)} = 1.77$	.08
M (*SD*)	12.1 (3.5)	11.7 (2.7)		
Gender				
Boys	55 %	83 %	$X^2_{(1)} = 88.39$	.001
Girls	45 %	17 %		

Instruments

Parenting Behavior

The Parental Behavior Scale-short version (PBS, Van Leeuwen and Vermulst 2004, 2010) was used to measure general parenting behavior, in combination with additional subscales to measure specific parenting behavior relevant to children with ASD (PBS-A, Van Leeuwen and Noens 2013). The PBS comprises five subscales: Positive Parenting (11 items), Discipline (6 items), Harsh Punishment (5 items), Material Rewarding (4 items), and Rules (6 items). The two additional subscales are: Stimulating the Development (11 items) and Adapting the Environment (9 items). All items are formulated as statements about concrete parenting behavior in everyday life towards one specific child, for example "When my child has to complete a task (e.g., homework), I restrict distraction to a minimum". The frequencies of these behaviors are rated on a 5-point Likert scale (1 = (almost) never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = (almost) always). Internal reliability was acceptable to good for all subscales. Confirmative factor analyses supported structural validity (Lambrechts et al. 2011).

Child Behavior Problems

The Strengths and Difficulties Questionnaire (Goodman 1997) is a brief behavioral screening questionnaire which evaluates child behavior. Mothers were asked to indicate the degree to which different statements were true about the child's behavior within the previous 6 months using a 3-point rating scale ranging from 'not true' to 'certainly true'. Besides negative attributes of behavior, also some positive attributes are questioned. Norms are available for 4–16 year olds. The age range of our participants slightly exceeds the age range of the available SDQ norms, however, analyses were based on the raw scores only. The 25 items are divided between five subscales: (1) emotional symptoms, (2) conduct problems, (3) hyperactivity/inattention, (4) peer relationship problems, and (5) prosocial behavior. Several measures indicated a good reliability of the parent version. The psychometric properties of the parent-report version of the SDQ were also proven satisfactory in Dutch and Flemish samples (Muris et al. 2003; Van Leeuwen et al. 2006). In the current study the first four subscales were used, creating two composite scores for internalizing behavior problems (emotional and peer items) and externalizing behavior problems (conduct and hyperactivity items). Factor analyses generally supported second-order internalizing and externalizing factors. Especially in general population samples it is better to use these broadband scales instead of the five-subscale division (Goodman et al. 2010).

Procedure

Parents were approached through the news letter from the Flemish and Dutch parent associations for autism and later contacted via an e-mail with a direct link to give permission to participate in this study. The remainder (12 % of the ASD sample) was included via five special schools for

children with ASD. Participants for the control group were recruited from 13 primary and 4 secondary schools. After informed consent was given, parents completed the questionnaires online or filled out the paper and pencil versions of the questionnaires. The Flemish data on parenting behavior have previously been analyzed in a study by Lambrechts et al. (2011), but in the current study only the questionnaires filled out by mothers were used.

Analyses

All statistical tests were performed using IBM SPSS Statistics 19. A MANOVA was conducted in order to compare means on the parenting behavior domains with groups based on diagnosis (ASD vs. control), gender, and age (6–12 vs. 13–18 years) as factors. Age could not be added as a covariate, as there was no homogeneity of regression slopes. The assumption of homogeneity of covariance matrices was also not met (Box's M test: $F = 1.37, p < .001$). However, when larger sample sizes produce unequal covariances, rather conservative significance values should be expected (Tabachnick and Fidell 2007). Pearson correlations were calculated between the different parenting domains and the SDQ composite scores. Next, partial correlations analyses controlling for age or gender were performed. The partial correlation coefficients only differed from the zero-order correlation coefficients on adapting the environment associated with externalizing behavior problems in children with ASD. For all other correlations, the partial correlation coefficients (controlling for age or gender) were essentially the same value as the bivariate coefficients. Correlation patterns in the ASD and the control group were compared by using a Fisher's Z transformation. Effect sizes were calculated using Eta squared values, with .01–.06 indicating a small effect, .06–.14 a medium effect, and >.14 a large effect or Cohen's d with .10, .30, and .50 as values for small, medium, or large effects (Cohen 1988).

Results

Parenting Among Mothers of Children with ASD During Childhood and Adolescence

Our first aim was to examine differences in parenting behavior between mothers of children with and without ASD (Table 2).

Analyses of the different domain scores suggested that mothers of children with ASD exhibited different parenting behavior in several domains, in general parenting as well as ASD-adapted parenting behavior, compared to mothers of children without ASD. Mothers of children with ASD reported lower scores on Rules and Discipline, and higher scores on Positive Parenting, Stimulating the Development, and Adapting the Environment (see Table 2). However, group differences on Positive Parenting and Stimulating the Development can only be interpreted in relation to the child's age.

Main effects for gender cannot be interpreted, because of the unequal distribution of boys and girls over the control and ASD group. Independent t-tests on the subscales Positive Parenting, Discipline, and Stimulating the Development showed a significant difference between boys and girls within the control group for Positive Parenting ($t_{(435)} = -2.07$, $p = .04$, Cohen's $d = .20$; boys: $M = 4.01$; girls: $M = 4.10$) and Stimulating the Development ($t_{(435)} = -2.69, p = .007$, Cohen's $d = .26$); boys: $M = 3.73$; girls: $M = 3.85$), and within the ASD group for Discipline ($t_{(549)} = 2.78, p = .006$, Cohen's $d = .30$; boys: $M = 2.65$; girls: $M = 2.43$).

A general age trend was present regarding Adapting the Environment (Fig. 1a; $F_{(1, 980)} = 26.97, p < .001, \eta^2 = .02$). This parenting behavior was reported to a lesser extent in adolescence compared to childhood, both in the control and ASD group. For three domains interaction effects between diagnosis and age groups were found. In the control group, mothers of adolescents reported less Positive Parenting than mothers of children aged 6–12 years, but this difference was not seen in the ASD group (Fig. 1b; $F_{(1, 980)} = 6.68, p = .01$, $\eta^2 = .01$). In the control group the mean score for Material Rewarding was higher in adolescence compared to childhood, whereas the opposite pattern was seen in the ASD group (Fig. 1c; $F_{(1, 980)} = 5.80$, $p = .02$, $\eta^2 = .01$). During childhood, Stimulating the Development was as often reported in the ASD group as in the control group. In the adolescent age range, however, mothers of children with ASD showed more, whereas mothers of children without ASD reported less of this parenting behavior (Fig. 1d; $F_{(1, 980)} = 6.13$, $p = .01$, $\eta^2 = .01$).

Parenting and Behavior Problems

Significantly more behavior problems, both externalizing and internalizing, were reported in the ASD group compared to the control group (Externalizing: $F_{(1, 958)} = 223.1$, $p < .001$, $\eta^2 = .18$; Internalizing: $F_{(1, 958)} = 660.1$, $p < .001$, $\eta^2 = .41$). A significant interaction effect between diagnosis and age for externalizing problems indicated that there were less externalizing behavior problems observed in childhood than in adolescence in the ASD group ($F_{(1, 958)} = 7.75$, $p = .005, \eta^2 = .01$). Bivariate coefficients between parenting and behavior problems are presented in Table 3.

In general, only weak correlations were found between behavior problems and maternal parenting behavior. The correlation patterns were comparable between the control and ASD group, as all comparisons between correlations

Table 2 Group differences in parenting behavior between the ASD and control group

	Control ($n = 437$) M (SD)	ASD ($n = 552$) M (SD)	MANOVA Dx: ASD versus control			Other significant effects[a]
			F	p	η^2	
General parenting behavior						
Positive Parenting	4.05 (.45)	4.09 (.40)	5.48	.02	<.01	gender, age, dx*age
Material Rewarding	2.44 (.59)	2.48 (.60)	.01	.92	–	dx*age
Rules	4.29 (.47)	4.13 (.46)	22.63	<.001	.02[b]	–
Discipline	2.85 (.69)	2.62 (.71)	31.89	<.001	.03[b]	gender
Harsh Punishment	1.36 (.41)	1.33 (.36)	1.44	.23	–	–
ASD-adapted parenting behavior						
Stimulating the Development	3.79 (.45)	3.87 (.45)	13.38	<.001	.01[b]	gender, dx*age
Adapting the Environment	2.83 (.54)	3.41 (.57)	204.93	<.001	.17[c]	age

dx = diagnosis

[a] No significant interaction effects for diagnosis*gender, age*gender, and age*gender*diagnosis were found; [b] small effect size; [c] large effect size

were nonsignificant (except for Positive Parenting in relation with externalizing behavior problems, see Table 3). Different parenting behavior patterns were seen for externalizing versus internalizing behavior problems. Externalizing behavior problems were related to general parenting behaviors. In both groups externalizing behavior problems were positively correlated with Discipline and Harsh Punishment. These processes went together with less positive parenting in the control group, while more rule setting was only present in the ASD group. Internalizing problems were correlated with ASD-adapted parenting behaviors: Adapting the Environment in the control group and both Stimulating the Development and Adapting the Environment in the ASD group.

Discussion

Although many parent interventions and practical handbooks or guidelines are available for parents of a child with ASD, concrete parenting behavior has seldom been empirically studied in this group. Previous studies on parenting in ASD mainly focused on perceptions, cognitions, and coping of parents. Our study extends previous findings and contributes to our knowledge about parenting in ASD by focusing on general and specific parenting behaviors in relation to child's age and behavior problems.

The first goal of this study was to examine similarities and differences in parenting behavior between mothers of a child with or without autism spectrum disorder and how these differences are related to or interact with the child's age. As expected, significantly more ASD-adapted parenting behaviors were reported in the group of mothers with a child with ASD, but also differences in general parenting behavior were present.

Mothers of a child with ASD were setting fewer rules and utilized less discipline than the control group during childhood as well as adolescence. As for rules, mothers of a child with ASD put less emphasis on stimulating their child to adhere to specific rules at school or at home compared to mothers of a child without ASD, whereas during adolescence these differences are only seen for rules at home. Harsh punishment was comparable between groups and only scarcely reported in both groups. Although the results of this study showed that children with ASD exhibit much more behavior problems than children without ASD, mothers of children with ASD seem to be less strictly controlling. On the one hand, this may be due to the fact that behavior problems in children with ASD are interpreted differently by parents (Reese et al. 2005). Aversive behaviors often cannot be labeled unwillingness or misbehavior on purpose, and parents may search for preceding events (e.g., unpleasant sensory stimuli, unexpected change, or unstructured time) that might provide insight into the behavior of their child. As a result, mothers of children with ASD probably are more focusing on changing the antecedents of their child's behavior or showing and explaining children how to behave, rather than paying attention to the consequences of their negative behavior. On the other hand, an alternative explanation can be given in line with the findings of Lucyshyn et al. (2004). If parents start to set fewer rules and lessen their discipline after behavior problems occur, this process can be seen as consistent with the coercion theory. When parents reduce or withdraw their demands in this situation, the child's behavior problems will be negatively reinforced. If subsequently the child's aversive behavior ceases, the child negatively reinforces parental submission (Lucyshyn et al. 2009).

This study further revealed a significant diagnosis versus age group interaction for material rewarding and positive

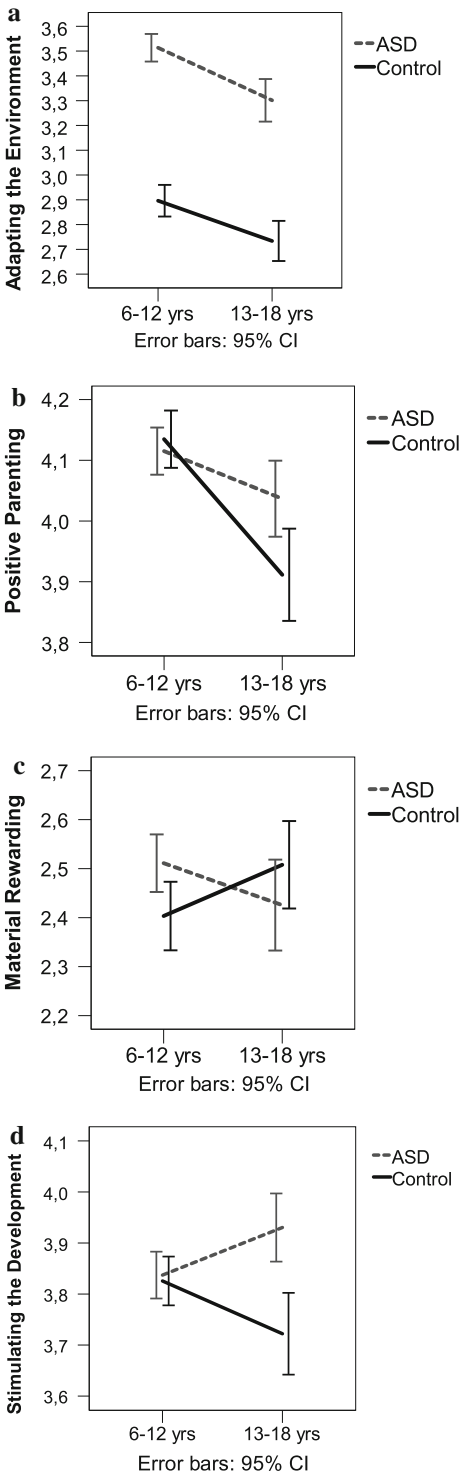

Fig. 1 Parenting behavior (**a** Adapting the Environment, **b** Positive Parenting, **c** Material Rewarding, and **d** Stimulating the Development) across childhood and adolescence for the control and ASD group

parenting. In the control group an increase in material rewarding and a decrease of positive parenting was seen in the transition from childhood to adolescence. Additional analyses at item level showed that rewarding strategies in the control group have a more social nature during childhood (e.g., verbal praise, pat on the back, which are part of the Positive Parenting subscale), and parents switch to more material, mainly monetary, rewarding during adolescence (items of the Material Rewarding subscale). During childhood, a higher level of material rewarding was reported in the ASD group compared to the control group. The largest difference was seen for the item about the use of reinforcement systems. It is assumed that children with ASD are less responsive to social incentives because of a reduced social motivation (Chevallier et al. 2012). Behavioral treatment programs have demonstrated that children with ASD particularly benefit from tangible reinforcers, such as tokens, money, and food in comparison to social rewards (Matson et al. 1996). As opposed to the control group, no increase in the use of monetary rewarding was seen during adolescence. Although mothers in the control group showed less positive parenting during adolescence compared to childhood, the level of positive parenting remained the same in the ASD group. The positive parenting subscale not only refers to social rewarding, but also includes items about positive involvement and problem solving (Van Leeuwen et al. 2004). The results suggest that mothers of adolescents without ASD are less directly involved in for example problem solving for their children, whereas adolescents with ASD are or are expected to be more dependent on their mother's involvement and guidance. However, these results may also reflect a sampling bias, as most of the parents belonged to a parent support group, and possibly have specific characteristics.

As expected, mothers of children with ASD were more likely than the control group to adapt the environment and stimulate the development of their child. The most striking difference between the control and ASD group was found for the domain of adapting the environment to their children's needs. Children with ASD are often easily distracted by visual or auditory stimuli, making it difficult for them to identify or attend to relevant cues. Blocking out extraneous distracting stimuli, can help them focus on their activities (Mesibov et al. 1994). Furthermore, mothers of children with ASD report that they modify their communication towards their child with ASD, for example by simplifying verbal questions and instructions or the use of augmentative communication. The questionnaire used in this study, however, only encompasses questions about more positively labeled adaptations. From literature it is known that parents of children with ASD also tend to make other adaptations, for example avoiding demands, routines or activities in which behavior problems are likely to occur, such as taking the child to a birthday party or a grocery store (Lucyshyn et al. 2009).

The subscale about stimulating the development mainly focuses on the parent's efforts to improve their child's social and daily living skills. Differences between mothers

Table 3 Pearson correlations between parenting behavior and child behavior problems for the ASD and control group

	Externalizing problems				Internalizing problems			
	Control ($n = 430$)	ASD ($n = 536$)	z	p	Control ($n = 430$)	ASD ($n = 536$)	z	p
General parenting behavior								
Positive Parenting	−.15*	n.s.	−2.74	<.01	n.s.	n.s.	−1.76	.08
Material Rewarding	n.s.	n.s.	.43	.33	n.s.	n.s.	−.34	.73
Rules	n.s.	.16*	−1.02	.30	n.s.	n.s.	1.08	.28
Discipline	.18*	.25*	−1.14	.25	n.s.	n.s.	.45	.65
Harsh Punishment	.16*	.27*	−1.76	.08	n.s.	n.s.	1.92	.06
ASD-adapted parenting behavior								
Stimulating the Development	n.s.	n.s.	−1.53	.13	n.s.	.12*	−1.07	.28
Adapting the Environment	n.s.	n.s.[a]	−.28	.78	.18*	.17*	.22	.83

* $p < .007$ after Bonferroni correction

[a] No significant correlation after controlling for age and gender

of children with ASD opposed to children without ASD were only present during adolescence. The results indicate that mothers of older children with ASD stimulate the development of their child even more compared to younger children with ASD. This might be due to the fact that the demands for and complexity of social interactions and daily living skills increase during adolescence (Shattuck et al. 2007) or parents expectations about when their children are able to master these skills. Overall, differences at item level suggest that the development of children with ASD is delayed on several domains and mothers of a child with ASD pay more attention to the development of these skills in a later age phase compared to the control group. Mothers of an adolescent with ASD stimulate their child more often to make their own choices, to develop problem solving skills, or to plan activities compared to mothers of younger children with ASD. In contrast, mothers of a child without ASD stimulate these skills more often during childhood compared to adolescence. In the ASD group, mothers explain emotions of others in both age groups, whereas in the control group mothers stimulate these skills during childhood and less during adolescence. As social difficulties are one of the core problems of children with ASD, children with ASD often need a lot of guidance and explanation in daily social contexts to learn how to respond appropriately in different situations (Howlin 1998). Social skills are also often addressed in individual or group training programs for children with ASD, but children with ASD frequently have difficulty generalizing skills from one setting to another setting or context. Practice at home is therefore important (Krasny et al. 2003). Impaired executive function in children with ASD may interfere with many daily activities in the home situation, such as practicing personal hygiene, completing household tasks, or doing homework (Gilotty et al. 2002). Children with ASD often need extensive instructions to master these daily living skills (Carothers and Taylor 2004).

The second purpose of the current study was to examine the relation between parenting behaviors and behavior problems in the ASD and control group. The results of the correlation analyses demonstrated rather comparable associations between maternal parenting behavior and child behavior problems among both groups and the associations were independent of age and gender. With respect to externalizing behavior problems, increased reports of behavior problems went along with a rise in more negative, controlling parenting behaviors, i.e., discipline and harsh punishment for both groups, and a converging decrease of positive parenting in the control group. These correlation patterns provide support for the possible presence of coercive family processes in both groups. As described in the coercion theory (Patterson et al. 1992), the negative reinforcement of externalizing behavior may increase the frequency and intensity of this problem behavior. However, based on this cross-sectional study, only cautious conclusions are allowed. Coercive family processes can only be detected in a longitudinal study.

By contrast, internalizing problems were not related to general parenting behaviors, but to both ASD-adapted parenting behavior subscales in the ASD group and to adaptation of the environment in the control group. The internalizing problem factor of the SDQ not only includes emotional problems, but also social problems with peers, which are related to the core problems of children with ASD. Not surprisingly, a rise in ASD-adapted parenting was seen with increasing internalizing problems.

However, the direction of the relationship between parenting behavior and children's behavior problems is not apparent from the analyses and only weak correlations were found. The failure to find strong correlations between parent behavior and child behavior problems is perhaps

caused by the measures used in this study. The SDQ is a very short screening questionnaire and probably not sensitive enough to differentiate in degree of behavior problems within the ASD group (mainly higher end of the scale) and within the control group (mainly lower end of the scale). The subscales about parenting behavior could be influenced by socially desirable responding, because of the use of self-report measures.

Limitations and Directions for Future Research

The potential limitations of this study provide suggestions for further research. A first and major limitation of the present study is its cross-sectional design. Possible cohort effects might obscure the relation between parenting behavior and the child's age. Further, it is impossible to formulate conclusions about directionality between parenting behavior and child behavior problems, because both variables were assessed concurrently. Longitudinal study of these construct would allow for better understanding of any possible causal pathways. Also direct observations of parental behaviors with the children would have helped in the interpretation of the complex relation between parent and child variables. Another limitation of the present study is a possible sample selection bias. Recruitment mainly took place via ASD parent associations. Members of such support groups can often be characterized as highly motivated and positively involved in raising a child with ASD. Moreover, parent associations provide information about ASD, how to obtain services, and how to cope with the child's behavior. This limitation might put constraints on the generalization of our results. A final limitation in interpreting the findings is that there are likely to be other variables that moderate or mediate the relationship between parenting behavior and children's behavior problems that were not measured in the current study and could not be controlled for. Variables that possibly influence parenting behavior are for example parenting stress (Hastings 2002), parental psychopathology (Berg-Nielsen et al. 2002), several other child factors, such as severity of ASD symptoms, or contextual factors. Future research needs to take them into consideration and examine their influence.

Clinical Implications

Examining parenting behavior in ASD and identifying the association between parenting and child behavior problems could be especially helpful for professionals interested in designing better and more comprehensive interventions that include a parent training component. Attention for parents and parenting skills is important in the assessment process. Assessment procedures only focusing on child characteristics are not sufficiently informative to recommend the most appropriate intervention program.

The current results suggested that autism related parenting is present in most of the families with a child with ASD, in other words many mothers reported important strengths in adjusting their behavior to the diagnosis of ASD for their child. We do not know whether this is a result of parent involved interventions or whether mothers spontaneously attune and respond to their child behavioral cues. However, probably not all parents manage to adapt their parenting behavior to the specific needs of their child with ASD. The study of Welterlin et al. (2012) showed that parents can learn to (physically) structure the environment and to create learning opportunities for the child, when appropriate training is available. Recent studies emphasize the importance of parents in stimulating the development of the child, because they can guide their child in everyday situations and offer a lot of learning opportunities to encourage generalization and overall improvement (Burrell and Borrego 2012).

Another implication of our findings is the need for services and training to support parents of children with ASD with accompanying behavior problems, as severity of behavior problems is greater in children with ASD. Moreover, the results suggest the presence of coercive patterns in parent–child interactions. Problem behavior is typically purposeful, and functional assessment of problem behavior can be helpful to ascertain the function of the behavior, to unravel the presence of coercive processes, and to develop effective interventions (Gavidia-Payne and Hudson 2002; Repp and Horner 1999). There is considerable evidence that behavior problems can be reduced successfully through parent interventions; reduction in negative parenting and improvement of positive parenting can result in improvement in child behavior (Beauchaine et al. 2005; Gardner et al. 2010; Lucyshyn et al. 2007). Although parent training is more and more considered as an essential component of successful intervention programs for children with ASD (Ingersoll and Wainer 2011), there is a lack of availability of formal parent training services (Thomas et al. 2007). Parent training may not only help them to manage their child's behavior more successfully, but can also improve self-efficacy and reduce parental stress (Burrell and Borrego 2012). However, prospective studies are needed to determine whether behavioral changes resulting from parent training cause long-term improvements in parent and child behavior in particular in case of ASD.

Conclusions

Despite the abovementioned limitations, this study fills an important gap in the literature. The study represents one of only a few studies that has examined concrete parenting behavior among mothers of children and adolescents with

ASD and the link between parenting behavior and behavior problems. These results suggest that parenting behavior may be important to consider in problem behavior in children with ASD and the effectiveness of interventions focused on parent behavior merits further examination.

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Conflict of interest The authors declare that they have no conflict of interest.

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