

Bidirectional relations between observed parenting and child symptoms of behavioral disorders

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Author Note

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Abstract

Behavioral disorders are prevalent in preschoolers. Parenting has repeatedly shown to affect the development and continuity of these disorders, but developmental theories also emphasize transactional processes whereby the child affects the parent. The purpose of the present study was therefore to test the bidirectional relations between parental hostility and structuring, and symptoms of attention deficit/hyperactivity disorder (ADHD), oppositional defiant disorder (ODD) and conduct disorder (CD), in a large and representative sample of 4-year-olds ($n = 997$) in Trondheim, Norway, followed up two years later. Child symptoms of behavioral disorders were assessed by the Preschool Age Psychiatric Assessment (PAPA) interview, and parental hostility and structuring were rated from videotaped parent-child interactions using the Emotional Availability Scales (EAS). Analyses were conducted using an autoregressive cross-lagged analysis within a structural equation modeling (SEM) framework. Results revealed that parental hostility and structuring when the children were 4 years old did not predict child symptoms of ADHD, ODD or CD two years later. However, evidence was found for the opposite direction of influence: Symptoms of ODD at age 4 predicted lower levels of parental structuring at age 6 when initial levels were adjusted for. Symptoms of ADHD and CD did not predict parental structuring, and none of the behavioral disorders predicted parental hostility. No gender differences were found. Findings are discussed in relation to relevant theory, as well as research on bidirectional relations between parenting and child behavioral disorders.

Keywords: Attention deficit/hyperactivity disorder, oppositional defiant disorder, conduct disorder, preschoolers, parental hostility, parental structuring, bidirectional relations

Bidirectional Relations Between Observed Parenting and Children's Symptoms of Behavioral Disorders

Attention deficit/hyperactivity disorder (ADHD), oppositional defiant disorder (ODD) and conduct disorder (CD) are some of the most prevalent psychiatric disorders in preschoolers (Bufferd, Dougherty, Carlson & Klein, 2011; Ezpeleta, de la Osa & Domenech, 2014; Lavigne, LeBailly, Hopkins, Gouze & Binns, 2009; Wichstrøm et al., 2012). Research indicates that early childhood symptoms of these disorders forecast educational problems (Kim-Cohen et al., 2005, 2009) and social difficulties, such as peer rejection (Stenseng, Belsky, Skalicka & Wichstrøm, 2016) and the likelihood of becoming a bully (Verlinden et al., 2015). Furthermore, there is high comorbidity between symptoms of ADHD, ODD and CD in preschoolers (Bendiksen et al., 2017; Bufferd et al., 2011; Ezpeleta et al., 2014; Lavigne et al., 2009; Wichstrøm et al., 2012), as well as between these behavioral disorders and anxiety (Ezpeleta et al., 2014; Martin, Granero, Domènech & Ezpeleta, 2017; Martin, Granero & Ezpeleta, 2014) and depression (Wichstrøm et al., 2012). In order to prevent the development of behavioral disorders in children, and possibly also the negative outcomes they forecast, modifiable factors predicting increased symptoms of these disorders need to be identified at an early age. An identification of such predictors will increase knowledge regarding preventative and treatment efforts for behavioral disorders in children.

One of the most powerful predictors of developmental outcome in children is parenting (Bronfenbrenner, 1977). Moreover, etiological models stipulate that parents influence early development of ODD (Dodge & Pettit, 2003; Hill, 2002), CD (Dodge, 2000; Dodge & Pettit, 2003; Frick, 2016; Hill, 2002) and even ADHD (Campbell, 2000). Such theoretical formulations have received extensive empirical support (Carlson, Jacobvitz & Sroufe, 1995; Hawes, Dadds, Frost & Russell, 2013; Keown, 2012; Lavigne, Gouze, Hopkins & Bryant, 2016; Murray & Farrington, 2010), and despite a strong consensus on the genetic underpinning of ADHD (Asherson, Kuntsi & Taylor, 2005; Faraone & Mick, 2010; Faraone et al. 2005), parenting may still be important (Modesto-Lowe, Danforth & Brooks, 2008). Notably though, developmental theories also emphasize the opposite direction of influence: Children play an active role in shaping their parents' behavior (Bell, 1968; Bell & Chapman, 1986; Belsky, 1984; Bronfenbrenner, 1999; Mischel, 1973; Sameroff, 1975). One of the most influential models on the development of child behavioral disorders is the "*model of coercion*" (Patterson, 1986, 2002; Patterson, Reid & Dishion, 1992). According to this model, transactional processes between parents and their offspring are the core mechanisms contributing to maladaptive developmental trajectories in children. Even so, to my

knowledge, only four studies have investigated bidirectional relations between parenting and symptoms of ADHD, ODD and/or CD in children (Brown, Granero & Ezpeleta, 2017; Burke, Pardini & Loeber, 2008; Hipwell et al., 2008; Pardini, Fite & Burke, 2008), and out of these only Brown et al. (2017) captured the important transition from preschool to school age. During this period children experience many changes linked to key developmental tasks, such as adjusting to a new environment with higher demands on social behavior and task focus, and on obtaining academic skills (Mesman, Bongers & Koot, 2001; Reinjfjell, Kårstad, Berg-Nielsen, Luby & Wichstrøm, 2016). Challenges at school entry have been linked to increased child behavioral problems (Parker, Rubin, Price & DeRosier, 1995) and may also lead to parenting difficulties (Anderson, 1985; Elizur, 1986), which may fuel each other in a reciprocal manner, i.e., child behavioral problems increasing parenting difficulties, and vice versa (Patterson, 1986, 2002; Patterson et al., 1992). Examining such interactions, covering the transition from preschool to school age, is thus highly important and will be the focus of the present inquiry. To the best of my knowledge, no other study has investigated the bidirectional relations between parental hostility and structuring, and symptoms of ADHD, ODD and CD as defined by DSM. The current investigation adds to present knowledge by examining this in a community sample of preschoolers, followed from ages 4 to 6, and by exploring gender differences.

Behavioral Disorders in Preschoolers – Prevalence, Characteristics, Persistence and Outcomes

Attention deficit/hyperactivity disorder (ADHD). Prevalence rates of ADHD in community samples range from 1.9 % to 12.8 %, indicating that ADHD is among the most common psychiatric disorders in preschoolers (Lavigne et al., 2009; Wichstrøm et al., 2012), and meta-analyses have shown a worldwide prevalence ranging from 5.9 % to 7.2 % in older children and adolescents (Polanczyk, de Lima, Horta, Biederman & Rohde, 2007; Thomas, Sanders, Doust, Beller & Glasziou, 2015; Willcutt, 2012). According to DSM-5, ADHD is defined by a persistent pattern of inattention and hyperactivity-impulsivity that interferes with functioning and development (American Psychiatric Association, 2013). Inattention is often displayed as disorganized behavior, such as the child wandering off tasks, lacking persistence and having difficulty sustaining focus. Hyperactivity refers to excessive motor activity and/or talkativeness. Impulsivity implies hasty actions without forethought, which have high potential for harm (American Psychiatric Association, 2013).

The prevalence of ADHD in community samples increases from preschool to school age (Bufferd, Dougherty, Carlson, Rose & Klein, 2012) and studies indicate moderately high

levels of persistence in symptoms during this period of time (Tandon, Si & Luby, 2011; Wichstrøm, Belsky & Steinsbekk, 2017). As shown in a previous study of the same sample as applied in the present inquiry, ADHD displayed the highest level of continuity among several psychiatric disorders from ages 4 to 10 (Wichstrøm et al., 2017), thus indicating that ADHD is not a transient condition and therefore implies a need for treatment. The effect of psychosocial treatment efforts for ADHD is well documented within research (Fabiano, Schatz, Aloe, Chacko & Chronis-Tuscano, 2015). In order to extend present knowledge regarding treatment efforts, the present study aims to uncover modifiable factors in the community that forecast the development and continuity of behavioral disorder symptoms. Longitudinal studies of community samples have proven potential harmful long-term outcomes of ADHD symptoms in preschoolers, such as suffering from peer rejection at ages 6 and 8 (Stenseng et al., 2016), as well as displaying symptoms of ODD at the age of 6 (Bufferd et al., 2012; Harvey, Breaux & Lugo-Candelas, 2016). According to Harvey et al. (2016), these early symptoms of ADHD forecast family disruptions, which in turn contribute to the development of ODD. Furthermore, ADHD in preschoolers is found to predict anxiety at the age of 10 (Wichstrøm et al., 2017), and both single and recurrent episodes of depression and suicidal behavior in adolescence (Chronis-Tuscano et al., 2010). By uncovering modifiable factors that may be at focus in treatment interventions, such potential additional negative outcomes may be avoided.

Oppositional defiant disorder (ODD). ODD is among the most prevalent psychiatric disorders in preschoolers, with rates ranging from 1.8 % to 13.4 % in community samples (Bufferd et al., 2011; Ezpeleta et al., 2014; Lavigne et al., 2009; Wichstrøm et al., 2012), and a lifetime prevalence of 10.2 % has been reported (Nock, Kazdin, Hiripi & Kessler, 2007). According to DSM-5, ODD is characterized by a pattern of angry or irritable mood, argumentative or defiant behavior, and/or vindictiveness (American Psychiatric Association, 2013). Argumentative or defiant behavior indicates that the child often argues with adults or refuses to comply with their requests, deliberately annoys others, and often blames others for self-caused mistakes or misbehavior (American Psychiatric Association, 2013).

Studies of community samples show a moderate to high level of continuity in ODD symptoms from preschool to school age (Bufferd et al., 2012; Husby & Wichstrøm, 2017; Lavigne et al., 2001; Maughan, Rowe, Messer, Goodman & Meltzer, 2004). This tendency is also visible in studies of clinically referred children (Bunte, Schoemaker, Hessen, van der Heijden & Matthys, 2014; Keenan et al., 2011), which have further shown that ODD is more stable than both ADHD (Bunte et al., 2014) and CD (Bunte et al., 2014; Keenan et al., 2011).

Prospective investigations of community samples indicate that preschool symptoms of ODD predict negative outcomes, such as becoming a bully (Verlinden et al., 2015). ODD in 3-year-olds also predicts separation anxiety at the age of 5 (Martin et al., 2014) and ADHD at the age of 6 (Bufferd et al., 2012). In a study conducted by Lavigne, Gouze, Bryant and Hopkins (2014), ODD at age 4 predicted depression two years later, after controlling for initial depression levels. When controlling for initial levels of anxiety, however, ODD in 4-year-olds did not predict anxiety at age 6. Furthermore, ODD in preschoolers is a precursor of later developing CD symptoms (Burke, Waldman & Lahey, 2010; Husby & Wichstrøm, 2017), and in a sample of clinically referred school-aged boys, ODD forecasted problems with peers, romantic partners, parents and getting a job recommendation in early adulthood (Burke, Rowe & Boylan, 2014).

Conduct disorder (CD). Studies of community samples have found CD to be present in 0.7 % to 2.1 % of preschoolers (Maughan et al., 2004; Wichstrøm et al., 2012). Prevalence rates increase in school age (Maughan et al., 2004), and an overall lifetime prevalence of 9.5 % has been reported (Nock, Kazdin, Hiripi & Kessler, 2006). CD is characterized by a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated by the child (American Psychiatric Association, 2013). In DSM-5, CD symptoms constitute aggression to people or animals, destruction of property, deceitfulness or theft, or serious violations of rules (American Psychiatric Association, 2013).

Findings from studies of community and clinical samples indicate that CD is modestly stable from preschool to school age, and the persistence is lower than for ODD (Bunte et al., 2014; Husby & Wichstrøm, 2017; Keenan et al., 2011). In clinically referred children, CD is also less stable than ADHD (Bunte et al., 2014). Long-term outcomes from preschool CD include behavioral problems and educational difficulties at school age, such as requiring special education and more effort from teachers (Kim-Cohen et al., 2005, 2009). In addition, CD in 3-year-olds have been found to forecast symptoms of ODD and ADHD (hyperactivity-impulsivity) at the age of 6 (Rolon-Arroyo, Arnold & Harvey, 2014). Moreover, CD in school-aged children is a precursor of later antisocial personality disorder (Burke et al., 2010), and in a study of clinically referred children, CD was found to predict later ADHD, ODD, depression and anxiety (Lahey, Loeber, Burke, Rathouz & McBurnett, 2002).

In sum, symptoms of ADHD, ODD and CD in preschoolers are prevalent, moderately to highly stable, and forecast a range of negative social and psychological outcomes in addition to increase the risk for each other. This implies that preventative and treatment

efforts are required, and research indicates that psychosocial treatment efforts are effective in reducing symptoms of all three behavioral disorders (Eyberg, Nelson & Boggs, 2008; Fabiano et al. 2015). As previously mentioned, in order to increase knowledge as regards treatment efforts, modifiable risk factors need to be identified. The present study will contribute towards this aim by examining whether parenting behavior (i.e., hostility and structuring) predicts symptoms of these disorders in a community sample of preschoolers.

Gender differences in ADHD, ODD and CD – prevalence and persistence. Studies of community samples of preschoolers indicate that ADHD is slightly more prevalent in boys than in girls (Lavigne et al., 2009; Wichstrøm et al., 2012). Regarding preschool ODD and CD, studies of both community and clinical samples generally show no gender differences (Keenan et al., 2007, 2011; Lavigne et al., 2009; Maughan et al., 2004), although one community study found CD to be more prevalent in boys than in girls (Kim-Cohen et al., 2005). Regarding persistence in symptoms from preschool to school age, studies of community samples indicate a higher stability for boys than girls with ODD (Lavigne et al., 2001) and CD (Kim-Cohen et al., 2005, Rolon-Arroyo et al., 2014). According to Maughan et al. (2004), boys show a steady increase in CD symptoms, whereas girls display low levels followed by an increase at the beginning of adolescence. For ADHD, no gender difference in stability has been detected (Tandon et al., 2011). Furthermore, research display a male predominance in symptoms of all three behavioral disorders in older children and in the general population (Demmer, Hooley, Sheen, McGillivray & Lum, 2017; Keenan et al., 2011; Maughan et al., 2004; Nock et al., 2006, 2007; Willcutt, 2012).

In total, behavioral disorders in children are more prevalent in boys than in girls, and the discrepancy increases with age. Researchers have suggested that this might be due to boys being more vulnerable to psychosocial risk factors for the development of these disorders than girls (Dodge & Pettit, 2003; Hill, 2002; Rutter, Giller & Hagell, 1998). I will therefore test the proposition that negative parenting (i.e., high levels of parental hostility and low levels of parental structuring) will be a stronger predictor of behavioral disorder symptoms in boys than in girls.

Comorbidity between the behavioral disorders. Studies of community samples of preschoolers indicate high comorbidity between ADHD and both ODD and CD (Ezpeleta et al., 2014; Wichstrøm et al., 2012), although this co-occurrence is found to be lower for CD than ODD (Bendiksen et al., 2017; Bufferd et al., 2011; Lavigne et al., 2009). In this age group, a high comorbidity has also been identified between ODD and CD alone (Ezpeleta et al., 2014), and the co-occurrences between all three disorders is shown to be persistent

throughout development (Angold, Costello & Erkanli, 1999; Maughan et al., 2004; Rowe, Maughan, Pickles, Costello & Angold, 2002; Tung et al., 2016). The substantial overlap between the behavioral disorders can to a large extent be attributed to shared genetic influences, although unique genetic influences also have been discovered, thus supporting the distinction between them (Dick, Viken, Kaprio, Pulkkinen & Rose, 2005; Tuvblad, Zheng, Raine & Baker, 2009).

The high level of comorbidity between ADHD, ODD and CD implies that when one of the disorders is associated with a risk factor, there is high probability that the other disorders will be correlated with that factor as well. However, correlation is not causality. Thus, even if there is only a true causal relationship between parenting and one of the disorders (e.g. ODD), prospective associations will appear with the other disorders as well (i.e., ADHD and CD), masquerading as causality. Even though no strong causal implications can be drawn from observational research, this still underlines the importance of applying a multivariate approach including symptoms of all three disorders when examining their potential predictors or outcomes. However, to my knowledge, no previous study has applied a multivariate model when investigating the bidirectional relations between symptoms of behavioral disorders and parenting. The present inquiry will thus extend former research by including symptoms of ADHD, ODD and CD in a multivariate analysis in order to reveal whether there are specific effects between parenting and symptoms of each of the three behavioral disorders.

Parenting Predicts Child Behavioral Disorders

Embedded in a developmental psychological framework, the ecological model of human development (Bronfenbrenner, 1977) suggests that although the growing human organism is constantly being affected by several factors in the environment, parenting is considered the most powerful predictor of developmental outcomes. It is within the parent-child relationship, which is characterized by direct, enduring, intimate and interactive processes, that the child experiences the most immediate influences (Bronfenbrenner, 1977). Parents will continually influence the development of their offspring by changing and maintaining particular environments that either encourage optimal developmental processes, or suppress the probability of such developmental trajectories (Bronfenbrenner, 1999; Stolzer, 2005). In this sense, parenting contributes to the development of a child's mental health at one end and mental disorder at the other (Sameroff, 2000), including behavioral disorders.

Indeed, despite a strong consensus the biological contribution to the development of childhood ADHD, ODD and CD, the hypothesized importance of deficiencies in parenting for

the development of these disorders is supported by a range of observational research (Campbell, 2000; Dodge, 2000; Dodge & Pettit, 2003; Frick, 2016; Hill, 2002). Parenting that contributes to maladaptive child development constitutes both the absence of positive parenting and the presence of negative parenting (Pettit & Bates, 1989; Stormshak, Bierman, McMahon & Lengua, 2000). As regards preschoolers, these paths have been confirmed by longitudinal research reporting that inconsistent discipline, low parental involvement (Hawes et al., 2013) and parental intrusiveness (Carlson et al., 1995; Keown, 2012) in preschool years forecasted hyperactivity in school age, and that inattentiveness was predicted by lack of parental sensitivity, positive regard and warmth (Keown, 2012). Furthermore, an investigation indicated that parental hostility when children were 4 years old predicted symptoms of ODD two years later (Lavigne et al., 2016). Poor parental supervision, low persistence in discipline, as well as harsh and punitive discipline in offspring's school age years was found to predict CD in adolescence (Murray and Farrington, 2010). The importance of deficiencies in parenting as regards the development and continuity of behavioral disorders implies that these children may benefit from interventions aimed at improving parenting skills, i.e., decreasing negative parenting and increasing positive parenting. In fact, experimental research convincingly documented that parenting programs are indeed effective (Eyberg et al., 2008; Fabiano et al., 2015; Presnall, Webster-Stratton & Constantino, 2014; Webster-Stratton, 1998), which further support the contention that parenting is a modifiable factor that may hinder a further development of behavioral problems in their offspring. It should be noted, that none of the abovementioned prospective studies investigated whether these paths differed between genders. The present study will thus extend on former knowledge by conducting gender-specific analyses on the potential prospective relations from parenting to child symptoms of ADHD, ODD or CD.

Child Behavioral Disorders Predict Parenting

In order to get a full understanding of what contributes to the development and persistence of child behavioral problems, the reciprocal relations between parents and children must be acknowledged. The notion that parents and children affect each other throughout development was first introduced by Bell in 1968 (Davidov, Knafo-Noam, Serbin & Moss, 2015; Hill, 2002; Pardini, 2008; Pettit & Ariswalla, 2008). With the "*control system theory*", he argued that all parents and children affect each other's behavior and show a pattern of constant reciprocal adaptation (Bell, 1968; Bell & Chapman, 1986). In this sense, children influence their parents just as much as parents influence their children. During the seventies and eighties, other prominent developmental psychologists also began highlighting

that children are not passive recipients, but play an active role in shaping their parents' behavior (Belsky, 1984; Bronfenbrenner, 1977; Mischel, 1973; Sameroff, 1975).

Transactional mechanisms are core elements of etiological models for the development of child behavioral problems, and according to Patterson's model of coercion, coercive mechanisms are what contributes to the generations of such developmental trajectories (Patterson, 1986, 2002; Patterson et al., 1992). The term coercion refers to the use of aversive behavior by one member of the dyad, which depends on the behavior of the other member. This reinforces both members into becoming increasingly aversive towards each other. For example, a parent responds to the child's mildly problematic behavior with a prohibition, which the child ignores or counterattacks. This might cause the parent to increasingly try to control the child's behavior, perhaps by using hostile reprimands. The child then escalates his or her behavior, and a mutual escalation continues until the parent backs off and the child goes free. This creates a cycle of reinforcement of disruptive behavior, because the child learns that he or she can determine the attempts of control given by the parent by increasing the intensity and duration of the disruptive behavior. Over time, these transactional processes increase the probability of the parent exercising ineffective parenting and the child developing behavioral problems (Hill, 2002; Pardini, 2008; Patterson, 1986, 2002; Patterson et al., 1992; Rutter et al., 1998; Snyder & Stoolmiller, 2002).

The model of coercion captures child behavior typically seen as antisocial, oppositional and defiant (Hill, 2002; Pardini, 2008; Pardini et al., 2008; Patterson, 1986, 2002; Patterson et al., 1992; Pettit & Ariswalla, 2008; Rutter et al., 1998), which are core elements of ODD and CD. The mechanisms involved in the model can also be applied to the development of ADHD symptoms (Campbell, 2000; Danforth, Barkley & Stokes, 1991). That is, parents of children with ADHD symptoms will devote frequent attention to the child's hyperactive and impulsive behavior, and at the same time give little praise to appropriate behavior, which in turn will increase negative child behavior (Danforth et al., 1991). For these reasons, research on parenting as a risk factor for the development of ADHD, ODD and CD symptoms in children should also investigate the reversed relationship, namely whether symptoms of these child behavioral disorders affect parenting. Considering that boys seem to be more vulnerable to psychosocial risk factors for the development of behavioral disorders than girls (Dodge & Pettit, 2003; Hill, 2002; Rutter et al., 1998), one might expect that the mechanisms of the model of coercion (Patterson, 1986, 2002; Patterson et al., 1992) will be especially amplified in boys. More specifically: If dysfunctional parenting increases disruptive behavior in boys more than in girls, more boys than girls will develop this type of

behavior, which in turn causes parents of boys to be at higher risk for developing dysfunctional parenting practices, than parents of girls. I therefore hypothesize that high levels of parental hostility and low levels of parental structuring will be more strongly predicted by symptoms of child behavioral disorders in boys than in girls.

Parental Hostility, Parental Structuring, and Child Behavioral Problems

In several descriptions of Patterson's model, parental hostility is outlined as a core element characterizing parents' attempts to control their children (Hill, 2002; Patterson, 1986, 2002; Patterson et al., 1992; Rutter et al., 1998). Parental hostility can be defined as parental behavior characterized by poorly regulated emotions, not taking the child's perspective into account, as well as inadequate and uncontrolled expressions of anger (Biringen, 2000). Prospective investigations of community samples found parental hostility in preschool age to forecast later child behavioral problems (Denham et al., 2000; Rubin, Burgess, Dwyer & Hastings, 2003), as well as symptoms of ODD (Lavigne et al., 2016). Furthermore, cross-sectional studies have found a link between parental hostility and ODD symptoms in preschoolers in the community (Lavigne, Gouze, Hopkins, Bryant & LeBailly, 2012) and in clinically referred school-aged children (Nordahl, Wells, Olsson & Bjerkeset, 2010). Studies with a cross-sectional research design provides no information about the direction of influence, i.e., whether parental hostility is causing or caused by symptoms of the child behavioral disorder. Nevertheless, it is reasonable to believe that this type of parental behavior is triggered as the child exhibits behavior that is provocative and hard to manage. In turn, this may increase disruptive behavior as the child experiences little verification of his or her emotions by the parent, thus supporting a bidirectional relationship, as indicated by Patterson's model of coercion (Patterson, 1986, 2002; Patterson et al., 1992).

Parental structuring will also contribute, or more precisely predict against, the development of behavioral disorders. Parental structuring can be defined as parents' ability to provide age appropriate rules, frameworks for interactions and regulations, as well as allowing the child to learn independently without intruding his or her autonomy (Biringen, 2000), and is closely related to the notion of scaffolding (Hoffman, Crnic & Baker, 2006). Parental scaffolding involves providing structure in ways that promote competence. In this sense, the parent helps the child when needed, but also withdraws that help when it is no longer required (Hoffman et al., 2006). A prospective investigation of preschoolers indicated that parental limit-setting predicts improvement in child behavioral problems (Denham et al., 2000), and in a cross-sectional study a positive association between parental scaffolding and symptoms of ODD was revealed (Lavigne et al., 2012). As regards school-aged children,

research indicates a prospective path from respect for autonomy by parents to reduced child behavioral problems (Boeldt et al., 2012), as well as a cross-sectional link between controlling parental behavioral and ADHD symptoms in children (Johnston & Mash, 2001; Modesto-Lowe et al., 2008; Woodward, Taylor & Dowdney, 1998). As shown in the previous example, a child that repeatedly behaves in a disruptive manner may weaken the parent's ability to provide rules and stick to them. One might assume that this in turn increases the child's problematic behavior, because children with behavioral problems benefit from parent's abilities to provide limit setting (Denham et al., 2000). Further, one might also assume that if parents display low levels of structuring, there will be more occasions where they attempt to use excessive control to cope with the child's behavior, and thus likely exceed the child's autonomy. More specifically: Less structure indicates less predictability (e.g., "you can play five more minutes, and then we have to leave"). Thus, there will be more situations where the child is unprepared and therefore less able to adapt to the situation, which increases the risk of disruptive behavior followed by excessive parental control. Such interactions may in turn contribute to the development of more disruptive child behavior. Given the importance of parental hostility and structuring within these coercive mechanisms, the present study will add to existing knowledge by investigating the bidirectional relations between these specific parenting variables and symptoms of behavioral disorders in preschoolers.

Research Investigating the Bidirectional Relations Between Parenting and Symptoms of ADHD, ODD and CD in Children

To the best of my knowledge, only one study has been conducted on the bidirectional relationship between parenting and symptoms of a behavioral disorder capturing the transition from preschool to school age (Brown et al., 2017). The authors found that poor parental monitoring when children were 3 years old predicted ODD three years later. Moreover, ODD in 3-year-olds was a precursor of poor parental monitoring when the children were 6, thus indicating a bidirectional relationship. In this study, parenting was captured by checklists as opposed to observational measures. Because of respondents' lack of opportunity for clarifying the questions or explaining the reasoning behind their answers, this may give rise to methodological issues (Holden & Edwards, 1989). Answers may also be influenced by individual differences in memory and perception, as well as social desirability (Herbers, Garcia & Obradović, 2017), and other reporting biases. Observation is generally known to be a more valid way of assessing parenting because the behavior of all parents are scored against the same criteria (Herbers et al., 2017), thus providing more objective information than self-report. Furthermore, Brown et al. (2017) did not account for the high comorbidity between the

behavioral disorders. Consequently, and as previously outlined, results obtained in this study may be due to symptoms of ADHD or CD. Finally, the study did not contain gender-specific analyses. The present study will extend the findings of Brown et al. (2017) by using observation to capture parenting, accounting for comorbidity between the behavioral disorders, as well as conducting gender-specific analyses.

Although they do not capture the transition from preschool to school age, three other studies have examined the bidirectional relations between parenting and behavioral disorders in school-aged children, whereof two examined community samples, one of girls only (Hipwell et al., 2008) and one of boys only (Pardini et al., 2008), and one investigated a sample of clinically referred boys (Burke et al., 2008). Results from these studies indicated a bidirectional relationship between symptoms of CD and harsh parenting (Hipwell et al., 2008), between symptoms of ODD and timid discipline (Burke et al., 2008), and between symptoms of both disorders and parenting characterized by physical punishment, low positive reinforcement, poor communication, poor parental monitoring, low parental involvement and timid discipline (Pardini et al., 2008). Furthermore, unidirectional paths were discovered from low parental warmth to an increase in CD symptoms (Hipwell et al., 2008), from CD symptoms to poor parental monitoring, as well as from ODD symptoms to lower parental involvement and poor communication (Burke et al., 2008). No relations were found between ADHD and parenting (Burke et al., 2008). It should be noted that both Hipwell et al. (2008) and Pardini et al. (2008) used checklist as opposed to clinical interview for measuring symptoms of ODD and CD. Checklist measures do not provide detailed information about onset, frequency, duration and context of symptoms (Bufferd et al. 2012; Egger & Angold, 2004, 2006; Egger et al., 2006). The information obtained also does not correspond to psychiatric symptoms as defined by the DSM, which makes it impossible for clinicians or researchers to make decisions about specific psychiatric diagnoses (Husby & Wichstrøm, 2017). Clinical interviews, on the other hand, can be used to determine whether the descriptions of symptoms meet the different criteria of a specific diagnosis, as it is conducted by an experienced clinician and therefore provides very detailed information (Bufferd et al., 2012). For these reasons, the present study will use clinical interviews, i.e., the Preschool Age Psychiatric Assessment (PAPA; Egger et al., 2006), to capture symptoms of DSM-defined child behavioral disorders. As the first data acquisition was conducted in 2007-2009, and the PAPA was developed before the release of DSM-5 (Egger et al., 2006), the present study uses DSM-IV rather than DSM-5.

It should be added that a substantial amount of prospective studies, including all age groups from infancy to adolescence, have been conducted on the bidirectional relationship between parenting and child externalizing behavior captured by checklist measures. Examples of the parenting variables investigated are parental sensitivity (Belsky, Fearon & Bell, 2007; Bradley & Corwin, 2013; Wang, Christ, Mills-Koonce, Garrett-Peters & Cox, 2013), harsh parenting (Bradley & Corwin, 2013), physical discipline (Choe, Olson & Sameroff, 2013; Serbin, Kingdon, Ruttle & Stack, 2015), inductive parenting (Choe et al., 2013), lack of positive parenting (Serbin et al., 2015), as well as parental support, lack of structure and psychological control (Verhoeven, Junger, van Aken, Dekovic & van Aken, 2010). Some of these studies found that there were bidirectional relations between parenting and child externalizing (Bradley & Corwin, 2013; Choe et al., 2013; Serbin et al., 2015), some reported unidirectional relations exclusively (Belsky et al., 2007; Fite, Colder, Lochman & Wells, 2006; Fletcher & Johnston, 2016; Verhoeven et al., 2010; Wang et al., 2013), whereas others revealed no direct paths at all (Eisenberg, Taylor, Widaman & Spinrad, 2015). Although these studies provide useful information on the relations between parenting and general child behavioral problems, none of the results can be attributed to ADHD, ODD or CD. In order to do so, diagnostically defined symptoms or disorders should be investigated. Also, several of these studies examined either positive or negative parenting. The inclusion of both types in research is important, because it allows a comparison of their effects (Pettit & Bates, 1989; Stormshak et al., 2000). For this reason, the present investigation will include aspects of both types (i.e., negative parenting: hostility; positive parenting: structuring).

Summary and Aims of the Present Study

Developmental theories emphasize transactional processes between parents and children as core mechanisms contributing to the development of child behavioral problems (Patterson, 1986, 2002; Patterson et al., 1992). However, to my knowledge, the four studies (Brown et al., 2017; Burke et al., 2008; Hipwell et al., 2008; Pardini et al., 2008) that have investigated the bidirectional relations between parenting and diagnostically defined behavioral disorders in children contain several methodological weaknesses. Also, out of these, only one (Brown et al., 2017) captured the period from preschool to school age. Therefore, the present study will extend and add to former research by examining the bidirectional relations between observed parental hostility and structuring, and symptoms of ADHD, ODD and CD, captured by clinical interview, in a community sample of 4-year-olds followed up at age 6. The current investigation aims to overcome former methodological shortcomings by adjusting for comorbidity by including symptoms of all DSM-IV defined

behavioral disorders in a multivariate model, by including both positive and negative parenting, in addition to conducting gender-specific analyses. Based on aforementioned theory and research I hypothesized that (1) higher levels of parental hostility and lower levels of structuring at child age 4 will predict symptoms of ADHD, ODD and CD at age 6 even when age 4 levels of these symptoms are adjusted for; (2) symptoms of ADHD, ODD and CD at age 4 will predict higher parental hostility and lower parental structuring at age 6, adjusting for age 4 levels of these parenting variables; and (3) all paths will be stronger in boys than in girls. Considering the strong biological underpinning of ADHD (Asherson et al., 2005; Faraone & Mick, 2010; Faraone et al., 2005), it is further hypothesized that symptoms of ADHD will be less affected by parenting than symptoms of ODD and CD. Finally, socioeconomic status (SES) is associated with child behavioral problems (McLeod & Shanahan, 1993) and has shown to predict parenting (Azad, Blacher & Marcoulides, 2014), and will thus be adjusted for.

Method

Participants and Procedure

All children born in 2003 and 2004 living in Trondheim, Norway and their parents were invited to participate in the Trondheim Early Secure Study (TESS) – a longitudinal study on children’s psychosocial development and mental health. Invitation letters were sent to their homes together with a brief screening of emotional and behavioral problems, the Strengths and Difficulties Questionnaire (SDQ; Goodman, Ford, Simmons, Gatward & Meltzer, 2000) version 4-16. Information about the study was given by health nurses at the routine community health checkup for 4-year-olds, who also obtained parents’ written consents to participate. Of all the 3,456 families who received an invitation letter, 2,477 eligible families agreed to participate. The flow-chart depicted in Figure 1 provides a description of the recruitment procedure and participation rates. The procedure is described in detail in Wichstrøm et al. (2012).

Based on the SDQ, an oversampling for emotional and behavioral problems was conducted in order to increase the variability, and thus the statistical power. The total SDQ difficulty scores were divided into four strata (0-4, 5-8, 9-11, 12-40), and the probability of selection increased with increasing SDQ-scores (.37, .48, .70, .89 in the four strata, respectively). Out of the 1250 selected families, 997 were interviewed and tested at time 1 (T1), when the children’s mean age was 4.7 ($SD = 0.30$). Interviews and testing were performed by skilled personnel ($N = 7$) at the university clinic. Among the participating children, 50.9 % were girls, and 49.1 % were boys. Of the parent respondents, 84.8 % were

mothers and 15.2 % were fathers. At the second data collection (T2), 795 of the initial families were tested ($M_{\text{age}} = 6.7$, $SD = 0.17$). The dropout rate from T1 to T2 did not differ across the four SDQ strata ($\chi^2 = 5.70$, $df = 3$, not significant) or by gender ($\chi^2 = 0.23$, $df = 1$, not significant). Further, none of the study variables at T1 predicted dropout at T2, with the exception of ADHD ($\chi^2 = 4.95$, $df = 1$, $p = .026$). Additional sample characteristics are presented in Table 1. All procedures were approved by the Regional Committee for Medical and Health Research Ethics.

Measures

The Preschool Age Psychiatric Assessment (PAPA). The PAPA (Egger et al., 2006) is a semi-structured interview for parents of children aged 2-6 years, developed for assessing DSM-IV diagnoses (American Psychiatric Association, 1994). PAPA is based on a structured protocol involving both required and optional follow-up questions capturing the 3 months immediately preceding the interviews. The interviewers ask questions until there is sufficient information to decide whether a symptom is present at the pre-specified level of severity, thus it is not up to the parent to decide whether a symptom is present or not. In DSM-IV (American Psychiatric Association, 1994), all symptoms of ODD and some symptoms of CD rely on normative evaluations of frequency (e.g., “often loses temper”). “Often” was defined post hoc as the highest 10 % as determined using frequency counts in the present sample at the specified age (Egger et al., 2006). Six CD symptoms deemed inappropriate for this age group and were by default excluded from the PAPA (e.g., “Forced someone into sexual activity”). As there is not sufficient evidence to support most psychopathology being categorical in nature (Haslam, Holland & Kuppens, 2012), symptom counts, rather than psychiatric diagnoses, were analyzed for the respective disorders, ADHD, ODD and CD. An inter-rater reliability using intra-class correlations of ADHD = .97, ODD = .97 and CD = .91 was established by having blinded raters recode 9 % of the audio-recordings.

Parental non-hostility and structuring. Interactions between parents and children were videotaped at T1 and T2 during four consecutive sequences (free play, child led play, parent led play, and a clean-up task), each sequence having a duration of 5 minutes. Ratings of parental non-hostility and structuring were based on the Emotional Availability Scales (EAS; Biringen, 2008). Non-hostility refers to the manner in which parents behave and talk towards their children (Biringen, 2000). A non-hostile parent will regulate emotions in a context-appropriate manner, and take the child’s perspective into account. Anger will therefore be expressed adequately and controlled. Parental structuring refers to the parents’

ability to support the child's learning and exploration without intruding the child's autonomy. It involves providing age-appropriate rules, frameworks for interaction and regulations, and at the same time allowing the child to learn independently (Biringen, 2000). Overall assessment of parental structuring and non-hostility was made across the four abovementioned sequences with seven subscales for each construct (structuring: $\alpha=.83$; non-hostility: $\alpha=.59$). All raters were trained and certified by Biringen, who developed the EAS. The interrater reliabilities at age 4 and 6, respectively, were ICC = .69/.70 for Structuring and ICC = .71/.69 for Non-hostility, based on a random 10 % sample of the videotapes rated by multiple blinded coders.

Socioeconomic status (SES). SES was measured by occupational status, coded on a 6-point scale (1 = *manual worker*, 6 = *leader*), according to the International Classification of Occupations (International Labour Office, 1990). For parents living together, the highest occupation was chosen.

Statistical Analyses

To test the bidirectional relations between parenting and children's symptoms of ADHD, ODD and CD, an autoregressive cross-lagged analysis within a structural equation modeling (SEM) framework was applied. Both types of parenting, as well as symptoms of all behavioral disorders, were tested in a multivariate model that adjusted for the covariate (SES). As illustrated in Figure 2, the model tested the paths from symptoms of child behavioral disorders at age 4 to parenting at age 6, and from parenting at age 4 to symptoms of child behavioral disorders at age 6. Gender-specific analyses were conducted and a Wald test using parameter constraints was applied to test if significant paths were different for boys and girls, comparing a model where the path in question was set to be identical between the genders with a model where it was freely estimated. The model was saturated thus fit the data completely (i.e., 0 degrees of freedom).

Because a screen-stratified sample was used, the parameters in all analyses were weighted with the inverse of the drawing probability (i.e., low scorers on the SDQ were weighted up and high scorers were weighted down). To adjust for moderate deviations from multivariate normality, a robust maximum likelihood estimator was applied. This estimator also provides robust standard errors. Missing data were handled with a full information maximum likelihood procedure. This implies that analyses are conducted on all available data, given that cases have values for the dependent variable. The analysis sample size was therefore 879. All analyses were performed using Mplus 7.4 Software (Muthén & Muthén, 1998-2012).

Results

Preliminary Analysis: Descriptive Statistics and Bivariate Correlations

Estimated means (M) and standard deviations (SD) of all study variables, as well as their bivariate correlations (Pearson's r) are displayed in Table 2. As shown, symptoms of ADHD at T1 was associated with slightly more symptoms of ADHD at T2. This tendency was also found for ODD and CD. Moreover, symptoms of all three behavioral disorders at both measurement points displayed modest and positive correlations with each other. Symptoms of behavioral disorders did not correlate with parental non-hostility. However, higher parental structuring at T1 was associated with slightly less symptoms of all behavioral disorders at both measurement points, with the exception of CD at T2. Negative and modest correlations also emerged between parental structuring at T2 and ADHD at T1 and T2, as well as ODD at T1 and CD at T2. Finally, a modest and positive correlation was found between parental non-hostility at T1 and parental non-hostility at T2, and the same tendency was found for parental structuring. Moreover, moderate and positive correlations were found between parental non-hostility at T1 and parental structuring at T2, as well as between parental structuring at T1 and parental non-hostility at T2. Overall, these correlations underline the importance of including all study variables in a multivariate model that accounts for such relationships.

Primary Analysis: Bidirectional Relations Between Parenting and Symptoms of ADHD, ODD and CD

Results of the main analyses are displayed in Table 3. As can be seen, symptoms of all three behavioral disorders were stable from T1 to T2. Parental structuring and parental non-hostility were also stable across these measurement points. Contrary to the first hypothesis, neither parental non-hostility nor parental structuring at T1 forecasted child symptoms of ADHD, ODD or CD at T2. Consistent with the second hypothesis, though, symptoms of ODD at T1 predicted lower levels of parental structuring at T2, even when the initial level of parental structuring was adjusted for. Surprisingly, ADHD and CD symptoms at T1 did not predict parental structuring at T2. Regarding the prediction of parental non-hostility at T2 from symptoms of the behavioral disorders at T1, no significant paths were found. Furthermore, contrary to what was hypothesized, no gender differences were revealed and no difference was found between the path from parenting at T1 to symptoms of ADHD at T2, compared with the corresponding paths from parenting to symptoms of ODD and CD. Overall, no bidirectional relations were found between parenting and child symptoms of behavioral disorders.

Discussion

The aim of the present study was to test the bidirectional relations between observed parental hostility and structuring, and child symptoms of ADHD, ODD and CD in a sample of 4-year-olds followed up at age 6. The current study also explored whether these paths differed between genders. Contrary to the first hypothesis, parental hostility and structuring measured when the children were 4 years old did not forecast child symptoms of behavioral disorders two years later. Consistent with the second hypothesis, though, evidence was found for the opposite direction of influence: Child symptoms of ODD at age 4 predicted lower levels of parental structuring two years later. Child symptoms of ADHD and CD, however, did not predict parental structuring, and none of the behavioral disorder symptoms examined forecasted parental hostility. No difference between genders was found, and no difference was found between the path from parenting to child ADHD symptoms, compared with the corresponding paths from parenting to symptoms of ODD and CD. Overall, the results did not support bidirectional relations between parenting and child symptoms of behavioral disorders during the transition from preschool to school age.

Parenting Does Not Affect Symptoms of Child Behavioral Disorders

The current finding that parental hostility and structuring did not forecast child symptoms of ADHD, ODD or CD is consistent with Burke et al. (2008) who reported that symptoms of these disorders in clinically referred school-aged boys were not predicted by poor parental monitoring, and that child symptoms of ADHD and CD were not predicted by timid discipline. Parental monitoring involves attention to and tracking of the child's whereabouts, activities and adaptations (Dishion & McMahon, 1998), and timid discipline includes resistance to engage in discipline because of concerns that the child will respond with undesirable behavior (Burke et al., 2008). Just as low parental structuring, both poor parental monitoring and timid discipline involve a lack of limit setting (Biringen, 2000; Burke et al., 2008; Dishion & McMahon, 1998), and the variables might thus be seen as related. The present study adds to the findings by Burke et al. (2008) by suggesting that a lack of prospective paths from such parenting behavior to child symptoms of behavioral disorders is also prevailing in a community sample of preschoolers. However, the present results also contrast findings from previous research on preschoolers revealing prospective paths from parental hostility, as well as parenting variables related to structuring (i.e., monitoring, intrusiveness and scaffolding), to child symptoms of ODD and ADHD (Brown et al., 2017; Carlson et al., 1995; Keown, 2012; Lavigne et al., 2016). Prospective paths from harsh parenting and poor parental monitoring to CD in school-aged children have also been

demonstrated (Murray & Farrington, 2010). Because both parental hostility and harsh parenting include uncontrolled expressions of anger (Biringen, 2000; Hipwell et al., 2008), comparisons between these parenting variables can be made. Discrepancies between the current and previous studies might partly be explained by the use of different parenting variables, such as harsh parenting capturing physical punishment (Hipwell et al., 2008), whereas parental hostility does not. Physical punishment is found to be an important predictor of CD in children (Murray & Farrington, 2010), which may explain the link between harsh parenting and CD symptoms. Differences in findings might also be accounted for by methodological differences, such as the previous studies using dichotomous rather than dimensional measures of behavioral disorders (Brown et al., 2017; Carlson et al., 1995) and capturing parenting by questionnaires rather than observation (Brown et al., 2017; Lavigne et al., 2016). Also, neither of these studies adjusted for comorbidity between the behavioral disorders, although such comorbidity is relatively high (Ezpeleta et al., 2014; Wichstrøm et al., 2012).

How might the present findings be explained? Research has shown that biological or biologically based factors, such as genes and temperament, are important risk factors for the development of childhood ADHD, ODD and CD (Campbell, 2000; Dodge, 2000; Dodge & Pettit, 2003; Frick, 2016; Hill, 2002). ADHD, for example, shows a heritability of 76 % (Faraone et al., 2005), and there is a possibility that such innate factors overshadowed the influence of parenting in the present study. Research has indicated that the association between quality of caregiving and child behavioral problems is larger for older children and adolescents, than for toddlers and preschoolers (Rothbaum & Weisz, 1994), and one might assume that external influences, such as parenting, over time will dilute the influence of biological factors. Thus it might be hypothesized that prospective paths from parental hostility and structuring to child symptoms of behavioral disorders would have been revealed in a sample of older children. On the other hand, though, genetic influences on externalizing child behavior have shown to increase with age from early adolescence to early adulthood (Bergen, Gardner & Kendler, 2007), and there is a possibility that the influence from genetic factors also increases from preschool to school age. No strong conclusions can thus be made, and future studies investigating both parenting and genetic factors in relation to child behavioral problems over a longer period of time, are therefore needed.

A methodological explanation for the present finding is that the significant stability across measurement points for symptoms of ADHD, ODD and CD left limited unexplained variance. That said, the stability ranged from small to moderate, thus substantial change was

also evident. Further, as the current investigation was of a community sample, the levels of child behavioral disorder symptoms were relatively low compared with those in a study of clinically referred preschoolers (Bunte et al., 2014). As previously mentioned, it is well established that parenting interventions are effective in reducing child behavioral problems (Eyberg et al., 2008; Fabiano et al., 2015; Presnall et al., 2014; Webster-Stratton, 1998), thus it is likely that parenting also *forecasts* behavioral disorder symptoms, and more so in a sample of clinically referred children. Aiming to explain the findings, I would also like to draw attention to the relatively high levels of parental structuring and non-hostility found in the present sample, as seen in Table 2, indicating participating parents to display relatively low levels of dysfunctional parenting thought to forecast children's symptoms. Theories on how parenting contributes to the development of child behavioral problems have included parenting skills at the lower end of the continuum (Campbell, 2000; Dodge, 2000; Dodge & Pettit, 2003; Frick, 2016; Hill, 2002; Patterson, 1986, 2002; Patterson et al., 1992), and one might assume that because the parenting levels of the present study ranged from good to very good, this did not substantially affect the level of child behavioral symptoms. Although the present study did not discover prospective paths from parental hostility and structuring to child symptoms of behavioral disorders, it is not suggested that parenting is unimportant. To gain increased knowledge, future studies investigating relations between parenting and child behavioral problems are needed in the community as well as in clinical samples.

Preschool Symptoms of ODD Predict a Decrease in Parental Structuring

The present finding that symptoms of ODD in 4-year-olds predicted lower levels of parental structuring two years later, accounting for baseline levels, is in accordance with Brown et al. (2017) reporting that ODD in preschoolers forecasted poor parental monitoring, and Burke et al. (2008) reporting that symptoms of ODD in clinically referred 7-year-old boys predicted timid discipline (Burke et al., 2008). Although the present study did not address underlying mechanisms, it is reasonable to assume that the decrease in parental structuring to some extent reflects that parents back off as a response to the oppositional and defiant behavior exhibited by their child, which is in accordance with the aforementioned model of coercion (Patterson, 1986, 2002; Patterson et al., 1992). In this sense, parents' abilities to maintain the same level of rules and limit setting diminish due to their child's difficult and supposedly hard-to-manage behavior. Alternatively, the decrease in structuring may be due to adaptation, in that parents realize, more or less consciously, that the level of structuring applied does not benefit the development of the child. Because of individual differences, children will profit differently from the same parenting strategies (Kiff, Lengua & Zalewski,

2011), and one might assume that if parents believe that their child do not profit from the applied level of parental structuring, they change parenting strategy (i.e., reduce the level of structuring) in order to facilitate their child's development. This is in line with the aforementioned concept of parental scaffolding (Hoffman et al. 2006). However, research has suggested that preschool symptoms of ODD is associated with increased levels of parental scaffolding (Lavigne et al., 2012, 2016), which contrasts the negative association between ODD symptoms and parental structuring found in the present study. There is no intuitive explanation for this difference in findings, and because both parental structuring and scaffolding involves a balance between two fairly contrasting aspects, i.e., on one hand, providing rules and limit setting and, on the other, not intruding autonomy (Biringen, 2000; Hoffman et al., 2006), no definite conclusions can be made as regards which aspects of these variables are at play. Future research may add to the present study by investigating underlying aspects of parental structuring in relation to child symptoms of behavioral disorders.

Symptoms of CD and ADHD in Preschoolers Do Not Affect Parenting

The finding that parental structuring was not predicted by symptoms of ADHD or CD in preschoolers, is consistent with Burke et al. (2008) reporting that symptoms of these disorders in clinically referred school-aged boys did not forecast timid discipline in parents over time. However, in contrast with the present finding, the authors also revealed that CD symptoms predicted poor parental monitoring. Moreover, inconsistent with the current finding that symptoms of child behavioral disorders did not predict parental hostility, Hipwell et al. (2008) reported that symptoms of CD in preschool girls predicted harsh parenting. The contrasting findings might be explained by differences in child age (i.e., preschoolers versus school-aged children), as well as differences in parenting variables and by the way they were measured. Furthermore, studies that are cross-sectional in nature have revealed positive associations between parental hostility and ODD symptoms in preschoolers (Lavigne et al., 2012), as well as between controlling parental behavior (i.e., intruding the child's autonomy) and symptoms of ADHD in school-aged children (Johnston & Mash, 2001; Modesto-Lowe et al., 2008; Woodward et al., 1998), which accords with the preliminary results of the present study, revealing a negative association between parental structuring and child symptoms of ADHD. The present study adds to existing findings by showing that although cross-sectional associations do exist, there is no evidence for prospective relations, at least not in the two-year time period examined in the present inquiry.

How can the present findings be explained? As previously mentioned, the parents in the present study as a group display good parenting skills. Norwegian parents are generally

good at managing and tolerating child behavioral problems, which further protect against interpersonal problems (Wichstrøm et al., 2012). As suggested by Wichstrøm et al. (2012), good parenting skills will likely protect parents and children from getting entrenched in coercive cycles (Patterson, 1986, 2002; Patterson et al. 1992), which might explain the present finding that parenting was not substantially affected by child symptoms of behavioral disorders. Notably, there is a slight chance that social desirability contributed to the high parenting scores found in the present study. Although observational measures are less sensitive to social desirability than questionnaires (Herbers et al., 2017), parents will probably aim to behave in a best possible way when being observed. This is especially likely in a study, as the present, where participation was not for treatment purposes, thus parents had little reason to expose difficulties. Many parents are able to behave in a more desirable way within the short time span of the parent-child interaction, which thus might not reflect on how they otherwise behave (Kårstad, Wichstrøm, Reinfjell, Belsky & Berg-Nielsen, 2015). Finally, the present findings do not generalize to children older than early school age. Research suggests that parental behavior might be more shaped by the child as it grows older (Bradley & Corwin, 2013), and one may expect that paths from symptoms of child behavioral disorders to parenting would be more visible in older children.

Clinical Implications

If replicated, the present finding that symptoms of child behavioral disorders are not predicted by parenting, may contribute to reduce the stigmatization many parents of children with mental disorders experience (Corrigan & Miller, 2004; Eaton, Ohan, Stritzke & Corrigan, 2016). Many parents are blamed for their child's mental disorder (Corrigan & Miller, 2004), and consequently feel like incompetent parents (Eaton et al., 2016). Although the present study investigated symptom counts in a community sample rather than diagnoses in a clinical sample, and only two aspects of parenting were tested, the present finding indicates that parents are not to blame for their child's behavioral difficulties. Communicating this to parents, and thus possibly reducing self-stigma, may in turn make parents more likely to seek help for their child's difficulties or their own challenges in handling their child's problems, as lower self-stigma in parents of children with a mental disorder is associated with higher likelihood of treatment enrollment (Dempster, Wildman & Keating, 2013). Second, the present finding that ODD in preschoolers predicted a decrease in parental structuring, whereas parental structuring or lack of structuring did not affect the level of ODD symptoms over time indicate that this is a one-way relationship. As previously suggested, a decrease in parental structuring might be due to parents being overwhelmed by the supposedly hard-to-manage

behavior exhibited by their child, and it is reasonable to assume that this may affect parents' psychological well-being, which is hypothesized to influence parenting capabilities (Belsky, 1984). For this reason, parents may benefit from being aware of how their child's oppositional and defiant behavior may affect their ability to provide structuring, and thereby having the opportunity to work on counteracting this development. Of note, given the discrepancy between the current findings and prevailing theories and research on the relations between parenting and child behavioral problems, replications are necessary before strong implications can be drawn.

Strengths and Limitations

The present study has several strengths, such as a prospective design, a large and population-representative sample, and multivariate analyses. Also, by using both interview and observation as means of collecting information, the discerned associations are likely not influenced by respondent bias. As several strengths of the current study have been outlined in the introduction and discussion, the focus here will be on limitations. The majority of the participating parents in the present study were mothers. Research has shown that mothers and fathers report externalizing behavior in children somewhat differently, and that information about child symptoms ideally should be obtained from both parents (Tretler & Epkins, 2003). In the present study, however, although both parents were encouraged to participate on the assessment day, this was so time-consuming (e.g., duration of one whole day at age 6) that such demands could not be made. Also, because the present study captured symptoms of child behavioral disorders by clinical interview, parents did not decide whether a symptom was present or not, thus possibly diminishing the potential difference between mothers and fathers. Moreover, it should be acknowledged that because the study was conducted in Norway and the majority of participants were of Norwegian ethnicity, findings may not generalize to other populations or cultures. Furthermore, the parent-child interactions might have been influenced by the fact that they were conducted in an unfamiliar setting at the university clinic, which may have compromised ecological validity. Ideally, such interactions ought to be observed repeatedly in a naturalistic environmental setting, such as at home. However, this would have been both too time consuming and resource demanding in a sample as large as the present. Furthermore, although research suggests that mental disorders are dimensional rather than categorical in nature (Haslam et al., 2012), the present research findings do not generalize to diagnosable behavioral disorders. Although the present study used a prospective, longitudinal design, causal conclusions cannot be made because unmeasured third variables may have affected the results. It should also be observed that the reliability of the parenting measures

was only moderately good, thus there is a possibility of associations being deflated. Finally, data were only obtained twice with two years in between. Ideally, data acquisitions should have been conducted with a higher frequency and over a longer time frame. To expand on the present study, future research should therefore investigate relations between parenting and symptoms of child behavioral disorders over a longer time period with more regular data assessments.

Summary and Conclusion

The aim of the present study was to investigate potential bidirectional relations between child symptoms of ADHD, ODD and CD, and parental structuring and hostility, in a sample of 4-year-olds followed up at age 6. Possible gender differences were also investigated, in addition to whether ADHD symptoms in children were less affected by parenting than symptoms of ODD and CD. By examining such prospective relations, early modifiable risk factors may be identified, which further may contribute to inform preventative and treatment efforts. Contrary to what was expected, parental hostility and structuring did not forecast child symptoms of ADHD, ODD and CD. However, evidence was found for the opposite direction of influence: Symptoms of ODD in preschoolers predicted lower levels of parental structuring two years later, adjusting for baseline levels. Preschool symptoms of ADHD and CD, however, did not predict parental structuring, and none of the behavioral disorder symptoms examined forecasted parental hostility. Contrary to what was expected, no gender differences were revealed, and no difference was found between the path from parenting to child symptoms of ADHD, compared with the corresponding paths from parenting to symptoms of ODD and CD. Overall, this indicates that during the transition from preschool to school age, children influence parents more than parents influence their children when it comes to parenting and child symptoms of behavioral disorders. The present findings underline the importance of investigating mechanisms underlying the development and continuity of child behavioral disorder symptoms. Moreover, the present finding that symptoms of child behavioral disorders are not predicted by parenting, may contribute to reduce the stigmatization many parents of children with mental disorders experience (Corrigan & Miller, 2004; Eaton et al., 2016). To the best of my knowledge, the present study is the first to examine potential bidirectional relations between symptoms of DSM-defined child behavioral disorders and observed parenting, using a multivariate model and capturing the transition from preschool to school age. To extend the present study, future research should investigate these relationships over a longer time period with more frequent data collections, as well as capturing more aspects of parenting.

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Table 1

Sample Characteristics at Age 4

Characteristics	%
Gender of child	
Male	49.1
Female	50.9
Gender of parent informant	
Male	15.2
Female	84.8
Ethnic origin of biological mother	
Norwegian	93.0
Western countries	2.7
Other countries	4.3
Ethnic origin of biological father	
Norwegian	91.0
Western countries	5.8
Other countries	3.2
Informant parent's socioeconomic status	
Leader	5.7
Professional, higher level	25.7
Professional, lower level	39.0
Formally skilled worker	26.0
Farmer/fishermen	0.5
Unskilled worker	3.1

Table 2

Means, Standard Deviations and Bivariate Correlation Coefficients Between All Study Variables

	Mean (SD)	1	2	3	4	5	6	7	8	9	10
Symptoms of behavioral disorders (Possible range)											
1. ADHD T1 (0-18)	1.01 (1.77)	1	.41***	.35***	.23***	.24***	.12***	-.07	-.02	-.13***	-.08*
2. ADHD T2	1.27 (2.19)		1	.20***	.38***	.16***	.18***	-.06	-.07	-.12**	-.12***
3. ODD T1 (0-8)	0.66 (1.07)			1	.29***	.36***	.25***	-.04	-.06	-.11**	-.11**
4. ODD T2	0.94 (1.21)				1	.17***	.33***	-.05	-.07	-.11**	-.07
5. CD T1 (0-9)	0.31 (0.62)					1	.25***	-.05	-.00	-.08*	-.02
6. CD T2	0.22 (0.49)						1	-.04	-.07	-.06	-.08*
Parenting (Possible range)											
7. Non-hostility T1(15-30)	28.0 (1.50)							1	.12**	.47***	.04
8. Non-hostility T2	26.8 (2.51)								1	.12**	.53***
9. Structuring T1(13-32)	25.9 (3.09)									1	.16***
10. Structuring T2	24.6 (3.42)										1

Note: * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. ADHD=symptoms of attention deficit/hyperactivity disorder; ODD=symptoms of oppositional defiant disorder; CD=symptoms of conduct disorder

Table 3
The Prospective Reciprocal Relations Between Parenting and Symptoms of Child Behavioral Disorders

Age 4	Symptoms of child behavioral disorders at age 6						Parenting at age 6			
	ADHD		ODD		CD		Non-hostility		Structuring	
	<i>B</i> (95 % CI)	β	<i>B</i> (95 % CI)	β	<i>B</i> (95 % CI)	β	<i>B</i> (95 % CI)	β	<i>B</i> (95 % CI)	β
Behavioral disorders										
ADHD	.47*** (.34, .61)	.38	.09*** (.04, .15)	.13	.01 (-.01, .03)	.03	.02 (-.09, .12)	.01	-.07 (-.23, .10)	-.03
ODD	.03 (-1.5, .21)	.01	.23*** (.13, .33)	.20	.08*** (.04, .12)	.17	-.11 (-.31, .08)	-.05	-.33* (-.62, -.04)	-.10
CD	.24 (-.03, .51)	.07	.14 (-.02, .29)	.07	.14*** (.07, .21)	.18	.03 (-.27, .34)	.01	.37 (-.04, .78)	.07
Parenting										
NH	-.01 (-.18, .15)	-.01	.01 (-.06, .08)	.01	.00 (-.03, .03)	-.00	.18* (.01, .36)	.11	-.07 (-.25, .12)	-.03
ST	-.04 (-.09, .02)	-.05	-.02 (-.06, .01)	-.06	-.00 (-.02, .01)	-.03	.04 (-.04, .12)	.05	.16** (.04, .27)	.14
Covariate										
SES	-.06 (-.22, .09)	-.03	-.01 (-.10, .08)	-.01	.02 (-.03, .07)	.03	.26* (.02, .50)	.10	.46** (.14, .78)	.13

Note: * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. ADHD=symptoms of attention deficit/hyperactivity disorder; ODD=symptoms of oppositional defiant disorder; CD=symptoms of conduct disorder; NH=non-hostility; ST=structuring

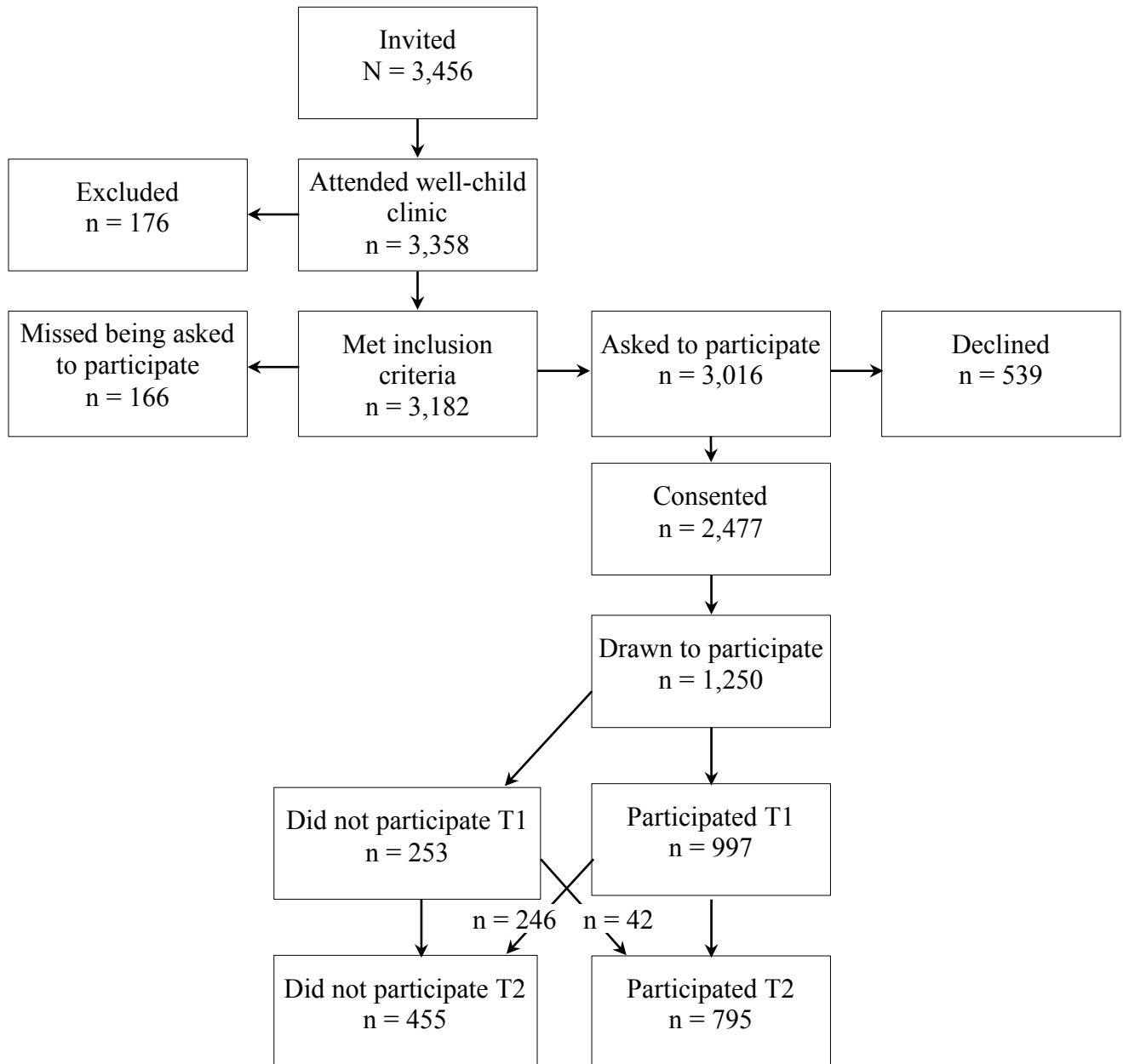


Figure 1. Recruitment procedure and participation rates.

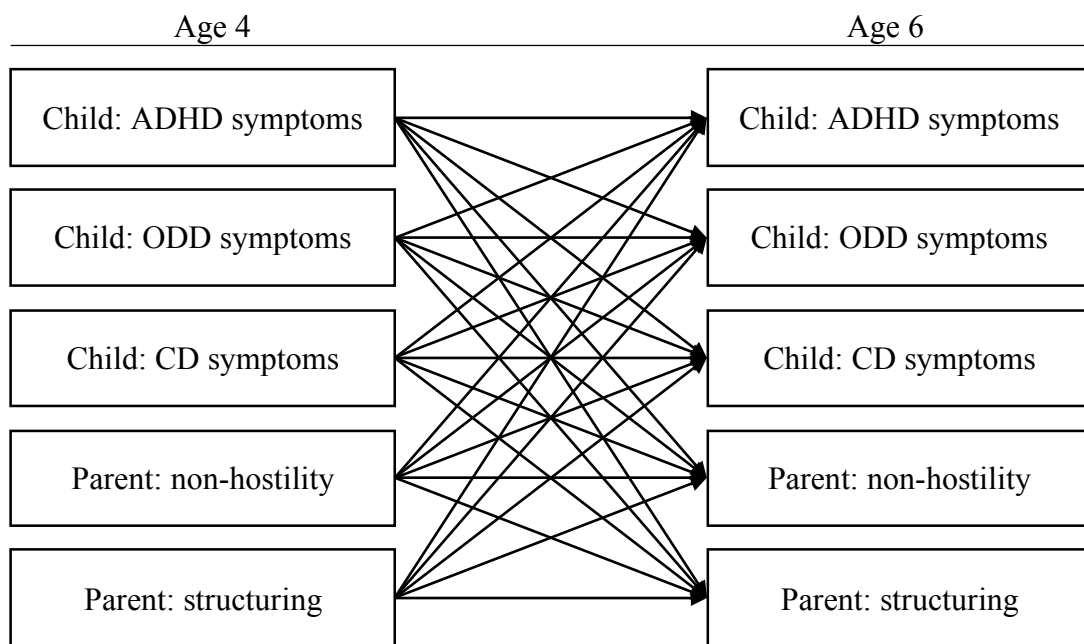


Figure 2. Prospective paths of the multivariate model – A graphical presentation.