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Lie-telling as a mode of antisocial action: Children's lies and behavior problems

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ABSTRACT

Despite the fact that lie-telling is a common concern among parents, clinicians, and professionals, there has been little systematic investigation of the lies that children tell in relation to their problematic behaviors, nor of other social factors that may influence this relation. This study explored the relation between children's problem behaviors and their lie-telling in two studies. The first examined whether children would tell an antisocial lie to an unfamiliar adult to conceal cheating behavior. The second analyzed the relation between children's problem behaviors, parenting styles, and the frequency of lies reported by parents over two weeks at home. Results suggest that children with higher levels of behavior problems are more likely to tell an antisocial lie to an unfamiliar adult and have a higher frequency of parent-reported lies. Results also indicate that parenting approaches moderate the relation between behavior problems and the frequency of lies that parents report.

For many people, telling lies is a common social behavior (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996; Serota, Levine, & Boster, 2010) that has few to no repercussions, and that may in fact serve a purpose through facilitating effective communication with others (Buller & Burgoon, 1996). However, for others, lie-telling can be a problematic behavior that interferes with their relationships and quality of life (Ford, King, & Hollender, 1988). Lie-telling, which many consider problematic, is a behavior that involves the deliberate attempt to mislead another individual (Bok, 1978; Coleman & Kay, 1981). Overall, there is a general social expectation that individuals will be truthful (Levine, Park, & McCornack, 1999) and because of this, lies can undermine trust and strain relationships.

Perhaps for the above reasons, deceitfulness is considered to be a symptom of disruptive behavior problems in children ([DSM-V]; American Psychiatric Association, 2013). Moreover, frequent lie-telling has been associated with overt and covert antisocial behaviors (Loeber & Schmaling, 1985; Ostrov, Ries, Stauffacher, Godleski, & Mullins, 2008). In fact, children who engage in antisocial behaviors, such as cheating and stealing, may actively use lies to conceal their misdeeds and avoid punishment (Gervais, Tremblay, & Desmarais-Gervais, 2000; Stouthamer-Loeber, 1986). Thus, parent, teacher, and clinician ratings of

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behavior problems often correlate with a perceived higher frequency of lie-telling. However, this association between problematic behaviors and children's actual lying behavior has not been measured experimentally in controlled settings, nor observationally in daily settings, both of which are needed to establish whether a true association exists, and whether it is specific to particular types of problem behaviors (i.e., externalizing behaviors). Both experimental and observational analyses provide rich information on children's lie-telling that cannot be captured through questionnaires alone, and together they contribute to a better understanding of the situations in which children may be more prone to tell lies.

Motivations for lie-telling

Children can, and do, tell lies for many reasons. As early as two-years-old, children begin telling lies for their own self-benefit, for example to avoid getting in trouble for a misdeed or to obtain a material reward (Evans & Lee, 2013; Williams, Leduc, Crossman, & Talwar, 2016). These lies told for self-interested purposes (antisocial lies; Talwar & Crossman, 2011) continue through early and middle childhood, but may decrease into early adolescence (e.g., Evans & Lee, 2011; Lavoie, Leduc, Arruda, Crossman, & Talwar, 2017) as children mature and learn other interpersonal and communication strategies. Conversely, lies told for other-oriented purposes, such as to be polite or to spare a person's feelings, may emerge later in childhood (Popliger, Talwar, & Crossman, 2011) and continue to be socially accepted through adulthood (Backbier, Hoogstraten, & Terwogt-Kouwenhoven, 1997).

This pattern of lie-telling behavior may resemble more broadly a pattern of moral development from frequent misbehaviors to behavior that is more socially accepted (Lavoie, Yachison, Crossman, & Talwar, 2017). For example, breaking rules or laws, cheating, stealing, causing harm to property or people, being argumentative, defiant, or hostile, may all be considered misbehaviors (American Psychiatric Association, 2013; Keenan & Wakschlag, 2004). However, as children age, they are expected to have more socially-conforming behavior and less deviant behavior as they acquire developmental skills such as self-regulation (Hill-Soderlund & Braungart-Reiker, 2008). At the same time, children who continue to rely on antisocial behavior to achieve their personal and interpersonal goals are more likely to stand out among their peers as having problematic behavior.

The same may be true of lie-telling. Specifically, it is possible that lie-telling early in childhood to conceal misdeeds or avoid punishment may be a normative and commonplace behavior (e.g., Talwar & Crossman, 2011), but that as children move into middle childhood, their self-regulation and communication strategies may instead support more socially-appropriate behaviors (Lavoie et al. 2017). Children who continue to commonly tell lies may not have developed such adaptive skills and their lie-telling may become problematic or antisocial (Talwar & Crossman, 2011). Indeed, research suggests that the association between lying and antisocial behaviors may increase with age (Stouthamer-Loeber & Loeber, 1986). Further, there is evidence to suggest that lying may be associated with externalizing behaviors such as disruptive behavior and fighting (e.g., Gervais et al., 2000; Loeber & Schmaling, 1985). Yet, there is also evidence that lying may be associated with covert behaviors, similar to internalizing behaviors, such as withdrawal behaviors (Loeber & Schmaling, 1985) and emotional problems (Engels, Finkenauer, & van Kooten, 2006). However, the concurrent relation between lying and problematic behaviors, both externalizing and internalizing and across a wide developmental age span, is not yet known.

Lies as a type of action

In addition to providing a means of communication, lies can also be thought of as a mode of action. This is the basic premise of Speech Act Theory (Austin, Urmson, & Sbisa, 1975), which asserts that speech is simultaneously a means of communication and of action. In terms of lies, children's speech can become a mode of antisocial action; thus, their lie-telling may be considered as a behavior problem in and of itself. Despite the fact that clinically, lying is considered to be a correlate of other deviant behaviors (Achenbach & Edelbrock, 1981; Stouthamer-Loeber & Loeber, 1986), children's actual lie-telling behavior has not been examined in relation to other problematic behaviors. Only a handful of studies have investigated children's perceived lie-telling in relation to other types of antisocial behavior, and these have each used a questionnaire in which parents or teachers were asked to rate child participants' frequency of lie-telling on a Likert-style scale (Gervais, Tremblay, & Desmarais-Gervais, 2000; Ostrov et al., 2008; Stouthamer-Loeber & Loeber, 1986). However, there has not yet been any systematic investigation of the lies that children tell in their daily environments in relation to other problematic behaviors. This systematic investigation can thus provide key information about the types of lies that children tell, the settings in which they are told, and even point to possible reasons for lying behavior. To do so, the current study explored children's lie-telling as an antisocial behavior through two studies.

Current study

The purpose of this multi-method, multi-informant study was to: (1) examine the relation between children's problematic behaviors and lie-telling both in an experimental setting and at home across a wide developmental age range; and (2) explore the associations among parenting, children's behavior problems and lie-telling. Study 1 examined children's lie-telling about a misdeed to obtain a prize in an experimental paradigm. We expected that children with higher levels of behavior problems would be more likely to tell an antisocial lie to the researcher, based on findings that suggest that children with behavior problems may rely on lie-telling to conceal their transgressions (i.e., Gervais et al., 2000; Stouthamer-Loeber, 1986). In addition, based on previous research (e.g., Ostrov, 2006; Stouthamer-Loeber, 1986), it was expected that children's lie-telling behavior would be associated with their externalizing problem behaviors, but previous findings were not sufficiently clear to hypothesize a relation with internalizing behaviors.

STUDY 1

Method

Participants

Participants were 63 children, five- to 14-years-old (M = 8.73 years, SD = 2.54 years), 53% male and 47% female. Specifically, 34% of the sample was aged five to seven years, 45% of the sample was eight- to 10-years-old, and 22% of the sample was 11- to 14-years-old. Families were recruited from a large metropolitan area (population greater than 4,000,000) in North America. The majority of participants were Caucasian, and parents reported their own level of education: the three most common were Bachelor's Degree (22%), College Certificate

or Diploma (19%), and Master's Degree (16%); and household income: the three most common were $60,000–70,000 (25%), $40,000–50,000 (17%), and $20,000–30,000 (15%).

Measures

Children's behavior problems.   Parents completed the Social Skills Rating System ([SSRS]; Gresham & Elliott, 1990), which measures children's prosocial and antisocial behaviors. The questionnaire has 55-items for elementary school-aged children and 52-items for secondary school-aged adolescents. Items on the questionnaire fall under two domains: children's social skills, which is a composite of prosocial behaviors (38 items; internal reliability α = .90), and children's problem behaviors, which was the focus of this study (14–17 items; six internalizing, six externalizing, two to five hyperactivity depending on the age group; subscale internal reliability α = .84). For example, some of the problem behavior items were 'Gets angry easily' and 'Fights with others.'

Procedure

After completing informed consent, parents completed the SSRS questionnaire and a demographic survey, while children completed the lie-telling paradigm, as described below.

Lie-telling paradigm.   Children engaged in a trivia game lie-telling paradigm that evaluated their propensity to tell a lie to cover for cheating behavior and obtain a prize, adapted from Talwar, Gordon, and Lee (2007). In this paradigm, children answered a series of developmentally-appropriate trivia questions on the computer. Prior to starting, children were told if they answered all eight of the questions correctly within the time limit (1 minute per question), they would win a prize (a toy and five dollars). The researcher remained with the child for the first seven questions and gave minor scaffolding when needed. For the first question, the researcher demonstrated the game for the child. The researcher indicated that there was a hint button on the computer that could help give the correct answer but that it could sometimes cause the game to shut down. While the researcher was present, each child pressed the hint button at least once during the game. For the first seven questions, the researcher also gave subtle hints when needed to ensure that participants answered every question correctly and ensured children were advancing and gaining points. On the eighth question, the researcher made an excuse to leave the room, but children were told to continue playing the game. The researcher also clearly told children that they were not allowed to use the hint button in her absence, and they were reminded that they would receive a prize if they answered all questions correctly. The eighth question was a fictitious question, and as a result, children could not know the answer from previous knowledge. Video cameras captured if the child used the hint button to guess the answer in the researcher's absence. After the child had responded, an error message appeared on the computer indicating that the game was broken. After the error message had been present for one minute, the researcher returned, and first asked what had happened, then asked if the participant had pressed the hint button in her absence (question order based on Talwar, Lee, Bala, & Lindsay, 2004). This protocol was similar to Evans, Xu, and Lee (2011) in which evidence of a transgression was present during questioning. Few children gave verbal answers to the first question. Children usually responded non-verbally either by showing surprise or indicating that they did not know what happened with a shrug of the shoulders. Some children did not respond at all to the question. As a result, children's verbal responses to the specific question ('did you press the

hint button while I was gone?') were used in conjunction with a video of whether they had pressed the hint button to determine whether they lied or told the truth. Then the researcher fixed the computer game, and all children were debriefed and given a prize.

Results

During the computer game paradigm, 22 participants cheated and used the hint button, and 41 did not use the hint button. Preliminary logistic regression analyses indicated that age and gender did not predict which children cheated and used the hint button, as such age and gender were not considered further in the analyses. A logistic regression was conducted with children's levels of problem behaviors on the SSRS ($M = 10.60$, $SD = 6.52$) as the predictor and their cheating behavior (cheat or not cheat) as the outcome. The model was significant, $\chi^2(1, N = 60) = 16.27$, $p < .001$, Nagelkerke's $R^2 = .32$, and correctly classified 73% of participants. For every one-unit increase in problem behaviors ($b = 0.19$, $SE = 0.06$), participants were 21% more likely to cheat, $p = .001$.

Of those who did use the hint button, 13 (20% of total; 52% of cheaters) lied and said that they had not used the hint button when the researcher asked. Neither age nor gender predicted lying behavior and were not included in further analyses. Logistic regression was used to determine whether behavior problems on the SSRS predicted whether children would lie to the researcher (all children were included in the model). The model was significant, $\chi^2(1, N = 58) = 5.27$, $p = .022$, Nagelkerke's $R^2 = .14$, with approximately 79% of participants correctly classified by the model. For every one-unit increase in behavior problems, children were 12% more likely to tell a lie ($M = 14.25$, $SD = 6.12$) rather than the truth ($M = 9.43$, $SD = 6.21$) about whether they had cheated during the computer game paradigm, $p = .028$. There were no significant differences in the mean problem behavior scores of children who used the hint button and lied and those who used the hint button and told the truth, $p = .541$.

A subsequent, exploratory logistic regression was conducted to probe whether children's internalizing items (sum of six items from the problematic behavior subscale, for example 'appears lonely') or externalizing items (sum of six items, for example, 'threatens or bullies others' within the problem behavior subscale) uniquely influenced their lie-telling during the computer game paradigm. Children's internalizing behavior scores did not contribute to the model, and were consequently removed to report the simplified model of predictors and increase power. Externalizing behavior problems ($M = 3.53$, $SD = 2.34$) did predict children's lie-telling, $\chi^2(1, N = 58) = 4.74$, $p = .030$, Nagelkerke's $R^2 = .12$, with approximately 81% of participants correctly classified. For every one-unit increase in externalizing behavior, children were 36% more likely to tell a lie ($M = 4.75$, $SD = 2.42$) than the truth ($M = 3.11$, $SD = 2.20$), $p = .037$. Mean externalizing behavior scores of children who used the hint button and lied did not differ from those who used the hint button and told the truth, $p = .753$.

Discussion

The findings of Study 1 suggest that children with more behavior problems are more likely to engage in lie-telling to cover cheating behavior of using the hint button. Thus, in this study, children who had higher levels of behavior problems used their speech (lies) as a mode of antisocial action to conceal misbehavior. Specifically, their antisocial action was

the attempt to deceive the researcher to deflect any responsibility that might have been their own for 'breaking' the computer after they had committed a misdeed and used a hint button to help them succeed in the computer game.

One possible explanation for this finding is that children with more behavior problems who lied to cover their transgressions did so out of fear of punishment, which previous findings have suggested may influence lie-telling behavior (Talwar, Arruda, & Yachison, 2015; Talwar & Lee, 2011). Yet, children with antisocial behavior problems tend to have decreased physiological responses to impending punishment (e.g., Raine & Venables, 1981). It is also possible that the lies reflected children's impulsivity, as children with higher levels of behavior problems also tend to have higher levels of impulsivity (Chen & Vazsonyi, 2011; Romer et al., 2009). Perhaps they spoke impulsively to deflect responsibility (i.e., they did not think through the long-term consequences of their lie before speaking), or perhaps lie-telling was the chosen strategy to cover their impulsive transgressive behavior. Previous research suggests that for some children, lie-telling is associated with low inhibitory control (Rasmussen, Talwar, Loomes, & Andrew, 2007; Talwar, Lavoie, Gomez Garibello, & Crossman, 2017; Talwar & Crossman, 2011). This hypothesis is further supported by the fact that externalizing behavior was a significant predictor of children's cheating behavior and of their lies to cover their transgressions, because impulsivity is highly correlated with externalizing behavior (Eisenberg et al., 2009). To some extent, if lying avoids consequences for the initial, impulsive misdeed, it can seem to be an effective strategy. Unfortunately, while lie-telling can serve the immediate, short-term goal of self-preservation, if detected, it can jeopardize a child's credibility, hurting them in the long run.

At the same time, previous studies have found that lying behavior (Talwar & Lee, 2008), and the sophistication of lying behavior (Evans & Lee, 2011), is associated with higher inhibitory control, which allows children to inhibit truthful responses. It is likely that the context for the lie and the age of the child may influence this relation. That is, for a relatively normative type of lie, lying may be associated with higher inhibitory control, as a typical developmental milestone, but for more deliberate or deviant misdeeds, there may be an association with low inhibitory control. Recent work by Lavoie et al. (2017) found that theory-of-mind (ToM) skills may be differentially associated with different developmental profiles of lie-telling behavior. Namely, they found that while those with higher ToM scores were more likely to lie for prosocial reasons, children who engage in antisocial lying had lower ToM scores. Taken with the current findings, future research is needed to clarify how inhibitory control is associated with different developmental profiles of lying.

One further possibility is that children with more problem behaviors may have lied to further their own self-interests without regard to the rules that the authority had set in place (e.g., American Psychiatric Association, 2013). Lying may be a crucial strategy used by children with externalizing problem behaviors (i.e., aggression) to maintain their antisocial behaviors (Ostrov, 2006), in particular, cheating. In fact, previous studies have found that externalizing behavior problems in particular are associated with the tendency to discount others, especially those with whom children are not relationally close (Sharp et al., 2012). Thus, children's behavior problems, specifically externalizing behavior problems, were highly associated with their propensity to tell an antisocial lie to cover their transgression, which supports our initial hypothesis that children with behavior problems would be more likely to tell a lie in an experimental situation.

However, children's propensity to tell a lie in one experimental setting is a snap shot of their behavior and may not be predictive of their use of lying as a means of social action in their daily lives. That is, children's lie-telling over an extended period of time and outside of a laboratory setting gives a sense of the frequency with which children use this strategy and can provide further information about patterns of lie-telling in relation to behavior problems. Further, given that the cheating and lying rate was low in this sample, perhaps due to the wide age range and the fact that the evidence of a transgression was present (the broken computer), it is necessary to test the relation between children's behavior problems and lie-telling in a broader context of social interactions. As such, the purpose of Study 2 was to measure the frequency of children's lies observationally to determine whether higher levels of behavior problems would also predict frequent lie-telling in the naturalistic setting of their daily home environments. In addition, given the role of parents in children's home environments and as lie reporters, the study also measures whether home influences, specifically parenting approaches, moderate a possible relation between children's lie-telling and their behavior problems.

STUDY 2

Researchers have asserted that a perceived higher frequency of lying is associated with other problem behaviors, such as aggression (Ostrov et al., 2008) and delinquency (Warr, 2007). For example, Ostrov et al. (2008) assessed young children's aggressive behavior in relation to teacher perceptions of children's lying and found a positive association, which highlights the need to explore children's actual lying behavior in relation to other problem actions. Similarly, Warr (2007) asked youth how often they lie about the specifics of their daily activities (e.g., where they were at a certain time) in relation to delinquent behaviors, such as damaging property, and found a positive association. These studies highlight the need to examine lying behavior systematically to establish whether, and how, children's lying behavior is associated with other problem behaviors.

Further, the relation between children's problem behaviors and lying may be influenced by additional factors, for example the home environment. In the home environment, parenting approaches have a substantial influence on children's behavior (Romano, Tremblay, Boulerice, & Swisher, 2005) and may directly or indirectly affect children's lie-telling behavior (e.g., Popliger et al., 2011; Talwar et al., 2017). Specifically, parenting that is characterized as rejecting or withdrawn has been associated with children's perceived frequent lying behavior, measured on a Likert-type scale (Stouthamer-Loeber & Loeber, 1986). Parenting approaches that are punitive have also been hypothesized to be associated with children's lying behavior, as children who are punished severely or rejected may seek to protect themselves from such consequences by lying about their actions (Stouthamer-Loeber, 1986; Talwar & Lee, 2011).

The likely impact of parenting is also supported by experimental findings. In one study, three-year-old children whose parents used more controlling parenting approaches were less likely to tell a lie about having peeked at a toy during a researcher's absence (Ma, Xu, Evans, Liu, & Luo, 2015). Another study found that children with high cognitive ability and whose parents tended to rely on authoritative parenting (i.e., high expectations and high support) were more likely to tell the truth about a misdeed (Talwar et al., 2017). Thus, parenting approaches are likely associated with children's lie-telling behavior, and may influence

whether their children's lie-telling suggests larger behavioral concerns. Specifically, parenting styles that are warm and responsive may be associated with children's tendency to tell the truth (e.g., Talwar et al., 2017). In contrast, parenting styles of high expectations, even with high warmth, could be associated with a higher tendency to lie because children may lie to avoid the consequences that they anticipate for their transgressions (Talwar et al., 2015).

Study 2 further explores the relation between children's behavior problems and their lie-telling using observational measures of children's lies told at home over two weeks to: (1) assess the relation between observations of daily lie-telling and problem behaviors; (2) analyze the direct relation between parenting approaches and daily lie-telling; and (3) explore whether parenting approaches moderate the possible relation between behavior problems and lie-telling in children's daily lives. Parents were asked to record each of the lies that their children told at home. The total number of lies, excluding prosocial lies, was analyzed in relation to children's levels of behavior problems. Parenting styles were also analyzed to explore their association with children's lie-telling. We expected that children with higher levels of behavior problems would have a higher frequency of lies reported, based on Gervais et al. (2000) and Ostrov et al. (2008). Finally, we expected that parenting would be directly associated with the relation between children's behavior problems and the frequency of lies reported. We anticipated that, in contexts of strict and harsh parenting approaches, there would be a positive association between lie-telling and behavior problems (based on Stouthamer-Loeber & Loeber, 1986).

Method

Participants
Eighty children, aged four to 14 years ($M = 8.44$ years, $SD = 3.05$ years), 43% male and 52% female, and their parents participated in Study 2 (an additional 60 parents did not complete the study). Specifically, 33% of the sample was aged four to six years, 39% of the sample was seven to 10 years, and 28% of the sample was 11- to 14-years-old. Families were recruited from a large metropolitan area (population greater than 4,000,000) in North America. The majority of participants were Caucasian, and parents also reported their own educational background: the three most common were Bachelor's Degree (34%), College or Certificate (14%), and Master's Degree (14%); and household income: the three most common were greater than $80,000 (21%), $60,000–70,000 (18%), and $50,000–60,000 (17%).

Measures
SSRS.   The same questionnaire from Study 1 was used in Study 2. Again for Study 2, only the problem behaviors domain was used in the analyses, as well as the internalizing and externalizing subscales for exploratory analyses.

Parenting Styles and Dimensions Questionnaire.   Parents completed a shortened version of the Parenting Styles Dimensions Questionnaire ([PSDQ] Robinson, Mandleco, Olsen, & Hart, 1995), which measures three main parenting styles: authoritative, authoritarian, and permissive (discussed in Baumrind, 1967, 1971). The questionnaire contains 32 items about parenting, discipline practices, and methods of interaction at home. Responses are on a 5-point, Likert-type scale to indicate the frequency with which a specific parenting approach is typically used (1 = Never; 5 = Always). The responses for each domain of authoritative,

authoritarian, and permissive are averaged to generate a mean score for each domain. Higher scores indicated a higher use of that parenting approach. The internal consistencies for the three domains range from good to excellent (Robinson et al., 1995), and were good in this sample: authoritative α = 0.84, authoritarian α = 0.73, and permissive α = 0.70.

Conflict Tactics Scale Parent–Child. The Conflict Tactics Scale Parent–Child ([CTSPC] Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) was used to evaluate how parents typically respond when engaged in a conflict with their child. The questionnaire consists of 27 items that describe conflict resolution strategies that parents may use when their child has done something wrong, or when parents are upset with their child. The questionnaire evaluates four domains of conflict resolution: non-violent discipline, which is the tendency to explain and discuss with the child; physical assault, which is the reliance on physical methods of discipline, such as spanking or hitting; psychological aggression, which is the use of speech to control, belittle, or punish the child, such as yelling; and neglect, which represents the tendency to ignore or be passively aggressive in situations of conflict. Parents are asked to rate the frequency with which they have used these conflict resolution strategies in the past year on an 8-point Likert scale, and options range from not at all to more than 20 times in the past year. Parent responses to each of the four domains were averaged to generate a score for each domain. Higher scores indicated a higher reliance on that method of conflict resolution. Overall, the internal reliability of each domain is low, which reflects the fact that items within each domain measure different behavioral approaches that vary in severity, for example yelling at the child compared to threatening to physically hurt the child, even while they measure the same construct of conflict resolution strategies (Straus et al., 1998). The internal consistency in our sample was fair in some domains, and low in others: non-violent discipline α = 0.22, physical assault α = 0.85, psychological aggression α = 0.54, and neglect α = 0.71. We include all of the results using this scale because other researchers have also documented that certain domains tend to have low internal consistency (Lorber & Slep, 2017), but we also add that the results of the non-violent discipline domain in particular should be considered in the context of the body of research given the low internal consistency. We also add that future research is needed with additional conflict resolution scales to further test these results.

Procedure

After completing informed consent, parents completed the SSRS and CTSPC questionnaires, and a demographic survey in the lab, while children completed tasks for a separate study. Parents subsequently completed the lie diaries, as described below.

Diary of children's lie-telling behavior. Parents completed a structured diary package in which they were asked to record each time that their child told a lie over two weeks. Parents described the scenario, as well as the people involved, the location in which the event took place, and the mood of the interaction. After two weeks, parents mailed back the completed diaries. Each lie instance was coded as an antisocial (self-oriented) or prosocial (other-oriented) lie according to the descriptions by Bussey (1999), Lee (2013), and Talwar and Crossman (2011). For example, antisocial lies included false accusations ('my sister colored on the wall'), false assertions of completion ('I ate my broccoli'), false assertions of permission ('Dad said I could have more computer time'), and false stories (child telling siblings who had slept at a grandparent's house, 'I got to go out for lunch and play games

while you were gone'). Prosocial lies included lies that were told to benefit another person, such as lies told to be polite ('I like the soup, Grandma'). The first 20% was coded by two raters (inter-rater reliability = 100% agreement), and the remainder were coded by the first rater. Afterwards, all codes were reviewed by the second rater, and any discrepancies were resolved by agreement. Prosocial lies (8% of total lies reported) were excluded from the analyses, which focus on antisocial lies.

Results

To analyze the relations among behavior problems, parenting approaches, and the frequency of children's parent-reported lies, we conducted several analyses. First, we examined simple correlations in the data (see Table 1). Next, we used negative binomial poisson regression to explore the relation between behavior problems and lie-telling frequency. We then used negative binomial poisson regression to determine whether parenting approaches predicted the frequency of lies that parents reported. Finally, we used moderation analyses to probe the relation between behavior problems and the total number of child lies reported, while also factoring in parenting approaches.

Behavior problems predict frequency of lies

A negative binomial poisson regression was used to analyze the relation between children's behavior problems and the frequency of lies that parents reported. Negative binomial poisson regression is a type of generalized linear model that is appropriate for count data, specifically for outcome variables that are overdispersed (i.e., the mean and variance are not equal; Cameron & Trivedi, 2013). Neither age nor gender contributed to the models and were excluded from further analyses. Children's SSRS behavior problems score ($M = 12.06$, $SD = 6.70$) was used as the predictor, and the total number of lies reported by parents was the outcome. The model was significant, $\chi^2(1, N = 78) = 4.71$, $p = .030$, and the test of model effects indicated that as children's problem behaviors increased, the total number of lies reported by their parents over two weeks increased as well ($b = 0.01$, OR $= 1.01$, $SE = 0.00$, $p = .034$).

Parenting predicts frequency of lies

Next, we examined the direct influence of parenting on the frequency of children's lies using a negative binomial poisson regression. Parents' scores on the authoritative, authoritarian, and permissive domains were entered as predictors of the total number of lies in the first

Table 1. Correlation of age, behavior problems, total lies, and parenting styles ($N = 76$–80).

	Age	1	2	3	4	5	6	7	8
1. Behavior problems	−.05	-							
2. Total lies	−.05	.24*	-						
3. Authoritative	−.08	−.18	.23*	-					
4. Authoritarian	−.04	.52**	.03	−.07	-				
5. Permissive	.17	.27*	.08	−.14	.40**	-			
6. Non-violent discipline	−.36**	.42**	.39**	.31**	.28*	−.01	-		
7. Physical assault	−.16	.42**	.12	−.15	.58**	.14	.34**	-	
8. Psychological aggression	−.02	.58**	−.07	−.23*	.64**	.14	.32**	.57**	-
9. Neglect	.28*	.02	−.16	−.17	.19	.35**	−.02	−.05	.20

*$p < .05$; **$p < .01$.

regression. Authoritarian and permissive parenting did not contribute to the model. Thus, the simplified first regression model is reported. The model of authoritative parenting did predict the frequency of children's lies, $\chi^2(1, N = 79) = 4.56$, $p = .033$, and the test of model effects indicated that as authoritative parenting scores increased, children's total lies reported over two weeks increased as well ($b = 0.14$, OR $= 1.15$, $SE = 0.07$, $p = .041$).

In the second regression model, parents' scores on the non-violent discipline ($M = 15.53$, $SD = 5.35$), physical assault ($M = 3.53$, $SD = 4.56$), psychological aggression ($M = 8.20$, $SD = 4.75$), and neglect domains ($M = 1.26$, $SD = 1.99$) were entered as predictors of the total number of parent-reported lies. Only non-violent discipline contributed to the model, and the simplified regression model is reported. Parents' use of non-violent discipline as a conflict strategy did predict the total number of lies told, $\chi^2(1, N = 76) = 16.79$, $p < .001$, and the test of model effects indicated that as non-violent discipline scores increased, the total number of reported lies increased as well ($b = 0.11$, OR $= 1.12$, $SE = 0.03$, $p = .001$).

Parenting as a moderator

We examined parenting approaches as a moderator of the relation between behavior problems on the SSRS and the frequency of lies that parents reported for their child. To this end, we conducted seven separate moderator analyses with each domain of parenting (authoritative, authoritarian, permissive from the PSDQ; non-violent discipline, physical assault, psychological aggression, and neglect from CTSPC) to probe the interaction of the moderator, and used a Bonferonni adjustment to correct for possible inflation of Type I errors. The adjusted significance cut-off value for each overall model was $p = .007$. Of the moderator analyses, two were significant and are reported here.

Psychological aggression

Parents' psychological aggression scores were entered as a moderator between behavior problems and frequency of lie-telling. The model was significant, $F(3, 72) = 5.45$, $p = .002$, $R^2 = .19$, and explained approximately 19% of the variance in the frequency of lies that parents reported (see Table 2). The interaction between children's behavior problems and psychological aggression conflict scores significantly added to the model, $\Delta R^2 = .06$, $F(1, 72) = 4.95$, $p = .029$, suggesting that the use of psychological aggression as a method of conflict resolution did moderate the relation between behavior problems and the frequency of parent-reported lies. The Johnson-Neyman region of significance of psychological aggression was 1.60, which was slightly above the mean of 1.29. Thus, at average and low (but

Table 2. Parenting moderates relation between problematic behaviors and total lies.

| Variable	b	SE	t	p
Psychological Aggression Model ($N = 76$)				
Intercept	−12.77	5.26	−2.43	.018
Psychological Aggression	7.21	3.97	1.82	.073
Problem Behaviors	0.20	0.05	3.83	.000
Physical Aggression*Problem Behaviors	−0.08	0.03	−2.22	.029
Neglect Model ($N = 76$)				
Intercept	−5.05	3.56	−1.42	.161
Neglect	22.98	11.09	2.07	.042
Problem Behaviors	0.11	0.04	3.28	.002
Neglect*Problem Behaviors	−0.25	0.11	−2.27	.026

*signifies interaction term.
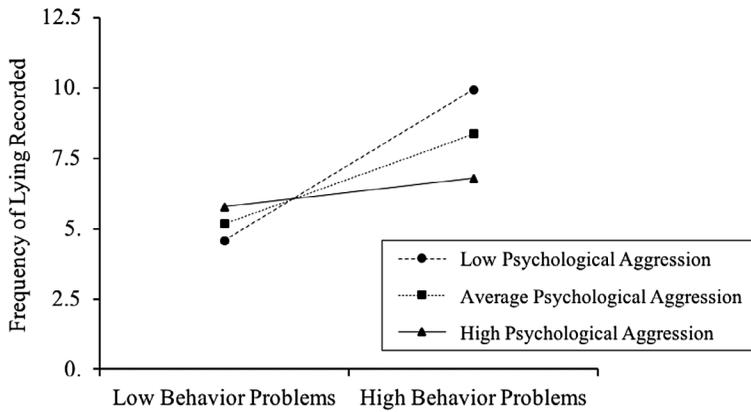
Figure 1. Psychologically aggressive conflict resolution styles moderate the relation between behavior problems and the frequency of lies reported over two weeks.

not high) levels of psychological aggression, behavior problems were positively associated with the frequency of lies that parents reported for their children (interaction depicted in Figure 1).

Neglect

Parents' neglect scores were entered as a moderator between behavior problems and frequency of lie-telling. The model was significant, $F(3, 72) = 4.33$, $p = .007$, $R^2 = .15$, and explained approximately 15% of the variance in the frequency of lies that parents reported (see Table 2). The interaction between children's behavior problems and parents' neglect scores significantly added to the model, $\Delta R^2 = .06$, $F(1, 72) = 5.16$, $p = .026$, which indicates that neglect as a method of conflict resolution moderated the relation between behavior problems and the frequency of parent-reported lies. The Johnson-Neyman region of significance was 0.24, which was slightly higher than the mean of 0.21 (see Figure 2). The moderation model suggests that for low (but not high) values of neglect, behavior problems were positively associated with the frequency of lies that parents reported for their children.
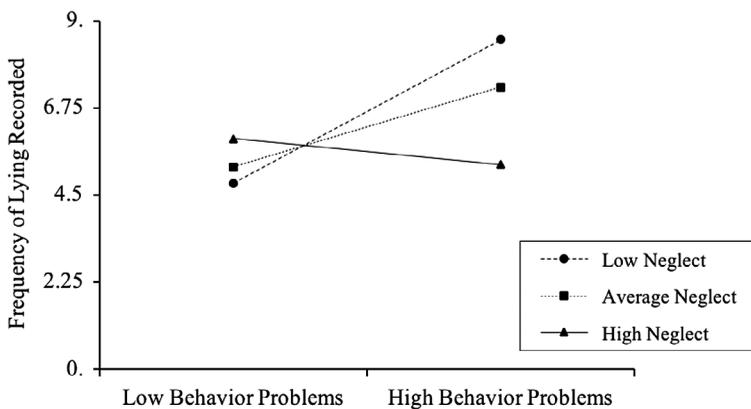

Figure 2. Neglectful conflict resolution styles moderate the relation between behavior problems and the frequency of lies reported over two weeks.

Discussion

The results of this study suggest that children's behavior problems are associated with the frequency of parent-reported lies over two weeks at home, and that parenting approaches may moderate this effect. Parenting approaches also predicted children's frequency of parent-reported lies, such that parents who used more authoritative styles and non-violent discipline in conflict situations reported more frequent lie-telling at home. Based on Stouthamer-Loeber and Loeber's (1986) findings that parents with low involvement and poor disciplinary approaches perceived that their children told lies more frequently (measured using two Likert-scale questions with options 'never,' 'sometimes,' and 'often'), we would have expected that low-nurturing parenting styles would have been associated with more frequent lie-telling. We also would have expected the reverse to be true; that consistent and involved parenting approaches would have been associated with a lower frequency of reported lie-telling because previous findings indicate a positive relation between authoritative parenting and prosocial behavior (Pettit, Bates, & Dodge, 1997). However, at the same time, Popliger et al. (2011) found that authoritative parenting styles were associated with a higher likelihood that children would tell a prosocial lie in an experimental setting. Although this study measured children's antisocial lie-telling, it is still possible that consistent and involved parenting approaches may be associated with more frequent lies, perhaps while children are learning to rely on more socially-accepted methods of communication. Future research is needed to examine the relation between parenting styles and children's lie-telling behavior, to understand how this relation may evolve and change as children develop.

We also found that there was a stronger association between child behavior problems and frequency of lying reported at low and average levels of psychological aggression and neglect, counter to our expectations. However, it is possible that parents who use authoritative parenting and non-violent discipline in conflict resolution may be more likely to address lying as a misbehavior. For example, these parents may be more likely to address their child's lying behavior through consistent consequences and discussions of lying as an unacceptable behavior. In this case, children may be using lies to avoid the consequences of their actions because they do expect negative repercussions for their actions due to their parents' consistency, as previous findings suggest that children's perceptions of anticipated punishment influence the likelihood that they will lie (Talwar et al., 2015; Talwar & Lee, 2011). Thus, children who expect to experience negative consequences for being truthful about a misdeed may be more willing to lie as a self-preservation strategy.

A further explanation is young children who have parents who employ a high level of control over their children's behavior are less likely to tell a self-serving lie in experimental settings (Ma et al., 2015). It is also possible that young children may be less likely to tell antisocial lies when parented using low-nurturing approaches, although authoritarian parenting was not a significant predictor of children's lying in the current study. However, Ma et al. found that young children who were parented using a high controlling approach had lower theory of mind (Ma et al., 2015), which suggests that cognitive ability may also be one of the factors that interacts with parenting approaches to influence lie-telling behavior. Related to our findings, children's cognitive ability, such as their perspective-taking ability or theory of mind, may influence the relation between children's behavior problems and their use of frequent lie-telling as a maladaptive social strategy in their everyday lives, especially when low-nurturing parenting styles are prevalent. Thus, cognitive ability may

be a factor that further explains the relation between behavior problems and lie-telling frequency when parenting approaches are overly controlling or neglectful, and should be tested in future studies.

Finally, it is also possible that these findings suggest a larger social phenomenon. Specifically, that higher levels of problem behaviors may indeed be associated with a high frequency of lie-telling in childhood, but that parents who are high in authoritative parenting and low in psychological aggression or neglect are more likely to capture this relation in their interaction logs. These parents may have been more in-tune and aware of their child's lying behavior, and as such these parents may have captured this relation more strongly than parents who were less aware of their child's lying behavior. In fact, although there was a relation between problem behaviors and the frequency of the child's lies (as reported) in the overall sample, this relation was strongest in children whose parents ascribed to more authoritative styles. Thus, future studies should examine the relation between problem behaviors and lying behavior further, and they also suggest that additional measures may be beneficial to our understanding of what factors drive the frequency of children's lying behavior.

Conclusion

Together, the results of Studies 1 and 2 suggest that children with higher levels of behavior problems may use lie-telling more frequently, with both unfamiliar (researchers) and familiar (parents) individuals. Overall, children's lies were crafted to achieve a specific aim that was self-motivated, such as to obtain a material benefit or to avoid a task. Findings from the current behavior-based and parent-observational studies comport with those of previous studies, finding a relation between teacher and parent Likert-scale ratings of children's lying and problem behavior, such as aggression (Gervais et al., 2000; Ostrov et al., 2008; Stouthamer-Loeber, 1986). Together these findings suggest that children's frequent lie-telling in their natural environments is likely associated with higher levels of behavior problems. These findings also suggest that children with higher levels of behavior problems may over-rely on lie-telling as a social strategy to further their own interests. In this way, frequent lie-telling that is self-motivated may serve as an immature social strategy used with the intention of preserving children's own interests. For example, instead of confessing a transgression or expressing a desire through discussion with a parent, children with higher levels of behavior problems may resort to using lies as a means of achieving their objectives. As such, it is possible that children's frequent self-motivated lies become part of their behavior problems as a type of antisocial action or behavior.

These results further imply that the frequency of self-oriented lies that children tell may be a distinguishing factor between typical trajectories of lie-telling, and atypical trajectories of lie-telling that suggest a larger behavioral concern. For instance, previous experimental research findings suggest that children's self-serving lie-telling is a typical part of development that begins in early childhood with a higher propensity to tell instrumental lies (Evans & Lee, 2013; Talwar & Lee, 2002), but that decreases into early adolescence. Children's lie-telling is also likely a typical part of development because it reflects their growing understanding that their own thoughts do not always mirror the thoughts of others, or their theory of mind, which is needed to tell a convincing lie (Polak & Harris, 1999; Talwar & Lee, 2008). Consequently, some lying is likely to be expected as children mature,

as it reflects the development of their social and cognitive abilities. However, over-reliance on lie-telling as an antisocial act, as children age, may reflect manifestation of broader behavioral dysfunction.

There are several factors that may affect the interpretation and generalizability of this research. The first is that parents may not detect all of their children's lies, in which case the frequency of children's lie-telling behavior may be underreported, which may have been more common for some parents or for some children as a function of their rates of lying. Indeed, this is one of the inherent challenges of deception research. However, previous studies have found that parents are more consistent reporters of their children's deception (i.e., Gervais et al., 2000; Stouthamer-Loeber, 1986) than other informants (e.g., teachers), and they are also the least disruptive to children's normal patterns of behavior. Yet, it is also possible that parents tended to report socially-desirable responses in the questionnaires or lie reporting activity, but this is tempered by the fact that parents completed both prosocial and antisocial questionnaire subscales, as well as reporting prosocial and antisocial lies.

Another limitation of this study is that no directionality can be inferred from the measures or analysis. That is, we did find that more problem behaviors were associated with more frequently reported lies, but this does not provide information about whether frequent lie-telling is a precursor to behavior problems, or whether frequent lie-telling is a behavior problem in and of itself. Thus, one important area for future research is to examine the possible bidirectional relation between frequent lying and children's behavior problems to determine if one precedes the other. This requires a large, longitudinal sample of children across a broader range of ages to explore variability of parenting approaches as well as complete more complex analyses of the environmental influences surrounding children's lie-telling and other problem behaviors. Similarly, future research can also consider the possible bidirectional relation between parenting approaches and children's behavior problems when analyzing children's lying behavior.

With regard to the measures used, there was low internal reliability within the CTSPC for several domains, notably for non-violent discipline, which could indicate that the measure does not reliably measure a similar construct of non-violent discipline, and would benefit from further research with additional measures of non-violent parenting. However, the addition of the PSDQ questionnaire with the authoritative subscale does temper this possibility and helps to support the validity of the findings of the current study. Based upon the current study and previous research (e.g., Talwar & Lee, 2011), future research is needed to examine systematically the relation between discipline methods and children's lie-telling behaviors.

Finally, a further area for future research is to include multiple observational measures of children's lie-telling behavior to increase the likelihood that all lying behavior is recorded to provide a wider frequency range, which may also strengthen the effect sizes found in future studies. Overall, these findings suggest children with higher levels of behavior problems may use lies as a type of antisocial action to achieve their interpersonal and material objectives. Thus, lie-telling for these children may become a maladaptive social strategy that can also be an indicator of larger behavioral concerns. Future studies can further explore children's typical and atypical trajectories of lie-telling to determine whether developmental factors influence children's use of lie-telling as a social strategy in their everyday lives.

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Disclosure statement

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