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Brief Report

Mirror, mirror on the wall: Increasing young children's honesty through inducing self-awareness

Jasmine Bender, Alison M. O'Connor, Angela D. Evans *

1812 Sir Isaac Brock Way, Psychology Department Brock University, St. Catharines, Ontario L2S 3A1, Canada

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ABSTRACT

Previous studies have shown that in older children, promising to tell the truth increases truth-telling rates; however, in preschool-aged children, this has not been found to be effective. The current study compared promising with a novel technique of increasing children's self-awareness (by asking children to look at themselves in a mirror). It was predicted that inducing self-awareness would encourage children's honesty given that self-awareness increases adherence to social and moral norms. Children aged 3 or 4 years ($N = 135$) completed a modified temptation resistance paradigm where they were asked to not peek at a toy in the absence of an experimenter. Next, children were randomly assigned to one of three conditions: Self-Awareness, Promise, or Control. When questioned about whether they peeked at the toy, children in the Self-Awareness condition were significantly more likely to tell the truth about peeking compared with those in the Promise condition. There was no significant difference between the Promise and Control conditions.

Introduction

Social relationships depend on trust, and honesty is an important factor for an individual's trust in interpersonal relationships (Hazan & Shaver, 1994; Knapp, 1984). Moreover, honesty is important for

* Corresponding author.
E-mail address: aevans@brocku.ca (A.D. Evans).

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the development and maintenance of social relationships; being able to trust and confide in others is related to the increased quality of friendship (Argyle & Henderson, 1984). On the other hand, dishonesty can have a negative impact on relationships because it can damage trust (DePaulo & Kashy, 1998; DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996; Lewis & Saarni, 1993; Schweitzer, Hershey, & Bradlow, 2006). Telling a lie has a long-term impact on trustworthiness even after amends are made by the lie-teller (Schweitzer et al., 2006). Thus, starting to encourage honesty at a young age is vitally important for children's social and moral development.

Although honesty is a valued trait, lies are told regularly in social interactions by adults and children (e.g., DePaulo & Kashy, 1998; DePaulo et al., 1996; Evans & Lee, 2011; Lee, 2013; Lewis, Stanger, & Sullivan, 1989; Newton, Reddy, & Bull, 2000; Polak & Harris, 1999; Talwar & Lee, 2002, 2008; Wilson, Smith, & Ross, 2003). Lie-telling begins to emerge at 2 or 3 years of age (Evans & Lee, 2013; Leduc, Williams, Gomez-Garibello, & Talwar, 2017), and its frequency increases throughout childhood (see Lee, 2013, for a review), such that by their fourth birthday the majority of children will lie to conceal their own transgressions. At around 7 or 8 years of age, children become more skilled in their lie-telling abilities (Talwar & Lee, 2008), and their lies become more difficult to detect when they are able to maintain their lies across questions. The developmental trajectory of children's lie-telling has been found to be related to their cognitive development. Specifically, children become better able to tell and maintain lies with improvements in theory-of-mind understanding and executive functioning skills (e.g., Evans & Lee, 2013; Ma, Evans, Liu, Luo, & Xu, 2015; Polak & Harris, 1999; Talwar, Gordon, & Lee, 2007; Talwar & Lee, 2008).

Given that honesty is imperative for maintaining social relationships and there is a high rate of dishonesty throughout childhood, developing methods for promoting honesty is important, particularly with young children whose lies are still easy to identify. However, relatively few studies have experimentally examined methods to promote honesty in children (e.g., Lee et al., 2014; Lyon & Dorado, 2008; Lyon et al., 2014; Talwar, Arruda, & Yachison, 2015; Talwar, Lee, Bala, & Lindsay, 2002). Most of these studies reduce rates of lie-telling by only approximately 20–30% and tend not to be effective with preschool-aged children. For example, asking children to promise to tell the truth significantly reduces lie-telling rates with children age 5 years and older (Evans & Lee, 2011; Lyon & Dorado, 2008; Talwar et al., 2002); however, promising is less effective with younger children. Talwar et al. (2002) examined the effectiveness of a promise on 3- to 7-year-olds' willingness to tell the truth about their own transgressions. Whereas the lie-telling rates for older children were reduced by 15% to 33%, preschool children's behaviors remained uninfluenced by the promise (only a 3% reduction in lie-telling).

Another technique that increases children's honesty is reading moral stories that emphasize the positive benefits of telling the truth. Lee et al. (2014) found that reading 3- to 7-year-olds a moral story about the positive aspects of truth-telling (e.g., *George Washington and the Cherry Tree*, where the character receives verbal praise for telling the truth) reduced lie-telling rates in comparison with a control story or stories about the negative aspects of lie-telling. Although this method successfully decreased lie-telling rates, nearly half of the children still lied after being read *George Washington and the Cherry Tree*. Building on the finding that modeling verbal praise for truth-telling can increase honesty, Talwar et al. (2015) examined how different types of verbal appeals influenced 4- to 8-year-olds' honesty. Verbal appeals made by the experimenter emphasizing external social approval (e.g., saying that she would be happy with the children if they told the truth) significantly reduced lie-telling rates by approximately 40%, the largest reduction found in the literature to date. Interestingly, the external verbal appeal emphasizes the social and interpersonal relationship between the children and the experimenter. Given the impact of honesty on social relationships, further exploration of the impact of these interpersonal interactions on honesty is warranted.

Considering that the limited honesty promotion techniques with preschoolers appear to be minimally effective, there is a need for new effective techniques. One possible technique is increasing children's self-awareness. *Self-awareness* refers to an internal focus where individuals become aware of themselves and of how others perceive them (Duval & Wicklund, 1972). Self-awareness is typically developed by 2 years of age (e.g., Amsterdam, 1972; Lewis & Brooks-Gunn, 1979) and represents an important milestone for children as they begin to recognize themselves as individuals. Self-awareness is often tested with the Rouge test, where a red dot is surreptitiously placed on children's

face during a game before they are presented with their reflection in a mirror. Children who make some indication toward the mark on their face are considered to have passed the task and have demonstrated self-awareness.

The social implications of self-awareness were demonstrated by Duval and Wicklund's (1972) theory of objective self-awareness, which suggests that bringing awareness to our own existence (e.g., through the use of a mirror) can increase our self-evaluation and heighten sensitivity to social and moral norms, rules, and standards. Furthermore, inducing self-awareness in adults increases the likelihood of adults taking the perspective of another person (Hass, 1984). Duval and Wicklund's theory has been supported by evidence from children and adults (e.g., Beaman, Klentz, Diener, & Svanum, 1979; Diener & Wallbom, 1976; Hass, 1984; Pryor, Gibbons, Wicklund, Fazio, & Hood, 1977, Study 2; Rochat, Broesch, & Jayne, 2012; Ross, Anderson, & Campbell, 2010). For example, Beaman et al. (1979) assessed children's adherence to a rule of taking only one candy from a bowl while trick-or-treating on Halloween. For half of the children, a mirror was placed above the candy bowl (no mirror was present for all other children). Because children were dressed in costume, some children were asked personal questions (i.e., their name and where they lived) to ensure that they were individuated. Thus, a total of four conditions were created: mirror and individuated, mirror and not individuated, no mirror but individuated, and no mirror and not individuated. All children were then asked to take only one candy from the bowl. The experimenter left the room while children helped themselves to the candy. Children over 4 years of age were more likely to adhere to the rule when they were individuated and made self-aware compared with all other conditions. However, no significant differences were found in the youngest children, those aged 1–4 years.

More recently, Ross et al. (2010) followed up on Beaman et al.'s (1979) initial null results with preschoolers by examining how inducing self-awareness (via the use of a mirror) influenced preschoolers' transgression and lie-telling rates in a more controlled experimental setting. Using a within-participant design, all children participated in three conditions of the temptation resistance paradigm: individuated, deindividuated (in costume), and self-aware. In all conditions, children were asked not to peek at a toy while the experimenter stepped out of the room. Prior to the experimenter leaving the room, the condition manipulations were implemented. In the control condition, children were individuated by being referred to by their name. In the deindividuation condition, children were dressed in costume and referred to as the "zookeeper". In the self-aware condition, children were referred to by their name and had a mirror facing them during the paradigm (i.e., they were individuated and self-aware). Self-aware children were significantly less likely to peek compared with the deindividuated children, suggesting that self-awareness increases adherence to moral norms even in preschool-aged children. However, no condition differences were found for lie-telling rates. This lack of effect on lie-telling is likely due to the timing of the self-awareness manipulation. When children were made self-aware *prior to* cheating (i.e., peeking at the toy), only a small number of children transgressed and, thus, few had the opportunity to tell the truth or a lie. The small sample size of transgressors may have made it difficult to detect a significant influence of self-awareness on truth-telling.

Given that previous studies have demonstrated that self-awareness can increase children's adherence to social and moral norms, the current investigation aimed to specifically examine the influence of self-awareness on children's truth- and lie-telling behaviors. As such, we manipulated self-awareness *after* children's transgressions had already occurred. Given that promising to tell the truth is frequently used by those working with children, the effectiveness of self-awareness was examined in comparison with promising. Children aged 3 or 4 years completed the temptation resistance paradigm (based on Talwar et al., 2002). Children were left alone in a room with a toy that they were asked not to peek at. Children were randomly assigned to one of three conditions: Self-Awareness, Control, or Promise. In the Self-Awareness condition, a mirror was placed in front of children prior to the experimenter questioning them about the toy. In the Control condition, the nonreflective backside of the mirror was placed in front of children prior to the experimenter questioning them about the toy. Finally, in the Promise condition, children were asked to promise to tell the truth prior to the experimenter questioning them about the toy. All children were then asked whether they had peeked at the toy and what they thought the toy was. It was predicted that children in the Self-Awareness condition would be significantly more likely to tell the truth compared with those in the Promise

and Control conditions given previous findings that self-awareness can increase children's adherence to social and moral norms (e.g., Beaman et al., 1979; Ross et al., 2010). Because promising to tell the truth has not previously been found to be effective with younger children, no significant differences were predicted between the Promise and Control conditions. Furthermore, we examined whether the self-awareness manipulation would influence children's ability to maintain their lies during follow-up questioning (i.e., "What do you think the toy is?"). Although to date no study has examined the influence of inducing self-awareness on children's ability to maintain their lies, it has been found that inducing self-awareness increases perspective taking in adults (Hass, 1984), a skill that is important for children's successful deception (e.g., Leduc et al., 2017; Li, Kelley, Evans, & Lee, 2011; Ma et al., 2015; Talwar et al., 2007). Furthermore, Johnson, Barnhardt, and Zhu (2005) demonstrated that adults with higher private self-awareness were better able to deceive others. As such, we predicted that children would be significantly more likely to successfully conceal their lies in the Self-Awareness condition compared with the other two conditions.

Method

Participants

A total of 135 children between 36 and 59 months of age (M = 48.0 months, SD = 6.47; 45% male) participated in this study. Of this sample, 63 children were 3 years old (M = 42.11 months, SD = 3.27; 52% male) and 72 were 4 years old (M = 53.1 months, SD = 3.49; 39% male). In total, 45 children were randomly assigned to the Control condition (M_{age} = 48.27 months, SD = 6.59; 44% male), 42 children were randomly assigned to the Self-Awareness condition (M_{age} = 47.17 months, SD = 6.06; 41% male), and 48 children were randomly assigned to the Promise condition (M_{age} = 48.46 months, SD = 6.78; 50% male). A one-way analysis of variance (ANOVA) was performed on age with condition (Control, Promise, Self-Awareness) as the between-participants variable and revealed no significant age differences between conditions, $F(2, 132) = 0.454$, $p = .636$. Information on maternal education was collected as an indicator of socioeconomic status (SES). The majority of participants were from a middle SES family (~1% of mothers did not complete high school, 2% only completed high school, 7% completed some college, 71% completed a college education, 17% completed postgraduate education, and 2% did not disclose). Children were recruited from a database of families interested in participating in research studies. Informed consent was obtained from parents, and verbal assent was obtained from children, prior to commencing the study.

Design and procedure

Children were seen individually in a quiet room and completed a modified version of the temptation resistance paradigm (Lewis et al., 1989; Polak & Harris, 1999; Talwar & Lee, 2002). Children played a guessing game with an experimenter where a toy was placed behind them (e.g., a cow), a noise associated with the toy was played (e.g., "moo"), and children were asked to guess what the toy was based on the sound that it made. After two trials, the experimenter told children that she had forgotten something, so she needed to leave the room. She put the last toy (an elephant) on the table with an unrelated sound playing (instrumental ABC song) and asked children not to peek at the toy. The unrelated song was played so that children could not correctly guess the toy without peeking. Hidden cameras monitored whether children peeked at the toy. After 1 min, the experimenter returned to the room and immediately covered the toy with a towel.

In the Self-Awareness condition, the experimenter placed a mirror in front of children. Based on Beaman et al.'s (1979) procedure, children were instructed to point to various parts of their own face in the mirror (e.g., "Point to your ears"), and to say their name and grade (or age if they were not yet in school) while looking in the mirror. The experimenter repeated the name and grade/age and reminded children to keep looking in the mirror. This procedure focused children on the mirror and induced self-awareness. In the Control condition, the experimenter placed the nonreflective side of the mirror toward the children so that they could not see themselves and asked children to point to various items

in the room (e.g., "Point to the books") to elapse a similar amount of time as the other conditions. Finally, in the Promise condition (based on Lyon & Evans, 2014), the experimenter told children that she was going to ask them a question but that first she wanted them to promise to tell the truth ("Do you promise that you will tell me the truth?"). All children agreed to promise with either a verbal "yes" or a head nod to indicate an affirmation to the request. Then, in all conditions, the experimenter (unaware whether children had peeked) asked, "Did you turn around and peek at the toy while I was out of the room?" to assess children's truth or lie-telling. Finally, the experimenter asked, "What do you think the toy is?" to assess children's ability to maintain their lie (semantic leakage control; Talwar and Lee, 2002).

Coding

Peeking

Children were coded either as "peekers" or "non-peekers" based on whether they turned around and looked at the toy.

Lie-telling

Children's responses to the question "Did you turn around and peek at the toy?" were coded as either "truth-tellers" (those who peeked and told the truth about peeking), "lie-tellers" (those who peeked and lied about peeking), or "truthful deniers" (those who did not peek and truthfully denied peeking). Given that we were only interested in the honesty of those children who had transgressed, truthful deniers were not examined further.

Semantic leakage control

To assess lie-tellers' ability to maintain their lies, responses to the question "What do you think the toy is?" were coded as "revealers" if they responded with the correct identity of the toy (i.e., "elephant") or "concealers" if they either feigned ignorance to the toy's true identity (i.e., "I don't know") or responded with a different toy (e.g., "music box").

Results

All analyses were preliminarily performed with gender on the first step of the model. Gender was not found to be significant in any of the analyses. Thus, all reported analyses collapse across gender.

Peeking

Overall, 81.5% (n = 110) of children peeked at the toy in the experimenter's absence. To ensure that there were no condition differences in the rate of peeking, a binary logistic regression with age in months entered on the first step, followed by condition (0 = Control, 1 = Self-Awareness, 2 = Promise) on the second step and the age by condition interaction on the final step, was performed on children's peeking behavior (0 = non-peeker, 1 = peeker). The first step was not significant, $\chi^2(1) = 0.00$, $p = .987$, Nagelkerke $R^2 = .00$, indicating no significant differences in the rate of peeking by age. Neither the second step, $\chi^2(2) = 0.944$, $p = .624$, Nagelkerke $R^2 = .01$, nor the third step, $\chi^2(2) = 0.30$, $p = .862$, Nagelkerke $R^2 = .014$, was significant, indicating that there were no significant differences in the rate of peeking across conditions.

Lie-telling

Of the 110 children who transgressed and peeked at the toy, 56% (n = 61) of children lied about their transgressions. A binary logistic regression with age in months was entered on the first step, followed by condition (0 = Control, 1 = Self-Awareness, 2 = Promise) on the second step and the age by condition interaction on the final step, was performed on peekers' lie-telling behavior (0 = truth-teller, 1 = lie-teller). The first model was significant, $\chi^2(1) = 20.25$, $p < .001$, Nagelkerke $R^2 = .22$, indicating

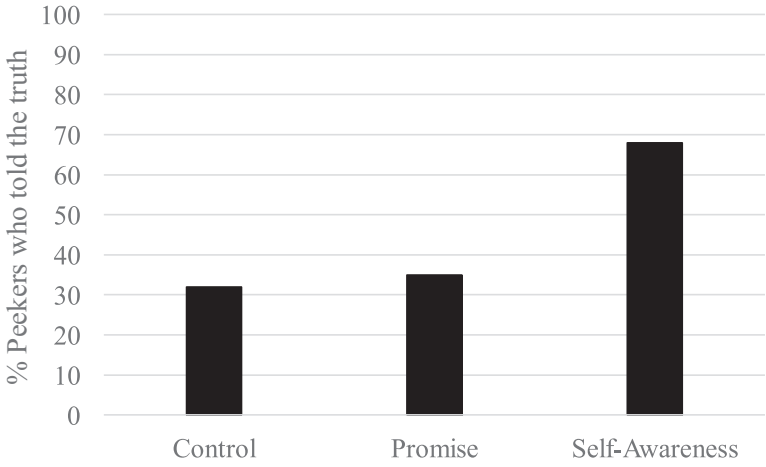

Fig. 1. Percentage of peekers who told the truth by condition.

that as age increased children were significantly more likely to lie, $B = 0.14$, $Wald(1) = 16.81$, $p < .001$, odds ratio (OR) = 1.15. The second step of the model was also significant, $\chi^2(2) = 10.88$, $p = .004$, Nagelkerke $R^2 = .32$. Specifically, children in the Self-Awareness condition were significantly more likely to tell the truth compared with children in the Promise condition, $B = -1.39$, $Wald(1) = 6.51$, $p = .011$, $OR = 4.00$. There was no significant difference between the Control and Promise conditions, $B = 0.20$, $Wald(1) = 0.14$, $p = .712$ (see Fig. 1). The third step was not significant, $\chi^2(2) = 1.61$, $p = .447$, Nagelkerke $R^2 = .34$.

Semantic leakage control

Next, we examined whether self-awareness would influence lie-tellers' semantic leakage control ($n = 61$). Overall, of the children who lied about peeking, 40% successfully concealed their lies (by either feigning ignorance to the toy's identity or providing an alternative response) and 60% revealed their transgressions and the fact that they had lied by leaking the toy's identity. A binary logistic regression was performed on lie-tellers' semantic leakage control (0 = revealer, 1 = concealer) with age in months entered on the first step, followed by condition (0 = Control, 1 = Self-Awareness, 2 = Promise) on the second step and the age by condition interaction on the final step. The first step was not significant, $\chi^2(1) = 0.828$, $p = .363$, Nagelkerke $R^2 = .02$, and neither was the second step, $\chi^2(2) = 4.41$, $p = .110$, Nagelkerke $R^2 = .111$, or the third step, $\chi^2(2) = 1.68$, $p = .433$, Nagelkerke $R^2 = .144$ (see Fig. 2).

Discussion

The aim of the current study was to uncover a novel honesty-promoting technique for preschool-aged children (3–4 years of age). Consistent with our prediction, children in the Self-Awareness condition were significantly less likely to lie compared with those in the Promise and Control conditions. Specifically, the Self-Awareness condition reduced lie-telling rates by 37%, which is one of the largest reductions to date for young children. As with previous studies (e.g., Talwar et al., 2002) demonstrating a minimal effect of a promise for young children, the Promise condition reduced lie-telling by only 3.5% compared with the Control condition, a difference that was not found to be significant. Considering that promising to tell the truth has not been found to be effective with preschool-aged children, our findings provide a novel alternative to assist in increasing preschool-aged children's honesty.

Based on previous findings indicating that self-awareness creates a sensitivity to social and moral norms (Beaman et al., 1979; Hass, 1984; Johnson et al., 2005; Rochat et al., 2012; Ross et al., 2010), we

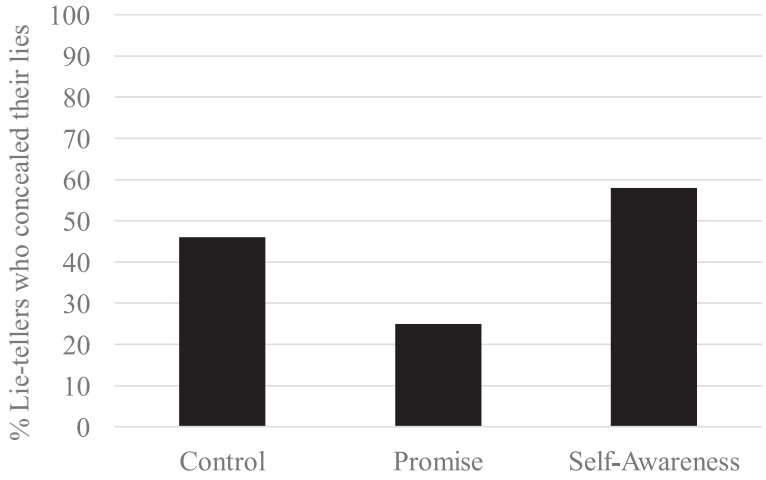

Fig. 2. Percentage of lie-tellers who concealed their lies by condition.

believe that inducing self-awareness, through the use of a mirror, prior to questioning children about a transgression increases the likelihood that children will follow the socially enforced norm of honesty. Future studies examining young children's understanding of the social norms of honesty in relation to self-awareness are needed to gain a deeper understanding of the nature of this relationship. In addition, although self-awareness appears to be an effective honesty-promoting technique for young children, future studies are needed to examine its effectiveness with older children in comparison with other established techniques (e.g., promising, putative confession, moral stories).

Beyond children's initial decision to lie about peeking, the current study also examined young children's ability to maintain their lies during follow-up questioning (semantic leakage control) in relation to self-awareness (see Fig. 2). Whereas we did not find any significant condition differences in semantic leakage control, this is likely due to preschoolers typically having poor semantic leakage control. It is often not until later childhood (7–8 years of age) where the majority of children show strong semantic leakage control (Talwar and Lee, 2008). Only 40% of our sample of lie-tellers successfully concealed their lies. This limited sample size may have influenced our ability to find a significant effect of self-awareness on children's semantic leakage control. Although not significant, the pattern of our findings suggests that self-awareness may have increased children's concealment of their transgressions after they decided to lie compared with children in the Promise condition. As such, future studies are needed to examine older children, who have stronger semantic leakage control abilities, to understand whether and how self-awareness influences semantic leakage control.

Future studies are also needed to examine the influence of individual differences on the effectiveness of inducing self-awareness. For example, given that inducing self-awareness increases perspective taking in adults (Hass, 1984), which is an important skill for children to be able to deceive others (Leduc et al., 2017; Ma et al., 2015; Talwar et al., 2007), it is possible that children's theory-of-mind understanding mediates the relation between self-awareness and lie-telling. Future studies examining theory of mind in this context are needed. Furthermore, differences in public versus private self-awareness may influence children's behaviors. Those high in public self-awareness tend to value others' evaluations of the self, whereas those high in private self-awareness tend to place importance on their own perception of the self. Johnson et al. (2005) found that adults with higher private self-awareness, but not public self-awareness, were better able to deceive. Thus, individual differences in public and private self-awareness may influence the effect of inducing self-awareness in both the rate of lie-telling and the quality of the lies. Future studies examining children's public and private self-awareness, as well as attempting to manipulate public and private self-awareness, are warranted.

It is important to note that our findings may be limited to the type of transgression committed. The current study specifically investigated children's minor transgression of cheating. Future studies are

needed to investigate the influence of self-awareness on children's more serious transgressions and on different types of lies (e.g., prosocial lies). It is possible that more morally or emotionally charged events may reduce the effectiveness of self-awareness given that children may attempt to actively avoid or distance themselves from the events. In addition, the current study examined the influence of self-awareness when direct yes/no questions were asked. Future studies should examine the influence of self-awareness when more open-ended questions are asked, akin to forensic interviewing questioning methods (e.g., Lyon, Malloy, Quas, & Talwar, 2008).

However, the findings from this study provide promising insight into how we can help to promote young children's honesty and an interesting avenue for future research. Although the self-awareness manipulation was successful, it did not eliminate lie-telling. This suggests that potentially more can be done to help promote young children's honesty, and future research should continue to investigate various honesty promotion techniques in the hopes of reducing lie-telling as much as possible in anti-social contexts.

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