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The Impact of Peer Observational Learning on Honesty Following a Transgression

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Parents and teachers worry about how lying affects children's development and socialization, as research links persistent lying to delinquency, aggression, and conduct issues. To investigate this, we examined two groups: Honest and Praise versus a Control Group, exploring how exposure influenced children's honesty and confession after transgressions. The study aimed to see if observing peers receive praise for honesty could promote truthfulness. Gender's impact on reporting honesty was assessed. Results showed no significant difference in honesty between the HP and CG groups; children confessed at similar rates in both conditions. Gender did not affect honest reporting. These findings differ from previous research in this area and suggest that factors beyond praise might be more influential in fostering honesty in children.

Keywords: Honest, Lying, Transgression, Observation, Peer Influence

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Lying involves intentionally making false statements. Successfully lying requires an individual to consider multiple perspectives and remember relevant information. The individual must hide true information while creating a statement that is false portraying a nonexistent reality that is designed to establish an untruthful belief in another individual (Evans & Lee, 2013; Talwar & Lee, 2008). Effective lying involves both verbal and nonverbal expressive behaviors. A verbal expressive behavior consists of the content of the statements that individuals make during dishonesty, which includes the lie and other statements that are made in the instance. Nonverbal expressive behavior includes facial expressions, body language, and vocal prosody which are more effective when they are congruent with the lie (Talwar & Lee, 2022). Parents and caregivers often express concern about lying in both schools and homes (Talwar & Lee, 2002). Research has primarily focused on how adults influence children's sociomoral behaviors. For decades, researchers have been interested in why lie-telling occurs and what functions lying serves the individual lying (Hall, 1891; Hartshorne & May, 1928; Nyberg et al., 1993; Stern & Stern, 1909).

Developmental Progression of Lying

Children are socialized at a young age to be honest and receive messages from adult figures that discourage lying (Lavoie et al., 2016; Stouthamer-Loeber, 1986; Talwar & Crossman, 2011). One of the ways that children learn about behaviors, attitudes, and values is by observing the behavior of other individuals and that behavior's consequences (Bandura, 1986). Parents are one of the most significant social influences on child development. (Talwar & Crossman 2022). Most adults have admitted that they have lied to children (Hays & Carver, 2014). Lying is occasionally promoted by parents which is ironic given parents' concerns regarding lying (Lavoie et al, 2016). Lies by adults often occur to children as a way to control their behavior and emotions, cooperation, or its easier than providing correct information that may be inconvenient (Heyman et al., 2009; Hays & Carver, 2014).

In a study conducted by Hays and Carver (2014) researchers investigated learning through modeling and imitation of adult figures. Preschool and school-aged children were assigned randomly to either a lie or no lie condition. In these conditions, the adult would either lie to the child or not lie before the game. The results suggested that school-aged children more often lied and peeked in the game when they were lied to by an adult (Hays & Carver, 2014). Preschoolers' behaviors were not influenced by whether an adult lied to them. This finding may have emerged because the preschoolers were unable to recognize that they had been lied to, due to difficulty understanding false beliefs and other individuals' thoughts (Hays & Carver, 2014).

Children can be influenced by parents either directly through observation or through explicit instructions about being honest. Honesty can also be influenced indirectly through observing parental lying or truth-telling and by different parenting styles (Talwar & Crossman 2022). Different parenting styles set a tone in a family that can impact the motivational benefits of lying compared to telling the truth. Prosocial liars are individuals who tell lies with the intention to benefit other individuals and reduce harm. Children who are prosocial liars are suggested to have more authoritative parents who don't express as many positive emotions within their household (Popliger et al., 2011; Talwar & Crossman 2022).

A child learns about the acceptability, consequences, and value of being honest or dishonest by observing individuals around them telling lies or the truth. Stourthamer-Loeber (1986), suggests that when a child witnesses an adult lie they are more likely to be dishonest themselves. This aligns with social learning theory. Social learning theory suggests that a child extracts information about the value of behaviors from observing the context and resulting consequences of the behaviors (Engarhos et al., 2020). Bandura (1977) proposed that a child is more likely to imitate a behavior if the model has a valued outcome as a consequence. Internalized self-sanctions and social sanctions are two psychological mechanisms that are implicated in the regulation of moral conduct within social learning theory (Bandura 1986, 1991). Social sanctions maintain behavior when an individual abstains from transgressions because they fear external consequences. Observational learning is used to understand information about the risk of consequences in a certain context (Engarhos et al., 2020). However, internalized self-sanctions result in an individual using self-control to behave pro-socially because this results in a positive feeling of self-respect (Bandura, 1986, 1991). Children who internalize moral standards against lying are more likely to tell the truth, even if it leads to negative consequences, due to the fear of internal guilt (Engarhos et al., 2020).

Developmental Model of Lying

A developmental model of lying was proposed by Talwar and Lee (2008). Primary lies emerge among children who are two to three years old, where a child is able to begin to deliberately make untrue statements. A primary lie is a lie that is told solely based on an individual's desire (Talwar & Lee 2008). An example of a primary lie is when a child initially denies they have played with a toy that they were not supposed to touch, however lying was not significantly related to the child's ability to pretend to be ignorant (Talwar & Lee, 2008). A child at this stage is not competent to produce any other types of lies. However, it is uncertain whether the statements are a form of wish fulfillment, wordplay, or authentic deception. When children began to lie it is frequently linked to situations of rule violations, avoiding incrimination, presenting themselves as desirable, or protecting self-interest (Talwar & Lee, 2008). Secondary lies then emerge around four years of age which requires a child to understand that the listener does not necessarily know the true state of affairs and can believe the false statement. Secondary lies are defined as lies children tell to conceal their own transgression (Talwar & Lee, 2008). Children who use secondary lies can act ignorant of the situation and answer follow-up questions that are presented. Banerjee and Yuill (1999) found that

children who have mastered secondary lies are likely to point out that protagonists in stories lies to make themselves appear more in a positive light. Talwar and Lee (2008) results suggest that children who understand how to tell a primary lie may have a significantly quicker development to be able to tell secondary lies.

Sematic leakage control is the detection of a lie due to inconsistencies in the individuals' statements and children tend to have difficulty with controlling it with secondary lies (Talwar & Lee, 2002). Last, tertiary lies began around seven to eight years of age. A tertiary lie is defined as when a child is able to conceal their lies by making subsequent statements that are consistent with their initial lies and follow-up statements (Talar & Lee, 2008). Children who tell tertiary lies are more advanced at semantic leakage control. Talwar and Lee (2002) suggest that children can reason about interactions that are complex between sustaining a lie and acting appropriately when the lie is told.

Gender Influence on Lying

Whether there are gender differences in honest and dishonest behavior has been a subject of research and disagreement since early in the history of this research (Capraro, 2018). Most studies of honesty have concluded that males behave more dishonestly than females (e.g., Cappelen et al., 2013; Conrads et al., 2013; Friesen & Gangadharan, 2012; Holm & Kawagoe, 2010; Houser et al., 2012; Ruffle & Tobol, 2014), while others have not found a gender difference (e.g., Abele et al, 2014; Aoki et al., 2013; Arbel et al, 2014; Erat & Gneezy, 2012; Holm & Kawagoe, 2010; Lundquist et al., 2009). Gender was researched broadly amongst age (e.g., children and adults). Research suggest that males are more likely to tell a "black lie" than females to get their preferred outcome of interest (Maggian & Villeval, 2016). A "black lie" is a lie that is told for personal interest or gain for the individual telling the lie. Maggian and Villeval (2016) suggest that females tell more "white lies" than their male counterparts. A "white lie" is deemed as usually trivial or harmless and is told when an individual is avoiding another's feelings.

Additional Factors Influencing Honesty

In addition to gender differences, researchers have been interested in the extent to which personality, temperament, or other individual factors may affect honesty. Talwar and Crossman (2011), proposed that children's social experiences in their environments, cognitive maturity, and dispositions interact in multifaceted ways which over time that potentially allows for the prediction of the development of lying. For example, children who are selfish and resentful are predicted to lie more than other children (Maggian & Villeval, 2015). Many parents are concerned with the development and socialization of lying due the links between persistent lying and delinquency, aggression, and conduct problems (Achenbach & Edelbrock, 1979, 1981; Gervais et al, 2000; Rutter, 1967; Stouthamer-Loeber & Loeber, 1986). Numerous children lie regularly, which compromises trusting relationships with adults and peers. As children age into adolescents, they lie more frequently (Wilson et al, 2003) and are more persuasive in how they deliver the lie (Lee, 2013; Talwar & Lee, 2002; Talwar et al, 2007). Lying is often one of the first antisocial behaviors children exhibit and may lay the groundwork for other covert behaviors in later years (Stouthamer-Loeber, 1986). The environment can also influence a child, including being socialized about the value of being honest (Lavoie et al., 2016). A study conducted by Williams and colleagues (2013) investigated whether children lie to their parents or unfamiliar adults. The first experiment investigated antisocial lies while experiment two investigated prosocial lies that were told to parents and unfamiliar adults. Antisocial lies are told strictly for an individual's personal gain. Prosocial lies are defined as lies told for the sole purpose to benefit others and prevent harm (Harvey et al., 2018). Results suggest that across both types of lies, children will lie more often to an unfamiliar adult than their parents (Williams et al., 2013). Parents and teachers relay social messages about the importance of telling the truth. Particularly, "white lies" can be beneficial when used for prosocial purposes, such as when an individual is trying to avoid interpersonal conflict or to refrain from hurting another individual's feelings (i.e., prosocial lies; Backbier et al, 1997; DePaulo & Kashy, 1998). Prosocial lies are typically encouraged and are used to form and sustain positive interpersonal relationships (DePaulo & Kashy, 1998; Talwar & Crossman, 2011). Prosocial lies tend to emerge in early child development however this type of deception occurs more often in older children. In tempting situations, some children will occasionally lie; others will lie only in certain contexts (e.g., school, to gain status by teachers or peers, Gervais et al., 2000). A study conducted by Fu and colleagues (2012), investigated whether young children decide to lie strategically based on the recipient's knowledge or if children tell lies more impulsively. Results suggest that young children are able to recognize and are strategic about when to tell a lie based on what other individuals know. Evans and colleagues (2011) suggest that children who are five years old and younger fail to lie strategically when probed with follow-up questions. Children this age usually reveal information that reveals their initial lie (Evans et al., 2011, Polak & Harris, 1999; Talwar & Lee, 2002, 2008). A study conducted by Talwar and Lee (2002) examined whether children lied about peeking at a cartoon character stuffed toy as part of a game. Children were asked a follow-up question about what the toy was. If the children answered correctly they were asked, "How did you know who the toy was?" Results suggest that the children's verbal statements were often not consistent with their initial denial and leaked critical information revealing that they had lied (Talwar & Lee 2008). Older children are competent to lie strategically by pretending to be ignorant about the identity of the object and discussing probable explanations for their knowledge about the object.

Theoretical Framework

Social Learning Theory (Bandura, 1977) is a psychological theory that predicts how specific dimensions of models, environments, and the consequences of their actions change or fail to change the behavior of observers (Mearns, 2009). This theory describes how an individual's perceptions of the consequences of

behaviors might affect how they behave in the future and how it can potentially transform an individual's perspective and thought process when deciding to lie (Maftei & Lăzărescu, 2022). Children replicate behaviors or avoid behaviors that are observed in their environment in part as a result of the observed reinforcers and punishments that follow those behaviors (Bandura, 1977). The social learning framework has proven to be an effective framework for examining and changing human behavior including lying behavior in children (Ma et al., 2018).

Social learning theory is described as requiring at least four learning processes: attention, retention, reproduction, and motivation (Horsburgh & Ippolito, 2018). This is a mediational process by which one variable affects another. When an individual is in the attention stage the individual needs to be attending to the model's behavior for that behavioral episode to have the possibility to influence the observer's subsequent behavior (Horsburgh & Ippolito, 2018). Next, the individual must retain what they have seen and be able to internalize the information. The individual may mentally rehearse the behavior that they intend to replicate (Horsburgh & Ippolito, 2018). Third, the individual must reproduce the behavior and turn it into an action. Finally, the individual needs to be motivated to imitate the behavior they have observed. The motivation transpires via reinforcement: direct reinforcement (positive and negative reinforcement), vicarious reinforcement, and self-reinforcement (Horsburgh & Ippolito, 2018). Direct reinforcement occurs when a behavior is performed, and the behavior results in positive reinforcement or it leads to the avoidance or removal of something that is aversive. Vicarious reinforcement is described as learning through observation of the consequences of the actions of other individuals. Self-reinforcement, which can be automatic reinforcement in some contexts, occurs when an individual creates and delivers a consequence contingent on their own behavior, or the consequence is a natural byproduct of the behavior.

Interventions to Increase Honesty

Social learning theory has been suggested as a framework for teaching children about the value and consequences of lying and honesty. Ma and colleagues (2018) investigated promoting honesty in children through observational learning. Two experiments were conducted to examine whether honesty could be promoted in children by observing a peer display honest behavior. A temptation resistance paradigm was used to assess honesty. In this paradigm, children are requested to guess the identity of an unobserved object and are tempted to cheat by peeking when the experimenter leaves the room. This arrangement allows the children to have an opportunity to lie about a transgression they have committed for those that peek. When the experimenter returns, they are asked if they peeked. Observing a classmate confess to peeking without any explicit consequence for confession did not promote honesty in the observing children. When a participant observed a classmate confess to having peeked and received praise and a prize the observing child was found to be more likely to be honest and to confess their own peeking. A second experiment within this study replicated this observational learning effect with praise alone for confession. This suggested that observing praise for honest confession alone was sufficient to induce honest behavior (Ma et al., 2018). Ma and colleagues' (2018) findings suggest new strategies to promote honesty in children and demonstrate that young children's observations of the social consequences of peers sociomoral behaviors can influence their choices.

Current Study

As children transition to adolescence, lying is predicted to increase as age increases (Sauter et al., 2020). Thus, promoting honesty early in a child's life may reduce lying by changing this early trajectory. Although Social Learning Theory may play a role in the development of both honest and lying behaviors in children, the research base examining observational learning and honesty is exceedingly limited. Further experimental research is needed to develop a better understanding of the processes that influence when children lie and when they tell the truth. It is important to understand if peers of similar age can influence one another as models for honesty. A better understanding of the impact of observational learning on lying also has the potential to inform interventions and parent education programs aimed at addressing lying. Additionally, given the steadily expanding extent to which children observe and interact with digital media, we were specifically interested in observations of video recordings.

Research Aims

The current study aimed to determine whether observing a video recording of a peer of similar age receiving praise for being honest for lying can promote honesty amongst children. The following research questions were investigated:

1. Will more participating children be honest about a transgression after viewing a peer of similar age receiving praise for being honest about a transgression?
    a. (Hypothesis 1): Children will be honest about transgressions if they have previously viewed a peer of relative age who is praised for being honest about a transgression.
2. Does the gender of the child influence honesty about a transgression?
    a. (Hypothesis 2): Females will be more honest about a transgression than males.

Method

Participants

Eighty-seven children were recruited from regional elementary schools in Virginia to participate in this study. Participants' ages ranged from four to seven years old and were in pre-kindergarten, kindergarten, 1st grade, or 2nd grade. The principal investigator (PI) secured principal consent for their schools to participate in the study. After agreement from the principal, the experimenters

sent an invitation to participate, and the IRB approved informed consent form home with eligible students who were enrolled at the participating schools. The invitation to participate explained the nature of the study and provided contact information if the parents had any questions. Informed consent from a parent or legal guardian and child assent was required prior to participation in any study activities. Children were granted the option to stop the study at any point for any reason.

Sample Size

A power analysis for a linear logistic regression model with two predictors indicated the minimum sample size of participants who lie (N = 45). The power estimate was based on an alpha of 0.05 a beta of .8 and an odd ratio of 3.5. This odds ratio was adopted based on the obtained odds ratio of 7.89 in a study examining observational learning effects on honest reporting that parallels the current methods Ma et al. (2018). The study needed a minimum of forty-five children who peek therefore we recruited more participants than the sample size suggested (N = 51). A power analysis for an Independent-Samples Binominal Test with two predictors to detect a gender difference indicated the minimum sample size of participants (N = 210) would be required to achieve a power of 0.80. In this current study, the obtained power based on observed differences was .281 with a sample size of 51. Gender differences were an exploratory focus of the study.

Setting and Materials

All sessions were conducted in a vacant classroom at the participants' school. An iPad was used to play one of the two video recordings during the temptation resistance game for each participant. Two children (one male and one female) and an adult were recruited to create two video recordings and a tic tac toe board was used. The experimenter recorded the interactions and provided the scripted lines described below. The video was recorded on the Photos application on the iPad. Each participant was assigned to watch one video that corresponded with the group they were randomly assigned to (HP or CG). Participants watched a video depicting a child who is matched to their gender (Perloff, 1982). The HP video displays a child lying about cheating during a game of tic tac toe that was played with an adult. The adult in the video asked the child if they lied about cheating and the child replied "Yes." The child was praised for being honest even though they did something that they weren't supposed to, "Even though you cheated, I am proud of you for telling me the truth. Telling the truth is important." The CG received a video of a child and an adult playing tic tac toe. The recorded game play is identical to the other video, but the verbal interaction between the adult and child in the video is simply asking and answering unrelated questions about the game rules. All prerecorded videos were less than 30 seconds long. Another iPad was used to play an audio file of the objects' corresponding noises on the voice memos application. Prizes included stickers, play-doh, coloring books and markers, small toys, and slime that the participants chose from. A dog and pig stuffed animals, and a toy car was used during the temptation resistance game. A webcam was used to monitor the child's safety and behavior while the experimenter was out of the room.

Experimental Design and Procedures

To examine the proposed research questions and hypotheses, we utilized a between-subjects design with participants randomly assigned to one of two experimental groups. The two experimental groups included observing a child being praised for honesty and observing a neutral video (control). The study was designed to examine the extent to which observing peers of similar age receiving praise for being honest or reprimands for dishonesty can promote honesty amongst children.

Participants were randomly assigned to one of two groups with assignments constrained to produce equal-sized groups: Honest and Praise (HP), or Control Group (CG). In each group, a prerecorded video was presented that was based on group assignments. Regardless of the condition, all participants took part in the temptation resistance game (Ma et al., 2018).

Temptation Resistance Game

The experimenter informed the child that they would be guessing the identity of three unseen toys based solely on the sound they made, and that peeking was not allowed (Ma et al., 2018). The experimenter told the child that if they guessed all three sounds correctly they would receive a prize. Before the game began the experimenter showed the participant all the prizes (see materials section) that were available to win. The participant was then prompted to choose their prize should they win. The toy that was selected by the participant was taken out of the prize box and placed near the child. This procedure was included to increase the motivation to peek during the temptation resistance game. After the prize was placed near the participant, the experimenter placed each toy on a table behind where the child was sitting and activated its sound from an electronic device. The sounds were a recorded audio clip that was 25 seconds long. Before the three sounds were activated the experimenter told the child that they had to leave the room, but they could listen to the sounds while the experimenter was out. Before leaving the experimenter told the child once more that peeking is not permitted (Cortez et al., 2022 & Ma et al., 2018). The experimenter left the room to decrease social inhibition for peeking (Cortez et al., 2022). The first two toys played a sound that was unambiguously related to their identity (i.e., a dog barking, and a pig oinking). The third sound was unrelated to its identity; therefore, the third toy (a car making a popping noise) was very unlikely to be guessed without peeking at it (Ma et al., 2018). Additionally, a car was an unlikely guess when the preceding sounds and cued responses were animals creating an availability or priming effect for an animal guess (Ma et al., 2018). There were low levels of peeking as six of the eighteen participants peeked at the beginning of the experiment. The participants appeared to assume they knew what the sound was and as a result the experimenters changed the sound to white noise to increase ambiguity. Participants reported that the white noise was the ocean or a fan, again without peeking.

Finally, the sound was changed to silence to maximize ambiguity of the stimulus. Following the change to silence peeking behavior increased. A hidden webcam was installed before the study which was used to view the child's behavior while the experimenter was out of the room.

After one minute the experimenter reentered the room again (Lee et al., 2014). The experimenter asked the child what three objects make those types of sounds. After the participant responded, one of the two prerecorded videos was presented. After the video was displayed the experimenter asked the participant the confession question, "Did you peek at the toys while I was away?" All participants were rewarded a prize at the end of the study regardless of their response for participation.

Results

Participants peeking behavior was coded as peeked or did not peek. The webcam was examined to determine whether the participant peeked. Peeking was defined as the child rotating their gaze sufficiently that they placed the toys in their field of vision. If the child did not peek, they were removed from the study. After the participants identified the three objects that produced the sounds and then viewed the condition video, they were asked if they peeked. Participant responses were coded as either honest (admitting to peeking) or lying. All coding was conducted by two experimenters by viewing the webcam of each individual session with the participant.

Experimenters subjected the data to a linear logistic regression to examine the differences between HP, and CG to test for the extent to which exposure to the experimental conditions influenced a child's decision to be honest and confess after a transgression. In addition, we tested whether gender predicted participants' behavior with regard to lying or confessing. Prior to analyses, the statistical assumptions were examined. We were additionally interested if gender plays a role in children being honest when they have the opportunity to lie. Stratification for gender (female and male) and grade (pre-kindergarten, kindergarten, 1st grade, and 2nd grade) was part of the random assignment process producing approximately balanced groups on these variables. We tested whether stratified randomization was successful using a chi-square test. To analyze honesty amongst children we ran a logistic regression to test for a statistically significant effect on honest reporting amongst children based on differential condition assignment. As described above, honest reporting was coded dichotomously based on whether the participant admitted to peeking. To determine if gender roles influence honest reporting, we included gender as a predictor in the logistic regression.

Eighty-seven children participated in this study and 51 (58.6%) of those children peeked. Random assignment resulted in 24 children being assigned to the control video modeling condition and 27 children were assigned to the Honesty and Praise video modeling condition. Preliminary analyses indicated no significant effects on honest responding among children based on age, $\chi^2(3) = 1.40$, $p = .705$; gender, $\chi^2(1) = 1.91$, $p = .167$; grade level, $\chi^2(3) = 0.772$, $p = .856$; school, $\chi^2(1) = 1.58$, $p = .691$; or video, $\chi^2(1) = .001$, $p = .971$. As a result, the data were collapsed for subsequent analyses (see Tables 1–5 for crosstabulations). We assigned age and grade as continuous variables and utilized a point biserial correlation to assess their relationship with honest reporting. We found no statistically significant correlation between the age or grade of the children and their honest reporting. The variable of interest was dichotomous (i.e., telling the truth or lying

Table 1. Crosstabulation of Age and Lying Behavior

Age	Truth	Lied	Total
4	50.00%	50.00%	100.00%
5	23.50%	76.50%	100.00%
6	27.30%	72.70%	100.00%
7	37.50%	62.50%	100.00%
Total	29.40%	70.60%	100.00%

Note. Age 4 n = 4, Age 5 n = 17, Age 6 n = 22, Age 7 n = 8.

Table 2. Crosstabulation of Gender and Lying Behavior

Gender	Truth	Lied	Total
Female	39.10%	60.90%	100.00%
Male	21.40%	78.60%	100.00%
Total	29.40%	70.60%	100.00%

Note. Males n = 28, Females n = 23.

Table 3. Crosstabulation of Grade and Lying Behavior

Grade	Truth	Lied	Total
Pre-K-4	25.00%	75.00%	100.00%
Kindergarten	29.40%	70.60%	100.00%
1st Grade	26.30%	73.70%	100.00%
2nd Grade	42.90%	57.10%	100.00%
Total	29.40%	70.60%	100.00%

Note. Pre-K-4 n = 8, Kindergarten n = 17, 1st Grade n = 19, 2nd Grade n = 7.

Table 4. Crosstabulation of School and Lying Behavior

School	Truth	Lied	Total
School A	26.90%	73.10%	100.00%
School B	32.00%	68.00%	100.00%
Total	29.40%	70.60%	100.00%

Note. School A n = 26, School B n = 25.

Table 5. Crosstabulation of Video Condition and Lying Behavior

Video	Truth	Lied	Total
Control	29.20%	70.80%	100.00%
Honesty and Praise	29.60%	70.40%	100.00%
Total	29.40%	70.60%	100.00%

Note. Control n = 24, Honesty and Praise n = 27.

about peeking), therefore we used a logistic regression model to test the effects of the experimental conditions (i.e., Control (CG), and Honesty and Praise (HP)). Exposure to the video model condition was modeled as a predictor in the logistic regression using a dummy code. Prior to the logistic regression, we examined all statistical assumptions. We graphically examined the distribution of the variables and checked for outliers, examined the linearity for the regression, assessed the normality of the residuals, and checked the data for lack of independence, homoscedasticity, and multicollinearity issues. All assumptions were upheld. The logistic regression did not detect a statistically significant effect for the HP condition, $\chi^2(1) = .001$, $b = -.022$, $SE = .616$, $Wald(1) = .001$, means odds ratio = .978, 95% confidence interval = [.292, 3.270], $p = .971$. The results suggest that there was no significant difference in honesty amongst children who were assigned the HP condition compared to the children randomly assigned to the control condition. Participants confessed to peeking at very similar rates across conditions. Participants in the HP confessed in 8 of 27 (29.6%), while participants in the CG condition confessed in 7 of 24 (29.2%) of cases.

Discussion

The current study examined the efficacy of observational learning of a video model in fostering honest responding in children after they had committed a minor transgression. We tested whether children would be more likely to confess to a transgression after viewing a peer of similar age receiving praise for being honest while playing a different game (tic-tac-toe). Children who observed another child via a video recording who received praise for being honest did not confess to peeking more often than the children in the control condition.

The absence of a statistically significant effect for the video modeling condition could potentially result from several factors. The videos in the current study presented children playing tic-tac-toe rather than a guessing game. The video displaying a different activity than the one the child was engaged in may have presented too great a challenge for the young children to generalize from the short video vignette to the experimental context (Cooper, Heron, & Heward, 2007). It is possible that generalizing across two different tasks was too distant a generalization for children who are four through seven years old. It is also possible that the video was too subtle in the interaction between the child and adult actors, leaving the participant uncertain about the message delivered by the adult actor. It is unclear which of the viable hypotheses resulted in the failure to replicate the prior research.

Ma and colleagues (2018) found that children confessed much more frequently when they saw another child receive praise and a material reward or praise alone for confessing. In the Ma and colleagues (2018) study, children observed the peer being praised and rewarded in person rather than via a video recording. This procedural difference may explain the differences in the findings. Children may be more likely to exhibit observational learning following in-person encounters rather after observing video recordings. This is an important issue that is discussed below. Our study overlapped the age range in the Ma and colleagues (2018) study but extended beyond it. Their participants were 5 and 6-year-old children, while in the current study, we worked with children ages 4–7. This demographic difference could have contributed to our failure to replicate. Children who were 4 years old may not have understood the concept of lying as clearly. Additionally, the 7-year-old children may not have perceived the task and risks of lying similarly to the 5 and 6-year-olds. To test this possibility an exploratory analysis was completed using just the 5- and 6-year-old participants to determine the extent to which extending the age range may have been an issue. We found that there is no statistically significant difference within the age range of 5- and 6-year-old participants for confessing response to the independent variable, suggesting that extending the age range did not significantly affect the results.

Cortez and colleagues (2022) conducted a study in which children played a computer game and had to report on their performance during and at the end of each session. Cortez and colleagues' (2022) study helps us contextualize our results by suggesting that the physical presence of our experimenters asking if the participant peeked might have influenced the children's decision to behave honestly. The computer automatically recorded the participant's performance while the examiner was examining the participant's behavior through a one-way minor. An adult was in the room during the audience condition, watching as the child played the computer game. Researchers found that the presence of an adult exerted control over children's honest reports

in comparison to an alone condition (Cortex et al, 2022). The results imply that an adult exerts some level of influence over the children's behavior, to lie or report accurately. These results are generally consistent with learning theory if the children previously learned that adults are likely to provide differential consequences for truthfulness and dishonesty. The discrepancy between Cortez and colleagues (2022) and our study's findings suggests that there may be additional nuances influencing children being honest. Our results along with Cortez and colleagues (2022) lead us to question how the status of the relationship between the adult (e.g., stranger, teacher, or parent) and the child plays a role in influencing the child's behavior. The unfamiliarity between the investigator and the participant could have had the potential to increase lying behavior due to there not being an emotional connection between the investigator and the participant (Bussey, 2010).

There is a substantial body of research that demonstrates that video modeling changes behavior for children across a variety of tasks (Spriggs et al., 2016; Ozen et al., 2012). The children in our study could have been unfamiliar with the context of the study therefore this could have influenced their behaviors to be less honest. Children in Ma and colleagues (2018) were more likely to be familiar with the context due to watching the live model. Ergenekon and colleagues (2014) conducted a study comparing video and live modeling in teaching response chains to children with autism. The authors found that there was not a significant difference between the video and live model (Ergenekon et al., 2014). In a study conducted by Flynn and Whiten (2013), children were shown a video model demonstrating the use of tools to extract a reward item from a complex puzzle box. The children between the ages of 3-5 completed the same task themselves successfully after viewing the video model. These results suggest that children younger than participants in our study were able to focus and retain information regarding the video model. It is possible that the video in Flynn and Whiten (2013) study was more engaging for their participating children than the video used in the current study. It is worth noting that most studies displaying the effectiveness of video models assess skill acquisition, which is quite distinct from promoting honesty. Observational learning studies using video recordings have predominantly examined observational learning as a means of skill acquisition. In this case participants are observing a new behavior and observing its novel consequences. We were examining whether observational learning would influence motivation to tell the truth or lie. We were examining the extent to which we could modify the appetitive function of a behavior with which the participants presumably had an extensive learning history before the study. Examined in that light retrospectively, it seems that a salient, powerful, and definite stimulus and learning experience was likely needed.

There have been mixed gender difference findings in honest and dishonest behaviors since the early stages of this type of research (Calraro, 2018). Most studies on honest behaviors have concluded that males behave more dishonestly than females (e.g., Cappelen et al., 2013; Conrads et al., 2013; Friesen & Gangadharan, 2012; Holm & Kawagoe, 2010; Houser et al., 2012; Ruffle & Tobol, 2014). In this study, there was not a statistically significant difference between gender in honesty. Gender was underpowered to test differences in lying. In the control condition, ten males and seven females lied. In the HP condition, twelve males and seven females lied. Males lied more often than females about peeking, although the results did not achieve statistical significance. It is also worth noting that some previous studies have not found differences between males and females (Abele et al, 2014; Aoki et al., 2013; Arbel et al, 2014; Erat & Gneezy, 2012; Holm & Kawagoe, 2010; Lundquist et al., 2009). The differences across studies may be due in part to statistical power as well as the tasks that elicit the opportunity to lie.

Limitations

Although not a primary aim of the study, the sample size to detect gender differences was a limitation as it was underpowered. This limitation reduced statistical power to detect a significant correlation between gender and lying. Our sample was limited to schools that consented to host the study and as a result, we recruited from private schools. Private school students are a unique demographic group whose response to the stimuli may not generalize well to the more diverse population of children nationally or internationally. Another limitation of the study was that the stimulus materials were not standardized as they were developed by the researchers. In the video model the adult and child played tic-tac-toe, while the participants in our study played a guessing game. This discrepancy in games may have reduced the participant's perception of the relevance of the video to the activity they were participating in. Furthermore, the recorded video models may not have been salient enough for the child, potentially leading to distractions or lack of comprehension. The video models were less than 30 seconds long therefore it is possible that the video was not lengthy enough to engage the children. The children could have had difficulty with comprehending what was occurring in the video. These limitations create the risk that our findings failed to detect meaningful observational learning effects that are possible but require stimuli that are better tuned to elicit them.

Future Directions

Future research might begin to bridge the results between the current null findings and Ma and colleagues (2018) significant findings by presenting the same activity the participants were engaged in the video model. The results from Ma and colleagues (2018) suggest that children are more likely to confess to a transgression after witnessing a classmate being praised for confessing to the transgression in person. This suggests that cultivating honesty may be more effectively achieved through a live model rather than a video presentation. Future research should compare a live-action model directly to a parallel video model. Furthermore, future research should investigate whether the child's relationship with the child they observe makes a

difference in observational learning. If we were to extend this line of research, we would change our stimulus material to replicate the game the participant is engaging in. The stimulus material would be enhanced to make it more explicit when the child is being praised for their honest behavior. Collecting data in public schools may also be a useful extension due to the population being more diverse. It may also prove fruitful in the future to investigate cultural and social values that can structure lie-telling behaviors through observational learning.

We need a better understanding of the impact of observational learning on lying as it has the potential to inform interventions and parent education programs aimed at addressing lying. Social learning may play an important role in the development of honest behaviors among children, however, considerable additional research is needed to clarify the conditions under which it changes behavior.

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