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Cheater, Cheater: Examination of Children's Lying for Different Motivations

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CHEATER CHEATER: EXAMINATION OF CHILDREN'S LYING FOR DIFFERENT MOTIVATIONS

By

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Table of Contents

Abstract

The current study examined children's lie-telling behavior across three motivational contexts. There were 32 children (M = 5.08 years, SD = 0.53) who participated in four experimental paradigms to examine the differences among antisocial and prosocial lying during preschool age years. Children were assessed on overall peer relations and working memory cognitive measures to gain a better understanding of how our social worlds and developmental trajectories affect the types of lies told. Results revealed children's lie-telling was not uniform across the sequential motivational contexts. Children utilized both lie types depending on the perceived severity or social influence, but at this age in particular, children were fairly more consistent in telling antisocial lies than prosocial lies. These findings advance our understanding of the development of lying and how children's decisions to lie may change over time and across different social and motivational contexts.

Tessa Hendrix: Examination of Children's Lying

From an early age, in nearly all Western social contexts, society teaches children consistency and truthfulness in their endeavors (Sweetser, 1987). Traditionally, learning to tell lies has generally been considered as undesirable behavior with morally reprehensible actions (Bok, 1978). However, not all lies are told with malicious intentions or even conscious awareness and this long-held perspective does not adequately incorporate children's cognitive development to explain the causes and mechanisms for lying. For this reason, the ontogeny of deception offers an interesting multidirectional paradox in that while lying is seen as a negative behavior, it is indicative of cognitive growth. The development of lying has elements of both positive and negative attributes and should be looked at through the lens of a life-span perspective with the joint occurrence of both growth and decline (Baltes, 1987). Thus, the objective of this current study is to explore the succession of changes and influence that various motivations and contexts have on lying behaviors across the life span.

While the capacity to deceive requires an activation of complex information processing and effective social-cognitive skills, it also sheds an unfavorable light on one's moral reasoning and corruption of ethical values (Bok 1978; Keller 1981). Because deception cannot sensibly be constructed into a universal principle, the diversity and directionality of changes are important in understanding these distinctions (Baltes, 1987). Understanding why people lie can be a very complicated process. Not only is it an exceptionally complex mental task requiring heightened brain activation (Garrett & Sharton, 2017), but people are motivated to lie for many different reasons (Poplinger et al., 2011) and under the context of many different situations.

Kohlberg's Theory of Moral Development

The development of epistemic value (value possessed by knowledge) and positive moral characteristics does not appear spontaneously (Berkowitch & Grych, 1998), but rather due to its discontinuous nature, develops over time in a series of distinct stages. Kohlberg's Theory of Moral Development proposed that if conditions are favorable, an individual will experience moral development or "goodness" from their concepts of equality, rights, human welfare, and justice. Kohlberg established three main level propositions to explain the course of moral development: pre-conventional, conventional, and post conventional morality (Kohlberg, 1973). Certain features of these propositions may directly relate to the development of deception throughout childhood. However, most people will not reach the last stages of the post-conventional level in their lifetime; this level of moral reasoning is far too complex and requires the highest level of independent abstract reasoning.

At the pre-conventional level, children foster their own idea of morality and are solely concerned with securing their own benefit. In this premature level, children actively avoid punishment and quickly assert security through pleasing others, such as adults or authority figures (Kohlberg, 1973). Their conceptual framework is underdeveloped, and most of their worries and concerns do not extend beyond their own. Due to these shortcomings, children's earliest lies emerge between the ages of 2 and 3 and ordinarily are told to escape negative consequences (Evans & Lee, 2013; Leduc et al., 2017). Most research on children's lie-telling has primarily focused on lying to conceal transgressions (Talwar & Crossman, 2011; 2012) as it is lying in its most basic naturalistic form.

The conventional level acts as a governing body for the ways in which we behave. It holds the 'conventions' that drive social behavior and the rules and authority which follow. At this level, children are concerned with pleasing others and understand that disobeying certain

rules has consequences (Kohlberg, 1973). While some people believe that preschool aged children are not emotionally or cognitively equipped to care about anyone but themselves, research may show otherwise (Callahan, 2004; Wycoff, 2000). This stage requires different motivational purposes and the developmental course of children's lying may vary. At this level a moral perspective has been developed, which may reflect children's conceptual understanding and enhanced cognitive abilities (Williams et al., 2016). These principles may reflect a utilitarian value with a mutual benefit to others, or a non-authoritarian perspective, which may be more individually centered. However, what is morally right or wrong often overlaps and bending a rule may be what is socially appropriate to do. For example, a study by Talwar et al. (2007) utilized the disappointing gift paradigm to assess whether children would lie after receiving an undesirable gift. It was discovered that after receiving a bar of soap, 77% of the children expressed to the gift-giver that they enjoyed their gift, but later confessed to their parents that they did not. It is through a variety of social interactions and experiences that children will begin to develop their own understanding of these concepts and construct a sense of acceptable human behavior. Therefore, Kohlberg's Theory of Moral Development is important to consider throughout the development of children's lying behavior.

Social Development

Although a significant body of research on children's lying behaviors has been cross-sectional, because the primary goal of humans is to foster relationships, it is crucial to see change in lying profiles at a societal level. Recent models of social development have endorsed the importance of the various social systems that children experience and stressed the demand for links between childhood development and our social worlds to be discovered (Hartup, 1979; Lewis & Fiering, 1981). The maintenance of social cohesion is critical in early childhood

development and varied social and emotional skills have been associated with positive peer relations, such as regulating emotions, inhibiting impulses, linguistic competence, and an understanding of various other cause and effect relationships. (MacDonald & Parke, 1984). By contrast, children who feel disliked by their peers exhibit greater difficulties with emotional regulation and present more antisocial behaviors, such as aggressive and temperamental behaviors. These developmental milestones such as communication with others, interaction skills, emotional understanding and self-regulation greatly influence the types of lies told.

As a result, lie-telling can often be paradoxical in nature; while "antisocial" lies may be told for personal gain and the avoidance of transgressions (DePaulo & Kashy, 1998), conversely, "prosocial" lies may be told to maintain social cohesion and to spare the feelings of others (DePaulo et al., 1996; Wilson et al., 2003). Prosocial lies are culturally specific, following the rules and norms governing society (Sweester, 1987), and overall may be told with positive intentions (Nyberg, 1993). Although, both forms of deception have been found to differ in the level of honesty among day-to-day social interactions. Adults have been found to tell lies to promote strong social links with like minded people, avoid fragmentation and isolation, and to achieve personal advantages over others. Typically, adults will engage in lies without serious consequences to facilitate and foster the relationships that surround them.

To date, children's lie telling has primarily been examined through studies of antisocial behaviors for personal gain (e.g., Alloway et al., 2015; Evans & Lee, 2011; 2013; Lavoie et al., 2017; Lewis et al., 1989; Talwler et al., 2002; 2008) or children's prosocial lie-telling behaviors for the benefit of others (e.g., Popliger et al., 2011; Talwar et al., 2007; Williams et al., 2016), but little remains known on children's lie telling that occurs simultaneously. Due to the fact that children are often put in situations that require both antisocial and prosocial lies to be old, the

research must identify an all-inclusive description accounting for a child's use of contrasting lie types in order to fully understand lie-telling behavior across various contexts.

Developmental Consistency of Lie-telling

In some of the earliest scientific analyses of verbal deception (i.e., lying), Hall (1891), Leonard (1920), and Krout (1932) established the foundation of their investigations on children's lying behaviors from the accounts of others. It was not until Tudor-Hart (1926) progressed the typology by talking with children about their lying and differentiating the intentionality of the lies that the field began to develop. Ultimately, the research still failed to interpret children's understandings of the concept of lying rather than just their evaluations or descriptions of the accounts. Pivotal studies by Hartshorne and May (Hartshorne & May, 1928; Hartshorne et al., 1930) finally began to explore the extent to which children's dishonest behavior was consistent throughout the development of personal character and integrity.

In their extensive *Studies in the Nature of Character*, they assessed the character of children in grades 5th through 8th by assessing their cheating and stealing across various contexts, but no clear consistencies were found for most children, leading to their proposition of the Doctrine of Specificity. Hartshorne & May suggested that the social context is crucial in understanding fact or fiction. Although honestly is the most fundamental or foundational character trait, is not always a constant trait due to its situational nature (Burton, 1963). Thus, individuals may lie for many reasons. Because of these differing reasonings, such as the active avoidance of consequence, the desire for personal gain, or even disappointing others, one lie cannot be categorized for all.

School aged children and their concern for oneself has been the focus of Hartshorne and May's research, however, the consistency in children's lie-telling behavior where the lies may be

motivated from significantly different contexts remains unknown. Because these contexts vary from antisocial to prosocial motivations, it is important to factor in the various other experiences that children face throughout development, which Hartshorne and May's (1928) research did not represent. The current study explores the possibilities of these critical social and cognitive motivations.

Bronfrenbrenner's Bioecological Model

Less well known are the conditions under which children's motivations to lie may vary. As life presents many opportunities and children progress through the various stages of development and begin questioning the world around them, the reasons and motivation for lying become more diverse. Because of this, it is possible that when torn between fact or fiction, their decisions may vary across various social contexts. Here, a relationship between development and contextualism may be crucial in understanding the influence that these various factors may present.

Bronfrenbrenner's Bioecological Model may help explain development from an ecological perspective, with the direct and indirect influence that an individual has with their surroundings and sequential growth (Bronfenbrenner, 1977). The model is comprised of four levels which include: the microsystem, mesosystem, exosystem, and macrosystem. The Bioecological Model can be depicted as an overall range from the center (i.e., the child) to the surrounding environments which have varying levels of influence on a child's interpretation, growth and understanding of the world around them (Bronfenbrenner, 1977; Rosa & Tudge, 2013).

The most important level that directly influences an individual's development is the microsystem. The microsystem is the immediate environmental surroundings that involve the

greatest interactions and foster personal relationships such as family or teachers. At this level we see the initial development of lie-telling behaviors as small children have the greatest access to their family demography (Evans & Lee, 2013). The mesosystem encompasses the first level of interaction and links these first crucial groups to each other. However, this can present conflicting emotions and affect development in both a positive and negative light. This level may present the emergence of lies to actively avoid punishment through the conflict of school misconduct and the messages sent home intertwining. The exosystem pertains to linkages between two or more settings that may or may not have a direct effect on the developing child, for examples: parent's workplaces, extended family members, large neighborhoods etc. Finally, the largest and most far-reaching level is the macrosystem. At this level, however distant, people and places still remain a significant influence in the child's life. It is composed of the cultural norms and values that a child will uphold and offers great insight into the development of various socially learned behaviors. The macrosystem reflects the tension between the satisfaction that arises from telling the truth and the considerations of sparing another (Lee, 2013; Brown, 1987).

Development of Children's Lie-telling

Many motives for the emergence of lying have been proposed such as a concern for pleasing parents, a need for attention, a fear of punishment, or the magnitude and consequence, etc., but ultimately, small children lie without conscious or moral knowledge (Talwar & Lee, 2010). Deceitfulness comes down to developmental components beginning from as early as ages 2 and 3 (Polak & Harris, 1999). Even as cognitively intact humans, small children lack the ability to attribute mental states and show great difficulty understanding perspectives that differ from their own. This is why children's earliest lies are often solely recognized as an avoidance of negative consequences.

Understanding children's lies to conceal transgressions and find a way around punishment has been the focus of most lie-telling research (Talwar & Crossman, 2012). However, the majority of children do not actively lie to conceal a transgression until age 4 (Leduc et al., 2017). Children's theory-of-mind (ToM) and varying levels of working memory and inhibitory control have been tied to concealing transgressions (Alloway et al., 2015), but fewer studies have considered the underlying values that shape human behavior. Social factors such as problem behaviors (Gervais et al., 2000), socio-economic status (Bradley & Corwyn, 2002), and even social communicative skills may have a significant impact.

As development progresses throughout childhood, neuronal connections in the prefrontal cortex grow and so does the ability to deceive others (Talwar & Lee, 2002). Beginning without any conscious or moral knowledge, to the ability to convincingly sustain a lie to an entire room, various contributing factors are at work when trying to understand children's conceptual knowledge and deceptive nature (Hala et al., 1991). As these stages progress, the motivational differences and developmental courses behind each lie will begin to mature as well. Thus, it is important to understand that generalizing lie types (i.e., lies to conceal a transgression) may not be appropriate in this less examined body of research.

The developmental trajectory for all lies may not be the same. For example, the most widely assessed lying behaviors are lies to conceal a transgression, (i.e. antisocial lies). However, when broken down even further, instrumental lies may also be told to accrue personal gain, which involves the intentional manipulation of others. These lies are typically considered at a higher order than lies such as fabrication of the truth or covering up misconduct. They are similar in nature to transgression lies, but they may be broken down into another category known as "instrumental lies." A simple denial of facts requires much less understanding and exploitation

(DePaulo & Jordan, 1982), but instrumental lies require motivation derived from a psychological, personal or materialistic gain (Newton et al., 2000; Talwar & Crossman, 2011).

As a result, the emergence of these lies may come in a slightly different sequential order. Penskin (1992) marked the development in children's ability to conceal information through his puppet study, discovering that 87% of preschool children (at least 4 years of age) would lie to an inanimate object about a prize, in comparison to nearly a third of that number seen in children 3 years of age. In situations of "high-affect," such as an experience of heightened emotions or mood, children 3 years of age lacked the ability to misinform or withhold information from a competitor. The success of the 4 and 5 year olds indicated a new representational understanding that in order to influence a person's behavior, one must understand and influence that person's mental state. Children need to understand what they know, but also how to successfully change what they think. Thus, because more cognitive experience is needed, antisocial lies for personal benefit occur slightly later in development, while the dismissal of wrongdoings (which requires much less sophistication) are experienced first.

Brain Orientation (activation of the PFC)

Certain regions in our brain might be key to understanding these specific processes more closely. The brain become more and less "active" during the various steps of taking in, processing, suppressing, and using logic to construct believable lies (Ganis & Keenan, 2009). Generally, the three primary areas of the brain that become "active" during deception are the dorsal lateral prefrontal cortex (DLPFC), anterior cingulated cortex (ACC) and the parietal cortex. When a lie is told, more blood flow can be seen in these various areas of the brain, indicating that they are working harder (Lass, et al., 2013). Even after all of this is completed,

one must still have a basic understanding and ToM to anticipate the reactions and assimilation of knowledge from another person.

The DLPFC executes a number of various executive functions including working memory, planning, abstract reasoning and overall cognitive flexibility and control (McCabe et al., 2010) It is an area involved in risky and moral decision making which may help explain deception in earlier years (Sturman & Moghaddam, 2011). The prefrontal cortex undergoes prolonged periods of maturation lasting well into adolescence and is one of the most pivotal parts of the human brain. It does not become fully developed until around the mid 20's and many implications can be attributed to this maturation deficit. Due to these underdeveloped brain regions, increased lying, illegal drug use, binge drinking, risky sexual behaviors, and pressure from their peers, risky decisions are often made.

Consequently, the ACC is attributed to monitoring for the occurrence of response conflict (i.e. simultaneous activation of incompatible response tendencies). It plays a role in a wide variety of the bodies autonomic functions, such as the regulation of heart rate and blood pressure (Stevens et al., 2011). Like the DLPFC, it is also involved in decision-making, ethics and morality. The ACC is an extremely active component in the minds conscious experience and shows the greatest levels of activation when emotionally awareness is present. As more complex lying develops around the school-aged years, the conscious knowledge between lies and the truth becomes stronger and motives for lying increase (Talwar & Lee, 2008).

The parietal cortex is crucial in processing our sensory input. It integrates sensory information in various modalities. From balance and proprioception, to the skins touch, the body's temperature, and each pain receptor, its role in the somatosensory cortex responds to changes on not only the body's surface, but inside as well. When a deliberate lie or falsehood is

told with the conscious intention to deceive another, the levels in our brain's arousal increase. The Autonomic Nervous System triggers a catecholaminic response and the emergence of these physiological indexes that reflect an individual's emotional perturbation can begin to show (Langleben et al., 2002).

Lies can be accurately spotted through a variety of techniques and are normally assessed from an overall baseline of normal behavior under "non-threatening" conditions (Proverbio, et al., 2013). When a lie is told, there are often increases in cardiac and respiratory frequencies. Because lying is such a highly articulated and demanding cognitive task, it takes control over conflicting mental discrepancies and an ability to produce normal verbal behavior becomes much more difficult (Anolli & Ciceri, 1997). This may help explain why children utilize various non-verbal responses such as nodding, shrugging, or shaking their head when attempting to compose a lie.

Although there are still great strides to be made in this field, the study of lying should be an integral part of research because the brain adapts to dishonesty (Garrett et al., 2016). Deception influences the domains of nearly every aspect of the social world. From politics, to finance, to even the most intimate relationships, lying is a learned behavior and programmed into our communicative nature at as early as age 2 ½ (However et al., 2011). Lying becomes such a fascinating field because many deceptive behaviors can be traced back to the escalation of smaller breaches that progressively escalate over time. Such empirical evidence provides that repeated exposure to an emotion-evoking stimulus becomes weakened over time (Garrett et al., 2016).

When evaluating the escalation of deception, these series of small breaches over time actually reduce sensitivity in the amygdala and as a result, lying becomes easier (Garrett et al.,

2016). The amygdala is the center of emotional processing and when an individual deceives, it becomes activated. Generally, a heathy individual's ability to process thoughts and function typically, would regularly result in feelings of guilt or shame. However, over time the amygdala requires less competing brain activity and the physiological responses and self-destructive behaviors that might have been seen prior become less and less present. A study by (Vrij et al., 2006) utilized the first empirical test of the Behaviour Analysis Interview (BAI) to assess the different verbal and non-verbal responses from liar and truth-tellers. By having 40 participants answer various questions tailored towards a narrative based on the theft of money from a wallet, the researchers discovered that truth tellers actually exhibited more nervous behaviors than the expected liars. The liars were more helpful, displayed less nervous behavior, and shifted their position far less concluding that it was an easier task and the impact of their responses carried far less weight than that of the "truth-tellers."

Fortunately, the human brain is permeable and if it can be trained to lie, then it can also be rewired to think differently. Over time and development, new neural connections can be made between the prefrontal cortex and the amygdala, changing not only higher order thinking, but managing emotions and reframing the unhelpful thoughts that overcome humans as a species (Porto et al., 2009). These new neural circuits allow for more conscious self-control and overall less impulsivity.

Present Study

The goal of the present study was to examine (a) whether motivations to lie for significantly different outcomes in preschool aged children remain consistent across situations, and (b) whether prosocial versus antisocial lie types can be predicted by differences in positive youth development and cognitive working memory factors. To understand these questions more

closely and acquire the most naturalistic observation, each child participated in various interactive conditions that were constructed to record their self-generated, spontaneous behaviors. Under each condition the child being assessed could freely chose to tell the truth or to tell a lie depending on the expense that he or she felt. Each lie paradigm was designed for the opportunity to tell lies socially out of politeness (prosocial), to lie for personal gain (antisocial), to conceal a transgression and avoid negative consequences (antisocial), and to even aid another at their own expense (prosocial). The choices were assessed in relation to children's age, peer evaluation, and verbal working memory scores.

Method

Participants

A total of 32 child participants between the ages of 4 and 6 years old (M = 5.08 years, SD = 0.53) participated in this study. Children were recruited via interest letters distributed at The University of North Florida Preschool. All child participants were English-speaking and had no known special education needs. The majority of participants (66%) in this study were Caucasian, middle and upper middle income families in a large North American city. Children's parents indicated their marital status and family income level. The most common marital statuses were Married (72%), Divorced (22%), and the most common family income levels were $100,000 or more (59%).

Materials

The stimuli consisted of a simple game of 10 paper balls and a basket. In each set played, children were asked to stand behind a blue line and instructed to throw each ball one time. Each paper ball was worth one point and to win the game, at least 7 points or more were needed to win a prize. Children received prizes for winning the game from a table full of small individually

wrapped gifts. The small wrapped gifts were intentionally undesirable, such as a pair of knitted socks or an unsharpened pencil (undesirable gifts were chosen based on the disappointing gift paradigm). A small concealed video camera was set up on the other side of the room to capture the children's responses.

Set-up

In the current study, children came to the university preschool in regular attendance and completed a series of lie paradigms comprised of four phases to access the motivational and situational differences between prosocial and antisocial lies. Following informed consent and assent, children were individually tested in an experimental room. At the beginning, two experimenters briefly introduced themselves and asked the child if he/she wanted to play a simple paper basketball game. The principle experimenter explained the procedure, rules, and demonstrated the game until the child fully understood. The research assistant's role was to play the paper ball game after the child and act as a "deceiving" presence.

Phase 1

Verbal Working Memory. Upon arrival to the preschool, two research assistants introduced themselves and individually escorted each child into an experimental room. The participant's information such as age, gender, race, and ethnicity were checked using a demographic survey questionnaire that had been previously sent home. To measure executive functioning, The *Automated Working Memory Assessment, North American Version* (AWMA; 2008) was administered.

We chose to use the AWMA because working memory likely impacts the composition of a lie. Working memory refers to the manipulation and temporary storage of information that a brain system can attain to (Baddeley, 1992). It is responsible for the acquisition of learning,

language composition, and nearly all complex cognitive tasks. Often referred to as the "workbench of cognition," the capacity of one's working memory directly impacts their abilities on high-level cognitive activities (Jarrold & Towse, 2006). Consequently, this can be said for the composition of a lie. Lying requires the ability to first suppress truthful information and then conduct a believable falsehood which requires the capacity of heightened control. Some variance can be accounted for by age throughout normal cognitive development, but the capacity for working memory differs from person to person (Gathercole & Alloway, 2009). From early childhood, the capacity increases and when adulthood is reached it remains relatively consistent over different motivational and situational contexts.

Backward digital recall was used to assess the children's verbal (auditory) short-term and working memory abilities. In the *backwards digit recall* task, the child is required to recall a sequence of spoken digits in the reverse order. Test trials begin with two numbers, and increase by one number in each block, until the child is unable to recall four correct trials at a particular block. The tests were administered in a fixed sequence designed to vary task demands as widely as possible across successive tests and to reduce fatigue. Spoken aloud at 1 digit per second by researcher.

Following the instructions, practice trials were presented by the principle experimenter saying a sequence of numbers that the participant was instructed to repeat and then say backwards (e.g., "*I am going to say some numbers; I want you to say them backward. If I say 8-2, what would you say?*"). There can only be one correct response, "2-8" and then another sequence can be given. If the participant was incorrect, the researcher would explain again, if necessary, and try another sequence, continuing until the child gets 3 incorrect in the same number category. After successful completion and understanding of the practice trials, the test

trials were presented as a series of blocks; each block consisting of six trials. The researcher recorded the child's response's on scoresheet.

Working Memory Scoring. The child received credits for a correct trial with a score of 1. According to the "move on" rule, if a child responds correctly to the first four trials within a block of trials, the program automatically proceeds to the next block and gives credit for trials that were not administered. However, if three or more errors are made within a block of trials, the program stops the test and automatically returns to the main menu. The score for that test reflects the number of correct responses up to the point at which the test was ended. Performance on the processing component of the working memory tasks was monitored; however, errors were not included in the recall score.

Peer Relations. After each child completed the Working Memory Test, they were provided with a 12-item Peer Relations Questionnaire Short Version for Children (Rigby & Slee, 1993) to access both the positive and negative influences that children's peers have on one another. The 12-item questionnaire is broken down into 3 sub-scales, with each scale contributing to 4 of the 12 questions. The scales do not contain any filer items and should be used as instructed in the published article. The items belonging to the scales include: The Bully Scale (9, 11, 16, 17), Victim Scale (3, 8, 18, 19), and Pro-Social Scale (5, 10, 15, 20). The scoring of these scales are as follows: Never = 1, Not Often = 2, Pretty Often = 3, Very Often = 4. An Overall Peer Relations Score was calculated by adding the scores from the bully, victim, and prosocial sub-scales.

Phase 2

Each child was asked if they would like to take a break from the working memory test and peer evaluations and given the option to play a simple game of paper basketball. Each child

was instructed that their parents had said that it was okay. A basket and ten paper balls were displayed on the table in front of the child. A small hidden video camera was unobtrusively set up approximately 5 feet away from the child to properly score the interactions. All correlation results between cognitive, social factors, and the lying behavior are shown it Table 1.

Each child began the session by receiving 10 paper balls which the experimenter would gesture to on the table. The child was asked to throw each ball into the adjacent basket. The instructions were that each ball would be worth one point and that each ball can only be thrown one time. A blue line was placed 5 feet from the basket and in order to win the game or avoid "cheating" the child must stay behind that blue line at all times. In order to obtain a prize and win the game, at least 7 points were needed. If the child got 7 points or more, than they win a prize. If the child did not receive at least 7 points, they did not receive a prize. Before proceeding, the experimenter insured that each child clearly understood the rules by asking them how many points they need to win the game. The correct response could only be 7 or more. An incorrect response would be anything below 7. The experimenter then proceeded by explaining that any other answer is not quite right and if necessary, taught further.

Once the instructions were verbally received and understood, the game began. The principle experimenter indicated that she need to do a few things and to come get her when the child had thrown all 10 balls and was done playing. The experimenter then turned their back from the child acting "busy" until the child tells them that he/she is done. Hidden cameras captured whether the child broke the rules of the game in the experimenter's absence.

The number of balls in the basket were counted aloud and the child was told how many points that they received, or did not receive. After the final count the principle experimenter once again asked all questions, regardless of if they answered them beforehand. For "*Did you cross*

the blue line when you were playing?" the child's responses were then recorded and scored as yes/no and truth/lie. Children who crossed the line, but replied no were coded as lying, and children who crossed the line, but truthfully reported their behavior were coded as truth-tellers. Each question was consecutively asked and scoring was elaborated on the scoresheet with just a few simple words.

If the child received 7 or more points the researcher told the child with excitement that they had won the prize and they may receive it at the end of the session. Consequently, if the child received less than 7 points, the researcher should apologize with a sad/sympathetic look and explain to the child that although they did not get enough points to win the prize, but since it was such a difficult game that they could keep the prize anyways at the end of the session. After assessing the video footage, the difference between the child's self-reported score and the actual video recorded score was subtracted. For example: if the child says that they threw 5, but the video shows that they threw 1, the difference score would equal 4.

Phase 3

The "watch me!" scenario tested whether children would lie to benefit another regardless of affiliation. A second researcher (E2) played the paper ball game and the child was asked to watch them as the researched turned away from them and acted busy. The child and E2 were both given the exact same set of rules and instructed that in order to win the game and receive a prize, they must get at least 7 or more points. The second researcher was instructed to intentionally step over the line and repeatedly throw the balls in the child's presence. After completion of the game the paper balls were counted and the researcher asked the child all questions again regardless of if they had been answered beforehand. For "*Did they cross the blue line when they were playing?"*, if the child responded "yes, they crossed the line" and they were

telling the truth, they received a scoring of Y/T (yes/no and truth/lie). Each question was consecutively asked and scoring was elaborated on the scoresheet with just a few simple words.

Phase 4

Disappointing Gift Paradigm. The disappointing gift paradigm (DGP; Talwar et al., 2007) was used in the polite lie scenario to assess how individual differences in regulating emotions (i.e. effortful control) combined with differing motivational factors might affect children's outward behavioral expressions. After completion of the session the children were asked to pick a wrapped gift off of the table. They were congratulated by the researcher and told that the gift was chosen especially for them and instructed to open it. The researcher then turned away for a moment while the child opened their gift; once they finished the researcher asked the child how they liked their gift, what they especially liked about it, and what they will do with it when they get home.

Children's responses to each question were scored on verbal (yes/no) and non-verbal responses (nodding head yes, shaking head no, and shrugging maybe) and observations of of self-soothing or gaze-like behaviors were used to clarify responses not easily understood. Self-soothing includes behaviors such as touching of the face or arms, playing with hair, etc. Gazing behaviors included looking at the second researcher or random objects to avoid focus.

Scoring

As the child leaves the session, E2 once again asked the child if they liked their gift. All of the responses were scored based on a semantic leakage control (Talwar & Lee, 2002). This is the overall ability that one has to maintain consistency throughout deception. Children were coded on a 0-3 score ratio. Children received a code of 0 (poor semantic leakage control) if they were unable to provide an answer to the latter two questions (e.g., "I don't know") or if their

responses indicated their disappointment (e.g., 'Nothing'). Children received a code of 1 if they presented a yes or no response, but could not further elaborate. They received a code of 2 (adequate semantic leakage control) if they were able to name qualities of the toy they liked (e.g., 'I like the color') and lastly, children received a code of 3 if they were able to name qualities that like about the toy and activities they would likely engage in with the toy (e.g., 'I will draw with this pencil at home').

Based on the child's response, scoring indicated that if they did not like their gift they told both the principle researcher and research assistant "no." By giving both researchers the same response, it was coded as the truth. If they did like it, then they told both researchers "yes" and it was coded as the truth. However, if the child told two different responses to the principle researcher and the assistant researcher, then it was scored as a lie. The lies that children told were used to categorize them in two ways: prosocial lying or antisocial lying. Two separate total lie composite scores were calculated by combining the 2 scores for the antisocial lies and the 3 scores for the prosocial lies.

Results

Consistency by Lie Type

To examine whether children were significantly inclined to lie with progression of the game, we divided the trials into the following antisocial and prosocial lie-telling paradigms.

Instrumental

Antisocial Lie 1: When asked if they crossed the line while throwing the ball in the basket, of these 32 children, 30 children (93.8%) answered "no" confirming that they did not

cross the line. However, when the researcher assessed the video footage, 19 children (59.4%) were lying.

Antisocial Lie 2: When asked if they threw the ball more than once, all 32 children (100%) of the children answered "no." However, when the researcher evaluated the video footage, 14 children (43.8%) were lying. This suggests that instrumental lying was not consistent for individual children. In addition, this marginal difference among the overall sample proportion of children who lied for the first question, compared to the second question, suggests evidence that children may vary in their decision making based on perceived severity.

Helping Another

Prosocial Lie 1: When asked if they thought the researcher had crossed the line while throwing the ball in the basket, 14 children (43.8%) answered "no" confirming that the researcher did not cross the line. However, when video footage was assessed, of the 32 children, 12 children (37.5%) were lying. When asked if they thought the researcher threw the ball more than once, 16 children (50%) answered "no." Further, after assessing the video footage, of the 32 children, 14 children, (43.8%) were lying. This suggests that lying to help another is slightly more consistent for individual children, as nearly half of the children did tell a prosocial lie on behalf of the researcher.

To evaluate the consistency of each lie-type, after completing both the transgression and helping paradigms, it was discovered that the majority of children were dual liars (telling both prosocial and antisocial lies). This meant that if a child told the truth on the number of balls thrown during their session, it did not predict that they would tell the truth when asked about the

number of balls thrown by the researcher. Of the (56.3%) children who did tell the truth, only (22.5%) of those children continued to tell the truth, while the remaining (33.8%) of children who initially told the truth, switched their pattern and lied on behalf of the researcher.

A chi-square analysis confirmed that children committed more antisocial lies compared to prosocial lies when talking about whether they crossed the line, $\chi^2(1, N = 32) = 5.40$, $p = 0.02$. However, although the pattern was the same, when talking about whether they threw the ball more than once, there was not a significant relationship, $\chi^2(1, N = 32) = 2.33$, $p = 0.13$. This finding fits the predicted pattern that children's responses will vary depending on the task, perceived severity, and motivational context.

Polite

Prosocial Lie 2: Finally, to examine whether children became significantly inclined to lie for the benefit of others, the disappointing gift paradigm was introduced. A chi-square analysis confirmed that children told the truth less than would be expected for the gift and they lied more than we would expect for the gift $\chi^2(1, N = 32) = 6.10$, $p = 0.01$.

The relation of children's lie-type to cognitive measures

We looked at the link between working memory and the nature of the lies that the children told. Analysis was conducted on the working memory (backward digit recall score) the two total lie score composites (prosocial vs. antisocial), the peer evaluation overall score, and the responses to the individual bully, victim, and prosocial scales. Pearson's correlation indicated there was a positive correlation between verbal working memory scores and the total antisocial lies score, $r = 0.764$, n = 32, $p < .001$. Specifically, our results suggest that working memory

capacity is related to antisocial tendencies. The data also indicated a positive correlation between the overall peer evaluation score and prosocial behaviors, $r = 0.801$, n = 32, $p < .001$, suggesting that children are aware of their prosocial behaviors.

Table 2

Correlations between cognitive, social factors and lying behaviors

	2	3	4	5	6	7
1. Verbal WM	-.02	.76**	.53**	-.04	.22	.53**
2. Prosocial Total Lie		-.43*	-.09	.26	-.21	-.12
3. Antisocial Total Lie			.27	-.11	.06	.34
4. Peer Eval Overall				-.23	.78**	.80**
5. Bully Scale					-.42*	-.55**
6. Victim Scale						.48**
7. Prosocial Scale						

*$p < .05$

** $P < .01$

A paired-samples t-test was conducted to compare the composite scores of the total-antisocial-lie scores and the total-prosocial-lie scores. There was not a significant difference in the scores for the total-antisocial-lie ($M = 2.81$, $SD = 1.00$) and the total-prosocial-lie ($M = 3.2$, $SD = 1.00$) scores, $t(31) = -1.31$, $p = 0.200$. These results suggest that there is no difference in children's antisocial and prosocial lying.

Semantic Leakage Control

Finally, to examine whether children had the ability to maintain consistency throughout their deception, semantic leakage control was assessed among the total prosocial and total antisocial lies. Results indicated that 13 children (40.6%) received a code of 0 (poor semantic leakage control) and were unable to provide an answer to the latter two questions of the gift paradigm, or responded in a way indicative of their disappointment (i.e. presented various self-soothing behaviors such as touching face or arms, playing with hair, etc.) The remaining 19 children (59.4%) received at least a code of 1 indicating more advanced semantic leakage control, such as the ability to name qualities of the toy that they liked or activities in which they might engage in with the toy. These findings support the notion that semantic leakage control is related to more cognitively advanced abilities and prosocial lying behaviors (e.g. working memory) (Talwar & Lee, 2008).

Discussion

The current study examined children's lie-telling across three motivational contexts to investigate whether their tendency to tell prosocial or antisocial lies was correlated with working memory ability and overall peer evaluation. Results suggest that children's decisions to tell any one specific lie type may change with socialization and development across these motivational contexts.

Antisocial

Analyses revealed that high working memory scores were associated with high antisocial lies. If children have high working memory, they lie more when it comes to antisocial lies about

themselves. Several factors could explain the shift in lie-type. With age, children tend to become "better" liars with their increasing ability to hold information. Unlike antisocial lies to conceal a transgression (which tend to emerge first), instrumental lies are told for personal benefit and may be indicative of higher social and working memory skills (Lavoie et al., 2016). In a longitudinal study of children's lying for different goals, it was discovered that instrumental lies for personal gain are more consistent at the individual level and increased slightly with age, while transgression lie-telling had a rapid decrease across time points (Talwar et al., 2011). Instrumental lies require an intentional manipulation of others to accrue personal gain and are considered highly sophisticated as they tend to require the fabrication of convincing details, rather than the simple denial of wrongdoings. In this regard, psychological motives may become surpassed in significance to the motive to attain personal advantage, such as winning a game or receiving a prize.

Throughout the observed antisocial paradigms, among the "throw" sequences, it was observed that children frequently yelled to the "distracted examiner" about each misstep or thrown ball to share what they had witnessed as the score keeper. This indication of antecedent "tattling" became a significant predictor of whether or not the child would tell the truth during the follow up questions. By having access to more cognitive resources and an overall higher working memory, children may have an easier time deciding whether they 'tattle' or whether they keep someone's secret, especially in the presence of an authority figure. In a study among young students, Wardlow (2013) reported that individuals who presented higher working memory scores could access more cognitive resources and distribute them towards deducing differences in perspectives among controversial partners. By integrating these chunks of information with their behavior, they could guide their language and overall social interactions

with others. This can be said even more so when the information is considered privileged, which to a child becomes very different. When knowledge is not shared, the listener needs to recruit certain cognitive resources in order to decide what can be revealed and what should remain hidden.

However, with respect to children's antisocial lying behavior, when discussing whether the researcher "threw" the ball more than once, it should be noted that working memory did not predict the children's decision making as it did when discussing whether they crossed the line. Although the throw sequence was in the same pattern, it was not significant, reinforcing the idea that working memory plays a role in processing multiple pieces of information involved in the actual lie (i.e. watching the experimenter's feet and counting the number of balls they still have in their possession), but not prior to engaging in lie-telling behaviors. This may be due to the lack of consistent prefrontal cortex activation seen in younger aged children. Because the PFC is crucial in performing various working memory tasks, the capacity of working memory is a strong predictor of cognitive abilities in childhood. As the number of items that children can process and remember increases throughout development, children become better able to juggle multiple pieces of information and effectively communicate social concepts and increase cognitive load (Keenan, 1998).

The limbic system may also play a crucial role throughout this development. As children become better able to juggle multiple piece of information and respond accordingly, their bodies may experience various physical and emotional responses. Due to this, children likely feel bad or become anxious when engaging in lie telling behaviors. Thus, in order to maintain consistency throughout their deception, they must have a higher working memory and an ability to maintain

semantic leakage control. However, when lying is done repeatedly, the amygdala (which becomes activated when engaging in lie telling behavior) actually decreases in responses. The more a child lies, the less sensitive their amygdala becomes. This likely contributed to the higher number of children presenting semantic leakage control during the final disappointing gift paradigm. It could be important to consider that by the end of the game it may have been more difficult to get the children to admit that they had not been honest the longer that they were given the opportunities to fib. Due to this, the children are no longer motivated by a sense of internal conflict and instead a sense of deconditioning begun.

A future direction could assess the lying outcomes as they present themselves by confronting each child in a safe and private space after each lie is told, rather than allowing them to get away with lie after lie until the study is concluded. This way researchers are better able to measure responses such as self-soothing or various autonomic nervous system responses such as the heart rate or blood pressure as they present themselves during deceptive behaviors. It may help us gain a better understanding of whether or not a child actually feels bad when telling a lie by how much anxiety or stress has been evoked.

Due to the overall sequence of the paradigms, it may also be important to consider examining the implications that cognitive load has on an individual's performance abilities throughout the duration of multiple tasks. In this particular sequence, the higher cognitive load tasks were presented at the beginning of the study. Due to the premise that lying is a cognitively demanding process, the detection of deception may be greatly manipulated by the resources still available to the subject (Vrij, et al., 2006). Consider putting the higher cognitive load tasks (such as the working memory assessment) at the end of the study to access the differences presented

after an individual has exhausted their mental load and depleted their cognitive resources by the act of lying. This knowledge becomes especially privileged when considering exactly which motivations are driving what people are lying for.

Lastly, following the significance of the sequence, the children were instructed in the beginning of the study that they would receive a small prize after they had completed all of the instructed paradigms and won the paper basketball game. Due to this initial agreement, the outcomes and lying patterns may have been motivated by the reward (a small wrapped gift), or by the fear of punishment for lying, which risks receiving the prize altogether. Although the use of material rewards has been widely used throughout research to enhance learning and performance abilities, certain circumstances may present negative contributions or enhance the presence of antisocial lying. Previous research supports that children expecting a reward may have learned to engage in hurried and low quality play as result of excitement caused by expectation of the reward or delay of gratification (Loveland & Olley, 1979). Future research may considerer changing the sequence of the paradigms by not only placing the higher cognitive load tasks at the end, but also by withholding the disappointing gift paradigm until the session is completely over.

Prosocial

Overall, we found that 33% of children told a prosocial lie without any personal benefit to themselves, whereas the majority of them were antisocial in nature. The data suggest that the higher the working memory, the more awareness children have of their prosocial behaviors, however it did not transfer to them lying to protect others. It should be noted that the prosocial lies were broken up into two categories (helping and polite), unlike that of the antisocial lies

solely focusing on instrumental lying. That being said, prosocial lies demonstrate advanced lie-telling skills which may have only been seen in the polite category due to the young age of the participants and early socialization throughout public childhood education.

Kohlberg's Theory of Moral Development may be important to consider. At this age, children may be in a transitional period moving from the pre-conventional level (which is an underdeveloped framework centered around securing one's own benefit) to the conventional level, which drives the rules and authority that our social world follows. Here a struggle between what is socially appropriate to do and what is morally right or wrong often overlap and cause internal conflict. The children have a moral understanding of what they think they should do and how they should act, but they do not yet fully understand why.

The peer evaluation scores showed that children know they like helping others and they understand that it is important to be kind, but they have not yet made the connection that lying for others benefit can still constitute those same "prosocial" behaviors. Here a struggle can begin to be seen between children's inability to separate the stigma that lying is bad and telling the truth good. Children who lie prosocially and maintain semantic leakage control also display more advanced ToM understanding. For example, they are better able to maintain the lie throughout the questioning and even further elaborate on qualities that they may "like" about the person or situation to reinforce their message. Preschool aged children lack this fully developed ability to attribute the mental states of others and understand their desires and intentions. Without this ability to infer others' beliefs, it would be difficult to consciously lie on their behalf.

At this developmental age, they are not making the connection between positive prosocial behaviors and prosocial lying being part of those behaviors. This supports previous research that

preschool aged children were more likely to tell self-oriented lies (i.e., antisocial lies) for personal benefit. Further, Lavoie, Leduc, and colleagues (2017) suggested that this may be due to a shift in socially acceptable behaviors with increasing age, reflecting an emerging understanding of honesty and goodwill throughout interpersonal situations, specifically with regard to the nature of lie-telling (Lamborn et al., 1994). Bronfrenbrenner's Biological Model encompasses these struggles through the emergence into the mesosystem (the first level of interaction that children experience outside of their parents). The mesosystem presents conflicting emotions and links these first crucial groups to one another. For most, preschool is the first time that children will experience this transition from home to school. These various new behaviors and routines will begin to establish a framework that we will use for the rest of our lives. With future research assessing a slightly different age group this shift should be much more easily accessible. As individual adjustments from each home have been made, a feeling of comfort and familiarity with school and the social world has already been established.

In summary, the current study sheds light on the importance of our perceived performance and communicative approach among others, as well as the role of working memory throughout deception. The data suggest that working memory does not predict prosocial lying at this time in preschool aged children, whereas higher working memory scores do predict antisocial lies when discussing socially unaccepted instrumental lies. Children use various lies to selectively achieve their goals and the cognitive ability, levels of social skills, and internalized expectations or desires that arise in the presence of our peers are indicative of which type of lie will be told.

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Appendices

Appendix A

THE PEER RELATIONS QUESTIONNAIRE (PRQ) FOR CHILDREN

Show how often the following statements are true of you. To do this <u>circle</u> one of the answers underneath each statement.

1. I like playing sport

   Never Once in a while Pretty Often Very Often

2. I get good marks in class

   Never Once in a while Pretty Often Very Often

3. I get called names by others

   Never Once in a while Pretty Often Very Often

4. I give soft kids a hard time

   Never Once in a while Pretty Often Very Often

5. I like to make friends

   Never Once in a while Pretty Often Very Often

6. I play up in class

   Never Once in a while Pretty Often Very Often

7. I feel I can't trust others

   Never Once in a while Pretty Often Very Often

8. I get picked on by others

   Never Once in a while Pretty Often Very Often

9. I am part of a group that goes round teasing others

   Never Once in a while Pretty Often Very Often

10. I like to help people are being harassed

Never Once in a while Pretty Often Very Often

Remember to <u>circle</u> one of the answers underneath each statement.

11. I like to make others scared of me

Never Once in a while Pretty Often Very Often

12. Others leave me out of things on purpose

Never Once in a while Pretty Often Very Often

13. I get into fights at school

Never Once in a while Pretty Often Very Often

14. I like to show others that I'm the boss

Never Once in a while Pretty Often Very Often

15. I share things with others

Never Once in a while Pretty Often Very Often

16. I enjoy upsetting wimps

Never Once in a while Pretty Often Very Often

17. I like to get into a fight with someone I can easily beat

Never Once in a while Pretty Often Very Often

18. Others make fun of me

Never Once in a while Pretty Often Very Often

19. I get hit and pushed around by others

Never Once in a while Pretty Often Very Often

20. I enjoy helping others

Never Once in a while Pretty Often Very Often

Ken Rigby and Phillip Slee, 1994

Interpretation:

This questionnaire contains 3 sub-scales and several filler items. The scoring of the scales is is as follows:

Never = 1
Once in a while = 2
Pretty often = 3
Very often = 4

Items belonging to the the Scales are these:

***Bully Scale**: 4, 9, 11, 14, 16, 17.*

***Victim Scale**: 3, 8, 12, 18, 19.*

***Pro-Social Scal**e: 5, 10, 15, 20,*

For a shorter 12-item scale (without filler items) the items underlined should be used, as in the published article: Rigby, K. and Slee, P.T. (1993) Dimensions of interpersonal relating among Australian school children and their implications for psychological well- being. Journal of Social Psychology*, 133(1), 33-42.*