

Contextual and Individual Factors Associated with the Interpretation and Usage of Prosocial Lies

by

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Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Statement of Contributions

Shirley Ong was the sole author for Chapter One: General Introduction, and Chapter Four: General Discussion, which were written under the supervision of Dr. Elizabeth Nilsen and, at the time of dissertation submission, were not written for publication.

This thesis consists of portions that were written for publication (abbreviation versions of Study 1: Children and Adults' Perceptions of the Emotional Impact of Prosocial Lies, and Study 2: Children's Endorsement of Prosocial Lies). Exceptions to sole authorship of material are as follows:

Research presented in Study 1:

This research was conducted at the University of Waterloo by Shirley Ong under the supervision of Dr. Elizabeth Nilsen. Shirley Ong designed the study with consultation from Dr. Elizabeth Nilsen. Judy Bueckert assisted with graphic design. Shirley Ong and Navya Roby collected the data for the study. Janel Silva-Grande organized the dataset. Shirley Ong was responsible for data analysis with consultation from Konstantyn Sharpinski and Linda Sosa-Hernandez. Shirley Ong drafted the manuscript, to which Dr. Elizabeth Nilsen contributed intellectual input. Dr. Elizabeth Nilsen provided guidance and/input during each step of the research and provided feedback on draft manuscripts.

Research presented in Study 2:

This research was conducted at the University of Waterloo by Shirley Ong under the supervision of Dr. Elizabeth Nilsen. Shirley Ong designed the study with consultation from Dr. Elizabeth Nilsen. Judy Bueckert assisted with graphic design. Shirley Ong, Navya Roby, and Kate Van Kessel collected the data for the study. Janel Silva-Grande organized the dataset. Shirley Ong was responsible for data analysis with consultation from Konstantyn Sharpinski and Linda Sosa-Hernandez. Shirley Ong drafted the manuscript, to which Dr. Elizabeth Nilsen

contributed intellectual input. Dr. Elizabeth Nilsen provided guidance and/input during each step of the research and provided feedback on draft manuscripts.

Abstract

Lying is a complex and multifaceted aspect of human communication, often viewed as a moral or social transgression. Growing up, children are instilled with the message that it is important to be honest. However, not all lies are told for malicious purposes, and there are situations where telling a lie may be socially appropriate and provide beneficial for the recipient. Prosocial lying is defined as a type of lie that is socially beneficial and enhances the quality of social interactions by minimizing harm to others. Within everyday exchanges both children and adults use prosocial lies on a frequent basis. While there may be social benefits to using prosocial lies, overuse or inappropriate use has negative outcomes. Thus, it is important for children to know how and when prosocial lying is more/less appropriate. My doctoral dissertation examines how contextual and individual factors relate to children's reasoning about prosocial lies. I examined this for both children's *perceptions* of lies, namely, how children felt the emotions of both the lie-teller and the lie-listener may be affected by the lie, as well as children's *endorsement* of lies (versus truth), that is, how likely they themselves would be to use lies in varying contexts. There were two contextual factors manipulated with my work. First, I examined the listener's knowledge of the situation, thereby allowing my work to build upon the rich body of work that has examined children's sensitivity to and use of others' knowledge to guide their communication. Second, I explored the role of statement content (i.e., whether there was a reference to an opinion or to reality), building on past work that has shown children's sensitivity to the moral weight of lies based on content. With respect to individual differences, I focused on the role of empathy in relation to perceptions/endorsement of prosocial lies, exploring whether increased sensitivity to others' emotional states (i.e., empathy) was associated with children's perception/endorsement of prosocial lying within certain contexts. My central focus was on the performance of school-aged children, a developmental stage chosen as children in this age range would both understand the

function of prosocial lies generally and show sensitivity to the content of lies. However, to assist with understanding developmental shifts in performance, I also assessed how adults would respond on similar tasks.

Two studies were conducted with different groups of children and adults. **Study 1** focused on children's (8–11 years, $N=80$) and adults' ($N=192$) perceptions of the emotional impact of prosocial lies (and truths) for both lie-tellers (i.e. speakers) and listeners. Participants read/heard a series of eight vignettes describing a negative event wherein a speaker says either a truth/lie (referring to their opinion or reality) to a listener who was/was not aware of the negative event. Before and after the statement was uttered, participants rated the emotions of both characters. Results demonstrated that the statement content did not affect children's or adults' perceptions of listener/speaker emotions. Both children and adults perceived that listeners would feel better after hearing a prosocial lie regardless of their knowledge state, suggesting that there may be a social benefit even when a prosocial lie is unlikely to deceive. However, following a lie, when listeners were unaware of the negative event (versus aware), their emotions were rated as more positive, suggesting that participants were tracking the listener's knowledge state and using this to gauge emotional outcomes. Children with higher empathy showed better accuracy in detecting lies (when told to ignorant listeners) and adults with better empathy perceived knowledgeable listeners as feeling worse following a prosocial lie. **Study 2** focused on children's (8–11 years, $N=81$) and adults' ($N=218$) endorsement of prosocial lies. Participants were asked to imagine themselves in scenarios involving a negative event that another person either knew or did not know about. They then rated how likely they would be to use the truth/lie statements which varied in content (referring to opinion or reality). Results demonstrated that while children endorsed statements similarly for ignorant/knowledgeable listeners, adults endorsed a greater likelihood of using a prosocial lie when the listener was ignorant of the negative event. Both age-

groups indicated higher likelihood of telling a prosocial lie about an opinion versus reality. Empathy was not associated with children's responses but was associated with adults' communicative choices.

Across the two studies, findings provide insight into how children (and adults) incorporate information about listener knowledge and statement content into their appreciation of prosocial lies. Findings also highlight the differing role of empathy throughout development within the context of these studies. My results have theoretical implications for children's communicative development and practical considerations for prosocial lying in general.

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Table of Contents

Examining Committee Membership.....	ii
Author’s Declaration.....	iii
Statement of Contributions	iv
Abstract	vi
Acknowledgements.....	ix
List of Figures	xii
List of Tables.....	xiii
Chapter 1: General Introduction.....	1
Communication	3
Speech Act Theory	4
Maxims of Communication.....	5
Lies	8
Overall Research Aims.....	28
Chapter 2: Study 1 - Children and Adults’ Perceptions of the Emotional Impact of Prosocial Lies	31
Introduction	31
Study 1a—Child Sample.....	38
Methods.....	39
Results	43
Study 1b—Adult Sample	54
Methods.....	55
Results	57
Summary of Results	67
Discussion	68
Chapter 3: Study 2 - Children’s Endorsement of Prosocial Lies.....	77
Introduction	77
Methods.....	84
Results	88
Discussion	103
Chapter 4: General Discussion.....	110
Summary of Results	111
Theoretical Implications.....	119
Limitations and Future Directions.....	121

Practical Considerations for Prosocial Lying.....	124
Conclusion.....	130
References	132
Appendices	148
Appendix A	148
Appendix B	149
Appendix C	150
Appendix D	152
Appendix E.....	155
Appendix F	158
Appendix G	159
Appendix H	160
Appendix I.....	161
Appendix J.....	163
Appendix K	164

List of Figures

Figure 1. Children's understanding of intent as a function of affective empathy and knowledge condition for truths (a) and lies (b).....	48
Figure 2. Children's listener emotion ratings as a function of knowledge and timing for truths and lies.	51
Figure 3. Children's perceived speaker emotion ratings as a function of cognitive empathy and knowledge context for prosocial lies.....	54
Figure 4. Adults' understanding of speaker intent as a function of statement type and listener knowledge condition.	59
Figure 5. Adults' listener emotion ratings as a function of statement type, listener knowledge, and timing.	61
Figure 6. Adults' speaker emotion ratings as a function of listener knowledge and timing for truths (a) and lies (b).	63
Figure 7. Adults' endorsement ratings as a function of cognitive empathy and statement type. .	100
Figure 8. Adult endorsement ratings as a function of affective empathy and statement content.	101

List of Tables

Table 1. Children’s intent accuracy and emotion ratings	47
Table 2. Adults’ intent accuracy and emotion ratings	58
Table 3. Children’s performance / report measures	89
Table 4. Adults’ performance / report measures	90
Table 5. Children’s statement endorsement ratings	93
Table 6. Children’s endorsement of different statement types.....	95
Table 7. Adults’ statement endorsement ratings	96
Table 8. Adults’ endorsement of different statement types	102

Chapter 1: General Introduction

The act of lying is common within our daily interactions. A lie is when a speaker makes a statement intentionally attempting to cause their conversational partner to accept an idea that is false, to be true (Bok, 1978; Lee, 2000). Imagine you are a young child, brimming with the excitement of your birthday and all the new and fun toys you are expecting to get. The doorbell rings and through the window you can see your grandparents holding a shiny giftbag with a big red bow tied on the front. After greeting them with hugs and kisses, you dig into the plastic bag and pull out... an itchy-looking, orange, knitted sweater. There is a silence as everyone waits for your reaction. “Thank you! This is the best present ever!” you lie, pasting a smile on your face. Your grandparents’ faces light up with joy.

Although lying looks different as we age, it persists within several domains such as in politics, marketing strategies, social relationships, and the workplace (DePaulo et al., 1996). In many cases, lying is portrayed in the media as immoral and inappropriate, and can be found in folklore that describe the inevitable downfall of lie-tellers (Talwar & Crossman, 2011). At a young age, children are taught about the consequences of lying and the virtue of honesty through classic moral stories such as “Pinocchio” and “The Boy Who Cried Wolf.” However, children are faced with mixed messages from parents about the importance of truth-telling generally, but the need to generate a lie within certain social contexts. Indeed, several authors have spoken out about the degree to which society increasingly accepts lies, even if delivered with positive intentions (hooks, 2001). Despite the potential cost of lies (or more specifically, of lies being discovered), lying persists in everyday life for both children and adults.

This thesis focusses on prosocial lies, illustrated in the example above, which are untrue statements used to benefit others by reducing conflict, making others feel better, and protecting others from harm. Given that prosocial lies are highly prevalent in our everyday communication,

serving several positive social functions, this thesis aims to explore children's sensitivities to the factors that influence their appreciation of the language form. As an overarching aim, this thesis assesses children's understanding of prosocial lies as a communicative strategy to achieve social aims. This is explored across two studies; the first study examines children's *perceptions of* the emotional impact of prosocial lies, and the second study examines children's *endorsement of* the likelihood of telling a prosocial lie. Across both studies children's sensitivities to nuances in prosocial lies are examined through an examination of the contextual and individual factors associated with children's perceptions and endorsement. In terms of contextual factors, my focus is on children's sensitivity to the **listener's knowledge state** as well as the specific **content** of statements (in terms of reflecting reality or opinion). The individual difference of primary focus is how **empathy** relates to children's understanding and endorsement of prosocial lies generally, as well as within specific contexts. Additionally, as researchers have argued that there may be a developmental shift in the conception of prosocial lies between childhood and adulthood (Lee & Ross, 1997) with a call to examine such differences (Xu et al., 2010), we also examined these questions in a sample of young adults.

To more fully understand how prosocial lies fit within our communication system, it is useful to consider how this language form is used to convey a myriad of social intentions. For example, prosocial lies are used to communicate a sensitivity to others' emotions, alleviate their distress, strengthen relationships, and avoid conflict with others (Backbier et al., 1997; DePaulo & Kashy, 1998; Lippard, 1988; Sweetser, 1987). Broadly speaking, prosocial lies are part of a large domain of prosocial behaviours which foster positive interpersonal connections. As such, to gain further insight into understanding how children recognize prosocial lies as a communicative strategy to reach social goals, it is useful to start with an exploration into the wider landscape of children's communicative development and prosocial behaviour. In the following section, I

discuss general principles relevant in guiding effective communication between two social partners. Following this review, I provide an overview of the development of children's detection, interpretation, and usage of lies, with a focus on prosocial lies.

Communication

Communication is a complex, dynamic process in which conversational partners have both individual and shared roles within a conversation (Clark, 1996). Theorists posit that social interaction is more than the sum of its parts, such that the joint action transpires when the speaker and listener perform their distinct actions in coordination, like a dance or a duet with two harmonious parts (Clark, 1996; Clark & Wilkes-Gibbs, 1986). In conversation, a speaker must tailor their utterance in such a way that the listener can easily comprehend the intended message, while a listener is required to take into consideration and integrate the speaker's cues to accurately appreciate the speaker's communicative intention (Clark et al., 1983). This process requires the interlocutors to work together and attend to the cues from their social partner to build a conversation. The ability to integrate information from different sources during conversation is not limited to adults—children learn this skill over time (through experience and growing cognition), along with their overall communicative development.

Children's communicative skills develop rapidly in the first years of life, maturing from gestures, vocalizations, word combinations, then sentences (Bates et al., 1975; Brown, 1973). By preschool years, children have a strong foundation to communicate verbally with others using simple grammar and vocabulary (Brown, 1973; Ninio & Snow, 1996). As preschoolers grow into their school-age years, they learn to recognize contextual cues and modify their communicative efforts accordingly to achieve specific goals in a socially appropriate manner (e.g., requesting, describing, greeting). Throughout school-age and adolescence, children learn to integrate information such as others' perspectives, context, and social cues to communicate effectively

with their social partners (Lloyd et al., 1998). During this development, children consider cues from various sources to accurately communicate the intent to fulfil either positive or negative social functions, including creating and maintaining new relationships, damaging connections with others, or expressing concern for others' distress. In the next section, I provide an overview of the relevant theories on the social functions of language.

Speech Act Theory

Beyond relaying the content of messages from one individual to another, we use language to communicate several social functions in our relationships with others. Austin's Speech Act Theory (1962; 1975) posits that a speaker performs "speech acts" when making comments that serve a specific function in communication. According to Speech Act Theory, verbal statements not only describe reality but also impact reality to fulfill certain social purposes (Evans & Lee, 2023). For example, telling a friend, "I like spending time with you," describes your experience within the social interaction, and may also represent a social gesture by conveying to your social partner that you feel connected and have a desire to strengthen the relationship. Speech acts are rule-governed behaviours that allow us to interact with one another in conversations, and uttering a speech act requires an understanding of the spoken language itself, along with its appropriate use within a given setting. All speech acts are governed by three components: actuality (speaker's actual utterance), intentionality (speaker's intention/beliefs), and conventionality (social rules guiding conversation) (Austin, 1975; Oishi, 2006). Given that this thesis explores lying, consider the following example: when lying about liking a disappointing gift (e.g., "*I love it!*"), the three components of speech acts are as follows: actuality refers to a speaker saying they like the gift, intentionality refers to the speaker's intention to deceive the gift-giver and conceal the truth, and conventionality refers to adhering to social norms to being polite and avoiding hurting others'

feelings (Lee, 2013). Thus, beyond the lie statement itself, telling a lie involves a speaker to reflect on their own intention and consider social necessity of telling a falsehood versus truth.

In general, by the time children are school-aged, they have developed the skills to appreciate all three components of speech acts (Lee, 2013); they understand that while an utterance is used to *describe* one's reality, it is also a "speech act" that *impacts* one's reality and thus may be used as a communicative strategy to serve several social benefits. However, for a speech act to successfully perform the relevant social functions, it is important that the speaker accurately conveys their intentions by following a series of communicative maxims.

Maxims of Communication

Grice's Cooperative Principle (Grice, 1975) is a fundamental communicative rule that posits that individuals within a conversational exchange attempt to reach a common goal by mutual efforts. This meta-maxim suggests that within a conversation, the listener and speaker work together towards a common purpose by following several conversational rules, several of which are relevant to prosocial lying. The maxims are known as the Maxims of Quantity, Quality, Relation, and Manner.

The Maxim of Quantity states that individuals should provide as much information as required to effectively convey a message. The Maxim of Quality posits that individuals should tell what they know to be true, and only say that for which they have sufficient evidence. The Maxim of Relation requires that individuals should provide information about what is relevant to the conversation that is held. The Maxim of Manner refers to how statements are said, and that speakers' messages should be as easy for a listener to understand as possible (e.g., avoid ambiguity, avoid obscurity, be logical, be brief) (Grice, 1975).

Both children and adults attend to the maxims that make up Grice's Cooperative Principle. For instance, Eskritt and colleagues (2008) found that preschool children (3–5 years)

are sensitive to the Maxims of Quantity, Quality, and Relation under some conditions (Eskritt et al., 2008). Specifically, children within the age range were more likely to ask a puppet for help if its comments adhered with the Relation maxim, suggesting that even at a young age, the concept of relevance is fundamental to communication. The researchers also examined learning across trials, with results demonstrating that older children (4–5 years, but not 3-year-olds) became more sensitive to the Maxim of Quantity over time, such that they more preferred speakers that adhered to the maxim. In addition to showing that young children have difficulty with the Maxim of Quantity, the results show that sensitivity to this maxim may be enhanced through input from conversational partners. As well, more recent work demonstrates that across development, preschoolers, school-age children, and adults detect infringements to the Maxims of Quantity, Relation, and Manner, and this sensitivity better develops over time (Panzeri & Foppolo, 2021). Further, all individuals were found to be more tolerant of violations of the Maxim of Manner and were more likely accept these statements as adequate than statements that violate the Maxims of Quantity and Relation. Generally, results show that listeners are less likely to accept statements that are false or incomplete, and more likely to accept those that allow us to understand what happened.

Together, the aforementioned work demonstrates that listeners as young as 3 years old are sensitive to the usage of Grice's Cooperation Principle within conversations and prefer speakers that adhere to the maxims. This said, the maxims of communication are not rigid rules that must be followed within every verbal exchange, but, rather, are general guidelines that direct speakers and listeners to achieve an effective conversation. These communicative rules are habitually violated in a number of situations and language forms for specific social functions. For example, in all examples of counterfactual language—like verbal irony, or sarcasm—the Maxim of Quality is violated given that the speaker intentionally makes a statement that directly contrasts what is

meant (e.g., teasing someone with messy bedhead by saying, “Nice hair!”). Further, there are also communicative situations in which the maxims are in contrast to each other, and speakers must balance and prioritize different communicative rules to achieve a specific social function.

In addition to Grice’s maxims of communication, there exists another equally fundamental overarching rule that requires speakers to be amicable (i.e., polite) and helpful to their conversational partners, known as the Meta-Maxim of General Cooperation (Sweetser, 1987; Talwar & Crossman, 2011). This meta-maxim guides individuals to communicate positive intentions to others and create/maintain positive relationships within our social worlds. As mentioned, some language forms pit the maxims of conversation against each other, and notably, one language form of interest is lying. Lying always violates Grice’s Maxim of Quality (as the statement is untruthful), and occasionally violates the Meta-Maxim of General Cooperation. More specifically, antisocial lies oppose the meta-maxim since they are used to protect oneself and harm others (e.g., lying about breaking a vase), in contrast, prosocial lies adhere to the meta-maxim such that they protect others from harm (e.g., lying about liking a disappointing gift). Despite violating the Maxim of Quality, prosocial lies follow the Meta-Maxim of General Cooperation and as such, are viewed as more polite and socially appropriate than antisocial lies (Bussey, 1999; DePaulo & Jordan, 1982). In politeness situations wherein speakers choose to tell a prosocial lie, they prioritize maintaining amicable relations (Meta-Maxim of General Cooperation) over being honest (Grice’s Maxim of Quality). Overall, the examination of prosocial lies allows us to learn more about understanding how children reconcile the paradox of these contradictory principles.

Taken together, the theories described above on communication posit that (1) conversations involve social partners to attend to and integrate social cues to accurately convey a message; (2) communicative exchanges represent key social functions; and (3) effective

communication is guided by a set of maxims that, in certain contexts, will oppose one another. These theories shape my conceptualization of lying such that (1) speakers are responsible for integrating relevant cues for a lie to serve its intended purpose; (2) lies have several social functions that may accrue more or less positive benefit depending on the context under which they are used; and (3) prosocial lies represent a communicative paradox in which two fundamental maxims conflict with one another. Thus, within the framework of these three fundamental concepts, in the next sections I will discuss the development of the understanding and usage of lies, along with its social functions, and relevant contextual and individual factors associated with lying.

Lies

Lying occurs when an individual says an untrue statement, with the purpose to deceive the listener to accept it as true (Bok, 1978). Lying plays a large part of our communication, and empirical research shows that there is a high prevalence of lies in children and adults within everyday interactions (DePaulo & Kashy, 1998). Specifically, children (3–14 years) tell approximately one lie every other day (Lavoie et al., 2017), and results from a diary study show that on average, college students tell two lies a day (DePaulo et al., 1996). In addition to its high frequency, lying also persists in several domains of life throughout our development, such as in politics, marketing strategies, social relationships, and the workplace (DePaulo et al., 1996).

Lying serves several functions and that may be socially negative or positive (Backbier et al., 1997; DePaulo & Kashy, 1998). That is, some types of lies are self-serving in nature (e.g., to avoid punishment, for resource gain); these lies are called **antisocial lies** and can be destructive to social relationships (Bok, 1978). In addition to antisocial lies, there are also **prosocial lies** (also known as “white lies”) which used to accomplish interpersonal goals (e.g., to protect

another's feelings). Overall, children and adults can recognize the differing social benefits of prosocial lies for themselves, others, and the interpersonal relationship.

Development of the Understanding of Lies

While this thesis is focused on prosocial lies specifically, in the next section, I will outline the development of children's understanding, usage, and associated factors for lies in general.

The emergence of children's understanding of lies starts at age 3, wherein children's identification and understanding of lies is first rule-based in nature (i.e., statements that are incorrect; Heyman et al., 2009; Talwar & Crossman, 2011). That is, children define a statement as a lie solely based on factuality, such that all incorrect statements are called lies and are unacceptable, including when the speaker did not know the truth and did not intend to deceive a listener (i.e., guesses, mistakes) (Strichartz & Burton, 1990). Children at 3 years old also have a basic understanding of the social norms regarding lies and recognize that lying after a transgression is inappropriate and they should tell the truth instead (Talwar & Lee, 2008). Children tend to accurately understand antisocial lies before prosocial lies, which are more sophisticated given their social acceptability (Bussey, 1999; DePaulo & Jordan, 1982; DePaulo et al., 1996). Preschoolers (4 years old) evaluate lies that conceal transgressions (e.g., lying about breaking a vase) as more negative than lies that are socially beneficial (e.g., lying about liking a disappointing gift) (Bussey, 1999). With respect to socially beneficial lies, children's perception of this language form gradually becomes more positive throughout school-age and adolescence (Bussey, 1999). At about 7 years old, children develop a sophisticated appreciation of the complexity of prosocial lying and begin incorporating information about a speaker's belief and intention, the social context, and a lie's social acceptability when understanding prosocial lies (Heyman et al., 2009; Talwar & Lee, 2008; 2011). It is also around 7 years old that children understand how lies can impact others' emotions (Warneken & Orlins, 2015) and evaluate lies

based on their impact on others (Heyman et al., 2009). Children's ability to fully appreciate prosocial lies extends into adolescent years, when youth develop a sensitivity to the nuances of lies (Talwar & Crossman, 2011). As such, from preschool years into adolescence, children become more accepting of prosocial lies and perceive them as being less negative than antisocial lies (Bussey, 1999; Xu et al., 2010). By school-age, children have a basic understanding of how lies can be used as a communicative strategy to achieve specific social functions.

As part of developing a nuanced understanding of lies, the content of lies plays a role in how they are evaluated by children. In one study, Fu and colleagues (2010) found that children are sensitive to the content of lies related to modesty when making evaluations, rating lies about good deeds (e.g., lying about giving money to a friend) more positively than lies about bad deeds (e.g., lying about making a mess). While this study demonstrated that children attend to statement content related to good/bad deeds when evaluating lies, of interest is how children evaluate lies that refer to objective reality versus one's subjective opinion. Typically, the field of deception defines antisocial lies as self-serving and referring to reality (e.g., Talwar et al., 2007) and prosocial lies are other-serving and referring to opinions (e.g., Xu et al., 2010). This distinction prevents the comparison of lie content given that it is conflated with self-serving and other-serving functions. Thus, little is known about how, within each type of lie, are lies about reality and lies about opinion perceived and used. Addressing this gap, in the two studies (Chapter 2 and 3), I specifically manipulate the content of the lies such that they reflect either reality or opinion. In this way, I am able to examine how statement content is associated with the perceptions and endorsements of prosocial lies; this factor is further discussed in a later section.

Development of Lie-telling

Young children's ability to understand the intention to tell a lie is most often examined using a temptation-resistance paradigm in which children lie about a transgression (e.g., looking

at hidden toy when instructed not to); this starts at 3–4 years of age and continues to increase into childhood and adolescence (e.g., Evans & Lee, 2011; Talwar & Lee, 2002a; Talwar & Lee, 2008). For instance, results from an experimental task showed that 29% of 3-year-olds lied and 86% of 5-year-olds lied (Peskin, 1992). Children understand the intention to deceive when telling lies, such that children are more likely to lie in situations where the rules were violated (versus when rules were followed), and when they sense that the experimenter is unaware of the transgression (versus when experimenter is aware; Fu et al., 2012). Children's initial lies tend to be self-serving in nature, namely, often antisocial lies such as lying about a transgression to escape punishment (DePaulo & Jordan, 1982). While children can understand the rudimentary social functions of prosocial lying at age 3, research shows that it is also at this age that children begin to *generate* prosocial lies (Talwar et al., 2007). However, prosocial lies can also be motivated by self-serving purposes. For example, a child may lie about liking a disappointing gift not to avoid hurting the gift-giver's feelings, but to avoid punishment from his/her parents. These self-oriented motivations for lies are common in children during preschool ages, increase in frequency and peak during adolescence, and decline in adulthood (Serota et al., 2010; Xu et al., 2010). Lying for self-serving reasons becomes more selective and much less frequent over time.

During childhood (7 years), children's motivations to tell lies change to include consideration of the benefits towards others, including protecting others' wellbeing and emotions (Popliger et al., 2011; Talwar & Crossman, 2011; Talwar & Lee, 2008). As children mature (7–11 years), coinciding with increased acceptability of prosocial lies, they are more likely to tell prosocial lies themselves; for instance, 40% of 7-year-olds and 60% of 11-year-olds told a prosocial lie in an experimental paradigm (Talwar et al., 2007; Xu et al., 2010). Further, there is evidence that older children (9–11 years) are more likely (84%) to produce prosocial lies than

younger children (3–5 years, 72%), suggesting that children’s propensity to tell prosocial lies increases with age (Talwar et al., 2007; Talwar & Crossman, 2011).

Thus, from preschool to school-age, children develop the ability to recognize how lies can impact others and increasingly use this language form to serve several self- and other-oriented benefits—even when there is a personal cost. After school-age, the prevalence of lying for self-serving reasons peaks and then declines, while lying for other-serving reasons continues to increase, suggesting that with development, children are better able to consider the social benefits of prosocial lies. However, both interpreting and producing prosocial lies depend on both the social context in which they are generated, as well as individual characteristics, discussed below.

Prosocial Lies

From here on in my dissertation, I will be focusing mainly on prosocial lies. As mentioned above, past work shows that prosocial lies are evaluated as more socially acceptable compared to antisocial lies (Bussey, 1999). Further, from childhood into the adolescent years, children develop a sensitivity to the nuances of prosocial lies and better understand how their language impacts others (Bussey, 1999).

Lie Content. As previously mentioned, a gap in the prosocial lying work is whether children are sensitive to a statement’s content (i.e., referring to opinion or reality) when perceiving the emotional impact and endorsing prosocial lies. Past work by Cheung and colleagues (2015) examined how statement content relates to the identification and evaluation of prosocial lies, finding that children (7–11 years) and adults are less likely to identify opinion lies as lies, compared to reality lies. Opinion lies are also evaluated as less negative than lies about reality (i.e., the lie content effect), likely because the untrue statement refers to a personal, subjective judgement that belongs to the speaker, which cannot be truly falsified or discoverable by others. In contrast, reality lies refer to untrue statements about an objective reality which does

not belong to anyone, and a listener can easily discover the deception (Cheung et al., 2015). The researchers found that the lie content effect is more pronounced for prosocial lies than antisocial lies. They speculated that since antisocial lies are quickly deemed as selfish and unacceptable, statement content plays a small role in evaluative ratings. On the other hand, prosocial lies are overall more socially acceptable and thus statement content may play a larger role in its interpretation and evaluation. While this work shows that children are sensitive to the lie content when evaluating prosocial lies, it is unknown whether the lie content alters the social functions and usage of prosocial lies. There is no known work investigating how children within varying situational contexts may differentially produce lies referring to opinion versus reality.

Social Benefits. Unlike antisocial lies, which are motivated by self-interest, as mentioned previously, children's explanations for their prosocial lying behaviour reflect both self- and other-oriented motivations, albeit differing by developmental stage and context.

With respect to self-oriented motivations, although prosocial lies are considered to be socially constructive, they can be motivated by selfishness, including avoiding punishment, being polite, managing appearances, and improving the emotion of the speaker (DePaulo et al., 1996; Lewis et al., 1989; Popliger et al., 2011; Talwar & Lee, 2002a; 2002b; Talwar et al., 2007; Xu et al., 2010). For example, Sally lies about how much she loves her new hand-knit sweater not because she wants to protect her grandma's feelings, but to avoid punishment from her parents later. Research shows that children (4–12 years) are more likely to tell prosocial lies when it results in a low cost to themselves and there are negligible consequences (Popliger et al., 2011). Moreover, there is some evidence that children (7 years) reflect on the impact of a speaker after telling a prosocial lie in politeness situations (Heyman et al., 2009). Together, it appears that children may consider the personal pros and cons when deciding to tell a prosocial lie and are

more likely to use the language form when there is a low cost, and high benefit to themselves as the lie-teller.

Though children are motivated by self-serving purposes to tell prosocial lies, this language form is primarily conceptualized as an other-oriented behaviour. Other-oriented motivations for prosocial lies include avoiding social conflict and spare another's feelings (Backbier et al., 1997; DePaulo & Kashy, 1998; Sweetser, 1987). Children's behaviour suggests that they are motivated by other-oriented reasons. For example, children (4–9 years) are more likely to tell a prosocial lie than the truth in a disappointing gift paradigm, and judge that the giver would believe the gift was liked and would be happy following the lie (Broomfield et al., 2002). Also, school-aged children (7–11 years) are more likely to tell a prosocial lie than the truth when the listener shows sad emotions, versus neutral (Warneken & Orlins, 2015). Together, this work demonstrates that children are sensitive to another person's affective state when making communicative decisions, and thus suggests that children recognize the other-oriented social functions of prosocial lies.

Positioning Prosocial Lies Within Children's Broader Prosocial Behaviours. Prosocial lies, particularly when motivated by other-oriented reasons, can be viewed as one example of the broader construct of prosocial behaviour. Given this, I will pause the discussion on prosocial lies specifically and provide a short summary of children's prosocial behaviour more broadly.

Prosocial behaviour is defined as voluntary behaviour intended to benefit others (Eisenberg & Fabes, 1998); it is a group of diverse actions that are integral to human social life given its importance in successful social interactions and peer acceptance (Dunfield et al., 2011; Eisenberg & Fabes, 1998). Prosocial behaviours are a response based on the observation and interpretation of a peer's demonstrated need; given that all needs come in different forms, each one requires varying interpretative skills and unique prosocial interference (Dunfield et al., 2011).

Dunfield and colleagues (2011) suggest that there are different types of prosocial responses that are used to alleviate different sets of needs—regardless of its underlying motivation (i.e., self- or other-serving). These include helping (fulfilling an instrumental need), comforting (fulfilling an emotional need), and sharing (fulfilling a material need) (Dunfield et al., 2011). Although these prosocial behaviours share the same intention to provide a benefit to a peer, the skills required to successfully respond to each need are unique to each prosocial intervention. Prosocial lies fall within the category of comforting, which involves action that is intended to alleviate an emotional need and requires a social partner to recognize and respond to others' negative affective states (Dunfield et al., 2011). Comforting is a relatively complex form of prosocial behaviour because it requires a child to interpret another's emotional display of need and then determine an appropriate response.

Past work models the development of a child's response to others' emotional distress as first self-distress (<1 year), then self-comfort (1 year), and finally comforting behaviours to benefit others (2+ years) (Dunfield et al., 2011; Hoffman, 2000). By 2 years of age, children are able to differentiate their emotional experiences from those of others and can respond to the emotional needs of others with rudimentary comforting behaviours (Hoffman, 2000). Moreover, by 2 years old, children have developed a basic framework for understanding prosocial behaviours and engage in such behaviour to help others in need (Dunfield et al., 2011), including comforting others in emotional distress and sharing resources. These behaviours appear to be motivated by concern for the welfare of others and desire to alleviate their negative states (Grueneisen & Warneken, 2022). During preschool years, children's prosociality becomes increasingly selective and they start to consider others' deservingness and personal impact when it comes to engaging in prosocial behaviour (Grueneisen & Warneken, 2022). By ages 5–7 children learn how to achieve a broad range of goals including helping and comforting others,

improving their own reputation, encouraging others reciprocate prosocially, and to be included in future cooperative experiences (Grueneisen & Warneken, 2022). Between preschool and school years, children's prosocial behaviour generally increases (Fabes & Eisenberg, 1996), and children continue to be discriminate about who they direct prosocial behaviours towards, depending on their own ulterior motives and knowledge about social norms. For instance, compared to younger children (4–5 years), older children (9–10 years) are more sensitive to the characteristics of others (level of health, luck) when deciding whether to be prosocial or not (in the context of sharing resources; Flook et al., 2019).

Overall, past research shows that prosocial behaviours start at a young age and throughout development children not only engage in more prosocial behaviours but also acquire a rich understanding of factors related to prosocial behaviours (Fabes & Eisenberg, 1996; Flook et al., 2019). Thus, as children mature, they become more sensitive to the contextual information as a guide to determine when and how to respond to others in a prosocial manner. In the next section I apply this notion to prosocial lies specifically, with a discussion as to children's sensitivity to the social context when interpreting and using prosocial lies.

Contextual Factors and Prosocial Lies. Social context, the immediate social environment in which a social exchange occurs, varies across several factors, including the setting, the consequences for a listener and speaker, and the type of relationship between individuals. Such variations in social context affect how prosocial lies are perceived and used. For instance, children (7–11 years) evaluate prosocial lies more positively than blunt truths when the social interaction occurs in a public setting (versus a private setting), where the truth may lead to negative social consequences for the listener (Ma et al., 2011). Further, children are also found to evaluate truthful statements as more positive than prosocial lies in situations where accurate information would likely benefit the listener's future success, reflecting insight on other-oriented

motivations (e.g., providing an opinion on a painting that will be submitted for a competition). The difference in children's evaluation of lies in different settings reflects their awareness of when it may or may not be socially appropriate to use a prosocial lie depending on how it impacts the listener.

Additional research suggests that children are also sensitive to the consequences for the *speaker* when deciding whether or not to use a prosocial lie, highlighting their sensitivity to self-oriented motivations—which are associated with several factors including perceived cost. For example, children (4–11 years) are more likely to tell a prosocial lie about their parent breaking an object when the personal cost is relatively low (e.g., could not be blamed for transgressing versus would be blamed) (Talwar et al., 2004). As well, children (4–12 years) are more likely to tell a prosocial lie about liking a disappointing gift when the personal cost is low (e.g., they get to keep an undesirable gift versus lose a desirable one). Moreover, adults are less likely to tell a prosocial lie to benefit others when in the presence of watching eyes (used to represent social scrutiny; Oda et al., 2015), suggesting that when under social pressure, adults' desire to be honest outweighs their desire to benefit others. The difference in the usage and interpretation of prosocial lies in settings with varied perceived cost (i.e., being blamed, social scrutiny) reflects children and adults' sensitivity to the consequences of prosocial lies.

In addition, the type of relationship between the social partners is a factor related to prosocial lies. Children (9–12 years) evaluate lying more positively when it benefits peers within their same group, versus those outside of the group (Sierksma et al., 2019). Moreover, children are also more likely to tell a prosocial lie when the lie benefits the in-group peer, with this effect becoming more pronounced with age (Sierksma et al., 2019). These findings suggest that children appreciate the social functions of prosocial lies in enhancing important relationships such as those who belong in the same group. However, research also shows that very close relationships

such children and their parents yield contrasting results, such that children (6–9 years) are more likely to say a prosocial lie to an unfamiliar adult than a parent, suggesting that they may be more concerned with sparing a stranger’s feelings, or that they are more comfortable with sharing their true disappointment with a familiar (versus unfamiliar) adult (Williams et al., 2013). Generally, past research shows that the relationship between the social partners is an important factor to consider when it comes to the perception and usage of prosocial lies.

Overall, school-age children have an understanding as to how prosocial lies affects others, with this varying across contexts. One possible outcome of both prosocial and antisocial lies is deception, namely, that the speaker creates a false understanding in a listener. This outcome typically requires a listener to be unaware of the true state of affairs. Past work shows that children are sensitive to a listener’s knowledge and integrate this information when telling antisocial lies about a transgression. In a series of experiments using a temptation resistance paradigm, Fu and colleagues (2012) found that children (3-5 years old) were less likely to lie when a listener was knowledgeable about the truth. This shows that after committing a transgression, children recognize that a telling a lie to deceive and avoid negative consequences is more effective when a listener is ignorant to the true state of affairs. Given that young children primarily tell lies for self-protective purposes, such as to escape punishment (DePaulo & Jordan, 1982), what is unknown is whether older, school-aged children integrate information about listener knowledge when telling lies to benefit others, and how that impacts children’s perceptions of the social benefits of prosocial lies.

Most, if not all, work in the prosocial lying literature assumes that the listener is unaware of the deception. From my knowledge, all research paradigms used in the prosocial lying field either explicitly state or imply that the listener is ignorant of the true context. Thus, it is unknown whether a prosocial lie’s social benefits remain when a listener is aware of the true context and

may suspect the deception. For instance, several studies have found that a key social function of prosocial lies is to enhance the emotions of a listener (e.g., Backbier et al., 1997; DePaulo & Kashy, 1998; Sweetser, 1987), and children perceive that a listener's mood is enhanced after a prosocial lie is told (Broomfield et al., 2002; Popliger et al., 2011). However, given that these studies use prosocial lying paradigms wherein the listeners are ignorant of the true state of affairs, it is unknown whether the social benefits hold true when the listeners are knowledgeable of the true context. It may be the case that despite being aware of the true situation and potentially suspecting the deception, listeners are still perceived as recognizing the speaker's intention to use prosocial lies as a positive social gesture and benefit from its social functions. To explore this gap, I examine in this thesis whether children and adults see there as being a social benefit for prosocial lies when a listener is aware of the true situation and deception is unlikely.

Role of Listener Knowledge in Language. Past work has found that children are sensitive to a listener's knowledge when both interpreting and producing language in general. In judging ambiguous language, Nilsen and Graham (2012) found that preschoolers (4 years) can identify when statements are ambiguous for a listener based on whether the listener was knowledgeable or ignorant of contextual information (through listener's visual perspective), even when the child's own knowledge disambiguates the statements. Further, children (8-10 years) and adults recognize that listeners require contextual knowledge in order to accurately detect that a statement is ironic and make interpretations about the ironic speaker (Nilsen et al., 2011). Listener knowledge has been studied in language production as well, showing that children (5-6 years) are sensitive to what information a listener has access to, and adjust their statements accordingly to avoid ambiguity (Nadig & Sedivy, 2002; Nilsen & Graham, 2009). In these studies, children provided listeners with additional contextual information when required from a listener's perspective.

Children also use listener knowledge when determining a speaker's intention to tell a lie (versus an ironic statement). For example, Winner & Leekam (1991) found that children (5–7 years-old) use a listener's knowledge to interpret untrue statements and distinguish between a speaker's intention to be mean (verbal irony) or nice (prosocial lie). When asked to identify which speaker was being nice, they were more likely to select the ignorant speaker, suggesting that they were interpreting the speaker to be telling a white lie. Along the same vein, Sullivan and colleagues (1995) found that children (5–8 years-old) accurately identified a prosocial lie from verbal irony only when the listener was ignorant of the context. Thus, children's ability to accurately appreciate a listener's knowledge is an important skill when identifying a speaker's intention to tell prosocial lies. These results are consistent with the conceptualization of lies, which often involves a function to deceive others.

However, little is known about the role of listener knowledge—which makes deception more or less likely—on the *social benefits* of prosocial lying, such as emotional impact. Given the myriad of interpersonal benefits associated with prosocial lying *beyond* deception, it is unclear whether lies *only provide* these social benefits when a listener is ignorant of the true state of affairs, or if children perceive these the social benefits to *remain* regardless of a listener's knowledge state. In order to explore this gap, it is first essential to examine how listener knowledge is associated with children's ability to differentiate a speaker's intention to tell a lie, versus truthful statement. While past work (e.g., Winner & Leekam, 1991; Sullivan et al., 1995) compared children's ability to identify between two counterfactual language forms (i.e., lie and verbal irony), my work examines the understanding of speaker intention for lies and truthful statements **as well as** the perceptions of how social partners feel in response to these statements. In doing so ensures that direct conclusions can be made about how participants perceive

interlocutors to feel when there is—what they and I interpret to be—a prosocial lie or truthful statement.

Furthermore, in exploring the link between listener knowledge and emotional outcome, it may be that a listener must have a false belief as a result of a prosocial lie to experience social benefits, and there are fewer (or no) benefits if the listener is aware of the lie. Moreover, it may be that in some social situations, if the listener is aware of the true state of affairs and suspects a lie (e.g., a friend praises their artwork that is clearly falling apart), they may subsequently feel worse, not better. Specifically, while a key function of a prosocial lie is to make a social partner feel better, it may also convey that the object of the lie (e.g., poorly-constructed artwork) is so bad that a lie is required, or that the listener is not able to handle the blunt truth—both of which may lead to negative emotions. In contrast, using a prosocial lie may represent a speaker offering a positive social gesture to a listener, which may not require a listener to be ignorant of the true state of affairs. This may reflect that we prioritize the interpersonal benefits of the language form, over the function to deceive others and create a false belief.

Moreover, there is a paucity of research exploring children's sensitivity to the listener's knowledge state when making perceptions about the emotional impact of prosocial lies and the likelihood of using the language form. Of interest is how a listener's knowledge alters children's perceptions of the social functions of a prosocial lie. More specifically, when listeners are aware of a negative situation (versus unaware), how are children's judgements of the emotion impact of the prosocial lie affected, and does this influence children's decision to tell a lie? Further, tying in a lie's statement content, does the impact of listener knowledge on children's judgment of prosocial lies/lie-telling decisions depend on the specific content of the prosocial lie, namely reflecting an opinion or reality?

So far in this thesis, I have outlined the contextual information that may affect how children utilize when detecting, interpreting, and using prosocial lies. Of course, there is much variability in how children interpret and use language even under similar conditions. This variability stems in part from the individual characteristics of the children themselves. In the following section, I will overview the literature on children's socio-cognitive skills in relation to their prosocial lying behaviour.

Child Characteristics and Prosocial Lying. Throughout development, children's socio-cognitive skills are associated with how and when they communicate with others (e.g., Nilsen & Fecica, 2011). The direction of such relations seems to be bidirectional in that through interactions with others, children's socio-cognitive skills grow (e.g., Bernard & Deleau, 2007; de Rosnay & Hughes, 2006)—and with that, developing socio-cognitive skills enable children to more effectively communicate and engage with others (e.g., Jenkins & Astington, 2000). In the context of prosocial lying, children's socio-cognitive skills (in particular executive functioning, Theory of Mind (ToM), and empathy) show associations with their understanding and use of prosocial lies, as reviewed below. Given the central role of empathy in this thesis, there is an additional review of theories related to empathy and its relation to prompting prosocial behaviour. In addition, specific to the goals of this thesis, I posit that more specifically, empathy may also relate to children's sensitivity to the contextual factors that impact the social functions and usage of prosocial lies.

Executive Functioning. Executive functions are higher-order psychological processes involved in goal-oriented behaviour under conscious control, and include skills such as inhibitory control, working memory, and cognitive flexibility (Zelazo & Müller, 2002). Inhibitory control is the ability to suppress a dominant response in favor of a subdominant response so that one can focus on other target processes or goal-related actions (Carlson et al., 2002); working memory is

the ability to temporarily hold and manipulate information in one's mind (Baddeley, 1986). When lying, children must be able to suppress the information they wish to conceal and reveal false information that is incongruent with reality (i.e., inhibitory control) (Carlson et al., 2002); they must also be able to maintain these conflicting thoughts and statements in their memory (i.e., working memory). These cognitive abilities have been found to develop in late infancy and continue to mature during the childhood years (Zelazo & Müller, 2002), a time when researchers have noticed a parallel increase in lie-telling propensity (Talwar & Lee, 2002a). While there are mixed findings in the literature (e.g., Sai et al., 2018; Talwar et al., 2019), several studies have found that inhibitory control and working memory are significantly associated with lie-telling behaviour (e.g., Evans & Lee, 2013; Fu et al., 2018; Talwar et al., 2017; Talwar & Lee, 2008; Williams et al., 2016). For instance, children (3–8 years) with difficulty with executive functioning tasks, especially those that require strong inhibitory control and working memory (e.g., the Stroop Task), are more likely to experience difficulties with deception tasks (Talwar & Lee, 2008). Along the same vein, children (6–12 years) who told prosocial lies had significantly higher performance on inhibitory control and working memory tasks (Williams et al., 2016). This work shows that the combination of inhibitory control and working memory is associated with prosocial lying, rather than each individual skill alone.

Theory of Mind. Theory of Mind (ToM) is the ability to recognize other people's mental states, and to identify their intentions, emotions, and thoughts (Astington et al., 1988). Lie-telling entails the recognition that others have mental states that differ from one's own, and that producing false statements can alter a social partner's mental state, thus creating a false belief. Studies have shown that better first-order false belief understanding is related to more antisocial lie-telling behaviour in children as young as 3 years of age (Polak & Harris, 1999; Talwar & Lee, 2008), with limited research suggesting that this relationship is found in children even as young

as 2 years old (Fu et al., 2018). Similarly, evidence shows an association between older children's ToM and lie-telling for the purpose of deception after a transgression (e.g., Polak & Harris, 1999; Talwar & Lee, 2002a; 2008; Talwar et al., 2007). Also, consistent with these findings, children with impaired ToM abilities, including some children with autism spectrum disorder (ASD) and other developmental challenges, may also find it more difficult to engage in behaviours like lying (Baron-Cohen, 1992; Sodian & Frith, 1992).

Most research examining the role of ToM and lying have focused on antisocial lying. However, researchers believe antisocial lies may be less reliant on complex ToM abilities given the relative simplicity of the language form compared to prosocial lies (Talwar & Lee, 2008; Williams et al., 2016), such that they are driven by personal benefits rather than other-oriented motivations. Although there is less empirical research with prosocial lies, children's (6–12 years) ToM appears to be associated with more prosocial lie-telling and better ability to maintain lies, as well (Williams et al., 2016).

Related to ToM is emotional understanding, known as a set of skills required for an individual to understand the nature, causes, and outcomes of the emotions of the self and others (Theurel et al., 2016). Past work provides evidence that emotional understanding is related to prosocial behaviours, and results from Demedardi and colleagues (2021) showed that children's (4-11 years) emotional understanding plays an essential role in their ability to produce prosocial lies. This suggests that when children make the decision to tell a prosocial lie to benefit a social partner in distress, they must be able to recognize and understand the cause of the emotion. Further, children must understand that telling a prosocial lie may change the social partner's emotional state.

In sum, well-developed ToM is linked to better understanding of the social functions and lie-telling for both antisocial and prosocial lies, and higher emotional understanding is related to

the production of prosocial lies. Given that ToM and emotional understanding allow individuals to understand the mental states of others and emotions of the self and others, another related construct is the concept of empathy (e.g., Denham, 1998).

Empathy. Empathy is an other-oriented affective response that allows individuals to recognize and experience another's emotional state (Batson, 1991; Eisenberg & Fabes, 1998; Findlay et al., 2006; Hoffman, 1975). Empathy has both affective and cognitive components (Davis, 1994), wherein affective empathy emerges early in development and entails vicariously feeling another's emotion (e.g., crying when a friend is crying), while cognitive empathy emerges later in development and involves the ability to understand others' emotions (e.g., knowing why a friend is happy). Children as young as 2 years old have been found to express concern for another, a basic form of empathy, learned through their interactions with others and responses modelled by parents (Rheingold et al., 1976). By understanding others' thoughts and emotions, children can respond appropriately in social situations, such as sharing a friend's joy or comforting a peer who is experiencing distress. In fact, empathy is found to be an overall important ability for children given its significant association with prosocial behaviour, which helps facilitate social relationships with peers (e.g., Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987). It appears that empathy is a motivational force that drives prosocial behaviour to build social connections with others.

Batson (1991) proposed that an increase in one's empathic emotional response increases the potential helper's desire to see the other's distress reduced—regardless of what can be gained from it. Although Batson (1991) acknowledged that there are two types of emotional arousal in helping contexts; that being, personal distress (self-oriented response motivated by the desire to reduce aversive personal distress) and empathy (other-oriented response motivated by the desire to increase the needy other's welfare), he posits that empathy motivates helping others not out of

self-interest but out of true interest in the well-being of others. This is known as the Empathy-Altruism Hypothesis (Batson, 1991; 1998). Providing evidence for his theory, one study shows that higher empathy in adults was related to other-oriented behaviour, and lower empathy was related to self-oriented behaviour (Batson et al., 1981). Specifically, adults watched a confederate receive electric shocks and were given a chance to leave the room with difficulty/ease (self-oriented) or switch places with the confederate (other-oriented). Adults with higher empathy were more likely to switch places with the confederate regardless of difficulty, and adults with lower empathy were more likely to switch places with the confederate only when escape was difficult, suggesting that empathy motivates other-oriented prosocial behaviour. The association between empathy and prosocial behaviours in adults demonstrates that a sensitivity to others' emotions promotes behaviours that benefit others (e.g., Yin & Wang, 2022).

The link between empathy and prosocial behaviour is also found within children. There is evidence that the development of empathy skills facilitates children's prosocial behaviour as assessed by observation (Ensor & Hughes, 2005; Ensor et al., 2011), parent-report (Ensor & Hughes, 2005; Ensor et al., 2011; Farrant et al., 2012), and task-based measures (Ensor et al., 2011; Williams et al., 2014). For instance, children's (3–6 years) empathy was found to be associated with more prosocial behaviours (sharing) and fewer non-prosocial behaviours (withholding resources) in an experimental resource-allocation task (Williams et al., 2014). Although this work did not explore how empathy relates to differences between other-oriented and self-oriented prosocial behaviours, the findings show that similar to adults, children's empathy supports prosocial behaviours in general, and inhibit non-prosocial behaviours. These results have also been replicated in other developmental work (see Yin & Wang, 2022 for a meta-analysis). Overall, the link between empathy and prosocial behaviour in children and adults may

be accounted for by the sensitivity to cues about the mental states of others followed by a desire to ease others' distress.

Considering the link between empathy and prosociality, it may be the case that there are associations between empathy and prosocial lying. Prosocial lies are an interesting form of prosocial behaviour given that they are intended to be deceptive (which can lead to negative consequences, such as decreasing liking and reducing trust; Schweitzer et al., 2006; Tyler et al., 2006), yet prosocial in the sense that they hold positive social intentions to benefit others. When interpreting lies in third-person vignettes, children with higher cognitive empathy evaluate prosocial lies more positively, suggesting that cognitive empathy facilitates children's awareness that prosocial lies can be benign compared to blunt truths (Lim et al., 2019). Moreover, children who exhibit higher levels of cognitive empathy are more likely to tell a prosocial lie to a confederate player during a game when there were negligible consequences to themselves, versus in trials where there was a higher perceived cost (Nagar et al., 2020). However, there is past work that did not find evidence to support the association between children's empathy and prosocial lying (e.g., Demedardi et al., 2021). Within an adult sample, the association between cognitive empathy and prosocial lying has also been found, such that individuals with higher levels of empathy tend to engage in prosocial lying when communicating with a social partner who is experiencing sadness (Xu et al., 2019). Also, a sensitivity to emotions (both experimentally induced and trait characteristic) is associated with prosocial lying, partially mediated by an emphasis on preventing emotional harm (Lupoli et al., 2017). Higher emotional sensitivity was linked to lies that benefitted others (e.g., financial gains for a charity) but not linked to lies that benefitted the self (e.g., personal financial gains; Lupoli et al., 2017). Overall, it appears that empathy relates to children and adults' understanding of prosocial lies as a socially beneficial communicative strategy to help others.

Overall, greater cognitive empathy in children and adults appears to relate to better understanding of the social functions of prosocial lies, and higher usage. Researchers have found that higher empathy is related to more positive evaluations of prosocial lies (versus blunt truth) and higher usage of the language form. However, it is unknown the role that empathy plays in the perception of the emotional impact of prosocial lies. Further, it is unknown how empathy is associated with a listener's knowledge and statement content with regard to the perceived emotional impact of prosocial lies, and the likelihood of telling a prosocial lie. Given that researchers have found that higher empathy supports prosocial lies as a social strategy when communicating with others, I posit that empathy may also increase children's sensitivity to the contextual factors that (may) impact the social functions and usage of prosocial lies—particularly, listener's knowledge and statement content.

Overall Research Aims

Given the importance of effective communication in children's socio-cognitive development and the varied social functions that language serves, it is essential to explore how children understand and use different language forms. The existing literature has demonstrated that, given the complexity of prosocial lies, children must incorporate cues in the environment to accurately interpret and use the language form. Past work on children's understanding and use of prosocial lies have focused on variations within the context, the relationship between the social actions, and consequences to a listener/speaker when reasoning about prosocial lies. However, children's ability to integrate contextual cues such as a listener's knowledge and a statement's content in the appreciation of prosocial lies remains largely unknown. Past work also demonstrates the importance of empathy in driving prosocial behaviour in general, and while there is some work examining the link between empathy and prosocial lies, the role of empathy in children's sensitivity to factors related to prosocial lying is also unknown.

Overall, my research investigates how contextual factors and individual differences influence how 8- to 11-year-old children interpret (Study 1) and endorse the use of (Study 2) prosocial lies. To examine how children's responses to prosocial lying shows similar or different patterns from adults, the same research paradigm is also used with an adult sample. In this thesis, two studies examine how contextual cues and individual characteristics are related to children's appreciation of prosocial lies (including how these factors relate to the understanding of speaker intent for lies, perception of the emotional impact of lies, and likelihood of telling a prosocial lie). Study 1 explores whether differences in listener knowledge (i.e., knowledgeable, ignorant) in a series of third-person communicative exchanges are associated with an observer's appreciation of speaker intent, and the perception of a listener/speaker's emotion after hearing/telling a prosocial lie. Of additional interest is how the content of the prosocial lies (e.g., opinion, reality) might lead to differences in speaker intent understanding, perceived emotional responses, and how listener knowledge interacted with the content of statements when interpreting a prosocial lie. For instance, is listener knowledge a more important factor when a lie involves a (false) statement about reality? Given the importance of empathy when inferring others' emotions, this individual characteristic is also explored in the context of children's understanding of speaker intent and listener/speaker's perceived emotional response to a prosocial lie.

Study 2 investigated how contextual cues impact an individual's endorsement of different types of statements in conversations. In this study, listener knowledge was manipulated in a series of stories involving two characters; participants were asked to identify as the speaker within the social interaction and were asked how likely they were to tell statements varying in veracity and content. Empathy was also measured and investigated further for its role in the endorsement of prosocial lying behaviour, as well as across the various contextual factors. These studies are described in detail in the sections that follow.

Prosocial lies present a dilemma between two contradictory socialization forces, honesty and avoiding harm to others. Given that negative outcomes can arise through either overuse of prosocial lies or misappropriate use (Talwar & Crossman, 2011), it is important to examine how children understand and endorse use of prosocial lies based on various factors. As noted above, Study 1 and Study 2 address novel questions within the literature, with both research aims contributing to a growing literature on children's reasoning about prosocial lies as a communicative strategy. In a broader sense, this work sheds light on the development of children's sensitivity to communicative cues when interacting with others and their understanding of how language influences others.

Chapter 2

Study 1 - Children and Adults' Perceptions of the Emotional Impact of Prosocial Lies

Introduction

Prosocial lies (or “white lies”) are untrue statements that are generally viewed as beneficial in that they can enhance the quality of social interactions by minimizing harm to others (Lippard, 1988). Prosocial lies are told to avoid social conflict, spare another’s feelings, and to be polite in situations where the blunt truth may be considered harmful (Backbier et al., 1997; DePaulo & Kashy, 1998; Sweetser, 1987). While positive outcomes may exist, there are criticisms about the ease with which society increasingly accepts lying within daily interactions (hooks, 2001). Indeed, this language form is used by children and adults frequently (Bussey, 1999; DePaulo & Jordan, 1982); within an experimental context, a third of children lied about liking an undesirable gift (Talwar et al., 2007), and work with adults suggests they tell a prosocial lie every 12 social interactions (DePaulo et al., 1996). Their prevalence is somewhat surprising given their complexity: prosocial lies present a conflict between proposed rules of communication (Gricean maxims), namely that speakers should be truthful (Maxim of Quality) *and* cordial (Meta-Maxim of General Cooperation) to their social partners (Grice, 1975). When evaluating the utility or impact of prosocial lies for a given social context, individuals must weigh the relative significance of the maxims.

In this study, we examine children and adults’ appreciation for speaker intent, and the emotional impact of prosocial lies for the recipient of the lie (listener) and the individual who told the lie (speaker). As well, we assess whether the interpretation of prosocial lies varies based on the listener’s awareness of the (negative) situation. As prosocial lies can be used to improve another’s feelings, we examined whether individual differences in empathy relates to the

perceived emotional impact of lies. To provide a foundation for understanding children's responses, we also examined performance within an adult population. This work contributes to a growing literature investigating how children navigate the paradox of prosocial lies, which pose a dilemma between honesty and protecting others (Talwar & Crossman, 2011).

Prosocial Lying

Children's understanding of lies starts at a young age, with shifts in their views from lies always being "wrong" to more nuanced perceptions (e.g., sometimes acceptable) continuing through into adolescence. At 3 years old, children identify a statement as a lie solely based on factuality, such that all incorrect statements are labelled as lies and are negative, even if the speaker is not aware of the truth (Strichartz & Burton, 1990). Children accurately identify antisocial lies (which are negative, self-serving in nature, destructive to social relationships; Bussey, 1999) before prosocial lies, which have a more positive interpretation and thus may be more socially acceptable (Bussey, 1999; DePaulo & Jordan, 1982; DePaulo et al., 1996). Although prosocial lies may provide more social benefit than antisocial lies, the degree to which they are more accepted varies depends on the lie's specific content—namely, whether the lie reflects objective reality (i.e., refers to negative event) or subjective opinion (i.e., speaker's judgement). The distinction in perceptions between lies about reality versus an opinion (i.e., content effect) is more pronounced for prosocial lies than antisocial lies, with children (7–11 years) and adults less likely to identify untrue statements about opinions (e.g., "These shoes are better") as being lies, and perceive them less negatively than lies about reality (e.g., "The chips are in that box") (Cheung et al., 2015).

With respect to the function of prosocial lies, at 4 years, children appreciate that lies can have positive social functions (e.g., protect others' feelings) and, at 7 years of age, they start to consider a speaker's intentions when evaluating whether a lie is socially appropriate (Broomfield

et al., 2002; Heyman et al., 2009; Talwar & Crossman, 2011). Children (5–11 years) understand that prosocial lies provide social benefits to listeners, including improving their affective state, and they are more likely to tell a lie when a listener is feeling sad and would benefit from prosocial language (Warneken & Orlins, 2015). There is also work examining what factors impact children's perceptions of a listener's emotions in a prosocial lying situation. Popliger and colleagues (2011) found that children who endorse telling lies were more likely to perceive listeners as feeling better after a lie (versus the truth), particularly in situations with a high personal cost (i.e., losing a gift). Although this shows that children appreciate that listeners feel better following a prosocial lie, little is known about other contextual factors that may affect children's perceptions of how much emotional benefit is accrued.

While telling a prosocial lie is often intended to improve the listener's feelings, it may also impact the *speaker's* emotions. On the one hand, a speaker may experience more positive affect if they feel they have said something to protect another person from negative feelings. On the other hand, they may feel worse because they have told a lie and were dishonest to their social partner. Although there is limited work examining a liar's emotions, researchers have theorized that children start to use prosocial lies because of the positive social functions to the speaker, including protecting the liar from consequences that may arise if they tell the truth (Talwar & Crossman, 2011; Talwar & Lee, 2002b). That is, children may be motivated to tell prosocial lies for self-serving purposes, which may lead to feeling positive emotions like relief (e.g., lying to someone saying they look okay for a photo to avoid negative reactions; Talwar & Lee, 2002b). While limited in nature, work by Heyman and colleagues (2009) found some evidence that 7-year-old children consider the impact of a lie on a speaker after they tell a prosocial lie in politeness situations, and further, Popliger and colleagues (2011) found that speakers were perceived to feel better if they told the truth rather than lying. Moreover, recent work by Preuter

and colleagues (2024) found that adults who report using both self-oriented and other-oriented lies also reported lower self-esteem and increased negative affect, compared to those who tell the truth. This association is yet to be studied in children. Mixed findings in the field highlight the need for additional research exploring how telling a prosocial lie may serve social functions for speakers, including impacting their affect.

While prosocial lies may impact the emotion of a speaker *and* a listener, perceptions of the degree of impact may depend on the social context. As well, there may be differences in individuals' perceptions of the emotional impact of lies, that vary by individual's own characteristics (discussed further below).

Contextual Factors. Social context, referring to the immediate social setting in which an interaction occurs, varies across several factors, including the relationship between two individuals, setting of the interaction, and content of a conversation. Such variations in context can affect how prosocial lies are perceived. For example, children (9–12 years) evaluated lying more positively when it benefitted in-group versus out-group peers (Sierksma et al., 2019). Thus, children appreciate the positive social functions of prosocial lies and recognize how this language form can enhance important relationships, such as those belonging to the same group. In addition, research investigating prosocial lies within different settings found that children (7–11 years) favoured prosocial lies over blunt truths in public situations (relative to private settings), where the truth may lead to negative social results for the listener (i.e., risk of losing face; Ma et al., 2011). This work also found that children favoured truths over lies in situations where accurate information would likely benefit the listener's future success (e.g., providing an opinion on a painting that will be submitted for a competition), versus situations with no such consequences.

Across various studies examining language interpretation, the knowledge state of the interlocutors has been highlighted. There are a few studies examining children and lying that have

manipulated listener knowledge. For instance, regarding the production of antisocial lies, Fu and colleagues (2012) found that young children (3–5 years) were more likely to tell a lie regarding a transgression when the listener was ignorant about the true state of affairs, showing that information regarding listener knowledge was integrated into their communicative decisions. Listener knowledge has also been studied with children's appreciation of speaker intent for lies, notably prosocial lies; Winner and Leekam (1991) showed that children (5–7 years) use a listener's knowledge when interpreting false statements, namely distinguishing between a speaker's intention to be mean (sarcasm) or nice (white lie). Specifically, when the children were asked which speaker was being nice, they selected the speaker who made a false statement to an ignorant listener, interpreting the speaker to be using a white lie. Extending this work, Sullivan and colleagues (1995) manipulated the *speaker's* assessment of what the listener knew to examine children's (5–8 years) ability to differentiate between sarcasm and lies. Children accurately identified a white lie (versus sarcasm) only when they correctly identified the listener's knowledge (from the speaker's perspective) as ignorant. Together this work demonstrates that young school-age children accurately appreciate a listener's knowledge (and a speaker's assessment of that knowledge) and use this to identify a statement as a prosocial lie from verbal irony.

Outside the studies noted above (Fu et al., 2012; Sullivan et al., 1995; Winner & Leekam, 1991), there is little work exploring the importance of listener knowledge for prosocial lying. However, studies examining other areas of language interpretation highlight children's sensitivity to, and use of, the knowledge of listeners. For instance, preschoolers use a speaker's knowledge to determine referential intent, such as choosing objects that are within, versus blocked from, the speaker's view (Nadig & Sedivy, 2002; Nilsen & Graham, 2009). Moreover, preschoolers (4 years) can identify when statements are ambiguous for a listener based on the listener's visual

perspective, even when their own knowledge disambiguates the statements (Nilsen & Graham, 2012). Studies on sarcasm demonstrate that children (7–10 years) and adults recognize that listeners require contextual knowledge to accurately detect sarcasm (Nilsen et al., 2011; Zajackowska et al., 2020). Results from this literature show that children and adults consider listener's knowledge when making interpretations about language. However, in the context of lies, beyond distinguishing the statements from verbal irony (i.e., Winner & Leekam, 1991; Sullivan et al., 1995), the impact of listener knowledge has not been empirically examined.

If the primary function of a lie is to deceive, in that prosocial lies are only appropriate to use when a listener is ignorant of the true state of affairs, it may be the case that both a listener and speaker would experience positive affect following a prosocial lie told when the listener is unaware of a situation, but negative affect when the listener is aware of the situation. Of course, it is possible that prosocial lies yield emotional benefit even when the deception is likely to be detected, given that prosocial lies have social functions (e.g., make a listener feel better; Backbier et al., 1997; DePaulo & Kashy, 1998; Sweetser, 1987), and it may be the case that children and adults do not perceive deception to be a prerequisite for such benefit. Addressing these possibilities, the present work examines how children and adults interpret a speaker's intent to tell a prosocial lie, and their perceptions of the emotional impact of prosocial lies for both conversational partners when a listener is ignorant or knowledgeable of the true state of affairs.

Individual Characteristics. In addition to the social context influencing how prosocial lies are interpreted, children's own characteristics may relate to their use and interpretation of lies. Indeed, studies have found connections between executive functioning and children's propensity to tell lies (e.g., Evans & Lee, 2013; Talwar & Lee, 2008; Williams et al., 2016), although there are mixed findings (e.g., Sai et al., 2018; Sai et al., 2021; Talwar et al., 2019). As well, past work has demonstrated that higher performance on measures assessing abilities related

to Theory of Mind (ToM; e.g., second-order ignorance task, second-order false belief task) is associated with higher lie usage (e.g., Lee & Imuta, 2021; Sai et al., 2021; Williams et al., 2016) and higher positive moral ratings for lies (Lim et al., 2019). Related to the domain of children's Theory of Mind abilities is empathy, which is an individual characteristic that may also account for variance in children's prosocial lying. As prosocial lies can be used to influence other's emotions, a child's level of empathy (ability to recognize/experience others' emotions) (Findlay et al., 2006), may be a key factor associated with their interpretation of prosocial lies. There is some work suggesting that ToM and empathy rely on similar neural networks associated with making inferences about others' mental states, although empathy requires the additional network involved in emotional processing (Völlm et al., 2006).

Empathy has both cognitive and affective components (Davis, 1994), wherein cognitive empathy involves understanding the reason underlying others' emotions, and affective empathy involves vicariously experiencing another's emotion. Empathy is important in children's social development, showing associations with prosocial behaviour (e.g., Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987). Batson (1998) posits that empathy increases an individual's desire to alleviate a social partner's emotional distress, and thus respond prosocially. That is, empathy motivates helping behaviours to benefit the well-being of others. Indeed, within an experimental setting, 3- to 6-year-old children's empathy was associated with more positive behaviours (sharing) and less non-prosocial behaviours (withholding resources) (Williams et al., 2014). Of interest is whether the relationship between empathy and prosocial behaviours extends to prosocial lies as well. Past work has found that cognitive empathy is associated with positive evaluation of prosocial lies: children (6–12 years) with higher cognitive empathy (versus lower) were more likely to evaluate prosocial lies as “good” (Lim et al., 2019). As suggested by these authors, greater empathy may increase children's awareness that prosocial lies elicit positive

emotional outcomes and that blunt truths may have negative emotional outcomes for the listener. However, this premise has yet to be examined empirically. Moreover, it may be that highly empathetic individuals show more sensitivity to how lie-tellers/recipients feel as contextual factors vary.

Study 1a—Child Sample

Addressing gaps in the literature and seeking to understand how contextual and individual factors influence children's interpretation of lies, we examined whether children understood speaker intent and rated listener and speaker emotions differently based on the listener's knowledge and the content of the lie (referring to reality or an opinion) or an interaction between these two factors. Moreover, we sought to explore whether children's self-rated empathy (cognitive and affective) was associated with the interpretation of speaker intent and the perceptions of the emotional impact of prosocial lies (and whether this varied by particular contexts).

Children in this study were 8–11-years-old, with this age range chosen as it is during this time when youth show a nuanced understanding of the positive social functions of prosocial lies, and can distinguish between reality and opinion (e.g., Broomfield et al., 2002; Cheung et al., 2015; Warneken & Orlins, 2015).

Participants heard/read vignettes involving two characters (listener, speaker) and a negative event (e.g., trampoline being not bouncy); in half the stories, the listener was unaware of the situation. The speaker then told either a prosocial lie or the truth (referring to reality or opinion), and participants answered questions about how they perceived the characters felt.

We anticipated that when listeners were ignorant (versus knowledgeable) of the negative event, children would perceive both characters (listener, speaker) as feeling better after a prosocial lie. We hypothesized that statement content (i.e., reflecting reality versus opinion)

would play a role in the knowledgeable condition, such that both characters would be rated as feeling worse when the prosocial lie refers to reality (versus opinion) when the true state of affairs is known by the listener. Further, we anticipated that higher levels of empathy would be associated with more positive emotions for both listeners/speakers following a prosocial lie, particularly in the ignorant condition.

Methods

Participants

Children 8–11 years old ($N = 80$; 32 boys, $M = 9.71$ years; $SD = 1.12$), were recruited from the Cognitive Development Lab database and the Children Helping Science website. The majority of parents reported English as their child's first language (90%). In an open-ended question, the most frequently reported ethnicities were within following categories: White ($n = 57$), Asian ($n = 16$), Middle Eastern ($n = 12$), Black ($n = 3$), First Nations ($n = 2$), Latin ($n = 2$) (missing values $n = 4$) (sum of n s are higher than sample due to multiple ethnicities reported). Parental education was high with 79% of mothers and 70% of fathers having at least a university degree.

Procedure

Parents/caregivers interested in their children participating in the study completed a survey with consent/demographic information and were asked to have their children complete an empathy questionnaire independently. A researcher then scheduled a 45-minute virtual meeting via Zoom where they obtained verbal assent from the child and administered the prosocial lying task, vocabulary measure, and ToM measure.

Measures

Prosocial Lying Task. Participants completed the prosocial lying task with a researcher. To evaluate how participants perceived the emotional outcome of prosocial lies, participants

viewed videos of eight scenarios involving two characters (gender-matched to the participant) and an interaction with an object, which then led to a negative occurrence with a toy that failed its function (e.g., a kite that doesn't fly, a glow-in-the-dark toy that doesn't glow, a trampoline that doesn't bounce, a pool toy that doesn't float, a movie that is not funny, a basketball that doesn't bounce, a remote control airplane that doesn't fly, a spinning top that doesn't spin).

Together, each of the eight stories reflected one of the conditions as per a $2(\text{truth, lie}) \times 2(\text{knowledgeable, ignorant}) \times 2(\text{reality, opinion})$ design, and was fully counterbalanced, such that all participants saw every vignette once, but in different conditions. All stories followed the same structure (see Appendix A), which first included an introduction and then information about the listener's knowledge as aware (knowledgeable) or unaware (ignorant) of the negative event. See Appendix B for an example of the ignorant condition. Following the knowledge manipulation, the speaker made a statement (truth, lie) about reality (referring directly to the negative event) or their opinion (a judgment that indirectly refers to the negative event). Reality truths were true negative statements about the negative event itself (e.g., "*This trampoline does not bounce*"); opinion truths were true negative statements about the speaker's opinion regarding the object involved in the negative event (e.g., "*I don't like this trampoline*"); reality lies were false positive statements about the negative event (e.g., "*This trampoline bounces*"); opinion lies were false positive statements about the speaker's opinion regarding the object involved in the negative event (e.g., "*I like this trampoline*").

Statements were voiced in a neutral intonation, using a blunt and factual tone of voice. As our aim was to assess how listener knowledge affected the perception of statements, speakers commented on an object belonging to the listener (that could be seen/not seen) rather than about the listener themselves (e.g., their appearance/performance), so that listener knowledge could be manipulated in a salient way.

Participants answered questions at specific times during the story. These included questions about the speaker's beliefs and intentions (to determine their understanding of the nature of the statement). As well, participants completed the emotion ratings for the speaker and listener both before and after each statement using a 5-point Likert scale depicted by emotion faces, with higher scores reflecting more negative affect (see Appendix B).

After the context was provided, but before the speaker's statement, participants rated:

1. *Listener's emotion (baseline)* assessed participants' perceptions of the listener's emotion before the speaker's statement (e.g., *How does Mike feel?*).
2. *Speaker's emotion (baseline)* assessed the participants' perceptions of the speaker's emotion before making a statement (e.g., *How does Dave feel?*).

Following the speaker's statement, participants indicated:

3. *Speaker belief*, a filter variable, assessed participants' interpretation of the speaker's beliefs with respect to the negative event (e.g., *When Dave said, "This trampoline bounces," did he actually think the trampoline bounces or does not bounce?*). Only responses (i.e., speaker intention and emotion ratings) that followed accurate speaker belief were retained for analyses.
4. *Speaker intention* assessed participants' interpretation of the speaker's intention to tell a lie or the truth about the negative event (e.g., *When Dave said, "This trampoline bounces," did he say a lie, the truth, or something else?*). This intention question was modeled after a concept classification question in previous work that looked at children's conceptual and moral evaluations of lying and truth-telling (e.g., Bussey, 1992; 1999; Peterson et al., 1983; Seigal & Peterson, 1998; Talwar & Lee, 2002a; 2008; Wimmer et al., 1984). Responses were examined as a measure of interest to allow for a better understanding of how participants perceive statements within the

different conditions. This variable was also used as a filter to ensure that emotion ratings were only analyzed if participants interpreted the speaker to believe that a negative event occurred *and* identified a speaker's intention to tell a lie/truth according to whether a statement was false/true (consistent with Glenwright & Pexman, 2010; Mewhort-Buist & Nilsen, 2019). Doing so ensures that the MLM models with emotion ratings only included responses in which the statements were interpreted as a lie/truth, which allows for conclusions made regarding how participants conceptualize prosocial lies and truthful statements specifically. This also allows for valid "nesting" in the hierarchical nature of the statistical analyses.

5. *Listener's emotion (response)* assessed the perceptions of how listeners felt after the statement (e.g., *After Dave said, "This trampoline bounces," how did Mike feel?*).
6. *Speaker's emotion (response)* assessed the perceptions of how speakers felt after their statement (e.g., *After Dave said, "This trampoline bounces," how did Dave feel?*).

Empathy Questionnaire. The Empathy Questionnaire for Children and Adolescents (EmQue-CA; Overgaauw et al., 2017), is a self-report measure containing 14 items on a 3-point Likert Scale. The present study used the Cognitive (e.g., *If a friend cries, I often understand what has happened*) and Affective Empathy (e.g., *If someone in my family is sad, I feel really bad*) subscales. The EmQue-CA has adequate convergent validity, concurrent validity, and internal consistency within each of the subscales (Cronbach's Alpha values from .70–.74). With the sample in the current study, the EmQue-CA cognitive and affective empathy subscales yielded reasonable reliability values of .75 and .66, respectively (Taber, 2018).

Receptive Vocabulary Measure. A vocabulary measure was included to be used as a control variable if it was found to relate to participants' responses on the prosocial lying task (given the language demands involved). Children's language skills were assessed using the

Receptive Vocabulary test from the Wechsler Individual Achievement Test-III (WIAT-III; Wechsler, 2009), where children were required to match correct pictures with words for a total summed score of 19.

Theory of Mind Measure. The prosocial lying task involves false belief understanding such that participants are required to infer the characters' emotions according to the listener's differing knowledge state. Because of the relationship between empathy and ToM (e.g., Völlm et al., 2006), and due to the children's age in this study, second-order false belief understanding was assessed for use as a potential control variable (i.e., if significant associations between this task and responses on the prosocial lying task were found). Using ToM as a control variable and controlling for overlapping variance of this measure allows us to isolate the unique contribution of affective empathy.

Children's second-order false belief reasoning was assessed using two stories from Coull and colleagues (2006) that were presented to participants in video format depicting puppet characters interacting with each other. To respond correctly on the task, participants had to recognize that one character has a false belief about another character's mental state by responding correctly to a false belief question (e.g., Where does Sally think Paul will look for the robot?) and justification question for each story (e.g., Why does Sally think Paul will look for the robot there?). Participant's accuracy of responses was combined to create a summed score of four.

Results

Preliminary Analyses

No variables violated normality assumptions based on Kline's criterion ($|\text{skew}| \leq 3$; $|\text{kurtosis}| \leq 10$; 1998), and there were no outliers ($> \pm 3\text{SD}$) in the prosocial lying task, nor were

there missing values. With respect to speaker belief, there were neither main effects nor interactions between any of the conditions ($ps > .091$). Refer to Appendix A for descriptives.

Analytical Strategy

Given the hierarchical nature of the data whereby speaker intent and emotion ratings (level 1) were nested within participants (level 2), Multilevel Modeling (MLM) approach was used to account for correlated participant error. Experimental variables were dummy coded as follows: statement type (0-truth, 1-lies), knowledge context (0-ignorant, 1-knowledgeable), and timing (0-pre statement, 1-post statement). Recall that participants were asked to rate the characters' perceived emotions both before and after the statement is made. Statement content (reality, opinion) was initially included in the models, but was removed from analyses because no main effects nor interactions with other predictors emerged ($ps > 0.07$). Each dependent variable was coded as follows: intent accuracy (0-inaccurate, 1-accurate) and emotion ratings (1-positive emotion, 5-negative emotion). The models were fit for each dependent variable using a backward stepwise approach, discussed in turn.

The analyses were deemed sufficiently powered to estimate unbiased regression coefficients, standard errors, and variance components, as there were more than 50 units at the participant level (Maas & Hox, 2005; Paccagnella, 2011). Additionally, the power of the analysis is enhanced by the fact that the model incorporates every individual time-specific data point from each of the 80 participants.

Model Set 1. We fit a set of two models to examine the effect of the task conditions (statement type, knowledge, timing), individual differences, as well as all interactions for each dependent variable (i.e., speaker intent, listener emotion, speaker emotion), for a total of nine models. The first exploratory model for each dependent variable included only main effects of the conditions and their interactions. To obtain the most parsimonious model, if the three-way

interaction term for each model did not reach the conventional threshold for statistical significance (i.e., $p < .05$), it was removed from the model and only two-way interaction terms were retained. Similarly, two-way interaction terms were removed if they did not reach the cut-off for statistical significance. Finally, if none of the interaction terms reached significance only main effects were retained in the final model.

To probe significant three-way interactions, we split the dataset into two sets on one of the conditions. To further unpack the resulting two-way interactions, we conducted post-hoc pairwise comparisons.

In addition to fixed effects, we also report the Intraclass Correlation Coefficient (*ICC*), which is an indicator of how strongly the observations within each participant are correlated with each other. It is also the proportion of total variance in the dependent variables that is due to observations within participants.

Model Set 2. A second set of MLM models were created to examine the association between individual differences and the conditions on speaker intent accuracy and the emotion ratings. The main individual difference of interest is cognitive/affective empathy.

However, before creating a final individual differences model, each covariate (i.e., gender, English first language, ToM, vocabulary, age [children only]) was individually analyzed for main effects and interactions within each condition for each DV. Covariates with significant main effects/interactions were included in the final individual difference model to ensure that the analyses were capturing for the unique contribution of cognitive/affective empathy. Non-significant covariates were excluded from further analyses. It is important to note that different covariates were significantly associated with each DV, and thus each individual difference model slightly varies in the covariates that are retained.

The final individual difference model included the condition main effects, significant covariates, cognitive/affective empathy, and all interactions. Refer to Appendix C (children) and D (adults) for results. Cognitive and affective empathy were analyzed separately. Significant three-way interactions with empathy were probed by examining the data separately by condition. Significant two-way interactions with empathy were explored with simple slopes analyses, collapsing across conditions when relevant.

Speaker Intent

The two-way interaction term did not reach the conventional threshold for statistical significance ($OR = 0.85, p > .05$), and was removed to analyse main effects. As shown in Table 1, there was a main effect of statement type suggesting that children were less likely to identify false statements as lies¹ versus true statements as truths. There was no main effect of knowledge context.

Empathy and Speaker Intent. To examine how cognitive/affective empathy are associated with the experimental conditions for children's speaker intent responses, we fit the data into models with the experimental conditions, empathy, and their interactions. When analyzing the covariates individually, results showed non-significant main effects and interactions ($ps > .714$), thus no covariates were included in the model.

For cognitive empathy, the model with the experimental conditions and cognitive empathy showed no three-way interactions ($OR = 0.82, p = .513$), two-way interactions (cognitive empathy and knowledge: $OR = 1.28, p = .092$, cognitive empathy and statement type: $OR = 0.92, p = .578$), nor main effect of cognitive empathy ($OR = 1.14, p = .138$).

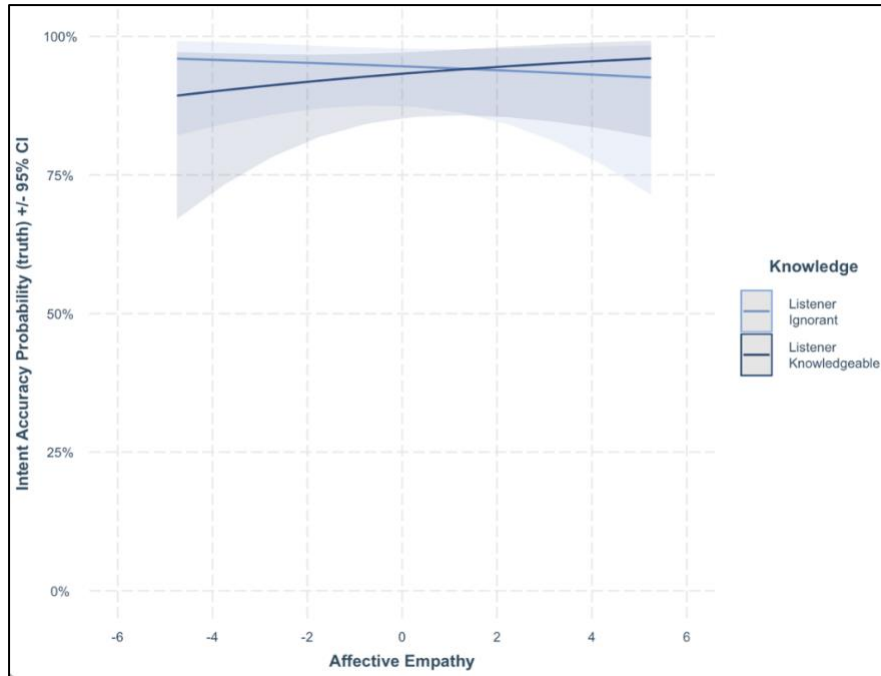
¹ For the sake of brevity, the term "lies" will be used throughout, though note that these would all be considered "prosocial lies" in this context.

Table 1

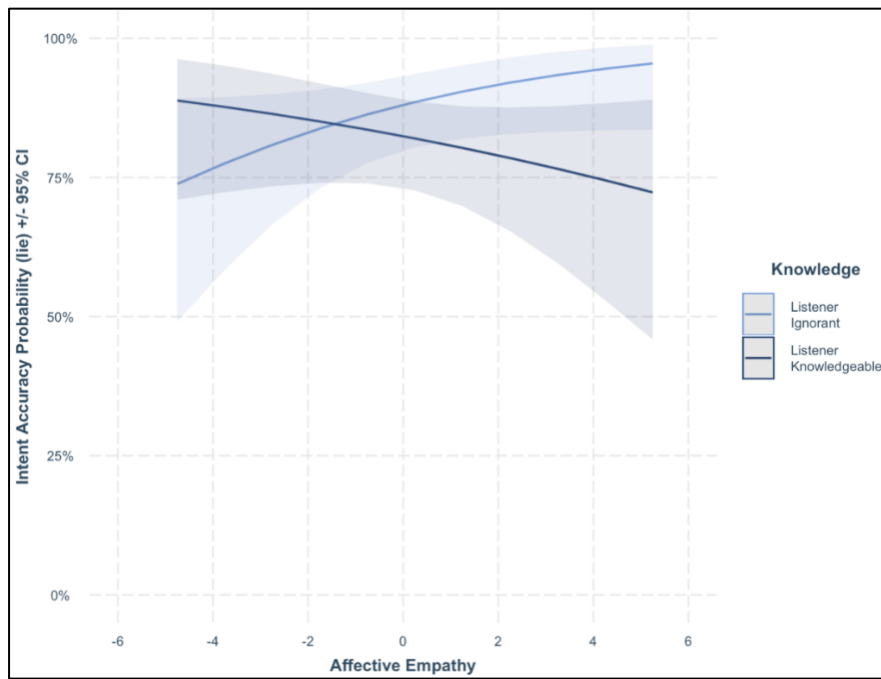
Children's intent accuracy and emotion ratings

Dependent Variable	Fixed Effects			
Speaker intent	Statement type + Listener knowledge			
	Predictors:	<i>OR</i>	95% CI	<i>p</i>
	(Intercept)	15.29	8.60 – 27.18	<.001
	Statement type (ST)	0.42	0.25 – 0.71	.001
	Listener knowledge (LK)	0.71	0.43 – 1.17	.179
	Random Effects:	<i>ICC</i> = .17		
Listener emotion	Statement type + Listener knowledge + Time + Interactions			
	Predictors	<i>B</i>	95% CI	<i>p</i>
	(Intercept)	1.94	1.76 – 2.12	<.001
	Statement type (ST)	0.25	-0.01 – -0.50	.056
	Listener knowledge (LK)	2.51	2.26 – 2.76	<.001
	Time (T)	2.54	2.29 – -2.79	<.001
	ST x LK	-0.34	-0.71 – 0.02	.063
	ST x T	-3.26	-3.62 – -2.91	<.001
	LK x T	-2.45	-2.81 – -2.10	<.001
	ST x LK x T	1.72	1.21 – 2.23	<.001
Random Effects:	<i>ICC</i> = .04 ²			
Speaker emotion	Statement type + Listener Knowledge + Time + Interactions			
	Predictors	<i>B</i>	95% CI	<i>p</i>
	(Intercept)	4.12	3.98 – 4.26	<.001
	Statement type (ST)	-0.05	-0.19 – 0.09	.465
	Listener knowledge (LK)	0.10	-0.09 – 0.11	.822
	Time (T)	-0.11	-0.24 – 0.03	.122
	ST x T	-0.28	-0.48 – -0.09	.004
Random Effects:	<i>ICC</i> = .34			

² Despite the low ICC in the listener emotion model, MLM analyses were conducted due to the clustered nature of the data within participants.



(a) Truths



(b) Prosocial Lies

Figure 1. Children's understanding of speaker intent as a function of affective empathy and knowledge condition for truths (a) and lies (b).

For affective empathy, the model included experimental conditions, affective empathy, and their interactions; it revealed a significant three-way interaction of affective empathy, statement type, and knowledge condition ($OR = 0.62$, 95% $CI [0.40, 0.95]$, $p = .028$). To better understand this interaction, we split the data on statement type such that truths and lies were examined separately (see Figure 1). For truthful statements, results showed no statistically significant interaction ($OR = 1.19$, $p = .318$) nor main effect with empathy ($OR = 0.79$, $p = .571$) to predict speaker intent responses (Figure 1a).

For prosocial lies, there was a significant two-way interaction between affective empathy and knowledge state ($OR = 0.73$, 95% $CI [0.56, 0.96]$, $p = .026$). Simple effects analyses showed that children with higher affective empathy (+1SD) were more likely to interpret false statements as lies when the listener was ignorant, versus when they were knowledgeable, $z = 2.40$, $p = .020$. This pattern did not emerge for children with low affective empathy (-1SD), $z = 0.65$, $p = .520$. (See Figure 1b). Overall, results suggest that children with higher affective empathy may be more sensitive to the fact that a lie is more likely to be used when a listener is unaware of the context.

Perceptions of Characters' Emotions

Listener Emotions. The model analyzing children's perceptions of character emotions included the experimental conditions and their interactions. There was a significant three-way interaction of statement type, listener knowledge, and timing (see Table 1). To probe this interaction, truths and lies were examined separately (see Figure 2).

For *truthful statements*, the model revealed a significant two-way interaction of listener knowledge and timing ($B = -2.45$, 95% $CI [-2.77, -2.13]$, $p < .001$). Post-hoc pairwise comparisons showed that children perceived ignorant listeners to feel worse after hearing the truth ($M = 4.47$, $SE = .08$) than before ($M = 1.94$, $SE = .08$), $t(232) = 22.15$, $p < .001$, but knowledgeable listeners as not feeling any differently (before: $M = 4.44$, $SE = .08$; after: $M =$

4.53, $SE = .08$; $t(232) = 22.15$, $t(232) = 0.72$, $p = .471$). Before the truth, ignorant listeners were rated as feeling more positive than knowledgeable listeners ($t(234) = -21.80$, $p < .001$), but after hearing the truth, there was no difference in children's perception of listeners' moods ($t(234) = -0.45$, $p = .657$).

For *prosocial lies*, the model revealed a significant two-way interaction of listener knowledge and timing ($B = -0.74$, 95% $CI [-1.14, -0.33]$, $p < .001$). Pairwise comparisons revealed that for both knowledge conditions, children perceived listeners to feel better *after* receiving a lie (knowledgeable: $M = 2.89$, $SE = .11$; ignorant: $M = 1.46$, $SE = .10$) versus *before* (knowledgeable: $M = 4.35$, $SE = .11$, $t(209) = -9.83$, $p < .001$; ignorant: $M = 2.19$, $SE = .10$, $t(209) = -5.13$, $p < .001$). Both before and after a lie, children perceived listeners to feel better if they were ignorant versus knowledgeable (before: $t(215) = -14.87$, $p < .001$; after: $t(215) = -9.82$, $p < .001$).

Overall, our findings demonstrate that children perceive listeners as feeling better after a prosocial lie (but not after the truth), even if they are knowledgeable about the negative event. Additionally, ignorant listeners who received a prosocial lie continued to be rated as having more positive emotions than those who are knowledgeable.

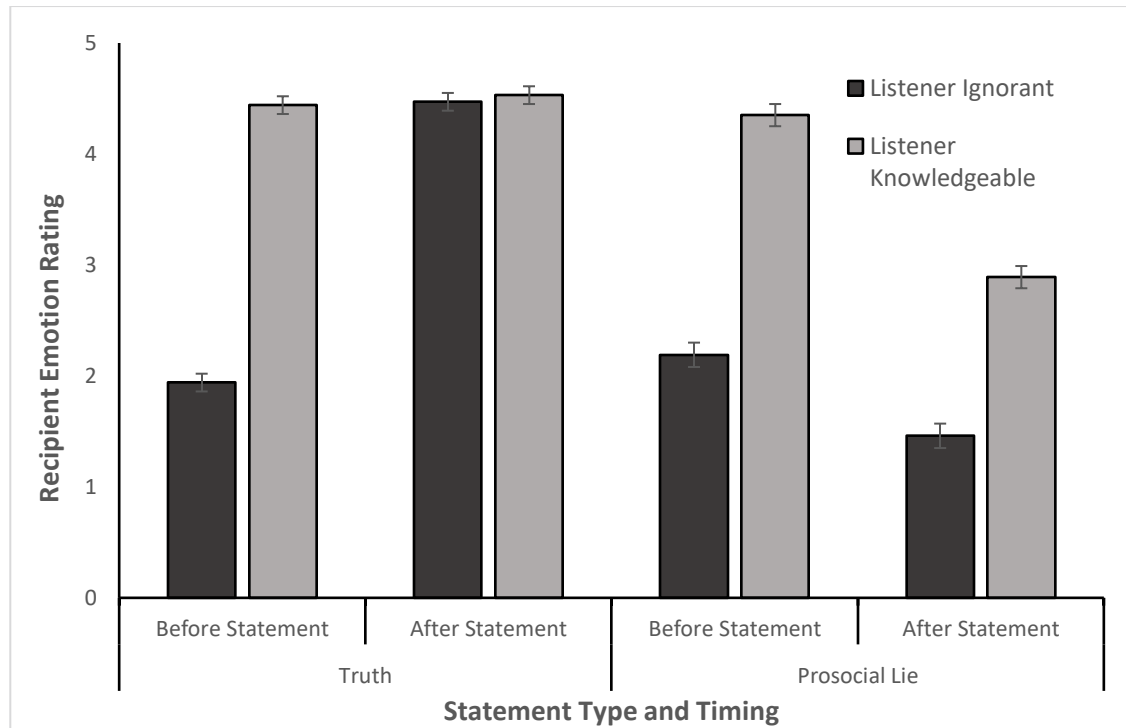


Figure 2. Children's listener emotion ratings as a function of knowledge and timing for truths and lies.

Note that higher ratings represent more negative the listener perceived emotion. Error bars represent 95% CIs for each condition.

Speaker Emotions. The model included all conditions and their interactions. The three-way interaction term was non-significant ($B = -0.09$, $p = .653$). The subsequent model (Table 1) revealed a significant two-way interaction of statement type and timing. Refer to Appendix E for a graphical depiction of these interactions.

To probe the interaction, post-hoc pairwise comparisons revealed that, unlike truthful statements (before: $M = 4.13$, $SE = .07$; after: $M = 4.02$, $SE = .07$), $t(516) = 1.55$, $p = .122$), children perceived speakers to feel significantly better after telling a prosocial lie ($M = 3.68$, $SE = .07$), compared to before ($M = 4.08$, $SE = .07$), $t(514) = -5.51$, $p < .001$). Moreover, unlike before the statements, $t(521) = 0.73$, $p = .465$, children perceived speakers to feel significantly better after telling a prosocial lie versus the truth, $t(519) = -4.78$, $p < .001$.

Taken together, children perceived both listeners and speakers as feeling better after a prosocial lie told following a negative event. Children consider the listener's knowledge when inferring listeners' (but not speakers') emotions following a prosocial lie.

Empathy and Characters' Emotions

Empathy and Listener Emotions. When analyzing the covariates, we found a significant two-way interaction of listener knowledge and vocabulary ($B = 0.13$, 95% $CI [0.05, 0.21]$, $p = .002$), such that children with a higher vocabulary score (+1 SD) rated knowledgeable listeners as feeling worse compared to ignorant, $b = 1.87$, $p < .001$, and the same was true for children with below average vocabulary scores (-1 SD), $b = 1.23$, $p < .001$, although the difference was less pronounced. As such, the vocabulary measure was included in subsequent models to account for variance explained by this variable. Analyses showed that the remaining covariates had non-significant main effects and interactions ($ps > .099$) thus were not included in the model.

We fit the models with the conditions, vocabulary, cognitive/affective empathy, and their interactions. For ***cognitive empathy***, there was no significant four-way interaction ($B = -0.23$, $p = .146$), three-way interactions (timing by knowledge: $B = -0.08$, $p = .291$, knowledge by statement type: $B = -0.10$, $p = .210$, timing by statement type: $B = -0.06$, $p = .419$), two-way interactions (timing: $B = -0.04$, $p = .270$, statement type: $B = 0.00$, $p = .970$, knowledge: $B = -0.02$, $p = .627$), nor main effects ($B = -0.02$, $p = .505$). For ***affective empathy***, there was no significant four-way interaction ($B = -0.03$, $p = .800$), three-way interactions (timing by knowledge: $B = 0.01$, $p = .814$, knowledge by statement type: $B = -0.06$, $p = .263$, timing by statement type: $B = -0.04$, $p = .467$), two-way interactions (timing: $B = -0.01$, $p = .778$, statement type: $B = 0.02$, $p = .400$, knowledge: $B = -0.03$, $p = .270$), nor main effects ($B = -0.01$, $p = .475$). This suggests that empathy does not relate to children's perceptions of a listener's emotions when there is a prosocial lie.

Empathy and Speaker Emotions. When individually examining the covariates for interactions with the conditions, we found a significant two-way interaction of listener knowledge and English first language ($B = -0.38$, 95% $CI [-0.76, 0.00]$, $p = .050$) whereby children whose first language was not English were significantly more likely to perceive speakers to feel better when the listener was ignorant ($M = 3.86$, $SE = 0.21$), versus knowledgeable ($M = 4.23$, $SE = 0.22$), $t(532) = -1.98$, $p = .048$. Thus, the English first language variable was included in subsequent models to account for variance explained by this variable. Analyses showed that the remaining covariates had non-significant main effects and interactions ($ps > .060$) thus were not included in the model.

The models included the conditions, English first language variable, cognitive/affective empathy, and their interactions. For *cognitive empathy*, there was no significant four-way ($B = -0.16$, $p = .167$) nor were there three-way interactions (timing by statement type: $B = -0.02$, $p = .760$, statement type by knowledge: $B = 0.07$, $p = .210$, timing by knowledge: $B = 0.01$, $p = .926$). Cognitive empathy was found to neither significantly interact with timing ($B = -0.05$, $p = .086$) nor statement type ($B = 0.01$, $p = .772$). There was a significant two-way interaction of the knowledge condition and cognitive empathy ($B = -0.07$, 95% $CI [-0.13, -0.02]$, $p = .013$), showing that children with lower cognitive empathy ($-1\ SD$) perceived speakers to feel worse when the listener was knowledgeable versus ignorant ($t = 1.97$, $p = .05$); this pattern was not seen for children with higher ($+1\ SD$) cognitive empathy ($t = 1.50$, $p = .14$). See Figure 3.

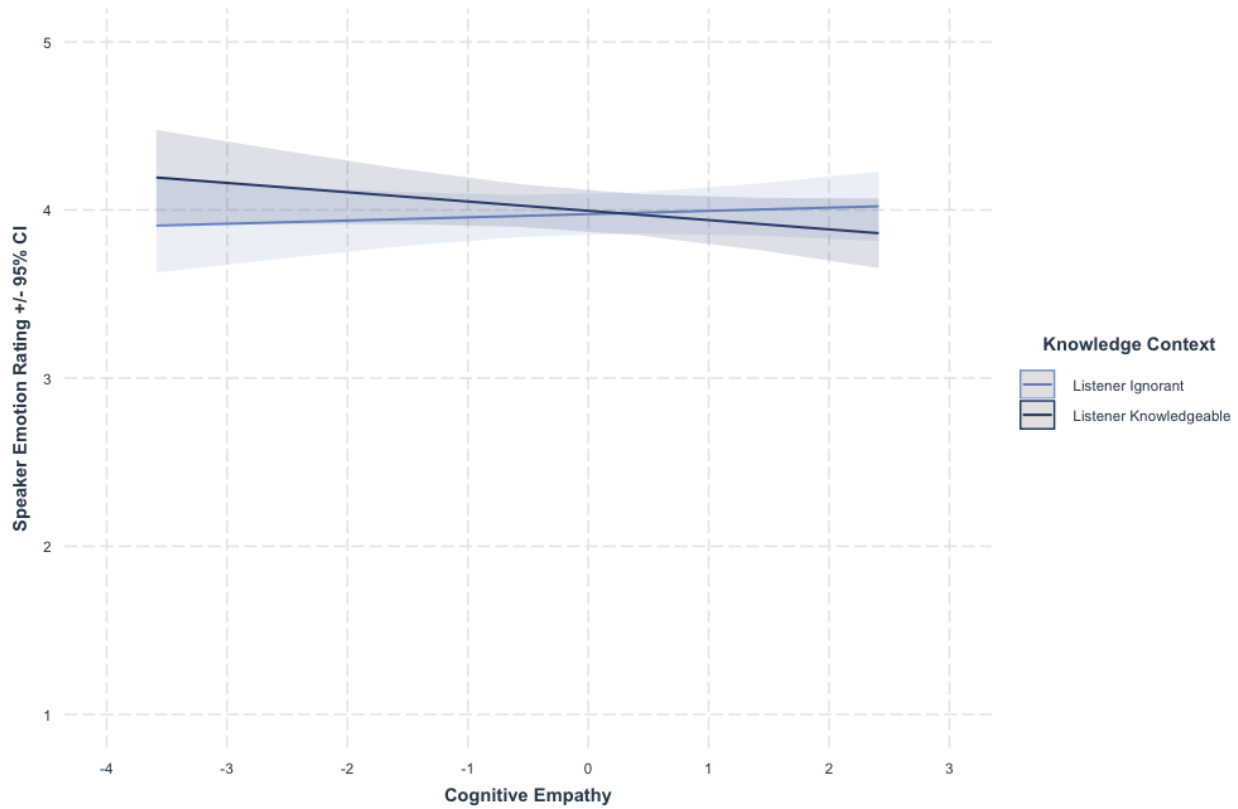


Figure 3. Children’s perceived speaker emotion ratings as a function of cognitive empathy and knowledge context for prosocial lies.

Note that higher ratings represent more negative the speaker perceived emotion. Error bars represent 95% CIs for each condition.

For *affective empathy*, there were no significant four-way interaction ($B = 0.03, p = .712$), three-way interactions (timing by statement type: $B = 0.01, p = .893$, statement type by knowledge: $B = -0.02, p = .568$, timing by knowledge: $B = 0.04, p = .279$), two-way interactions (timing: $B = 0.01, p = .575$, statement type: $B = -0.03, p = .169$, knowledge: $B = -0.03, p = .205$), nor main effects ($B = -0.01, p = .661$).

Taken together, results generally suggest that empathy is not related to children’s ratings of a listener’s emotions after a prosocial lie, although there are some associations with perceived speaker emotions.

Study 1b—Adult Sample

Although our focus was on children's responses, we also examined these questions in a sample of young adults to understand how patterns within this age range related to patterns at later stages in development.

Overall, it was anticipated that children and adults would perform similarly, reflecting sensitivity to the nuances of prosocial lying, but that patterns would be more pronounced for the adult sample due to more experience with integrating multiple cues when interpreting language.

Methods

Participants

Undergraduate students ($N = 192$; 32 men, $M = 20.90$ years; $SD = 6.00$) were recruited from a university online undergraduate recruitment system. The majority of participants reported English as their first language (66%). Out of provided options, participants reported their ethnic backgrounds as: Asian ($n = 97$), White ($n = 67$), Middle Eastern ($n = 8$), Black ($n = 7$), Latin ($n = 6$), Mixed ($n = 4$), Other ($n = 3$) (missing values $n = 2$).

Procedure

Undergraduate participants signed up for the study on a university participation system and were sent a Qualtrics survey link to complete the study before a scheduled deadline. The survey took approximately 30 minutes to complete, and consisted of a prosocial lying task, vocabulary measure, ToM measure, and empathy questionnaire.

Measures

Prosocial Lying Task. Adults completed the same prosocial lying task that was given to children in Study 1a, although participants completed the task independently without a researcher. As such, modifications were made to ensure the quality of the data. For instance, a response request prompt appeared when the participant chose to advance to the next page and did not respond to one of the questions, stating "Response Requested: There is 1 unanswered

question on this page. Would you like to continue?” At this prompt, participants were given the choice to “Continue Without Answering” or “Answer the Question.” As well, the arrow to advance to the next page appeared after a delay that was equivalent to the length of the videos to ensure that participants were taking time to watch the video and read the vignette.

Empathy Questionnaire. Adult’s self-reported empathy was assessed using the Basic Empathy Scale (BES; Carré et al., 2013; Jolliffe & Farrington, 2006), a 20-item self-report questionnaire rated in 5-point Likert scale with Cognitive (e.g., I have trouble figuring out when my friends are happy) and Affective Empathy (e.g., My friend’s unhappiness doesn’t make me feel anything) subscales. The BES has demonstrated good psychometric properties, including construct validity, convergent validity, and discriminant validity (Carré et al., 2013; D’Ambrosio et al., 2009). In the current sample, the reliabilities of Cognitive and Affective Empathy were .88 and .85, respectively.

Receptive Vocabulary Measure. Adults’ language skills were assessed using the vocabulary subscale of the Shipley Institute of Living Scale (Shipley, 1940). This measure has sufficient psychometric properties, with a reliability of .87. In this task, participants read a target word and then select the most synonymous of the four other words. There were 40 items in total.

Theory of Mind Measure. Participants’ second-order false belief understanding was assessed using a modified (i.e., shortened) version of the Embedded False Belief test (Rutherford, 2004) in which participants listened to and read four stories that involved embedded false beliefs (i.e., one character has a false belief about another character’s beliefs). After each story, participants saw two statements on the computer screen and were asked to choose the correct one according to what happened in the story. The statement pairs assessing second-order false belief reasoning required participants to understand character’s mental states (e.g., “Father thinks that the children think the chocolate is on the counter.”). Our modified version only included

statement pairs involving the understanding of second-order false belief. Participant's accuracy of responses on the second-order false belief questions were combined for a possible score of five.

Results

Preliminary Analyses

No variables violated Kline's criterion for normality assumptions (1998), and outliers (ToM, $n = 2$; vocabulary, $n = 4$; cognitive empathy, $n = 1$; affective empathy, $n = 1$) were Winsorized for subsequent analyses. Missing data values (ToM, $n = 3$; vocabulary, $n = 19$; 0.17% of total data) were imputed using single imputation (Eekhout et al., 2014). Consistent with past studies, participants better understood speaker belief for truths than prosocial lies. There was no significant effect of knowledge, statement content, nor their interactions on the interpretation of speaker belief ($ps > .075$).

We examined the total completion time via Qualtrics in relation to accuracy on the prosocial lying task (belief and intent variables). No participants took less than 15 minutes to complete the study. Participants who completed the study quickly ($< 2SD$) did not show significant differences in belief and intent responses compared to participants who took longer to complete the task. Thus, study completion time was not considered for excluding participants.

Speaker Intent

As shown in Table 2, the model with the conditions and their interactions revealed a significant interaction of statement type by knowledge. As depicted in Figure 4, post-hoc pairwise comparisons showed that for both listener knowledge conditions, participants were more likely to interpret true statements as truths (knowledgeable: $M = .96$, $SE = .01$; ignorant: $M = .94$, $SE = .01$) than false statements as lies (knowledgeable: $M = .74$, $SE = 0.03$, $z = 7.97$, $p < .001$; ignorant: $M = .85$, $SE = .02$, $z = 4.15$, $p < .001$). Participants were more likely to interpret false statements as lies when the listener was ignorant than knowledgeable ($z = 3.59$, $p < .001$).

Table 2

Adults' understanding of speaker intent and emotion ratings

Dependent Variable	Fixed Effects			
Speaker intent	Statement type + Listener knowledge + Interaction			
	Predictors:	<i>OR</i>	<i>95% CI</i>	<i>p</i>
	(Intercept)	15.90	10.12 – 24.97	<.001
	Statement type (ST)	0.36	0.22 – 0.58	<.001
	Listener knowledge (LK)	1.60	0.88 – 2.90	.121
	ST x LK	0.30	0.15 – 0.62	.001
	Random Effects: <i>ICC</i> = .28			
	Statement type + Listener knowledge + Time + Interactions			
	Predictors	<i>B</i>	<i>95% CI</i>	<i>p</i>
Listener emotion	(Intercept)	2.10	1.98 – 2.21	<.001
	Statement type (ST)	-0.14	-0.30 – 0.03	.100
	Listener knowledge (LK)	2.26	2.10 – 2.41	<.001
	Time (T)	2.34	2.18 – 2.49	<.001
	ST x LK	0.17	-0.06 – 0.40	.145
	ST x T	-2.79	-3.02 – -2.56	<.001
	LK x T	-2.10	-2.33 – -1.88	<.001
	ST x LK x T	1.46	1.13 – -1.78	<.001
	Random Effects: <i>ICC</i> = .09			
Speaker emotion	Statement type + Listener knowledge + Time + Interactions			
	Predictors	<i>B</i>	<i>95% CI</i>	<i>p</i>
	(Intercept)	3.95	3.84 – 4.07	<.001
	Statement type (ST)	0.05	0.08 – 0.18	.487
	Listener knowledge (LK)	0.12	-0.01 – 0.24	.068
	Time (T)	0.05	-0.07 – 0.18	.418
	ST x LK	0.00	-0.19 – 0.18	.987
	ST x T	-0.53	-0.71 – -0.35	<.001
	LK x T	-0.05	-0.23 – 0.13	.565
	ST x LK x T	-0.28	-0.54 – -0.02	.032
	Random Effects: <i>ICC</i> = .37			

However, this effect was not seen for truths ($z = 1.55, p = .121$).

Adults are better able to interpret speaker intent for truths than lies. Moreover, they use listener knowledge to interpret speaker intent for lies, such that they are more likely to identify a false statement as a lie when a listener is ignorant. Listener knowledge was not used to interpret a speaker's intention to tell a truthful statement.

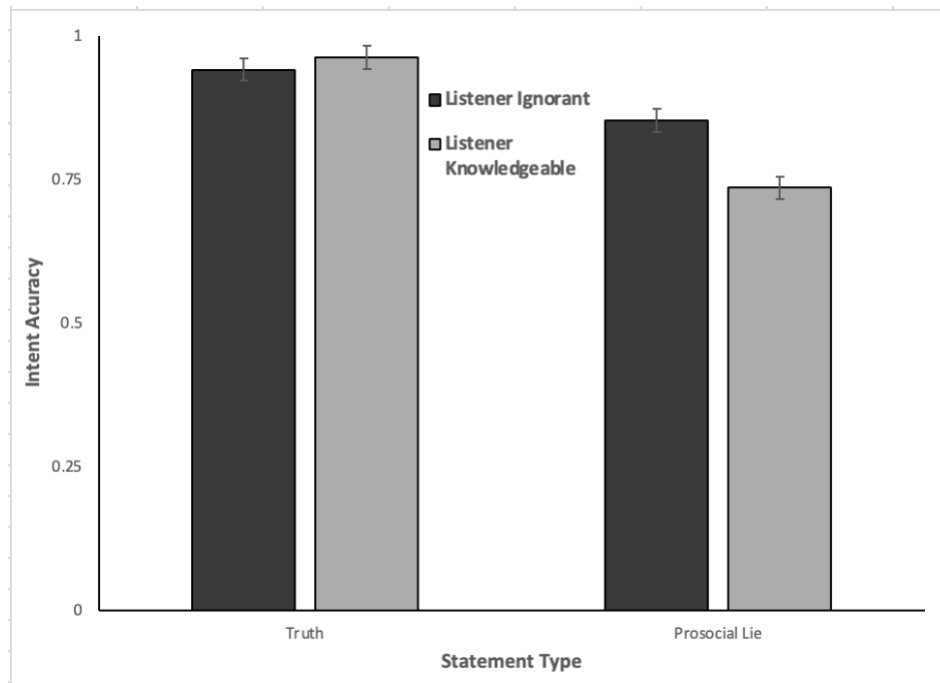


Figure 4. Adults' intent responses as a function of statement type and listener knowledge condition.

Error bars represent 95% CI for each condition.

Empathy and Speaker Intention. We fit the data in a model with the conditions, cognitive/affective empathy, and their interactions. When analyzing the covariates individually, we found a significant two-way interaction of statement type and gender ($OR = 0.38, 95\% [0.16, 0.90], p = .027$), demonstrating that men and women better understand speaker intent for truths than lies, although this difference is greater for women. In addition, there was significant two-way interaction of statement type and ToM ($OR = 0.64, 95\% [0.46, 0.88], p = .006$), revealing

that higher ToM was associated with lower intent responses for lies and higher intent responses for truths. As such, gender and ToM were included in the following models.

For cognitive empathy, results showed no three-way interactions ($OR = 0.98, p = .818$), two-way interactions (knowledge: $OR = 1.01, p = .854$, statement type: $OR = 0.98, p = .475$), nor main effects ($OR = 1.02, p = .378$). For affective empathy, results showed no three-way interactions ($OR = 0.96, p = .445$), two-way interactions (knowledge: $OR = 0.98, p = .395$, statement type: $OR = 1.02, p = .533$), nor main effects ($OR = 1.00, p = .904$). This suggests that neither cognitive nor affective empathy impacts adults' understanding of speaker intention for prosocial lies.

Perceptions of Characters' Emotions

Listener Emotions. The model with the experimental conditions and their interactions revealed a significant three-way interaction of statement type, knowledge state, and time (Table 2). Truths and lies were explored separately and depicted in Figure 5.

For *truthful statements*, there was a two-way interaction of listener knowledge and timing ($B = -2.10, 95\% CI [-2.31, -1.89], p < .001$). Post-hoc pairwise comparisons showed that for both knowledge contexts, adults rated listeners as feeling worse *after* receiving a truthful statement (knowledgeable: $M = 4.59, SE = .05$; ignorant: $M = 4.43, SE = .06$) versus *before* the statement was made (knowledgeable: $M = 4.35, SE = .05, t(547) = 3.09, p = .002$; ignorant: $M = 2.10, SE = .06, t(547) = 30.54, p < .001$). Further, adults rated listeners as feeling significantly worse when knowledgeable (versus ignorant) both before ($t(553) = 29.62, p < .001$) and after ($t(553) = 1.99, p = .046$) the truthful statement.

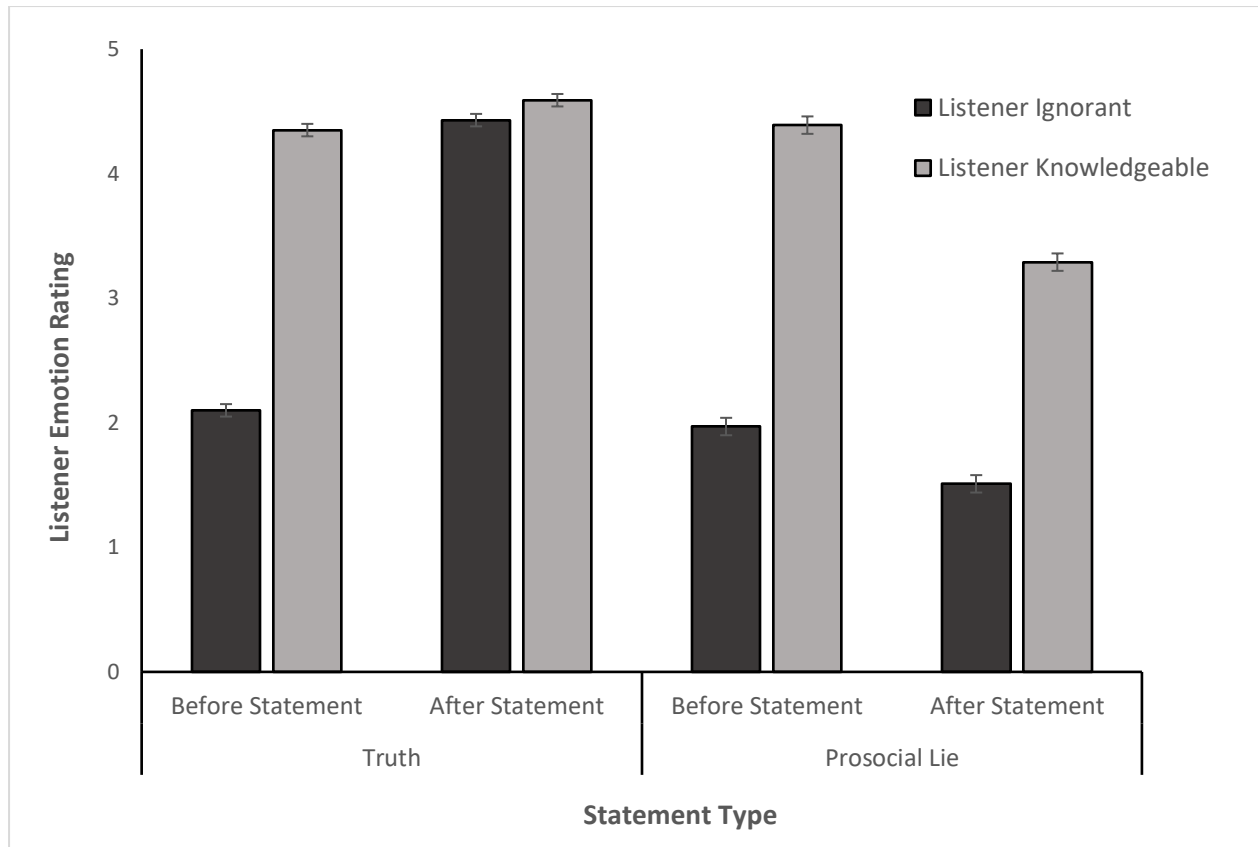


Figure 5. Adults' listener emotion ratings as a function of statement type, listener knowledge, and timing.

Note that the higher the rating, the more negative the listener's perceived emotion. Error bars represent 95% CI for each condition.

For *prosocial lies*, there was a two-way interaction of listener knowledge and timing ($B = -0.64$, 95% CI $[-0.89, -0.39]$, $p < .001$). Post-hoc pairwise comparisons showed that adults perceived both knowledgeable and ignorant listeners to feel significantly better after hearing a lie (knowledgeable: $M = 3.29$, $SE = .07$; ignorant: $M = 1.51$, $SE = .07$) than before (knowledgeable: $M = 4.39$, $SE = .070$, $t(472) = -11.95$, $p < .001$, ignorant: $M = 1.97$, $SE = .07$, $t(472) = -5.17$, $p < .001$). Moreover, both before and after the lie, adults rated listeners to feel better when they were ignorant, versus knowledgeable (pre: $t(494) = -26.73$, $p < .001$; post: $t(494) = -19.63$, $p < .001$).

In sum, adults perceive listeners to feel worse after hearing the truth and better after hearing a prosocial lie, across both knowledge conditions. Further, adults perceive that after a

prosocial lie, listeners who were unaware of the context would feel better than those who were aware of the negative context.

Speaker Emotions. Results from the model with conditions showed a three-way interaction of statement type, listener knowledge, and timing (see Table 2). To better understand this interaction, truths and lies were analyzed separately.

For *truthful statements*, the model did not reveal a significant two-way interaction ($B = -0.05, p = .491$). There was, however, a main effect of knowledge type such that across timing, speakers were rated to feel worse when telling the truth to knowledgeable listeners (versus ignorant), $B = .09, 95\% CI [0.01, 0.16], p = .020$.

For *prosocial lies*, the model revealed a two-way interaction of listener knowledge and timing ($B = -0.34, 95\% CI [-0.54, -0.13], p = .002$). See Figure 6. Post-hoc pairwise comparisons showed that for both knowledge conditions, speakers were rated as feeling significantly better after telling a lie (knowledgeable: $M = 3.30, SE = .07$; ignorant: $M = 3.53, SE = .07$) than before (knowledgeable: $M = 4.11, SE = .07, t(469) = -10.64, p < .001$; ignorant: $M = 4.01, SE = .07, t(469) = -6.51, p < .001$). Also, after telling a lie, speakers were rated to feel significantly better in the listener knowledgeable conditions, versus ignorant ($t(486) = -3.09, p = .002$), but not before ($t(486) = -1.35, p = .177$).

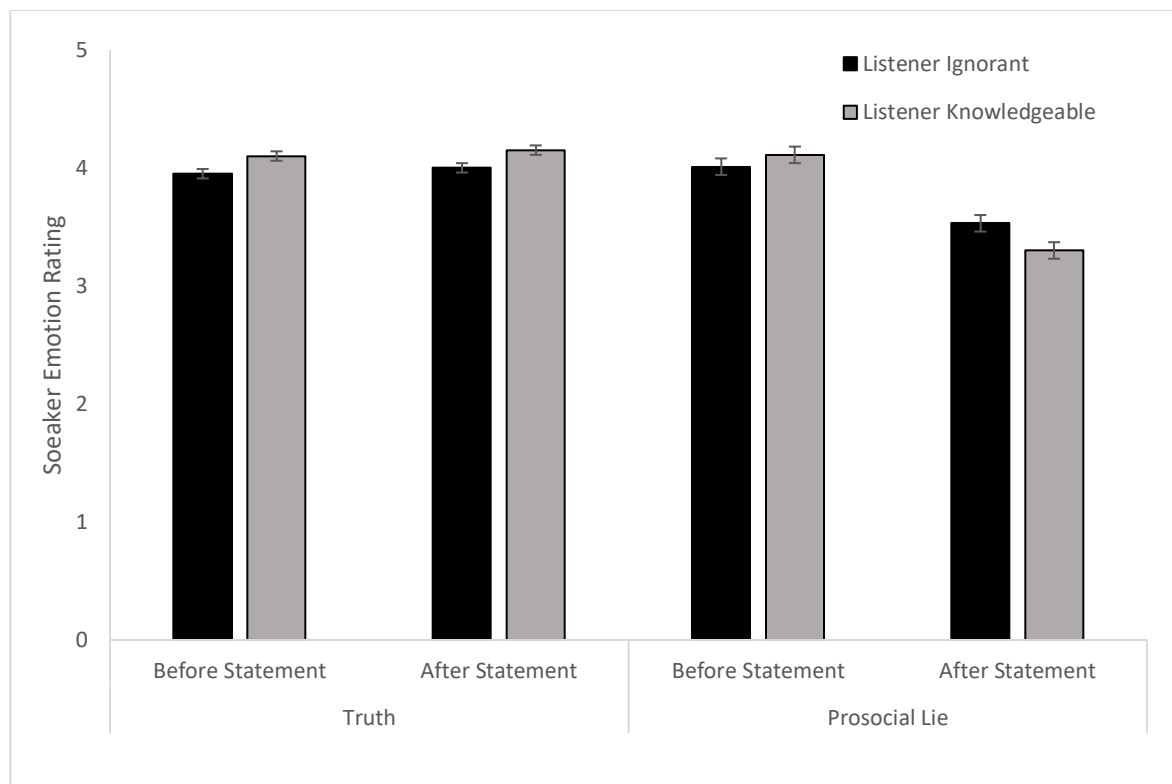


Figure 6. Adults' speaker emotion ratings as a function of listener knowledge and timing for truths (a) and lies (b).

Note that the higher the rating, the more negative the speaker's perceived emotion. Error bars represent 95% CI for each condition.

Thus, adults see listener knowledge as being important for how a speaker feels after generating a prosocial lie, but not after telling the truth. Speakers are reported to feel better after telling a lie when the listener is aware of the context.

Summarizing across emotion ratings, adults perceive listeners and speakers to feel better after a prosocial lie for both knowledge conditions. There appears to be a social benefit for a prosocial lie even when the listener was aware of the context, and thus, potentially aware that the statement was not true. Interestingly, adults perceive that after a lie, a listener feels significantly better in the knowledgeable condition and a speaker feels worse (versus when a listener is ignorant).

Empathy and Characters' Emotions.

Empathy and Listener Emotions. When analyzing the covariates individually, we found that there were two two-way interactions: listener knowledge and ToM ($B = 0.23$, 95% CI [0.10, 0.35], $p < .001$), listener knowledge and vocabulary ($B = 0.04$, 95% CI [0.01, 0.06], $p = .012$); this shows that higher ToM and vocabulary scores were related to more negative emotion ratings within the knowledgeable condition. As such, ToM and vocabulary were included in the models to control for variance accounted for by these covariates.

Cognitive Empathy. The model included ToM, vocabulary, all experimental conditions, cognitive empathy, and interactions. It revealed a marginally significant four-way interaction of cognitive empathy, statement type, knowledge, and timing ($B = 0.06$, 95% CI [0.00, 0.13], $p = .058$). To better understand this interaction, truths and lies were analyzed separately.

For **truthful statements**, there was a three-way interaction of cognitive empathy, listener knowledge, and timing ($B = -0.10$, 95% CI [-0.14, -0.05], $p < .001$). The pre- and post-statement emotion ratings were analyzed separately. As the pre-statement emotion ratings are less relevant to addressing the research questions, they are not reported. After a truthful statement, there was no significant two-way interaction of cognitive empathy and listener knowledge ($B = 0.00$, $p = .782$), although there was a significant main effect of cognitive empathy on listener emotion ratings ($B = 0.02$, 95% CI [0.01, 0.04], $p = .001$). This suggests that highly empathetic adults perceive listeners to feel worse after hearing a truthful statement about a negative event (versus those with lower levels of empathy).

For **prosocial lies**, there was no significant three-way interaction with the conditions ($B = -0.03$, $p = .233$). When this term was removed from the model, there was a non-significant two-way interaction of timing and cognitive empathy ($B = 0.00$, $p = .753$) and a significant two-way interaction of knowledge context and cognitive empathy ($B = 0.04$, 95% CI [0.02, 0.07], $p = .001$). Simple slopes analyses showed that higher cognitive empathy (+1 SD) was related to

knowledgeable listeners feeling worse after a prosocial lie, $b = 2.31, p < .001$, versus lower cognitive empathy ($-1\ SD$), $b = 1.90, p < .001$.

Thus, these results suggests that higher cognitive empathy is associated with more negative perceived listener emotion after both types of statements (versus lower in cognitive empathy), and importantly, cognitive empathy supported adults' sensitivity to listener knowledge such that knowledgeable listeners were perceived as feeling worse after a prosocial lie.

Affective Empathy. To examine the relation of affective empathy and listener's perceived emotion, we fit a model with ToM, vocabulary, the conditions, affective empathy, and their interactions. The four-way interaction model showed a non-significant interaction ($B = 0.04, p = .107$) and when removed from the model, there were two non-significant three-way interactions of affective empathy, knowledge context, and statement type ($B = 0.02, p = .184$), and affective empathy, timing, and statement type ($B = -0.02, p = .113$). There was also a significant three-way interaction with affective empathy, statement type, and timing ($B = -0.04, 95\% CI [-0.07, -0.02], p = .002$). This interaction was probed by examining truths and lies separately.

For *truthful* statements, there was a marginally significant two-way interaction of timing and cognitive empathy ($B = 0.02, 95\% CI [-0.00, 0.05], p = .058$). Simple slopes analyses showed that at all levels of affective empathy, adults are more likely to perceive listeners as feeling worse after a truthful statement, versus before ($-1\ SD: t = 9.83, p < .001$; $+1\ SD: t = 12.52, p < .001$).

For *prosocial lies*, there was no significant two-way interaction of timing and cognitive empathy ($B = 0.00, p = .795$) nor main effect ($B = 0.00, p = .994$).

Overall, it was found that adults with higher cognitive and affective empathy perceive listeners to feel worse after a truthful statement and a lie.

Empathy and Speaker Emotions. When analyzing the covariates individually, we found that there was a two-way interaction with timing and ToM ($B = -0.08, 95\% CI [-0.15, -0.02], p =$

.017), showing that higher ToM was related to speakers perceived as feeling better after making a statement. As such, ToM was included in the following models to control for variance accounted for by the covariate.

For *cognitive empathy*, the model with ToM, the conditions, cognitive empathy, and the interactions showed a non-significant four-way interaction ($B = 0.00, p = .926$), three-way interactions (timing by statement type: $B = 0.01, p = .435$, statement type by knowledge: $B = -0.01, p = .321$, timing by knowledge: $B = 0.01, p = .616$), and two-way interactions (timing: $B = 0.00, p = .687$, statement type: $B = -0.01, p = .218$, knowledge: $B = -0.01, p = .354$). The main effects model revealed a significant main effect of cognitive empathy ($B = 0.03, 95\% CI [0.02, 0.05], p < .001$), demonstrating that higher cognitive empathy was associated with worse perceived speaker emotion.

For *affective empathy*, the model with ToM, conditions, affective empathy, and the interactions showed non-significant four-way ($B = -0.01, p = .720$) and three-way interactions (timing by statement type: $B = 0.00, p = .844$, statement type by knowledge: $B = -0.01, p = .265$, timing by knowledge: $B = 0.01, p = .160$). When these interaction terms were removed, the model revealed non-significant interactions with timing ($B = -0.01, p = .140$) and statement type ($B = 0.00, p = .484$), and a significant two-way interaction of affective empathy and knowledge condition ($B = -0.01, 95\% CI [-0.02, -0.00], p = .043$). Further, we found those with low affective empathy ($-1 SD$) perceive speakers as feeling significantly worse when the listener is knowledgeable, versus ignorant ($t = 1.93, p = .05$), whereas those with higher affective empathy ($+1 SD$) did not show this pattern ($t = -0.93, p = .35$).

Thus, when considering speaker's emotions, adults' empathy showed different patterns such that high *cognitive empathy*, but low *affective empathy* was related to the perception of more negative speaker emotion.

Overall, when considering how adults' cognitive and affective empathy relates to the perceived emotional impact following statements, it appears that high cognitive empathy is associated with the perception of more negative emotion (for both social partners), and higher affective empathy is associated with the perception of more negative emotion for a listener, but not a speaker. Empathy is also related to knowledge context in that adults with higher empathy perceived knowledgeable listeners to feel worse after a lie than ignorant listeners.

Summary of Results

Together, both children and adults were more likely to interpret true statements as truths, than false statements as lies, across knowledge conditions (See Tables 1 and 2). However, for adults, but not children, listener knowledge affected their interpretation of speaker intention for false statements, such that they were more likely to identify them as lies when the listener was ignorant.

With respect to the perceptions of listener's emotions, both children and adults perceived listeners as feeling better after a prosocial lie, even if they were knowledgeable about the negative event. In contrast, after hearing the truth, listeners were rated as feeling worse, but, for children, only if they were previously unaware of the situation. Following a lie, both groups indicated that unaware listeners would feel better than listeners who were knowledgeable of the context (but it does not seem that the gain was greater than that of knowledgeable listeners).

When making judgements about a speaker's emotions, both children and adults rated speakers to feel more positive after telling a prosocial lie following a negative event (versus how they felt before the lie). Whereas knowledge did not have an impact on children's ratings of the speaker's emotions, it did for adults, such that adults rated speakers as feeling better after telling a lie to a knowledgeable (versus ignorant) listener, and worse after telling the truth to a knowledgeable listener.

It was found that Theory of Mind, as measured by second-order false belief understanding, was not significantly related to children's responses (unlike adults), and was thus not included in subsequent analyses. For adults, the impact of ToM led to some mixed findings. Overall, empathy appears to play an important but different role when it comes to children and adults' appreciation of prosocial lies. Findings showed that children with higher affective empathy were more likely to identify a speaker's intention to tell a lie when the listener was ignorant, versus knowledgeable. Although this pattern did not emerge for adults' speaker intent ratings, adult's empathy was related to a sensitivity to contextual information when perceiving the emotions of others. Generally, adults' *cognitive empathy* was associated with the perception of more negative perceived emotion for both social partners after the truth, and *affective empathy* was associated with perceptions that a listener would feel negatively in general. Cognitive empathy is also related to knowledge context in that adults with higher scores perceived knowledgeable listeners to feel worse after a lie than ignorant listener.

Discussion

Prosocial lies provide a window into understanding how children interpret and use language for social purposes. This study examined whether a listener's knowledge (of a negative situation) as well as the type of statement (reality versus opinion) affected children's interpretation of a speaker's intent (which allows them to detect lies) and their perception of a prosocial lie's emotional impact for a listener and speaker. A second goal was to examine the role of empathy in the appreciation of prosocial lies, due to its importance in understanding other's emotional experiences and with prosocial behaviour more generally (Davis, 1994; Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987). A measure of second-order false belief understanding (i.e., ToM) was administered as potential control variable for empathy. An adult sample

completed similar tasks to provide a broader context in which to better understand the development of children's responses.

Results from the prosocial lying task revealed that children interpreted speaker intentions in a way that is consistent with past work (Bussey, 1999): children were more likely to identify true statements as truths, than false statements as lies. Children's interpretation of speaker intent did not differ across listener knowledge conditions, suggesting that children, unlike adults, did not use this contextual cue to guide their interpretation of speaker intent for truths and lies. Children appear to interpret a speaker's intent based on the statement's veracity, regardless of the listener's awareness of negative event. Although these results may suggest children were generally not attending to the listener's knowledge in the vignettes, we feel this is unlikely given that past work has shown they detect and use this information in other communicative tasks, such as when telling antisocial lies (Fu et al., 2012) and predicting interpretations of irony (Nilsen et al., 2011) —as well, importantly, we see this factor influencing children's ratings of listener emotion (discussed further below). Instead, it appears children have similar speaker intent responses regardless of the listener's knowledge, namely, that a false statement can still be a lie even if the listener is likely to detect it as such. In contrast, adults determined counterfactual statements to be lies more often when a listener was ignorant. As we did not ask participant to elaborate on their choices, nor let us know what they felt the statement was if they chose "something else" (other than lie/truth) for the speaker's intention, it is possible that adults viewed counterfactual statements towards a knowledgeable listener as an ironic criticism.

Importantly, when examining children/adults' perceptions of emotions following statements, we only included emotion ratings when the participant detected counterfactual statements as a lie. As noted in Results, we did not find there to be any impact of statement content (i.e., opinion versus reality). Thus, to broaden work showing that children perceive

opinion lies to be seen as less negative than reality lies (Cheung et al., 2015), it appears that statement content does not impact the emotional impact of prosocial lies, for either a listener or speaker. We speculate that statement content is not a salient cue when perceiving interlocutors' emotional impact after a prosocial lie. That being, while prosocial lies referring to an opinion are more acceptable than those referring to reality, they do not differentially impact the emotions of those within the interaction.

With respect to listener emotions, while past work has found that children appreciate that prosocial lies can be used to improve others' emotions (e.g., Broomfield et al., 2002; Warneken & Orlins, 2015), our findings extend this research by suggesting that children perceive a social benefit for prosocial lies (i.e., enhanced mood), even when the listener is aware of the true situation. That is, for both children and adults, there was an increase in positive mood from before the prosocial lie to after, regardless of whether the listener was ignorant or knowledgeable of the negative event. It may be that the participants felt that the prosocial lies conveyed a positive social gesture that holds benefit (e.g., concern about listener's feelings) regardless of whether a listener has information that makes deception more likely (or not). However, listener knowledge was not completely disregarded. After a prosocial lie, children and adults perceived ignorant listeners to feel better than knowledgeable listeners. This could mean that prosocial lies are seen as more beneficial (i.e., mood-enhancing), when the lie is more believable (i.e., when the listener is ignorant). However, it is important to note that the degree of change in positive mood was not greater for ignorant (versus knowledgeable) listeners, which is understandable given that participants perceived them as initially having a more positive mood relative to the knowledgeable listeners (likely because they had no reason to feel negatively as they were unaware of the negative situation).

Adding to past work showing that children highlight the impact on a listener as a central factor that motivates lie-telling in prosocial situations (e.g., Heyman et al., 2009), our findings suggest that children are sensitive to the contextual factors that influence the listener's emotions in prosocial lying situations. Together, this shows that children and adults perceive that prosocial lies can improve others' feelings regardless of whether a listener is likely to detect the lie, but that deception maintains the affective boost that ignorance brings.

In addition to benefitting the listener, prosocial lies may be perceived to also provide a benefit for the speaker (e.g., navigating awkward situations). This finding emerged across listener contexts, suggesting that deception was not seen as necessary for the prosocial liar to experience benefits. The exact reason(s) for this mood enhancement cannot be determined by our data. There are both self-serving and other-oriented reasons for telling a prosocial lie; it may be the case that children perceive speakers to feel better after saying a prosocial lie because they avoided negative consequences by being polite (e.g., Talwar & Crossman, 2011; Talwar et al., 2019) or because of the lie's positive impact on the listener (which in turn benefits the speaker; Broomfield et al., 2002; Heyman et al., 2009). Overall, the present work demonstrates that children are sensitive to this mood enhancement for the speaker after saying a prosocial lie, and future work is required to determine the reason for this effect.

Similar to children, adults also perceived there to be a mood enhancement for prosocial liars. Contrary to our predictions, adults rated the speakers who lied as feeling better when the listener was knowledgeable (versus ignorant). It may be that adults perceive a speaker who uses a lie when the listener is ignorant to feel less positively as this creates an increased gap between the listener and speaker's understanding of the situation. In contrast, when the listener is knowledgeable, the speaker can convey positive intentions (via prosocial lie) using the language form as a social gesture without increasing a knowledge gap. This interpretation is in line with

work suggesting that reducing a knowledge gap (i.e., through shared knowledge) builds feelings of social connectedness for a speaker (Jolly et al., 2019). Thus, adults may perceive speakers to feel better when telling a prosocial lie to a knowledgeable listener (versus ignorant) to communicate positive social and relationship intentions, at the same time not increasing the knowledge gap between the two individuals.

In sum, we found that although children did not consider knowledge context when inferring the impact of a lie on listener's emotions, they perceived there to be mood enhancement for both listeners and speakers following a prosocial lie. The pattern of responses was relatively similar for children and adults; thus it seems that by school age, children can integrate information (in this case, knowledge) in a way that is similar to that of adults when considering how prosocial lies impact affect.

Associations with Empathy

An additional aim was to understand whether individual differences in empathy related to children's interpretation of speaker intent, and their perceived emotional impact of prosocial lies. Results showed that both children and adults with higher affective empathy considered a listener's knowledge state when interpreting speaker intent, in that they were more likely to identify a statement as a lie when a listener was ignorant of the true state of affairs. Our findings are in line with past work showing that children's empathy (6–12 years) is related to higher accuracy in interpreting a liar's intentions (Lim et al., 2019). Importantly, our results extend these findings, highlighting that empathy is related specifically within contexts. For instance, in this study, understanding that prosocial lies are more likely to be used when a listener is unaware of the negative context. Although additional work is needed to replicate findings, our work supports the notion that children and adult's empathy supports their interpretation of communicative intentions.

Contrary to predictions, we did not find that children's empathy was related to their perceptions of a listener's emotions. Given past work showing associations between both cognitive and affective empathy and prosocial behaviour (see a meta-analysis by Yin & Wang, 2022), we anticipated that increased empathy would relate to perceptions of a listener's improved affect following a prosocial lie, particularly when the listener was ignorant (reflecting sensitivity to the deception function of lies). However, in past work, prosocial *behaviour* has been assessed through observation (Williams et al., 2014), or questionnaires completed by parents (Farrant et al., 2011; Findlay et al., 2006) or peers (Marshall et al., 2020), rather than *perceptions of prosocial language* (as was in the current study), which may account for the different findings. However, for adults, higher affective empathy was associated with listeners perceived as feeling worse when knowledgeable of the context. Thus, it seems that for adults, greater affective empathy facilitates higher sensitivity towards the feelings of a listener based on their prior knowledge.

For the prosocial lie-tellers' (i.e., speakers') emotions, children's empathy did not show any associations with their perceptions (similar to listeners' emotions). Again, we found that adults' cognitive and affective empathy showed associations with their perceptions of speakers' emotions. Interestingly, our results show that adults with higher cognitive and affective empathy rated speakers to feel worse overall regardless of statement type, knowledge, and timing. As noted above, adults rated speakers as feeling better after a prosocial lie, however, it appears that this effect is reduced for adults with higher empathy, such that adults with high empathy perceive speakers as experiencing overall negative emotions (when compared to those with low empathy). This may be because highly empathetic adults are attentive to the fact that the speakers are always knowledgeable of the negative event in the vignettes, which likely evokes negative emotions. Additional empirical evidence is needed to learn more about these results, although our

findings suggest that adult's empathy (both cognitive and affective) is important when considering how prosocial lies impact the emotions of those within the social interaction.

Given that empathy and ToM involve overlapping mechanisms, second-order false belief understanding was used as a potential control variable in this work. While ToM was not associated with children's responses, results showed that there were significant interactions between ToM and other variables in the adult ratings. Generally, better second-order false belief understanding was related to adults' ratings of knowledgeable listeners feeling worse, and speakers feeling better, after any type of statement. However, the results are mixed and are difficult to interpret, and future work is needed further explore how ToM relates to this research. In terms of other covariates, for the child sample, children with higher vocabulary and whose first language was English perceived listeners as feeling worse in the knowledgeable condition and speakers to feel worse in the ignorant condition, respectively.

Overall, when controlling for other factors, empathy appears to play a different role when it comes to children and adults' appreciation of prosocial lies. Empathy supports children's ability to integrate contextual information in their interpretation of communicative intentions, a fundamental and basic skill in social communication. Whereas for adults, empathy is related to a more nuanced and complex communicative skill: a sensitivity to contextual information that affects the social functions of prosocial lies, that being how it impacts the emotions of the interlocutors. Thus, it may be that within the school-age years, greater empathy initially facilitates more sensitivity to interpreting communicative intentions, which is then followed by a more nuanced appreciation of a prosocial lie's emotional impact. Our results show that empathy is linked to the interpretation of language and how it impacts others, which may also relate to the production of certain language forms (e.g., prosocial lies). Indeed, research with children (7–11 years) and adolescents (12–15 years) has shown that empathy is associated with children's

propensity to tell a lie (Nagar et al., 2020), and prosocial online communicative choices (Bowman-Smith et al., 2021), respectively. Together, this work provides further insight into empathy's varying role throughout development in navigating the complex nuances of language.

Limitations

This research is not without its limitations. One such limitation is the homogeneity of the current sample, and future work should include participants with a wider range of diversity (i.e., ethnicities, socio-economic status) to yield more generalizable conclusions. The second-order false belief understanding (i.e., ToM) task only included four questions, which may have limited the variability in children's performance. Also, the third-person prosocial lying task may not have captured how children would respond in everyday interactions. As third-person tasks are typical when studying counterfactual language, future work should explore the use of naturalistic, first-person paradigms to examine the emotional impact of prosocial lies. Further, given that the relationship between interlocuters (Sierksma et al., 2019) and the setting of the interaction (Ma et al., 2011) are important when considering prosocial lies, it is unclear how various contextual cues are combined and integrated into one's interpretation of prosocial lies.

With the current methodology, we cannot know why children/adults were responding in the way they were—for instance, why they felt that a listener or speaker was feeling the way they indicated. Thus, we do not know the extent to which speakers were feeling better because of self-serving versus other-focused reasons. In future work, it would be useful to incorporate open-ended responses into the methodology.

Prosocial lies are often subjective and personal in nature, including saying that you like a disappointing gift (Disappointing Gift Paradigm; Broomfield et al., 2002), or that someone looks okay for a photo (Reverse Rouge Task; Talwar & Lee, 2002b). However, within the vignettes used in the current study, the lies referred to external objects belonging to the listener so that the

listener's knowledge of the situation could be manipulated. However, in doing so, these lies may not have been personally relevant to the listener (e.g., relative to personal characteristics). Thus, it is unclear to what extent the pattern of results would hold if the prosocial lies were more personal.

Conclusion

Overall, results from the study suggest that children (similar to adults) perceive that a listener's ignorance enhances the social benefit of prosocial lies, as per the finding that children rated ignorant listeners to feel better than knowledgeable listeners after a prosocial lie. However, children perceive that listeners will feel better even when they are aware of the true state of affairs, suggesting that children feel prosocial lies may have a positive effect even if deception is unlikely. In addition, empathy was associated with children and adult's appreciation of prosocial lies, albeit in differing ways. For children, greater empathy was related to their interpretation of a speaker's intention to lie. Whereas for adults, greater empathy was associated with perceptions of the emotional impact of the lie. Our findings shed light on the role of a listener's knowledge and empathy in children and adult's perceptions of the social benefits of prosocial lies, and more specifically, how prosocial lies impact the feelings of others.

Chapter 3

Study 2 - Children's Endorsement of Prosocial Lies

Study 2 expands on Study 1 by investigating how knowledge context and statement content relate to children and adult's *endorsement* of prosocial lies. Of additional interest is how self-reported empathy relates to the endorsement of statements.

Introduction

Prosocial lies are false statements that are often told for the benefit of others by minimizing harm, avoiding social conflict, or being polite (Backbier et al., 1997; DePaulo & Kashy, 1998; Lippard, 1988; Sweetser, 1987). These are unlike antisocial lies, which are told for personal benefit, such as to escape punishment or acquire material gain. As such, despite being untruthful, prosocial lies are evaluated as more socially acceptable than antisocial lies (Heyman et al., 2009, Xu et al., 2010). Perhaps because of the social functions prosocial lies provide, they are commonly used both by children (Talwar et al., 2007) and adults (DePaulo et al., 1996). However, knowing when to use prosocial lies requires sensitivity to socio-communicative norms and understanding as to how context may affect possible social benefits. In this study, we examined children's (and adults') sensitivity to the listener's knowledge and whether the statement reflects an opinion or reality when deciding whether to use a prosocial lie (versus truth). To provide a broader landscape from which to understand children's performance, we also examined adults' responses. As prosocial lies can be used to influence the feelings of others, we also examined whether sensitivity to others' feelings, namely empathy, relates to prosocial lie endorsement. This work contributes to a growing literature on the interplay between children's individual characteristics and their sensitivity to contextual factors when making communicative decisions, in this study, with a particular focus on prosocial lies.

Prosocial Lying

Children as young as 3 years old start to tell lies (Lewis et al., 1989; Talwar & Lee, 2002a; Talwar & Lee, 2002b; Talwar et al., 2007), although the reasons for lie-telling vary throughout development. When children are younger, lies (antisocial and prosocial) tend to be self-oriented (Lewis et al., 1989; Talwar & Lee, 2002b; Talwar et al., 2007). Self-serving purposes for prosocial lies include avoiding consequences from the truth, being polite, and managing appearances (DePaulo et al., 1996; Popliger et al., 2011; Talwar et al., 2007; Xu et al., 2010). By 7 years old, children's motivations change, and they start to tell prosocial lies to benefit others, including to protect others' well-being (Popliger et al., 2011; Talwar & Crossman, 2011). As they get older (7–11 years), children view prosocial lies as more socially acceptable and generate more prosocial lies (Talwar et al., 2007; Xu et al., 2010). Older children (9–11 years) are more likely (84%) to produce prosocial lies than younger children (3–5 years, 72%), suggesting that children's propensity to tell prosocial lies increases with age (Talwar & Crossman, 2011). However, children's use of prosocial lies depends on both the social context, as well as their individual characteristics, discussed in turn below.

Contextual Factors

Social context can vary according to several factors, including the relationship between two individuals, perceived cost of the lie, and a listener's knowledge state. Past work found that children (6–9 years) were more likely to say a prosocial lie to an unfamiliar adult than to a parent, suggesting that children may be more concerned with sparing a stranger's feelings or are more comfortable with displaying negative affect (e.g., disappointment) with a familiar adult (Williams et al., 2013). In addition, 11–12-year-old children (but not 9–11-year-olds) and adults were more likely to lie to benefit an in-group peer compared to an out-group peer (Sierksma et al., 2019). Children's prosocial lie-telling also differs according to the perceived personal cost of using this

language form (e.g., Talwar et al., 2004). For instance, Popliger and colleagues (2011) found that children (4–12 years) were more likely to tell a prosocial lie (liking an undesirable gift) in a low-cost situation (child keeps an undesirable gift), versus the high-cost situation (child loses a desirable gift).

In addition, a listener's knowledge state may be a possible contextual factor in children's decisions to use a prosocial lie. Certainly, within the preschool-age, children modify their utterances based on the knowledge state of their communicative partner, such as providing more information to absent communicative partners (O'Neill, 1996; Perner & Leekam, 1986) and providing clarifying information when required by the listener's knowledge (Nadig & Sedivy, 2002; Nilsen & Graham, 2009). One study by Fu and colleagues (2012) examined whether young children (3-5 years) detect and use listener knowledge to inform their decision to lie about a transgression. The researchers found that children were indeed sensitive to a listener's knowledge context and were more likely to tell a self-protective lie when the listener was ignorant of the true situation. What is less known is whether older children, who better understand the other-oriented benefits of prosocial lies, integrate listener knowledge information in deciding whether to tell a prosocial lie. There exists past work that examines children's *interpretation* of prosocial lies—for instance, early research found that children (5–8 years) interpreted speakers to be using a prosocial lie when the listener was ignorant (versus knowledgeable) of the situation (Sullivan et al., 1995; Winner & Leekam, 1991). Consistent with this work, recent research found that adults were more likely to interpret a counterfactual statement as a lie when listeners were ignorant about the true context (refer to Chapter 2).

There is a paucity of research exploring how listener knowledge may influence the *production* of prosocial lies. Similar to antisocial lies (Fu et al., 2012), children may feel that prosocial lies are only appropriate to use when a listener is unaware of the situation and, thus, can

effectively be misled to believe something different from reality. Alternatively in line with results from Chapter 2, it may be that even when a listener is aware of the situation, a prosocial lie still conveys a speaker's desire to provide some prosocial intention, and thus, children may still choose to use this language form. This empirical question, how a listener's knowledge influences a child's inclination to use a prosocial lie, is a focus of the present work. In addition, we examined whether the content of the prosocial lie affects their decision to lie or not.

Lie Content. Children show sensitivity to statement content when interpreting lies (e.g., Fu et al., 2010). Lies about a speaker's opinion are untrue statements about a speaker's judgment of a situation (e.g., "These shoes are better."), whereas lies about reality are untrue statements about a situation (e.g., "The chips are in that box."; Cheung et al., 2015). Typically, past research has examined lies that only either reference reality or opinions (e.g., Talwar et al., 2007; Xu et al., 2010), which limits analysis as to whether the statement content affects interpretation/use within each lie type. For instance, Strichartz and Burton (1990) found that preschoolers (4–6 years) relied on the factuality of statements when identifying a lie from a truth, although the researchers only used lies referring to reality (e.g., "Spot is in the doghouse," when Spot actually ran away). Given that prosocial lies are typically viewed as more socially acceptable than antisocial lies, statement content may play a bigger role in their interpretation relative to antisocial lies (since all antisocial lies are self-serving). Evaluating this premise, Cheung and colleagues (2015) asked children (7–11 years) and adults to read vignettes and identify the statements (as truths/lies) and evaluate them as good/bad. For prosocial lies, children were less likely to identify opinion lies as lies (compared to reality lies), and evaluated opinion lies as less negative, likely because the untrue statement refers to a personal, subjective judgement that belongs to the speaker (versus reality lies refer to untrue statements about an objective reality which does not belong to anyone; Cheung et al., 2015). This finding was seen for prosocial lies

but not antisocial lies. Together, this work shows a “lie content effect” when interpreting lies, though it is not clear whether similar patterns emerge when children are asked about using lies, and whether such effects interact with the listener’s knowledge of the situation. To address this gap, the current study examines whether children endorse prosocial lies differently when the lie refers to reality or an opinion, and whether a listener is aware or unaware of the truth.

Individual Characteristics

Even within a particular context, children’s lying behaviour shows variability, suggesting that there are individual differences associated with their use of this language form. Indeed, children’s cognitive abilities are associated with production of prosocial lies. For instance, children with better executive functioning are more likely to tell prosocial lies (e.g., Evans & Lee, 2013; Talwar & Lee, 2008; Williams et al., 2016); however there is much variability in findings (e.g., Sai et al., 2018; Sai et al., 2021; Talwar et al., 2019). As well, children with better Theory of Mind (ToM) abilities, such as second-order false belief understanding, are more likely to tell lies in an experimental context (e.g., Lee & Imuta, 2021; Sai et al., 2021; Talwar & Lee, 2008; Williams et al., 2016). Talwar and Lee (2008) found that first- and second-order understanding was related to children’s (3–8 years) ability to say an initial lie and maintain their lies respectively, and a meta-analysis by Lee and Imuta (2021) found associations between measures of ToM domains and anti/prosocial lying behaviour. However, the study described in Chapter 2 of this dissertation showed that second-order false belief understanding was not related to children’s perceived emotional impact of prosocial lies. Regardless, there is still much unexplained variability in children’s production of prosocial lies and other individual characteristics are important to consider. In particular, empathy, the ability to recognize and experience others’ emotions (Findlay et al., 2006), may be important. Specifically, given that a key social function of prosocial lies is to enhance the emotions of a listener, empathy may also

relate to the likelihood of telling prosocial lies—and do so within particular contexts. We examine this premise in the current study. However, as ToM abilities and empathy involve similar neural networks associated with inferring others' mental states (although empathy requires the additional network involved in emotional processing; Völlm et al., 2006), children's ToM (in this case second-order false belief) was assessed as a possible control variable.

Empathy has both cognitive and affective components (Davis, 1994), wherein cognitive empathy involves the understanding of why others experience specific emotions and affective empathy is the ability to vicariously experience another's emotions. Batson (1991) theorized that when seeing someone in distress, one's own vicarious experience of their emotion (i.e., empathy) motivates prosocial behaviour to alleviate negative emotions. Empathy is important in children's social development, showing associations with prosocial behaviour (e.g., Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987).

Further, there is some evidence suggesting that empathy is linked to specific facets of prosocial behaviour, including prosocial lies, though the findings are mixed. Nagar and colleagues (2020) found that children (7–11 years) with higher cognitive empathy were more likely to tell a prosocial lie within an experimental context, and Lim and colleagues (2020) found that children's (6–12 years-old) empathy positively related to more positive evaluations of prosocial lies. Similar results have been demonstrated within an adult population: higher self-reported empathy was related to higher prosocial lie production when communicating with a social partner who was experiencing sadness (Xu et al., 2019). However, Demedardi and colleagues (2021) did not find children's empathy to be related to their usage of prosocial lies. Moreover, as described in Chapter 2, my first study did not reveal a relationship between children's empathy and perceived emotional impact (though, after a lie, adults with higher cognitive and affective empathy perceived ignorant listeners to feel better, but speakers to feel

worse). Thus, the picture of empathy's role within prosocial lying is unclear. Moreover, it is not known whether higher empathy is associated with decisions about whether to use a prosocial lie specifically in contexts that vary by listener's knowledge and statement content.

Current Study

The aim of this study was to explore how a listener's knowledge (ignorant versus knowledgeable of the situation/true state of affairs) and statement content (referring to opinion versus reality) are associated with children's endorsement of telling a truth/lie. Moreover, we explored whether participants' self-reported empathy predicted or interacted with contextual factors to predict truth/lie endorsement rates.

Children were 8–11-years-old, with children at this age having shown an understanding of the social functions of prosocial lies and the distinction between opinion and reality (e.g., Broomfield et al., 2002; Cheung et al., 2015; Warneken & Orlins, 2015). Although our focus was on the children's pattern of responses, we also examined these research questions in a young adult sample. Participants were asked to imagine themselves in a series of vignettes in which a negative event occurs (e.g., a trampoline not bouncing) of which the listener is unaware/aware, and rate how likely they were to make statements differing in type (truth, lie, unrelated statement) and content (opinion, reality).

It was predicted that overall children and adults will be more likely to endorse telling a lie when the listener is ignorant versus knowledgeable of the negative event, as in this situation the lie would be more believable. Given that lies referring to opinion are evaluated more positively than lies referring to reality (Cheung et al., 2015), we predicted that participants would more readily endorse saying a prosocial lie related to their opinion, rather than objective reality—and that this difference would be greatest in the listener knowledgeable condition (when there is a greater chance that the listener would detect the lie).

It was anticipated that, in general, children with higher empathy would indicate greater use of prosocial lies (and less truth) because they would be more likely to protect the feelings of their social partner (versus children with lower levels of empathy). It was anticipated that such an effect would be qualified by interactions with context. Specifically, we predicted that when the listener is ignorant, children with higher empathy would be more likely to endorse telling a lie (versus truth), and when the listener is knowledgeable, children with higher empathy would be more likely to endorse a prosocial lie referring to the opinion (versus reality).

Methods

Participants

Children

Participants between 8–11 years old ($N = 81$; 39 boys, $M = 9.43$ years; $SD = 1.16$) were recruited from a lab database and Children Helping Science. The majority of participants reported English as their first language (93%). The most frequently reported ethnicities were in the following categories: White ($n = 56$), Middle Eastern ($n = 8$), Asian ($n = 9$), Latin ($n = 5$), Black ($n = 1$) (missing values $n = 7$) (sum of n s are higher than sample due to multiple ethnicities reported). Parents reported their education experience as 74% of mothers and 67% of fathers having at least a university degree.

Adults

Participants ($N = 218$; 37 men, $M = 20.45$ years; $SD = 4.17$) were recruited from a university's online undergraduate recruitment system. The majority of participants reported English as their first language (68%). Out of provided options, participants reported their ethnic backgrounds as Asian ($n = 109$), White ($n = 79$), Middle Eastern ($n = 9$), Black ($n = 6$), Latin ($n = 4$), Other ($n = 11$).

Procedure

Children

Parents/caregivers who consented to their children participating completed a demographic questionnaire and children completed the empathy questionnaire via Qualtrics. Once this was received, a 45-minute Zoom meeting was scheduled. During the meeting, a researcher described the study, obtained verbal assent from the child, and then shared their screen to administer the prosocial lying task, as well as a receptive vocabulary and ToM task. Tasks were presented in a fixed order, a standard practice when assessing individual differences as it ensures that participants are exposed to identical stimulus contexts (Carlson & Moses, 2001).

Adults

Participants who were interested in participating were sent a Qualtrics survey link. The survey took approximately 30 minutes to complete, and consisted of the consent form, prosocial lying task, vocabulary measure, ToM task, and empathy questionnaire. As adult participants completed the study independently, modifications were made to the tasks to ensure the quality of the data, such as prompts to complete unanswered questions.

Measures

Prosocial Lying Task

Children and adults completed the same prosocial lying task with a researcher or independently, respectively. To evaluate participants' endorsement of truthful statements and prosocial lies, participants heard/viewed vignettes of six scenarios involving themselves and another character (gender-matched to the participant) interacting with an object that failed its function (e.g., a kite that doesn't fly, a glow-in-the-dark toy that doesn't glow, a trampoline that doesn't bounce, a pool toy that doesn't float, a movie that is not funny, a basketball that doesn't bounce). In the current study, statements (truth/lie) were about the listener's object so that listener knowledge (of the event) could be more easily manipulated. The task employed a 2(listener

knowledge: ignorant, knowledgeable) x2(statement type: truth, prosocial lie) x2(statement content: opinion, reality) within subject design and was fully counterbalanced, such that all participants saw every vignette once, but in different conditions. The stories followed the same structure (see Appendix F), which included an introduction and information about the listener's knowledge as unaware (ignorant) or aware (knowledgeable) of the negative event (See Appendix G for an example of the ignorant condition, including pictures and statement choices). See Appendix H for a list of full scenarios for both knowledge contexts.

Following the knowledge manipulation, participants were asked what they might say in the scenario. There were five possible responses to the scenario: opinion truth, reality truth, opinion prosocial lie, reality prosocial lie, and unrelated statement³. Reality truths were negative true statements directly about the negative event itself (e.g., *"This trampoline does not bounce"*); opinion truths were negative statements about the speaker's opinion indirectly about the negative event (e.g., *"I don't like this trampoline"*); reality lies were positive statements about the negative event (e.g., *"This trampoline bounces"*); opinion lies were positive statements about the speaker's opinion indirectly about the negative event (e.g., *"I like this trampoline"*). An unrelated statement, a positive statement unrelated to the object (e.g., *"It is a great day"*), was provided to provide participants with an option that was neither a truth nor lie.

Participants indicated the likelihood they would produce each response on a 5-point Likert scale: 1 (*Definitely not*) to 5 (*Yes, definitely*). Thus, importantly, we were able to assess the degree to which participants felt such response was reasonable, rather than forcing them to choose one response over another.

Empathy

³ The order of options was consistent across trials as we were primarily interested in how responses varied across the conditions and whether they related to individual characteristics.

Children's empathy was assessed using the Empathy Questionnaire for Children and Adolescents (EmQue-CA; Overgaauw et al., 2017), a self-report measure containing 14 items on a 3-point Likert Scale. The present study used the Cognitive (3 items) and Affective Empathy (6 items) subscales. The EmQue-CA has adequate convergent validity, concurrent validity, and internal consistency within each of the subscales (Cronbach's Alpha .70–.74; Overgaauw et al., 2017). With the sample in the current study, the Cognitive and Affective Empathy subscales yielded reasonable reliability values of .77 and .67, respectively (Taber, 2018). **Adult's** empathy was assessed using The Basic Empathy Scale (BES; Carré, et al., 2013; Jolliffe & Farrington, 2006), a 20-item self-report questionnaire, with Cognitive (9 items) and Affective empathy (11 items) subscales. Participants provided ratings using a 5-point Likert scale: 1 (*Strongly disagree*) to 5 (*Strongly agree*). The BES has good construct, convergent, and discriminant validity (Carré et al., 2013; D'Ambrosio et al., 2009). The current sample yielded reliabilities of Cognitive and Affective Empathy of .80 and .84, respectively.

Receptive Vocabulary

As we were assessing communicative decisions, a vocabulary measure was included as a possible control variable. **Children's** language skills were assessed using the Receptive Vocabulary test from the Wechsler Individual Achievement Test-III (WIAT-III, Wechsler, 2009). In this task, participants were asked to match a correct picture and word for a total summed score of 19. **Adults'** language skills were assessed using the vocabulary subscale of the Shipley Institute of Living Scale (Shipley, 1940). In this task, participants read a target word and then selected the most synonymous of the four other words. There were 40 items in total.

Theory of Mind

Given the relationship between empathy and ToM abilities (e.g., Völlm et al., 2006), a measure of a domain of ToM was included. **Children's** second-order false belief understanding

was assessed using second-order false belief stories from Coull and colleagues (2006), which were presented in two videos depicting puppet characters interacting with each other. To respond correctly, participants had to recognize that one character has an incorrect belief about another character's mental state for a summed score of four. **Adults'** second-order false belief understanding was assessed using a modified (i.e., shortened) version of the Embedded False Belief test (Rutherford, 2004) in which participants listened to/read four stories that involved embedded false beliefs (i.e., one character has a false belief about another character's beliefs). After each story, participants were asked to accurately choose one of two statements that described what happened in the story. The statement pairs assessing second-order false belief required participants to understand character's mental states (e.g., "Father thinks that the children think the chocolate is on the counter"). Our modified version only included statement pairs involving the understanding of second-order false belief. Participant's accuracy of responses on the questions were combined to create a possible total score of five for each participant.

Results

Preliminary Analyses

Children

No variables violated normality assumptions based on Kline's criterion ($|\text{skew}| \leq 3$; $|\text{kurtosis}| \leq 10$) and no measures showed outlier values of ± 3 *SD* (Kline, 1998). There were no missing values. Consistent with work showing no, or even negative correlations between cognitive and affective empathy, (e.g., Demedardi et al., 2021; Nagar et al., 2020), we did not find children's affective and cognitive empathy to be related (Table 3; unlike the pattern for adults in Table 4). Children's age was unrelated to their ToM or empathy scores (consistent with past work showing variability in relations between empathy and ToM with age; Gallant et al., 2020).

Table 3

Children's performance / report measures

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Age	9.42	1.16	-	-	-	-
2. Vocabulary	13.17	2.55	.375**	-	-	-
3. Theory of Mind	2.39	0.83	.231*	.150	-	-
4. Cognitive empathy	6.64	1.57	.157	-.118	-.043	-
5. Affective empathy	13.17	2.37	.152	-.092	.123	.150

Note. $N=81$. *M* and *SD* are used to represent mean and standard deviation, respectively.

* indicates $p < .050$. ** indicates $p < .010$.

Adults

There were no variables that violated normality assumptions based on Kline's criterion ($|\text{skew}| \leq 3$; $|\text{kurtosis}| \leq 10$; 1998). Outliers of ± 3 *SD* were Winsorized: ToM measure ($n = 2$), vocabulary measure ($n = 1$), cognitive empathy ($n = 1$), and affective empathy ($n = 2$). Missing items found in the cognitive ($n = 7$) and affective empathy subscales ($n = 2$) were imputed using single imputation (Eekhout et al., 2014). See Table 4.

Table 4

Adults' performance / report measures

Variable	<i>M</i>	<i>SD</i>	1	2	3
1. Vocabulary	29.70	4.49	-	-	-
2. Theory of Mind	3.84	1.01	.209**	-	-
3. Cognitive empathy	35.56	4.46	.161*	.194**	-
4. Affective empathy	41.19	6.85	-.026	.201**	.407**

Note. *N*=192. *M* and *SD* are used to represent mean and standard deviation, respectively.

* indicates $p < .050$. ** indicates $p < .010$.

Analytical Strategy

Given the hierarchical nature of the data whereby statement endorsement ratings (level 1) were nested within participants (level 2), a Multilevel Modeling (MLM) approach was used to account for correlated error in the dependent variable. Experimental variables were dummy coded as follows: statement type (0-truth, 1-prosocial lies), knowledge condition (0-ignorant, 1-knowledgeable), and statement content (0-opinion, 1-reality). A backward stepwise approach was used to fit two sets of models for the statement endorsement rating.

The analyses were deemed sufficiently powered to estimate unbiased regression coefficients, standard errors, and variance components, as there were more than 50 units at the participant level (Maas & Hox, 2005; Paccagnella, 2011). Additionally, the power of the analysis is enhanced by the fact that the model incorporates every individual time-specific data point from each of the 81 participants.

Model Set 1

We fit a set of two models (for children and adults) to examine the effect of the conditions (statement type, knowledge, statement content), individual differences, as well as all interactions

on the statement endorsement ratings. The first exploratory model included only main effects of the conditions and their interactions. To obtain the most parsimonious model, if the three-way interaction term for the model was not significant (i.e., $p > .05$), it was removed from the model and only two-way interactions were interpreted. If the two-way interaction terms were not statistically significant, only main effects were retained in the final model and interpreted. Significant three-way interactions were probed by splitting the dataset into two sets on one of the conditions. To explore two-way interactions, we conducted post-hoc pairwise comparisons. Conditions that showed no significant main effects and were not involved in significant interactions were removed from the model.

In addition to fixed effects, we also report the Intraclass Correlation Coefficient (*ICC*), which is an indicator of how strongly the observations within each participant are correlated with each other. It is also the proportion of total variance in the dependent variables that is due to observations within participants.

Model Set 2

A second set of MLM models were created to examine the association between individual differences and the conditions on the statement endorsement ratings. The main individual difference of interest is cognitive/affective empathy.

Before creating a final individual differences model, each covariate (i.e., gender, English first language, ToM, vocabulary, age [children only]) was individually analyzed for main effects and interactions within each condition for the statement endorsement ratings. Covariates with significant main effects/interactions were included in the final individual difference model to ensure that the analyses were capturing the unique contribution of cognitive/affective empathy. Non-significant covariates were excluded from further analyses.

The final individual difference model included the condition main effects, significant covariates, cognitive/affective empathy, and all interactions. Cognitive and affective empathy were analyzed separately. Refer to Appendix I (children) and J (adults) for tables. Significant three-way interactions with empathy were probed by examining the data separately by condition. Significant two-way interactions with empathy were explored with simple slopes analyses, collapsing across conditions when relevant. When all interactions terms were not statistically significant, they were removed, and only main effects were reported.

These results from the main analyses are presented below. Hereafter the term “lies” refers to prosocial lies.

Children’s Endorsement of Statements

We fit the conditions and their interactions in a model which revealed a non-significant three-way interaction ($B = -0.10, p = .761$). When trimmed from the model to examine two-way interactions, the model showed two non-significant two-way interactions of statement type and knowledge ($B = -0.01, p = .946$) and knowledge and statement content ($B = -0.04, p = 0.809$). There was also a significant two-way interaction of statement type and statement content (Table 5). Post-hoc pairwise comparisons indicated that for both statement content options, across knowledge, children were significantly more likely to endorse telling the truth (opinion: $M = 3.17, SE = .08$; reality: $M = 3.86, SE = .08$) than lie (opinion: $M = 2.09, SE = 0.08, t(564) = 9.25, p < .001$; reality: $M = 1.66, SE = 0.08, t(564) = 18.75, p < .001$). In addition, across knowledge, when telling a lie, children were more likely to endorse using an opinion (versus reality), $t(564) = 3.66, SE = 0.12, p < .001$, and when telling the truth, children are more likely to endorse a reality statement (versus opinion), $t(564) = 5.84, SE = 0.12, p < .001$.

These results suggest that, in the context of a negative event, children indicate they would be more likely to tell the truth than use a prosocial lie. However, if they were going to lie, they

would be more likely to use an opinion lie (whereas, for the truth, they would be more likely to use a reality statement). We did not find evidence that children were using listener knowledge as a cue to guide their communicative choices.

Table 5

Children's statement endorsement ratings

Fixed Effects			
Statement type + Listener knowledge + Statement content + Interactions			
Predictors:	<i>B</i>	<i>95% CI</i>	<i>p</i>
(Intercept)	3.17	3.01 – 3.34	<.001
Statement type (ST)	-1.08	-1.31 – -0.85	<.001
Statement content (SC)	0.68	0.45 – 0.91	<.001
ST x SC	-1.11	-1.43 – -0.79	<.001
Random Effects	ICC = 0.00 ⁴		

Role of Empathy

We analyzed the covariates individually with the conditions and found a significant two-way interaction of statement type and age ($B = -0.28$, $95\% CI [-0.42, -0.14]$, $p < .001$), showing that as age increases, children are significantly more likely to endorse telling the truth ($b = .14$, $p = .01$) and less likely to endorse telling a lie ($b = -.15$, $p < .01$). As well, there was a two-way interaction of statement type and English first language ($B = 2.08$, $95\% CI [1.31, 2.84]$, $p < .001$), showing that children whose first language was English were more likely to endorse telling the

^{4 4} No random effects were detected in the child data, however, using MLM was retained due to the task design and to maintain consistency with statistical approach for adult data.

truth ($M = 3.58$, $SE = 0.06$) versus a lie ($M = 1.84$, $SE = 0.06$), $t(551) = 19.85$, $p < .001$, unlike children whose first language was not English (truth: $M = 2.50$, $SE = 0.27$; lie: $M = 2.83$, $SE = 0.27$), $t(551) = 0.88$, $p = .38$; children whose first language was English were more likely to endorse telling the truth ($t(270) = 3.91$, $p < .001$) and less likely to endorse telling a lie ($t(270) = -3.62$, $p < .001$), when compared to children whose first language was not English. Further, there was a two-way interaction of statement type and ToM ($B = -0.66$, 95% CI [-0.85, -0.46], $p < .001$), wherein children with higher ToM were more likely to endorse telling the truth ($b = .35$, $p < .01$), and less likely to endorse telling a lie ($b = -.31$, $p < .01$). As such, age, English first language, and ToM were retained in the subsequent models involving empathy.

Cognitive Empathy. The model included age, English first language variable, ToM, conditions, cognitive empathy, and their interactions. The four-way ($B = -0.07$, $p = .755$), three-way (knowledge and statement type: $B = -0.05$, $p = .651$, knowledge and statement content: $B = 0.01$, $p = .948$, statement type and statement content: $B = -0.03$, $p = .789$), and two-way (statement type: $B = -0.06$, $p = .262$, knowledge: $B = 0.03$, $p = .609$, statement content: $B = 0.05$, $p = .378$) interaction terms were non-significant and trimmed from the model. The main effects model also revealed a non-significant main effect of cognitive empathy ($B = -0.02$, $p = .415$).

Affective Empathy. The model included age, English first language variable, ToM, conditions, affective empathy, and their interactions. The four-way ($B = 0.01$, $p = .956$), three-way (statement type by knowledge: $B = 0.04$, $p = .591$, statement type by statement content: $B = 0.04$, $p = .595$, knowledge by statement content: $B = -0.01$, $p = .924$), and two-way (statement type: $B = -0.01$, $p = .764$, knowledge: $B = 0.00$, $p = .898$, statement content: $B = 0.02$, $p = .632$) interaction terms were non-significant and trimmed from the model. The main effects model also showed a non-significant main effect of affective empathy ($B = -0.03$, $p = .189$).

Unrelated Statements

Recall that participants were asked how likely they would be to make a statement that was neither a truth nor lie. As unrelated statements did not vary by content type, this option was analyzed separately from the truths and lies using paired samples t-tests. Results showed that listener knowledge did not impact children's endorsement of an unrelated statement about a negative event ($t(80) = -0.153, p = .439$). See Table 6. In both knowledge conditions, and regardless of content, unrelated statements were endorsed less than truths ($ps < .050$), but more than lies ($ps < .001$). Empathy was not related to children's endorsement of unrelated statements ($ps > .273$).

Table 6

Children's endorsement of different statement types

Knowledge Condition	Statement	<i>M</i>	<i>SD</i>
Ignorant Listener	Truths		
	Opinion Truth	3.19	1.12
	Reality Truth	3.87	1.00
	Prosocial Lies		
	Opinion Lie	2.09	0.97
	Reality Lie	1.71	0.98
	Unrelated Statement	2.82	1.16
Knowledgeable Listener	Truths		
	Opinion Lie	3.16	1.21
	Reality Truth	3.84	1.08
	Prosocial Lies		
	Opinion Lie	2.09	1.03
	Reality Lie	1.62	1.02
	Unrelated Statement	2.81	1.07

Note. $N=81$. *M* and *SD* are used to represent mean and standard deviation, respectively.

Adults' Endorsement of Statements

We fit the conditions and their interactions in a model which revealed a non-significant three-way interaction ($B = -0.04$, $p = .799$). When trimmed from the model to examine two-way interactions, the model revealed two significant two-way interactions: (1) statement type by knowledge context, and (2) statement type by statement content. See Table 7.

Table 7

Adults' statement endorsement ratings

Fixed Effects			
Statement type + Listener knowledge + Statement content + Interactions			
Predictors:	<i>B</i>	<i>95% CI</i>	<i>p</i>
(Intercept)	2.55	2.45 – 2.65	<.001
Statement type (ST)	-0.29	-0.42 - -0.16	<.001
Listener knowledge (LK)	0.36	0.25 – 0.47	<.001
Statement content (SC)	1.21	1.10 – 1.32	<.001
ST x LK	-0.58	-0.74 – -0.43	<.001
ST x SC	-1.69	-1.84 – -1.53	<.001
Random Effects	ICC = .10		

Interaction (1) was probed by examining post-hoc pairwise comparisons, showing that, similar to children, in both knowledge conditions, adults were more likely to indicate they would make a truthful statement (ignorant: $M = 3.16$, $SE = .04$; knowledgeable: $M = 3.51$, $SE = .04$) than tell a lie (ignorant: $M = 2.02$, $SE = .04$, $t(1521) = 20.41$, $p < .001$; knowledgeable: $M = 1.80$, $SE = .04$, $t(1521) = 30.88$, $p < .001$). However, differing from children, when the listener was

knowledgeable (versus ignorant) of the negative event, adults were more likely to endorse telling the truth ($t(1521) = 6.42, p < .001$)—and, when the listener was unaware (versus knowledgeable) of the event, more likely to endorse telling a lie ($t(1521) = 4.04, p < .001$).

Interaction (2) was also probed using post-hoc pairwise comparisons, showing that for both statement content conditions, participants were more likely to endorse telling a truthful statement (opinion: $M = 2.73, SE = .04$; reality: $M = 3.94, SE = .04$) than a lie (opinion: $M = 2.15, SE = .04, t(1521) = 10.47, p < .001$; reality: $M = 1.67, SE = .04, t(1521) = 40.81, p < .001$). When endorsing the truth, participants indicated they were more likely to refer to reality than an opinion ($t(1521) = 21.73, p < .001$); in contrast, for prosocial lies, participants indicated they would be more likely to tell an opinion lie than a reality lie ($t(1521) = 8.61, p < .001$).

Thus, after a negative event, adults indicated they would be more likely to tell the truth than a lie, but they reported being more likely to use a prosocial lie when the listener was unaware (versus aware) of the negative event—and they indicated they would be more likely to tell the truth when the listener was knowledgeable (versus unaware) of the negative event. In addition, adults indicated they would more likely tell the truth about reality, but lie about their opinion.

Role of Empathy

We analyzed the covariates individually and found a significant two-way interaction of statement type and gender ($B = 0.31, 95\% CI [0.07, 0.55], p = .011$), such that while both genders were more likely to endorse telling a truthful statement (men: $M = 3.59, SE = 0.08$; women: $M = 3.28, SE = 0.04$) than a prosocial lie (men: $M = 1.90, SE = 0.08, t(1524) = 14.99, p < .001$; women: $M = 1.91, SD = 0.04, t(1524) = 27.00, p < .001$), men endorsed truths more than women ($t(612) = 3.22, p = .001$), with no gender difference in the endorsement of lies ($t(612) = 0.09, p = .93$). This suggests that women may be more hesitant to tell the truth in a negative context,

compared to men. As well, there was a significant two-way interaction of statement type and ToM ($B = -0.20$, 95% $CI [-0.29, -0.11]$, $p < .001$), such that higher ToM was negatively associated with the endorsement of prosocial lies ($b = -.19$, $p < .001$), and this association was not seen for truthful statements ($b = .01$, $p = .680$). Adults were overall more likely to endorse truthful statements than prosocial lies, across all levels of ToM ($-1SD$: $t = 18.78$, $p < .01$; $+1SD$: $t = 24.92$, $p < .01$). Subsequent models contained gender and ToM as covariates.

Cognitive Empathy. The model included gender, ToM, conditions, cognitive empathy, and their interaction. It showed that the four-way ($B = -0.02$, $p = .882$) and three-way (knowledge by statement type: $B = -0.06$, $p = .436$, knowledge by statement content: $B = -0.03$, $p = .685$, statement type by statement content: $B = -0.08$, $p = .291$) interaction terms were non-significant. When these terms were trimmed, the model showed two non-significant interactions of cognitive empathy and knowledge ($B = 0.00$, $p = .972$), and cognitive empathy and statement content ($B = -0.04$, $p = .365$), and a significant two-way interaction of cognitive empathy and statement type ($B = 0.10$, 95% $CI [0.02, 0.17]$, $p = .014$). The interaction was probed by simple slopes analyses, which revealed a marginal negative association between cognitive empathy and truths ($b = -.06$, $p = .07$), and this association is not seen for prosocial lies ($b = .03$, $p = .33$), See Figure 7. Adults were more likely to endorse truthful statements than prosocial lies at all levels of cognitive empathy ($-1SD$: $t = 27.67$, $p < .001$; $+1SD$: $t = 24.18$, $p < .001$).

Affective Empathy. The model included gender, ToM, conditions, affective empathy, and their interaction. It showed that the four-way ($B = 0.04$, $p = .783$) interaction term was not statistically significant, though when trimmed from the model, it revealed a significant three-way interaction of affective empathy, statement type, and statement content ($B = -0.21$, 95% $CI [-0.37, -0.05]$, $p = .009$). To better understand this interaction, truths and lies were analyzed separately.

For truthful statements, there was a significant two-way interaction of affective empathy and statement content ($B = 0.18$, 95% $CI [0.09, 0.27]$, $p < .001$). As shown in Figure 8a, higher affective empathy was associated with lower likelihood of telling an opinion-related truth ($b = -0.16$, $p < .001$); this pattern was not seen for reality-related truths ($b = .02$, $p = .750$)

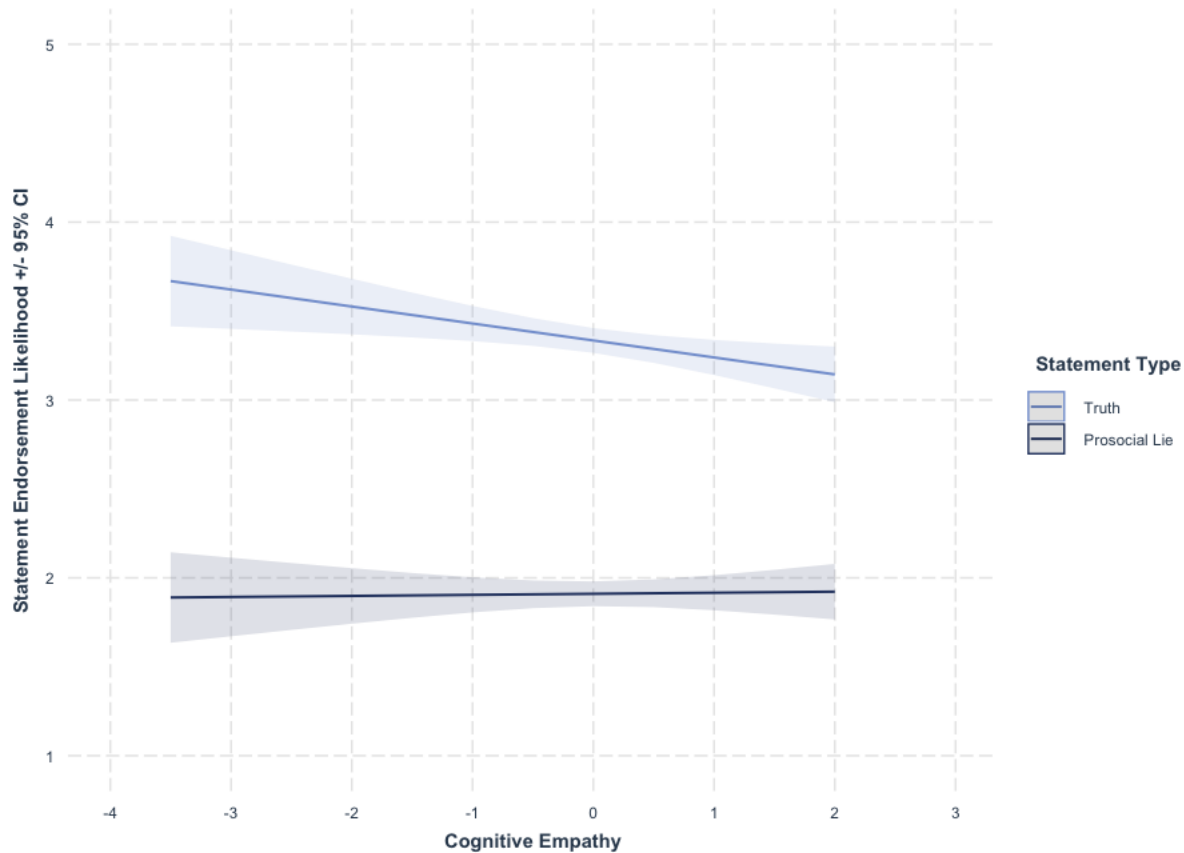
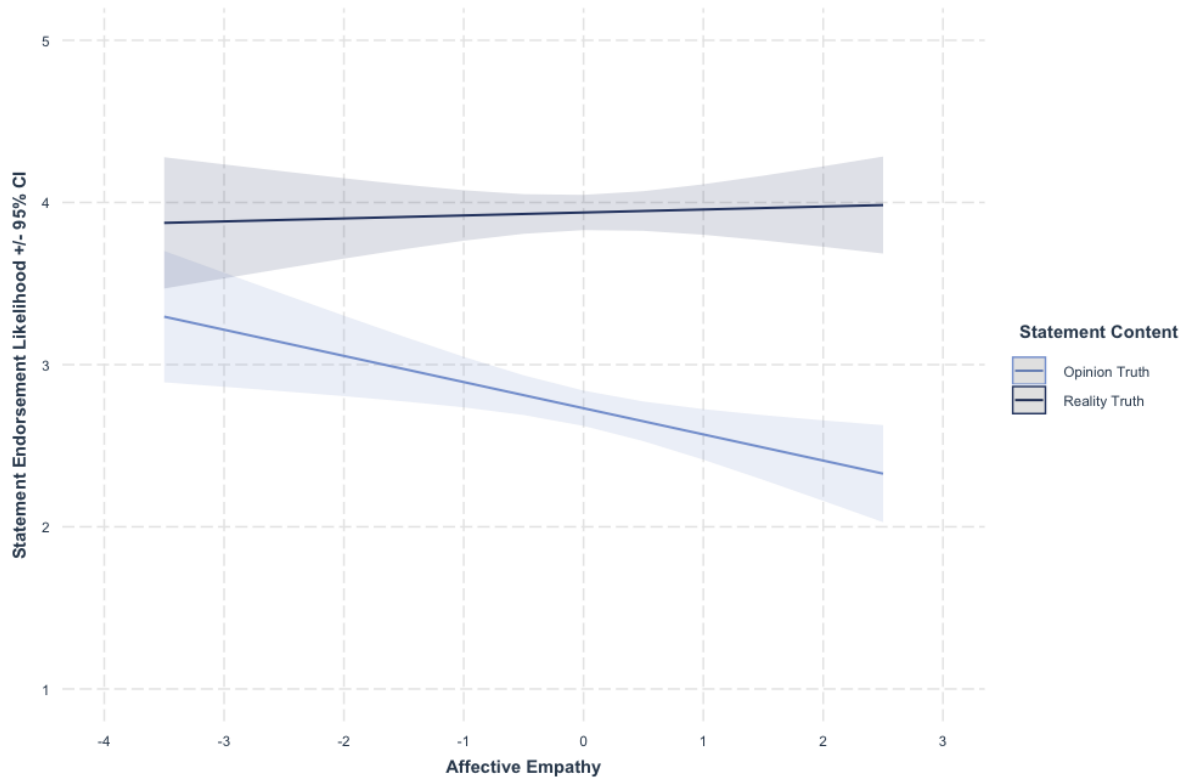


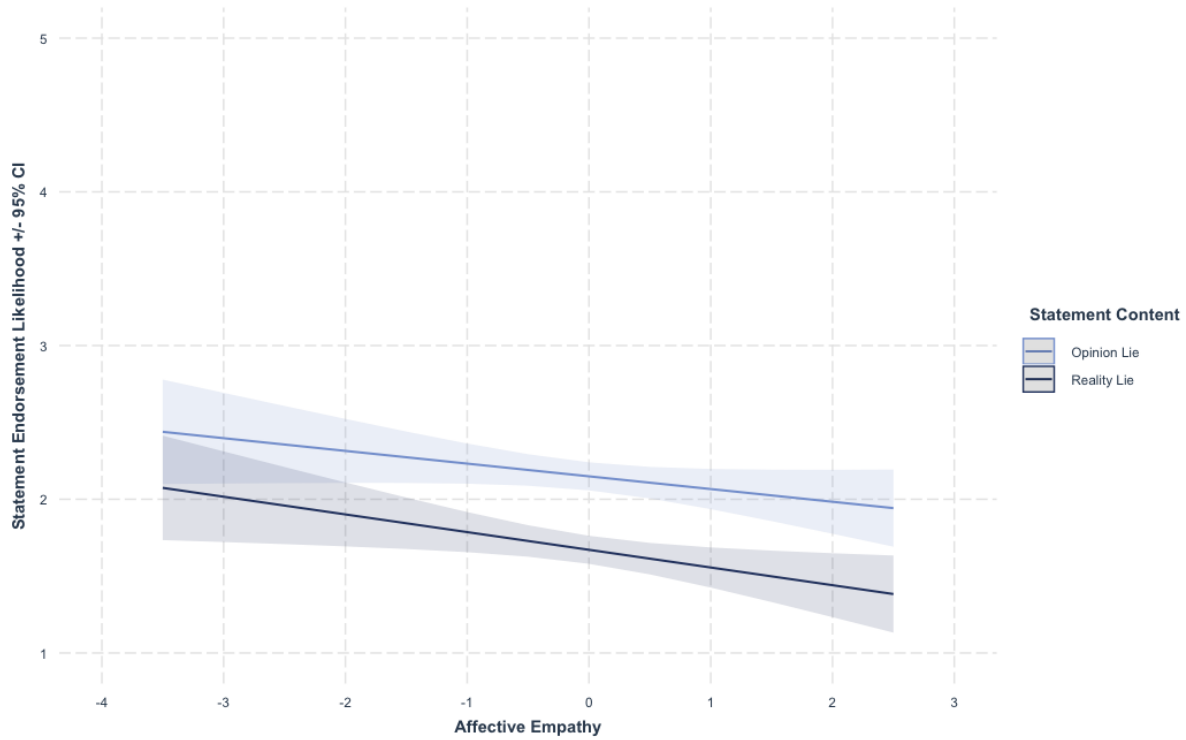
Figure 7. Adults' endorsement ratings as a function of cognitive empathy and statement type.

For prosocial lies, the two-way interaction term of affective empathy and statement content was found to be non-significant ($B = -0.03, p = .339$). When removed, the model showed a significant main effect of affective empathy ($B = -0.10, 95\% CI [-0.19, -0.01], p = .027$), indicating that participants with greater affective empathy are less likely to endorse telling a prosocial lie. See Figure 8b.

Taken together, results suggest that adults with greater empathy make different communicative choices in a context involving a negative event. First, with greater cognitive empathy they are less likely to tell the truth. Second, with greater affective empathy, they are less likely to make truthful statements about their opinion, and less likely to use prosocial lies generally.



Truths (a)



Lies (b)

Figure 8. Adult endorsement ratings as a function of affective empathy and statement content

Unrelated Statements

Adults considered a listener's knowledge context when choosing to use unrelated statements: they were more likely to endorse saying an unrelated statement when a listener was ignorant of the negative event ($t(217) = 3.87, p < .001$), versus knowledgeable (Table 8).

Unrelated statements were less likely to be endorsed than truths (reality: $ps < .001$), and more likely to be endorsed than lies ($ps < .001$). Neither cognitive nor affective empathy was related to the endorsement of unrelated statements ($ps > .100$).

Table 8

Adults' endorsement of different statement types

Knowledge Condition	Statement	<i>M</i>	<i>SD</i>
Ignorant Listener	Truths		
	Opinion Truth	2.55	1.03
	Reality Truth	3.76	0.87
	Prosocial Lies		
	Opinion Lie	2.25	0.83
	Reality Lie	1.79	0.77
	Unrelated Statement	3.15	1.09
Knowledgeable Listener	Truths		
	Opinion Truth	2.91	1.07
	Reality Truth	4.12	0.74
	Prosocial Lies		
	Opinion Lie	2.05	0.80
	Reality Lie	1.55	0.73
	Unrelated Statement	2.96	1.07

Note. $N=192$. *M* and *SD* are used to represent mean and standard deviation, respectively.

Discussion

To understand how children navigate choosing between honesty and lies, it is important to understand the individual and contextual factors influencing their communicative decisions. We asked children (and adults) to imagine themselves in social interactions in which a negative event occurs and the listener's awareness of the event differs; they were then asked to rate how likely they were to use truths/lies referring to varying content. In addition, we asked about children and adult's empathy to explore how this characteristic relates to their likelihood of telling a prosocial lie, and their sensitivity to contextual cues when deciding to tell a prosocial lie, given empathy's role in prosocial behaviour generally (e.g., Davis, 1994; Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987; Nagar et al., 2020). An adult sample completed the same task and age-appropriate measures. While the overall rates of endorsement should not be considered reflective of how often children/adults lie or tell the truth generally (given that such rates are highly dependent on our methodology), comparisons across conditions provide information about how contextual cues and individual characteristics relate to the endorsement of prosocial lies.

On the prosocial lying task, unlike past work with antisocial lies (Fu et al., 2012) and adults who showed different responses based on the listener's knowledge of the situation, we did not find that children used listener knowledge to guide their communicative decisions. That is, children's rating of using a prosocial lie was comparable whether the listener was aware *or* unaware of the true state of affairs, which is in line with past work finding that children perceive listeners to feel better despite them knowing what happened (refer to Chapter 2).

Although it is plausible that children did not attend to the listener's knowledge within the scenarios, past work has shown that they are sensitive to knowledge context in other tasks that involve social vignettes (e.g., Nilsen et al., 2011; Sullivan et al., 1995; Winner & Leekam, 1991), including interpretation of emotional impact of prosocial lies. For example, in Chapter 2, we

found that children perceived ignorant listeners as having a more positive mood than knowledgeable listeners. Thus, we speculate that although children were aware of the listener's knowledge, it is not a salient cue guiding their endorsements of prosocial lies. This said, children's overall endorsement of lies was low (showing less endorsement than truth-telling, which is consistent with previous work; e.g., Broomfield et al., 2002). Thus, results should be interpreted in terms of children not being inclined to use a lie even when it was likely to deceive (i.e., ignorant listener), rather than endorsing a lie even if the listener is aware of the situation and unlikely to be deceived (e.g., to convey a gesture of caring). To further understand the role of listener knowledge, it would be useful for future studies to use a first-person/behavioural task, which is common when exploring lies (e.g., Fu et al., 2012; Nagar et al., 2020, Talwar et al., 2019) and/or include open-ended questions for children to provide rationale for their choices.

As mentioned above, adults' communicative decisions were found to vary by the listener's knowledge: they were more likely to endorse telling a truthful statement when a listener was knowledgeable, and a prosocial lie when a listener was ignorant. Other work finds that adults are more likely to identify a statement as a lie when a listener is ignorant (versus knowledgeable), thus, our findings may have emerged because adults think that it is more appropriate to use a prosocial lie in an ignorant context (refer to Chapter 2).

Children differentially endorsed statements based on the statement's content: they were more likely to endorse truths about reality (than opinion), and prosocial lies about opinion (than reality). These findings are in line with Cheung and colleagues' (2015) results wherein children/adults rated reality truths more positively than opinion truths, and opinion lies more positively than reality lies (the "content effect"). The researchers suggested that statements about reality carry the most moral weight since they acknowledge a shared objective world, while statements about one's opinion only acknowledge the speaker's own personal thought, thus carry

less moral weight and are seen as more acceptable. Thus, in our work children may have indicated they would use an opinion lie more than a reality lie because of feeling it was more acceptable. In addition, children's greater endorsement of using lies about their opinion (versus reality) may reflect a sensitivity to how discoverable the lie is [i.e., it is more difficult to identify/catch an opinion lie (e.g., *I like this trampoline*) than a reality lie (e.g., *This trampoline bounces*)]. Indeed, past work by Evans and colleagues (2011) found that the discoverability of a lie is an important factor in lie-telling. In sum, past findings demonstrate that children perceive prosocial lies to differ in their levels of acceptability based on content (Cheung et al., 2015), and current findings demonstrate that such content effects impact their communicative decisions. The same pattern of results was found for adults, suggesting that the lie content effect, demonstrated here for varying endorsement of prosocial lies, is present from school-age onwards through development.

Taken together, children used statement content, but not listener knowledge to guide their communicative decisions regarding when to tell a prosocial lie. In contrast, adults' decisions were guided by both factors.

Individual Characteristics Associated with Communicative Choices

Covariates

Recall that covariates were individually analyzed with each condition (i.e., knowledge condition, statement type, statement content) to identify any significant associations, and not included in subsequent analyses with empathy if found to be non-significant. In the child sample, the covariates age, English first language, and ToM interacted with statement type; overall, children whose first language was English, were older, and had higher ToM scores, were more likely to endorse the truth and less likely to endorse using a prosocial lie. These patterns diverge from past work (e.g., Lee & Imuta, 2021; Sai et al., 2021; Talwar & Crossman, 2011) but may

have emerged because in our scenarios the situation was either known to the listener (knowledgeable condition) or may have been perceived as easily discoverable as they related to the function of an object (ignorant condition). Thus, prosocial lying may not be deemed as appropriate in our vignettes as is the case in other lie paradigms, with results demonstrating that older children (and adults) with greater second-order false belief understanding show more sensitivity to the discoverable nature of the lie.

Associations with Empathy

We sought to assess whether individual differences in both types of empathy relate to children's (and adults') endorsement of language within different contexts. Contrary to our hypothesis that greater empathy would relate to greater lie endorsement, particularly for an ignorant listener, children's cognitive and affective empathy was not related to their ratings. While consistent with Demedardi and colleagues (2021), we may not have found significant associations because our paradigm did not 'activate' empathy in the same way past work has. For instance, Nagar and colleagues (2020) used a first-person task and provided information about the lie listener, such as distress. Given that children tell prosocial lies to improve others' feelings (Warneken & Orlins, 2015), having children interact with a distressed confederate may activate their own distress, and thus facilitates a response to alleviate the confederate's (and their own) negative emotions.

Within the adult sample, empathy was associated with their endorsement of statements: higher cognitive empathy was associated with lower endorsement of truths; higher affective empathy was associated with less endorsement of opinion truths. This reduced endorsement of truths suggests that adults with greater empathy seem to be adhering to the adage, "If you can't say something nice, don't say nothing at all." (Walt Disney Productions, 1942). However, we also found that greater affective empathy was associated with less endorsement of prosocial lies.

Thus, similar to our speculation above, we wonder whether the nature of our task wherein lies in both knowledge conditions would be known or possibility discovered, may have contributed to this latter finding. Future work is needed to better understand these results.

Unrelated Statements

While the endorsement of unrelated statements was analysed separately, its endorsement does provide further information on how listener knowledge may affect communicative choices. Adults, but not children's endorsement of unrelated statements, varied by listener knowledge. Work by Carson (2016) suggests that people use evasive language as a way of avoiding the consequences that may be associated with either truths or lies. That is, an unrelated statement may be used to protect the listener, the speaker, and/or their relationship (Afifi & Guerrero, 2000; Carson, 2016). Here we show that adults use this strategy more with ignorant listener, potentially because this communicative strategy would seem obviously evasive if the listener was knowledgeable.

Limitations

Despite the novel findings, several limitations should be noted. In terms of methodology, some participants may have had difficulty imagining themselves within the specific scenarios used. Also, the hypothetical nature of the scenarios lacks the social intensity that may be involved with some real-world interactions. Future research designs may consider how to directly observe children's prosocial lying behaviour in a production task (which may be more generalizable), while also providing nuanced data (differing in content). However, it is important to note that the data should be considered in the context of this design itself; of interest was not how our results reflect lying behaviour in the real world, but how endorsement ratings differ across variables. Moreover, the specific choices given as possible communicative strategies may have not fit with the participants' natural communicative style (in terms of language, tone), which may have led to

lower likelihood ratings, even if they would have endorsed the general strategy (e.g., using a prosocial lie). The order of options was also consistent across trials and while the pattern of responses does not suggest that order had an effect (i.e., there was not an increase of endorsement ratings consistently from one response to the next), we cannot rule out the possibility of order effects. In addition, in the current study, the lies were external to the listener, because we needed to manipulate the listener's knowledge. This differs from previous work on prosocial lies, which has tended to focus more on lies that are more personal (e.g., about listener's attributes, a gift they chose; Broomfield et al., 2002; Talwar & Lee, 2002b; Warneken & Orlins, 2015). As such, these prosocial lies may hold different meanings.

An important limitation and area for future work within the present study is that the reasoning underlying participants' endorsement rating patterns is unclear. For instance, children were more likely to endorse telling a truth about reality, and lie about their opinion; however, we can only speculate that this pattern emerged because children feel more comfortable acknowledging an objective negative truth (i.e., blunt truth) and lie about a subjective internal judgement, due to the "ownership" of the information (thus the moral implications of the statement), and how discoverable the truth may be. Although not directly assessed, comments made by the children during the task suggest that at least some of them were considering flexibility inherent in opinion lies (e.g., for an opinion lie saying, "*It could still be a good movie [even though it was not funny],*" and the impact on a listener, "*My friend can see, so I would tell the truth since she would know if I was lying*"). Future work would benefit from asking follow-up questions to assess the rationale behind children and adult's choices.

Conclusion

Overall, findings yield insight into contextual cues and individual characteristics relating to children and adults' communicative decisions. Children showed a similar (low) rate of

endorsing prosocial lies regardless of whether a listener was aware or not of the negative situation, unlike adults who used listener knowledge to guide endorsement of lies. When choosing to tell a prosocial lie, children were more likely to endorse a lie about their subjective opinion than the reality of a negative event, likely because such lies (according to past work) are more morally acceptable. In terms of individual characteristics, both children and adults with greater ToM were less likely to endorse prosocial lies, potentially because of greater sensitivity to the listener's ability to discover the lies within our vignettes. Adults', but not children's empathy was related to their endorsement of communicative decisions, with greater cognitive and affective empathy generally relating to lower endorsement of truths (particularly opinion truths), as well as fewer prosocial lies. Together this work highlights the interplay between contextual and individual factors for communicative decision-making.

Chapter 4: General Discussion

Given the importance of effective communication for children's socio-cognitive development, it is important to explore how children understand and use different language forms. The overarching goal of this thesis was to explore factors associated with children's appreciation of prosocial lying. More specifically, the aim of the two studies was to investigate children's and adults' sensitivity to listener knowledge and statement content to guide their reasoning about prosocial lies. Study 1 and Study 2 examined the perceived emotional outcomes of prosocial lies and endorsement of prosocial lies respectively. Additionally, the role of individual differences in empathy in relation to response to prosocial lying was examined.

There are several strengths of this work to note: first, it included data from two developmentally distinct populations (i.e., children and adults), which allowed for insight into how 8-10 year old children, whose general ability to understand the social function of prosocial lying has recently developed (e.g., Broomfield et al., 2002; Cheung et al., 2015; Warneken & Orlins, 2015), responded in ways that were similar/distinct from individuals with more mature communication skills; second, it adopted the use of multi-method procedures (i.e., using questionnaires and tasks), which reduces the potential for shared method variance; third, the examination of prosocial lies involved both children's interpretation/understanding as well as their endorsement, with separate samples of children/adults for both studies; fourth, the stimuli were carefully designed such that within the vignettes I was able to isolate variables of interest while holding other aspects consistent, and in doing so, allowed me to examine pre/post measures of emotion, which (to my knowledge) has not been done before.

Together, this work filled a gap in the child and adult prosocial lying literature regarding the perceived emotional outcome and usage of this language form. Further, this thesis highlights the influence of contextual factors as well as individual differences on reasoning about prosocial

lies, which allows for a nuanced understanding as to how different children (and adults) approach diverse communicative situations.

The sections below discuss the various findings that emerged from both studies, across the child and adult samples. Following, there is a summary of the theoretical implications of this work and practical considerations for prosocial lying in general.

Summary of Results

Listener Knowledge

One of the aims of this work was to explore whether children and adults use a listener's knowledge to guide their reasoning about prosocial lies, in particular, the emotional impact and endorsement of the language form. Results from Study 1 demonstrated that children (and adults) appreciate that prosocial lies can lead to a mood enhancement for interlocutors within both knowledgeable and ignorant conditions. That is, even when deception is unlikely (i.e., listener is knowledgeable), prosocial lies still lead to perceived positive emotional outcomes for a listener and speaker; however, ignorant listeners were perceived as having a more positive mood than knowledgeable listeners (both before and after the lie). Further, Study 2 findings demonstrated that children did not use listener's knowledge context to guide their decision to tell a truth, prosocial lie, or unrelated statement. Notably, children indicated they would use a prosocial lie even when the listener was aware of the true state of affairs (potentially because they perceive that doing so would make someone feel better, as per results from Study 1). Results showed that adults were more likely to endorse prosocial lies in the listener ignorant condition.

Together, results from these studies show two overarching findings. Firstly, children perceive there to be a positive emotional impact for both social partners (speaker and listener) when a speaker tells a prosocial lie, and this social benefit exists even when a listener is knowledgeable about the truth. Thus, it seems listener knowledge does not play a significant role

in children's perceptions of the emotional outcomes of prosocial lies, which is consistent with the finding from Study 2 that children's endorsement of lies was comparable for listeners were/were not knowledgeable of events. These findings add to previous work highlighting that lies are used to enhance others' emotions by adding in the role of listener knowledge and considering the emotional impact of both conversational partners. Past literature shows that children perceive a listener of a prosocial lie to feel positive emotions (Broomfield et al., 2002) and are more likely to tell a prosocial lie when a listener shows sad versus neutral emotions (Warneken & Orlins, 2015). Findings from my studies add that a deceptive context is neither necessary for a prosocial lie to be perceived to improve others' emotions nor the endorsement of the language form. However, past work shows that a deceptive context is important for children's usage of antisocial lies (Fu et al., 2012). Unlike antisocial lies, children may perceive that prosocial lies convey a positive social gesture that holds benefit (e.g., concern about listener's feelings) regardless of whether a listener has information that makes deception more likely (or not).

Secondly, my results demonstrated that while a listener's knowledge neither impacts the perceived emotional impact nor children's endorsement of prosocial lies, information regarding a listener's knowledge was not completely ignored. Specifically, children (and adults) perceived ignorant listeners to feel better than knowledgeable listeners both before and after a prosocial lie. However, the degree to which a listener's mood changed before and after the statement did differ by listener knowledge state. Thus, there was not a greater *improvement* in mood for ignorant listeners. In contrast to children, adults' increased likelihood of endorsing prosocial lies when a listener is ignorant (versus knowledgeable) suggests that although adults perceive similar emotional outcomes despite knowledge context, they recognize that prosocial lies are more appropriate or more often used when a listener is ignorant of the true state of affairs.

It is important to note that a lack of significant findings relating to children's integration of listener knowledge in the interpretation and endorsement of prosocial lies may not necessarily reflect that children do not take into account the internal states of others when navigating this language form. That is, while listener knowledge was not associated with children's ratings of speaker intent and likelihood of using prosocial lies, suggesting that the possibility of deceit is less relevant, they may be justifying their ratings on other aspects of the listener or speaker's internal states. For example, some comments children made while completing the prosocial lying task were related to the characters' internal states (e.g., "*he could have liked it even though it didn't fly,*" "*maybe she liked how it looked,*" "*could have liked the movie but it didn't make him laugh,*" "*maybe liked the colour*"). In addition, participants also demonstrated a sensitivity to others' internal states when justifying rating speakers/listeners feelings after truthful statements (e.g., "*[felt] better because he confessed,*" "*truth was out,*" "*feels better because he told Kevin the truth,*" "*better because not keeping anything from his friend*"). While children may not have been using information about others' knowledge states in the way that was captured in the study, it may be the case that they were incorporating this information in other ways.

Together, findings from my studies add to previous work examining how listener context relates to reasoning about language forms by further exploring the role of listener knowledge in prosocial lies more specifically. Past work in the verbal irony literature show that untrue statements directed towards knowledgeable listeners are more likely considered to be ironic, while statements directed towards ignorant listeners are more likely considered to be white lies (Aguert, 2022). Further, Nilsen and colleagues' (2011) work found that children perceived a knowledgeable listener (versus ignorant listener) to interpret an ironic speaker as critical with mean intentions. Winner and Leekam (1991) demonstrated that when listeners were ignorant of the truth, speakers who made untrue statements were more likely to be categorized as "nice" and

interpreted to be telling a white lie (versus sarcasm). With respect to the endorsement of antisocial lies, preschool children (3-5 years) were more likely to lie about a transgression when they believed the listener to be ignorant of the true state of affairs (Fu et al., 2012). While past studies found that listener knowledge plays a role in distinguishing between language forms, making inferences about a speaker, and telling antisocial lies, my work (which isolated situations wherein prosocial lies were indeed being interpreted as such) adds that for children and adults, knowledge context is considered when reasoning about the emotional impact of prosocial lies, and deception maintains the affective boost that ignorance brings. Further, this consideration is reflected in adult's higher endorsement of prosocial lies within a deceptive context.

Statement Content

An additional aim of this work was to explore the role of statement content in the perceived emotional impact and endorsement of prosocial lies. Results from Study 1 demonstrated that neither children nor adults used statement content as a cue to guide their perceptions of the emotional impact of prosocial lies. In contrast, in Study 2, children (and adults) were more likely to endorse telling a prosocial lie about an opinion, versus a lie about reality.

Together, results showed that while statement content is not used to guide perceptions about the emotional impact of prosocial lies, it is considered when endorsing the language form. Although it is plausible that in Study 1 children did not attend to the statement content within the vignettes, past work has shown that children within a similar age range are sensitive to content when identifying and evaluating lies in other social vignettes (e.g., Cheung et al., 2015). Children also showed sensitivity to the content when asked about the types of statements they would make, thus it seems that they specifically do not rely on this cue when inferring the emotion impact of lies. Study 2 results extend Cheung and colleagues' work (2015) by showing that children were more likely to endorse opinion lies than reality lies. It may be that this pattern of endorsement

emerged due to differences in moral evaluation: children may be more likely to endorse an opinion than reality because lies about opinion violate only an individual's 'truth,' versus lies about reality violate a shared truth. In addition, lying about a personal thought is easier to hide and is more believable than lying about an objective reality, and as such, a speaker who uses opinion lies is less likely to be discovered as a liar. Indeed, past work shows that the discoverability of a lie is an important factor in lie-telling (Evans et al., 2011).

Together, my work shows that the lie content effect extends from the evaluation of lies (Cheung et al., 2015) to the likelihood of telling prosocial lies throughout development. Adults responded similarly, suggesting that by school-age, children show a communicative strategy similar to adults with respect to statement content.

In addition to the unique impact of statement content, my dissertation also explored a possible interaction between listener context and statement content on the reasoning of prosocial lies. Given Cheung and colleagues' work (2015) showing differences in evaluative ratings for prosocial lies of differing content, of interest was whether the statement content is associated with perceived emotional impact and endorsement of prosocial lies when a listener is ignorant or knowledgeable of the truth. My results showed that listener knowledge did not interact with statement content across children and adults' reasoning of prosocial lies. The combination of these communicative cues does not seem to be relevant, at least in the context of my experimental design.

Empathy

My dissertation also explored whether empathy plays a role in how children (and adults) reason about prosocial lies. Across both studies there was not a clear pattern for the role of empathy, with many examined associations found to be not significant. As such, in the following section, cognitive and affective empathy were aggregated for simplicity purposes. This said, there

were a few significant findings: in Study 1, results showed that children with greater empathy were more likely to identify a speaker's intention to tell a lie when the listener was ignorant (but empathy did not relate to children's perceptions of emotions), and adults with greater empathy perceived knowledgeable listeners and speakers to experience more negative emotions. Study 2 did not find a relationship between children's empathy and their endorsement ratings. However, adults' empathy was related to lower endorsement ratings for prosocial lies and truthful statements.

Taken together, empathy may relate to the interpretation and endorsement of prosocial lying differently according to developmental stage. For children, individual differences in empathy may facilitate the ability to integrate relevant cues to accurately appreciate communicative intentions, which is a fundamental skill when conveying and receiving messages within a conversation. This work shows that children with higher empathy better understand that prosocial lies are more likely to be used when a listener is ignorant of the negative context, and deception is more likely. Results from my studies add to existing work showing that children's empathy is related to higher sensitivity to a speaker's intentions when telling a prosocial lie versus antisocial lie (Lim et al., 2020) by highlighting that empathy is related specifically within contexts. Contrary to initial hypotheses, my work did not show an association between children's empathy and their perceptions of the emotional outcomes of lies, nor the endorsement of prosocial lies. These results were inconsistent with studies that found a significant link between children's empathy and the usage of prosocial lies (e.g., Nagar et al., 2020; Xu et al., 2019) but are in line with results from Demedardi and colleagues (2021) who also did not find an association between children's empathy and prosocial lying behaviour.

To explain these findings, it may be that the methodology of the studies did not sufficiently activate children's empathy for a prosocial response. Recall Batson's theory (1991)

that an increase in one's empathic emotional response increases a helper's desire to see the other's distress reduced, which drives prosocial behaviour. Past studies showing a relationship between empathy and prosocial behaviour involve inducing empathy in the participants by showing their social partner in distress (e.g., Fabes et al., 1994; Nagar et al., 2020). Generally, these studies found that higher levels of induced empathy increased the likelihood of prosocial behaviours in the context of behaviour-based tasks. In the current studies, the use of vignettes may not have sufficiently activated children's empathy enough to encourage prosocial behaviour, given that vignettes are less emotionally evocative in nature. Real-life prosocial lying situations are a complex context with social and emotional pressures in play that are difficult to emulate in a vignette. In addition, the statements used in the studies were related to external objects (e.g., trampolines, kites) rather than a listener's personal characteristics (Broomfield et al., 2002; Talwar & Lee, 2002b; Warneken & Orlins, 2015), thus children may not have inferred the lie listener to experience high levels of emotional distress. As such, these statements may be less likely to evoke children's empathy, which results in a lack of endorsement of prosocial behaviour. In line with past studies (Demedardi et al., 2021; Edele et al., 2013) and the Empathy-Altruism Hypothesis (Batson, 1991; 1998), my results further suggest that situations with low empathy arousal show little association between empathy and children's engagement in prosocial lies. Future work could use a more naturalistic research design to evoke a stronger sense of vicarious emotional distress for the speaker, which may in turn activate children's empathy and lead to empathic responses (which may include increased prosocial lying).

Further, an alternative explanation may be that children who were higher in empathy intended on improving others' affect by using communicative strategies other than prosocial lies, which were not directly measured in the current experimental design. For example, although not directly assessed, children in Study 1 who rated that truthful statements would lead to the listener

feeling better made comments including “[got] the truth out, not keeping anything from friend,” “truth was out,” “lying to friend won’t make you happier.” Telling the truth in a negative situation may reflect a desire to improve others’ affect because although you are acknowledging the negative situation, this language form avoids deception (i.e., prosocial intentions). Indeed, past work shows that there are situations wherein telling the truth (versus prosocial lie) in a negative situation is evaluated positively, such as when accurate information is likely to be helpful for the listener to achieve future success (Ma et al., 2011). Research shows that telling the truth showcases to others that you value honesty and are a trustworthy peer, which are qualities related to stronger relationship quality (Li et al., 2014; Rodriguez et al., 2021). Thus, while the study results did not show an association between empathy and endorsed prosocial lies, there may be relations between empathy and prosocial intentions underlying communicative behaviour that are not captured in my work.

For adults, higher empathy was related to more negative perceived emotional impact in a knowledgeable context, and lowered likelihood of endorsing prosocial lies and truthful statements. Together, these results suggest that, in line with Batson’s theory (1991), adults with high empathy are more sensitive to the emotions of others, and, specific to my findings, may be more aware of how language impacts others’ feelings, particularly under specific conditions (i.e., knowledge context). In terms of endorsement, adults with higher empathy may feel that using a prosocial lie or truthful statement is not the most appropriate option to comfort others after a negative event, and that another (unexplored) option may be preferred. Without asking for open-ended responses regarding how individuals might respond, it is difficult to speculate on what a preferred response could be.

Taken together, findings provide some, albeit preliminary, evidence that empathy may play a role in communicative decisions that differs across development. Within the school-age

years, empathy may facilitate the interpretation of prosocial lies in relation to context, and then during adulthood, it may support a more nuanced appreciation of a prosocial lie's emotional impact and endorsement of prosocial lie-telling.

Theoretical Implications

My results can be viewed through a theoretical lens, notably considering Clark's Theory of Communication, Austin's Speech Act Theory, and Grice's Maxims of Communication.

Clark's Theory of Communication and Austin's Speech Act Theory

Recall that for communication to be successful, interlocutors must attend to and use cues from each other and the exchange to effectively build a conversation (Clark, 1996). This includes information about others' perspectives, context, and social cues (Lloyd et al., 1998). While some communicative cues are important when using some language forms, others may not be as relevant and are not integrated into conversation. According to Austin's Speech Act Theory (1962; 1975), incorporating relevant cues also allows us to use language to fulfil various social functions, such as creating and maintaining new relationships, protecting others from harm, or expressing concern for others' distress.

Past work shows that variations in social context affect how prosocial lies are perceived and used. For example, Ma and colleagues (2011) found that 7–11-year-olds evaluated prosocial lies more positively than blunt truths in a public situation (versus private), when a truthful statement is likely to have negative social consequences. The researchers also found that participants evaluated truthful statements more positively than prosocial lies when accurate information is likely to be helpful for a listener to achieve future success. Sierksma and colleagues (2019) also demonstrated that 9–12-year-olds perceived lying to be more positive when it benefits peers within their peer group (versus those outside of the group) and they are more likely to tell a prosocial lie when it benefits the in-group peer (versus out-group). Taken

together across various studies, children demonstrate that they are sensitive to, and will incorporate, contextual cues such as setting, consequences, and relationship with others when reasoning about prosocial lies—which then allows children to take advantage of the social benefits of the language form, as suggested by Austin’s Speech Act Theory (1962; 1975) that statements have social functions beyond description.

Adding to previous work, my findings show that children show *some* sensitivity to, and will *sometimes* incorporate, listener knowledge and statement content when interpreting/endorsing lies. As mentioned, prosocial lies have a myriad of social benefits, and Study 1 explored the specific social function of improving emotions, with results indicating that prosocial lies lead to a positive emotional impact for both interlocutors. While this social benefit has been explored in past work for listeners (e.g., Broomfield et al., 2002; Warneken & Orlins, 2015), what is less studied is the emotional impact for *speakers* after using a prosocial lie. Further, results broaden our understanding of prosocial lies as a means to improve affect, and the relevant cues associated with this social benefit: although children detected differences in listener knowledge, this cue was not integrated into their reasoning about emotional impact, demonstrating that deception is not perceived to be necessary for both interlocutors to experience an enhancement in mood. The methodology of Study 1 more directly explored emotional impact as a social function of prosocial lies, whereas in Study 2 participants were not asked to comment on the reasoning behind their communicative choices. Thus, for example, it is unknown what social functions adults were reflecting on when giving higher endorsement ratings to prosocial lies to ignorant listeners versus knowledgeable listeners. Further, participants were more likely to endorse opinion-related lies, and I speculate that this may be because when in the role of a speaker they are more sensitive to the content of the message, and in particular, the moral weight of statements (as per Cheung et al., 2015). Regardless of the social function that is considered,

results may reflect children and adults feeling that it is more *socially appropriate* to lie to ignorant listeners, or about one's own opinion, given differences in moral weight and discoverability. It would be important for future work to explore the reasoning underlying different endorsement ratings across listener knowledge and statement content.

Gricean Maxims of Communication

Prosocial lies are a language form that pit the maxims of conversation against each other; namely, although they violate Grice's Maxim of Quality (as the statement is untruthful; 1975), they adhere to the Meta-Maxim of General Cooperation (Sweetser, 1987) such that they are used to protect others from harm. In situations where a prosocial lie is warranted, dishonesty is tolerated to maintain positive relations. In line with past work (Broomfield et al., 2002; Warneken & Orlins, 2015), my results provide additional evidence that children perceive that prosocial lying will lead to positive emotions. However, my work extends past research by manipulating a listener's knowledge context within the situations, while past research has assumed a listener is ignorant when receiving a prosocial lie (e.g., Sullivan et al., 1995; Winner & Leekam, 1991). In vignettes in past work, typically only a speaker would be aware of the dishonesty (i.e., violation of the Maxim of Quality). My work shows that even when both the speaker and listener are likely aware of the dishonesty, children and adults perceive that both parties experience positive emotions, suggesting that within this scenario the meta-maxim of general cooperation is perceived to be intact.

Limitations and Future Directions

It is important to note that research on children's reasoning about language can be significantly impacted by the methodology used and the experimental environment. Therefore, the results of the current research must be interpreted within the context of the study itself,

specifically in a virtual format involving a series of vignettes with two characters wherein a negative event occurs.

The most significant methodological consideration of my work is the vignettes used for the prosocial lying task. While third-person tasks are typical when studying counterfactual language (e.g., Cheung et al., 2015), future work should explore the use of naturalistic, first-person paradigms (e.g., Nagar et al., 2020, Talwar et al., 2019) to capture more nuanced responses in emotional impact and endorsement; this may also yield more generalizable results. Also, participants may have had difficulty imagining themselves within the specific scenarios provided, and the hypothetical nature of the scenarios lacks the social intensity that may be essential in eliciting certain responses. It is possible that this lack of social intensity led to non-significant associations between empathy and the perceived emotional impact and endorsement of prosocial lies given Batson's (1991; 1998) belief that prosocial behaviour is prompted by a speaker's vicarious distress. Also, the specific choices given as possible communicative strategies may not have fit with the children's natural communication style (in terms of language, tone), which may have led to overall lower likelihood ratings, even if children would have endorsed the general strategy (i.e., using a prosocial lie). Considering the specific statements used in the prosocial lying tasks, an additional limitation is that the prosocial lies were external to the listener, which was required in order to manipulate listener knowledge. This differs from previous work on prosocial lies, which has tended to focus more on lies that are more personal (e.g., about listener's attributes, a gift they chose; Broomfield et al., 2002; Talwar & Lee, 2002b; Warneken & Orlins, 2015). As such, the prosocial lies within the current study may have held different meaning/relevance. In addition, while the current methodology allowed for comparisons across specific conditions, I did not ask for participants' rationale for choices, thus it is unclear why children/adults chose to respond the way they did; for instance, why they rated a characters'

emotions a certain way, or why they were more likely to endorse one communicative decision over another. In future work, it would be useful to incorporate open-ended questions into the methodology to assess the rationale behind children and adults' choices.

A further consideration regarding the methodology of this study was the virtual nature of the research design. Due to the COVID-19 pandemic, my originally proposed research (to be conducted in-person) was adapted to children/adults engaging in the prosocial lying task and completing measures in a virtual format. Previous work examining research with children virtually highlights challenges (e.g., technological difficulties including children struggling to use a computer mouse, adapting in-person tasks to online formats) as well as benefits (e.g., decreasing socio-economic barriers to participating in research studies, increasing diversity of research samples; Shore et al., 2023). My originally proposed research design involved children to work one-on-one with an experimenter completing the experiment, with parents/caregivers having the option to observe the meeting through a two-way mirror. The virtual format of my study meant that some children were with their parents/caregivers, whether in the same room or sitting beside them also looking at the computer screen. While parents were instructed not to respond to what the child was doing or prompt them in any way, it is possible that the physical presence of the parents may have influenced children's behaviours (e.g., children less likely to endorse telling prosocial lies). In particular, the presence of a parental observer may have possibly been a factor in the lower endorsement ratings for prosocial lies, compared to truthful statements, in Study 2.

In addition, the adaptation of the measures (i.e., empathy, vocabulary, ToM) from in-person facilitation to an online format may also be considered as a potential limitation to this work. Whenever possible, I aimed to maintain continuity of the online version of the task to its original in-person format. However, this may have affected results. For example, I asked children

to complete an empathy questionnaire before the session started and while I instructed parents to refrain from helping or prompting their child when completing this questionnaire, it is possible that parents supported children during this process, thereby influencing results (e.g., overestimated empathy scores due to children providing responses they think are more socially desirable). For the receptive vocabulary task that required participants to give a verbal response to looking at pictures and a verbal cue from the experimenter, the online formatting of the task was almost identical to how they would have been delivered in-person. The Theory of Mind task was administered similarly virtually versus in-person, wherein children watched a video and verbally answered questions that were asked by the experimenter. With respect to the adult versions of the measures completed in an online format and thus unsupervised, it is possible that adults used the internet to help them respond correctly in the vocabulary or ToM task.

Acknowledging the limitations, I am careful to interpret the results within the context of my particular methodology. For instance, I make no claims about this work providing an estimate of how often children/adults engage in lying behaviour generally (i.e., in their everyday lives). Instead, I interpret the results between the particular conditions, with a focus on what increases/decreases the emotional outcomes for interlocutors and/or endorsement of lies.

Practical Considerations for Prosocial Lying

The topic of lying is one that receives a great deal of public interest, as parents grapple with teaching children the value of truthfulness while trying to promote prosocial behaviours. There are a number of practical considerations for prosocial lying in general that may be useful to parents and educators of children when providing support in building communicative competence. Given the high frequency and complexity of prosocial lies, it is important to consider that: 1) Prosocial lying, and lying in general, reflects typical communicative development; 2) Empathy training may facilitate communication skills, which includes

understanding when/how prosocial lies may serve social functions; 3) There are negative consequences related to chronic prosocial lying behaviour.

Prosocial Lying and Communicative Competence

A primary practical consideration that this work highlights is that children's lying is normative and reflects a milestone in children's communicative development. Lying appears at similar ages across various cultures (e.g., Talwar & Lee, 2002a) and certain lies (i.e., prosocial) are often socially accepted (e.g., Bussey, 1999). Although lying is not always a desirable behaviour and may lead to negative consequences (discussed in a later section), children's effective interpretation and usage of lies mark a high degree of cognitive and social sophistication, including well-developed ToM and executive functioning skills (e.g., Williams et al., 2016), and a nuanced understanding of social norms (Talwar & Crossman, 2011).

However, parents and caregivers often have conflicting thoughts and feelings about prosocial lies, since they have a number of social benefits and are often considered as socially acceptable, but also require deception and dishonesty. Indeed, past work has found that untrue statements are only identified as lies when a listener is ignorant of the true situation and is thus more likely to be deceived (e.g., Sullivan et al., 1995; Winner & Leekam, 1991), suggesting that deception may be a primary function of prosocial lies. My work extends this conceptualization of prosocial lies with the finding that even when listeners know about the true situation, a counterfactual statement can still be identified as a prosocial lie and may be perceived to improve others' emotions. My results indicate that deception may not be necessary in order to take advantage of a prosocial lie's social benefits. Previously I discussed how a prosocial lie told in a knowledgeable context may be considered to be a positive social gesture, which leads to positive emotions for both a listener and a speaker. Thus—while dishonesty is normally discouraged and condemned, it may be the case that children use this language form to communicate positive

intentions, rather than primarily to deceive their social partner. Given that deception may not be a child's main reason for choosing to tell a prosocial lie, it may be helpful for parents and caregivers to discuss other ways to fulfil the same positive social functions, such as maintaining the relationship and protecting the other person's feelings, while also remaining honest (e.g., assertiveness; discussed in a later section).

Further, given the frequency that lies are used in daily conversations (DePaulo & Kashy, 1998), it is inevitable that children are exposed to situations where a lie may be used, and it is important that children learn how to navigate these social situations. It may not be useful to teach children that all lies are 'bad,' since prosocial lies are used to benefit relationships and protect others from harm. There may be situations wherein it is considered appropriate for children to use a prosocial lie—and, on the receiving end of a lie, see past the deception in order to appreciate the positive social intentions. Past work shows that in prosocial lying situations, children learn how to consider different contextual cues when reasoning about prosocial lies, such as: what is the emotion of the other person (Warneken & Orlins, 2015), how important is this statement for the social partner's success (Ma et al., 2011), what is my relationship with the social partner (Sierksma et al., 2019), and what is the context of the situation (Ma et al., 2011). These factors likely inform children about whether a prosocial lie is socially appropriate or not. In contrast, there may be situations wherein it is less appropriate for children to use a prosocial lie, such as if the lie leads to negative consequences for either social partner (Popliger et al., 2011). The ability for children to navigate these situations proficiently reflects communicative competence and a flexibility to use different language forms when interacting with others. Thus, considering the different contextual cues within situations that render prosocial lies to be more or less socially appropriate, it is important that parents and caregivers help children understand these situations in a more nuanced way.

Potential Benefits of Empathy Training

There was limited support for empathy's role in supporting children's understanding of a speaker's communicative intent. Associations between individual characteristics and communicative skills are interesting to consider in the context of intervention work. Essentially, will bolstering a particular characteristic through training/intervention give rise to more advanced skill in another area? Results from my study are far too preliminary for advocating for pursuing this line of work. However, it is interesting to consider what research would be needed to further explore the association found here. A natural first step would be to explore whether empathy can indeed be enhanced through intervention. Past work suggests that teaching empathy to children through awareness of emotions, modeling, structured programs, problem-solving activities, and creating supportive environments may be associated with greater emotional understanding and social competence (Feshbach & Feshbach, 1982; Hirn et al., 2019). For example, Garner (2003) found that parents who modelled a sensitivity to others' needs and perspectives and encouraged conversations about emotions, were more likely to have more empathic children. Similarly, parents who displayed more warmth towards their children were more likely to foster empathic behaviours in their children (Robinson et al., 1994; Zhou et al., 2002).

As second step would be to explore whether empathy training leads to measurable improvements in other areas of children's functioning, such as communication skills. While no research to date has specifically examined whether empathy training directly impacts children's communication abilities, studies have shown that empathy training can have broader effects. For example, Hicks and colleagues (2016) showed that in schools, young adolescents who participated in an empathy training program exhibited more prosocial behaviours. Further, while not training empathy, Ding and colleagues (2015) found that training abilities within the domain of Theory of Mind such as false belief leads to an emergence in young children's (3 years) lying

behaviour. In the study, children who had undergone ToM training were more likely to lie during a game to win candy (i.e., antisocial lie), versus those in a control group. As well, Levy and Amsel (1986) found that 3-month ToM training for children using a language-oriented sociodramatic play task (which has been found to improve ToM related skills such as false belief understanding; e.g., Harris, 2000) resulted in higher receptive vocabulary. More recently, studies by Pronina and colleagues (2021) and Restrepo Lora (2021) found that training preschoolers' false belief (i.e., a key aspect of ToM) was related to improvements in their abilities to understand implicit communicative meanings and respond appropriately in social situations.

Together, there is some support for the effects of empathy/ToM training generalizing to communicative and social domains. Thus, should the modest association between empathy and communicative intent found here be replicating, there may be value in further exploring empathy training in relation to navigating prosocial lie situations.

Prosocial Lies and Negative Consequences

Throughout my dissertation I have spoken about how there are positive aspects to prosocial lying. However, it is important to point out that chronic lying to conceal the truth is not adaptive and is related to a number of negative outcomes (hooks, 2001; Talwar & Crossman, 2011). For instance, while not found in my study, in other contexts such as ones that are more of a personal nature, when deception is unsuccessful there may be natural immediate costs related to the truth being discovered such as hurting others' feelings (e.g., Grandma is disappointed to know that you dislike the socks she gave you for your birthday). Over time there is also the social consequence of losing credibility with others as a result of chronic lying, which may lead to a loss of trustworthiness in relationships (Levine & Schweitzer, 2015; Tyler et al., 2006).

Further, there may even be negative outcomes when deception is "successful" and lies remain undetected. Given that telling a lie requires concealing the truth, and people are motivated

to view themselves as good and honest people, engaging in lying behaviour could negatively impact a speaker's self-image (Leary, 1999). For instance, through a series of studies, Preuter and colleagues (2024) found that compared to telling the truth, lying was associated with lowered self-esteem and increased negative affect. As reported in a diary study design, researchers found that increased lying predicted lowered self-esteem, and not the reverse (Preuter et al., 2024). This relationship was seen for both antisocial and prosocial lies, suggesting that there are adverse psychological effects even when using prosocial lies to benefit others (e.g., lying about liking your friend's new dress). Further, as prosocial lies require a speaker to suppress their own true thoughts/emotions, using this language form may inadvertently support children's invalidation of their emotions, that being, when children conceal their negative emotions so as to not cause distress to others (e.g., saying they feel fine after losing a favourite toy so parents do not have to buy a new one, or so parents are not upset). Self-invalidation can lead to more severe psychological difficulties such as low mood and persistent worries further down the road (Schreiber & Veilleux, 2022). As well, self-invalidation through prosocial lying may occur with thoughts when children's opinions do not match that of others, and they lie to acquire a sense of belonging or to avoid conflict. As it is typical and valid to have emotions and thoughts that are different from others, prosocial lying may not always be an appropriate communicative strategy. There is some evidence to support that those who are more likely to endorse prosocial lying are also more likely to be unassertive (Demedardi et al., 2021; Kammrath et al., 2015).

In sum, while prosocial lies may foster children's ability to connect with others, it is important to note that prosocial lie-telling is also related to various short- and long-term negative consequences. Consequently, it may be helpful to encourage children to have a broader repertoire of communicative approaches, including those that do not require dishonesty, such as assertiveness, compassionate statements, and unrelated statements. Assertiveness is a core

communication skill that allows individuals to express themselves effectively and advocate for their point of view. A compassionate response would be one that acknowledges the negative event (truth) but does so in a way that conveys a sense of caring (e.g., “*That’s rough that your trampoline doesn’t work*”). As well, there may be also situations where it is detrimental to a social relationship to tell the truth *or* lie. In Study 2, we provided an option for children to endorse telling an unrelated statement that was positive and was not related to the negative context, such as commenting on the weather or the setting the characters were in (e.g., “*It is a beautiful day!*”). This option was not often endorsed in either children or adults, possibly reflecting that the example statements provided in the task were too evasive which may be awkward in a real setting. It may be that individuals are more likely to endorse an unrelated statement if it referred to the activity itself, such as “It’s so cool you have a trampoline,” or “I wish I had a trampoline,” or “My cousin just got a new trampoline.” These options may be evasive to the object’s failure in function (i.e., trampoline being not bouncy) while still pertaining to the joint activity (i.e., jumping on the trampoline). Further, in Study 2, adults (unlike children) considered listener knowledge when endorsing unrelated statements; this skill of recognizing and integrating knowledge context in social interactions may also be a skill that can be encouraged for children when making communicative decisions. That being, it may be more appropriate to say an unrelated statement or change the topic of conversation when the listener is unaware that a negative event occurred.

Taken together, even though well-intentioned, prosocial lying may have negative consequences (Talwar & Crossman, 2011), and other forms of communication can be encouraged.

Conclusion

This research provides further insight into the intricate dynamics of prosocial lying, offering a broader understanding of how children and adults navigate this complex language form. While children show sensitivity to a listener's knowledge when interpreting prosocial lies, they do not view a listener's ignorance—which increases the chance of deception—as central to the emotional impact or the endorsement of prosocial lies. Interestingly, children are more inclined to endorse lies about opinions rather than reality, reflecting an understanding of how certain types of deception might be more socially acceptable or emotionally less harmful than others. Adults also exhibit similar patterns in their interpretation and endorsement of prosocial lies, but they are more likely to endorse prosocial lies when a listener is ignorant to the true state of affairs, highlighting a more sophisticated, nuanced understanding of how contextual cues influence communication strategies. Further, the role of empathy was found to shift across development in supporting children's basic communication skills and adults' more complex and nuanced understanding of language to drive prosociality. Taken together, these findings shed light into the developmental trajectory of empathy and communication, and capture the importance of understanding how different factors—notably, listener knowledge, statement content, and empathy—shape how we approach prosocial lies.

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Appendices

Appendix A

Descriptives for Study 1

Children's performance / report measures

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Age	9.62	1.46	-	-	-	-
2. Vocabulary	13.89	2.48	.262*	-	-	-
3. Theory of Mind	2.52	0.91	-.214	.205	-	-
4. Cognitive empathy	6.59	1.70	.223*	-.020	-.193	-
5. Affective empathy	12.75	2.40	.011	-.015	-.066	.192

Note. $N=80$.

* Indicates $p < .050$. ** indicates $p < .010$.

Adults' performance / report measures

Variable	<i>M</i>	<i>SD</i>	1	2	3
5. Vocabulary	27.65	5.16	-	-	-
6. Theory of Mind	6.948	1.83	.426**	-	-
7. Cognitive empathy	30.06	2.40	.145*	.129	-
8. Affective empathy	31.48	3.12	-.082	-.082	.190**

Note. $N=192$. *M* and *SD* are used to represent mean and standard deviation, respectively.

* indicates $p < .050$. ** indicates $p < .010$.

Appendix B

Trampoline Story Structure Each Knowledge Condition

	Listener Ignorant	Listener Knowledgeable
Introduction	Mike and Dave are in Mike's yard. Mike's dad just set up his new trampoline. Mike has not even tried it yet. Mike says, "My trampoline is going to be really bouncy." Dave likes trampolines that bounce.	Mike and Dave are in Mike's yard. Mike's dad just set up his new trampoline. Mike has not even tried it yet. Mike says, "My trampoline is going to be really bouncy. You can jump first." Dave likes trampolines that bounce.
Listener knowledge context	Mike goes inside to get a snack, and tells Dave to go ahead and jump on the trampoline.	Mike is standing next to his trampoline, watching Dave jump on it. Dave is trying to bounce.
Negative event	The trampoline does not bounce and doesn't work very well so Dave cannot jump very high.	The trampoline does not bounce and doesn't work very well so Dave cannot jump very high.
Listener knowledge statement	Dave gets off the trampoline and Mike returns with a snack. Mike does not see that his trampoline does not bounce.	Mike can see that the trampoline does not bounce.

Appendix C

Trampoline Story (Listener Ignorant Condition) with Pictures



Story 1 - I

Mike and Dave are in Mike's yard. Mike's dad just set up his new trampoline. Mike has not even tried it yet. Mike says, "My trampoline is going to be really bouncy." Dave likes trampolines that bounce. Mike goes inside to get a snack, and tells Dave to go ahead and jump on the trampoline. The trampoline does not bounce and doesn't work very well so Dave cannot jump very high. Dave gets off the trampoline and Mike returns with a snack. Mike does not see that his trampoline does not bounce.



How does **Mike** feel?



1

2

3

4

5



How does **Dave** feel?



1

2

3

4

5

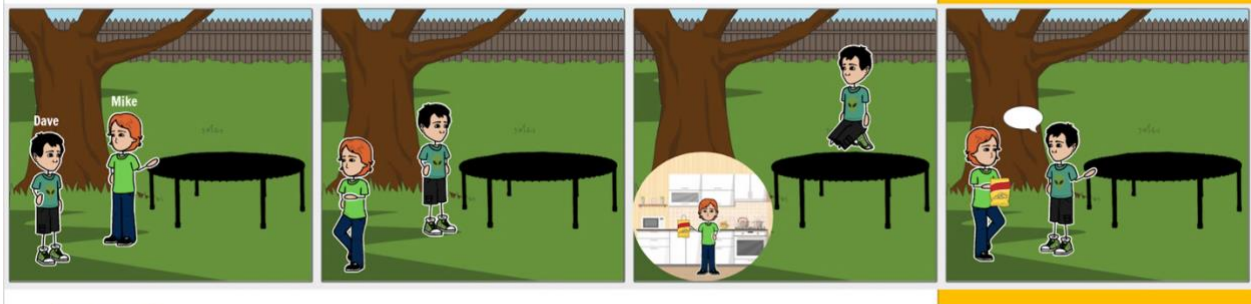




Mike comes back outside with his snack, and Dave says, "This trampoline bounces."



- When Dave said, "This trampoline bounces," did he actually think the trampoline bounces or does not bounce?
- When Dave said, "This trampoline bounces," did he say a lie, the truth, or something else?



Mike comes back outside with his snack, and Dave says, "This trampoline bounces."

After Dave said, "This trampoline bounces," how did Mike feel?



1

2

3

4

5



After Dave said, "This trampoline bounces," how did Dave feel?



1

2

3

4

5



Appendix D

Study 1 – Individual differences model for children

Children's intent responses and cognitive empathy

Predictors	Odds Ratios	95% CI	<i>p</i>
(Intercept)	14.14	7.36 – 27.19	<.001
Listener knowledge (LK)	0.90	0.39 – 2.06	.798
Statement type (ST)	0.47	0.22 – 0.98	.043
Cognitive empathy (CE)	0.99	0.69 – 1.41	.939
LK x ST	0.76	0.27 – 2.14	.598
LK x CE	1.44	0.91 – 2.26	.117
ST x CE	1.02	0.67 – 1.57	.915
LK x ST x CE	0.82	0.46 – 1.47	.513

Children's intent responses and affective empathy

Predictors	Odds Ratios	95% CI	<i>p</i>
(Intercept)	14.91	7.63 – 29.15	<.001
Listener knowledge (LK)	0.80	0.36 – 1.78	.578
Statement type (ST)	0.48	0.22 – 1.03	.060
Affective empathy (AE)	0.94	0.73 – 1.21	.616
LK x ST	0.81	0.29 – 2.28	.686
LK x AE	1.18	0.85 – 1.63	.332
ST x AE	1.30	0.95 – 1.77	.099
LK x ST x AE	0.62	0.40 – 0.95	.028

Children's listener emotion ratings and cognitive empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	1.94	1.76 – 2.12	<.001
Vocabulary	-0.01	-0.04 – 0.02	.399
Timing (T)	2.54	2.29 – 2.79	<.001
Listener knowledge (LK)	2.51	2.26 – 2.76	<.001
Statement type (ST)	0.25	-0.01 – 0.50	.055
Cognitive empathy (CE)	-0.02	-0.12 – 0.09	.775
T x LK	-2.45	-2.81 – -2.10	<.001
T x ST	-3.26	-3.62 – -2.91	<.001
LK x ST	-0.35	-0.71 – 0.01	.060
T x CE	-0.03	-0.18 – 0.12	.691

LK x CE	0.01	-0.13 – 0.16	.859
ST x CE	0.02	-0.13 – 0.17	.768
T x LK x ST	1.74	1.23 – 2.25	<.001
T x LK x CE	0.02	-0.18 – 0.23	.824
T x ST x CE	0.05	-0.17 – 0.26	.662
LK x ST x CE	0.02	-0.20 – 0.23	.888
T x LK x ST x CE	-0.23	-0.53 – 0.08	.146

Children's listener emotion ratings with affective empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	1.94	1.76 – 2.12	<.001
Vocabulary	-0.01	-0.04 – 0.02	.427
Timing (T)	2.54	2.29 – 2.79	<.001
Listener knowledge (LK)	2.51	2.26 – 2.76	<.001
Statement type (ST)	0.24	-0.01 – 0.50	.059
Affective empathy (AE)	-0.02	-0.10 – 0.05	.541
T x LK	-2.45	-2.81 – -2.10	<.001
T x ST	-3.26	-3.62 – -2.91	<.001
LK x ST	-0.34	-0.70 – 0.02	.066
T x AE	-0.00	-0.10 – 0.10	.995
LK x AE	-0.02	-0.12 – 0.09	.774
ST x AE	0.07	-0.04 – 0.17	.216
T x LK x ST	1.72	1.20 – 2.23	<.001
T x LK x AE	0.03	-0.12 – 0.17	.730
T x ST x AE	-0.03	-0.17 – 0.12	.729
LK x ST x AE	-0.05	-0.20 – 0.10	.540
T x LK x ST x AE	-0.03	-0.24 – 0.19	.800

Children's speaker emotion ratings with cognitive empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	4.12	3.73 – 4.52	<.001
English first language	-0.04	-0.43 – 0.36	.853
Timing (T)	-0.06	-0.25 – 0.13	.540
Listener knowledge (LK)	0.08	-0.11 – 0.26	.428
Statement type (ST)	-0.06	-0.25 – 0.13	.561
Cognitive empathy (CE)	0.07	-0.02 – 0.17	.139
T x LK	-0.10	-0.36 – 0.17	.480
T x ST	-0.24	-0.51 – 0.03	.078
LK x ST	0.01	-0.27 – 0.28	.964
T x CE	-0.08	-0.19 – 0.03	.158
LK x CE	-0.15	-0.26 – -0.04	.009
ST x CE	-0.06	-0.17 – 0.06	.322

T x LK x ST	-0.08	-0.46 – 0.31	.687
T x LK x CE	0.08	-0.08 – 0.24	.311
T x ST x CE	0.06	-0.10 – 0.22	.455
LK x ST x CE	0.15	-0.01 – 0.32	.062
T x LK x ST x CE	-0.16	-0.39 – 0.07	.167

Children's speaker emotion ratings with affective empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	4.12	3.73 – 4.52	<.001
English first language	-0.04	-0.43 – 0.36	.850
Timing (T)	-0.06	-0.25 – 0.13	.551
Listener knowledge (LK)	0.08	-0.11 – 0.26	.433
Statement type (ST)	-0.05	-0.25 – 0.14	.574
Affective empathy (AE)	0.01	-0.06 – 0.08	.715
T x LK	-0.10	-0.36 – 0.17	.477
T x ST	-0.24	-0.51 – 0.03	.078
LK x ST	0.01	-0.26 – 0.28	.942
T x AE	-0.00	-0.08 – 0.07	.901
LK x AE	-0.03	-0.11 – 0.05	.452
ST x AE	-0.01	-0.09 – 0.07	.752
T x LK x ST	-0.09	-0.48 – 0.30	.649
T x LK x AE	0.03	-0.08 – 0.14	.596
T x ST x AE	-0.01	-0.12 – 0.10	.873
LK x ST x AE	-0.04	-0.15 – 0.08	.506
T x LK x ST x AE	0.03	-0.13 – 0.19	.712

Appendix E

Study 1 – Individual differences model for adults

Adults' intent responses and cognitive empathy

Predictors	Odds Ratios	95% CI	<i>p</i>
(Intercept)	12.79	3.66 – 44.72	<.001
Gender	1.13	0.60 – 2.14	.711
ToM	0.90	0.70 – 1.14	.377
Listener knowledge (LK)	1.61	0.88 – 2.94	.120
Statement type (ST)	0.36	0.22 – 0.58	<.001
Cognitive empathy (CE)	1.03	0.95 – 1.12	.430
LK x ST	0.30	0.15 – 0.62	.001
LK x CE	1.02	0.91 – 1.14	.770
ST x CE	0.98	0.90 – 1.08	.699
LK x ST x CE	0.98	0.86 – 1.13	.818

Adults' intent responses and affective empathy

Predictors	Odds Ratios	95% CI	<i>p</i>
(Intercept)	11.87	3.25 – 43.32	<.001
Gender	1.18	0.61 – 2.29	.629
ToM	0.93	0.73 – 1.19	.582
Affective empathy (AE)	0.99	0.92 – 1.06	.754
Listener knowledge (LK)	1.60	0.88 – 2.90	.123
Statement type (ST)	0.36	0.22 – 0.59	<.001
LK x AE	1.01	0.92 – 1.11	.856
ST x AE	1.04	0.96 – 1.12	.333
LK x ST	0.30	0.15 – 0.62	.001
LK x ST x AE	0.96	0.85 – 1.07	.445

Adults' listener emotion ratings and cognitive empathy

Predictors	B	95% CI	<i>p</i>
(Intercept)	2.11	2.00 – 2.23	<.001
Vocabulary	0.01	0.00 – 0.03	.038
ToM	-0.08	-0.14 – -0.02	.006
Timing (T)	2.31	2.16 – 2.47	<.001
Listener knowledge (LK)	2.23	2.08 – 2.39	<.001
Statement type (ST)	-0.14	-0.30 – 0.02	.089

Cognitive empathy (CE)	-0.05	-0.08 – -0.03	<.001
T x LK	-2.08	-2.30 – -1.86	<.001
T x ST	-2.77	-3.00 – -2.55	<.001
LK x ST	0.17	-0.06 – 0.40	.143
T x CE	0.08	0.05 – 0.11	<.001
LK x CE	0.10	0.06 – 0.13	<.001
ST x CE	0.03	0.00 – 0.07	.048
T x LK x ST	1.45	1.12 – 1.77	<.001
T x LK x CE	-0.10	-0.14 – -0.05	<.001
T x ST x CE	-0.07	-0.12 – -0.02	.003
LK x ST x CE	-0.04	-0.09 – 0.01	.095
T x LK x ST x CE	0.06	-0.00 – 0.13	.058

Adults' listener emotion ratings with affective empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	2.10	1.99 – 2.22	<.001
Vocabulary	0.01	0.00 – 0.03	.022
ToM	-0.07	-0.13 – -0.01	.014
Timing (T)	2.32	2.16 – 2.48	<.001
Listener knowledge (LK)	2.24	2.09 – 2.40	<.001
Statement type (ST)	-0.13	-0.29 – 0.03	.105
Affective empathy (AE)	-0.03	-0.05 – -0.01	<.001
T x LK	-2.08	-2.31 – -1.86	<.001
T x ST	-2.78	-3.01 – -2.56	<.001
LK x ST	0.16	-0.07 – 0.39	.161
T x AE	0.06	0.03 – 0.08	<.001
LK x AE	0.05	0.03 – 0.08	<.001
ST x AE	0.01	-0.02 – 0.03	.490
T x LK x ST	1.45	1.13 – 1.77	<.001
T x LK x AE	-0.06	-0.10 – -0.03	.001
T x ST x AE	-0.04	-0.08 – -0.01	.024
LK x ST x AE	-0.00	-0.04 – 0.03	.844
T x LK x ST x AE	0.04	-0.01 – 0.09	.107

Adults' speaker emotion ratings with cognitive empathy

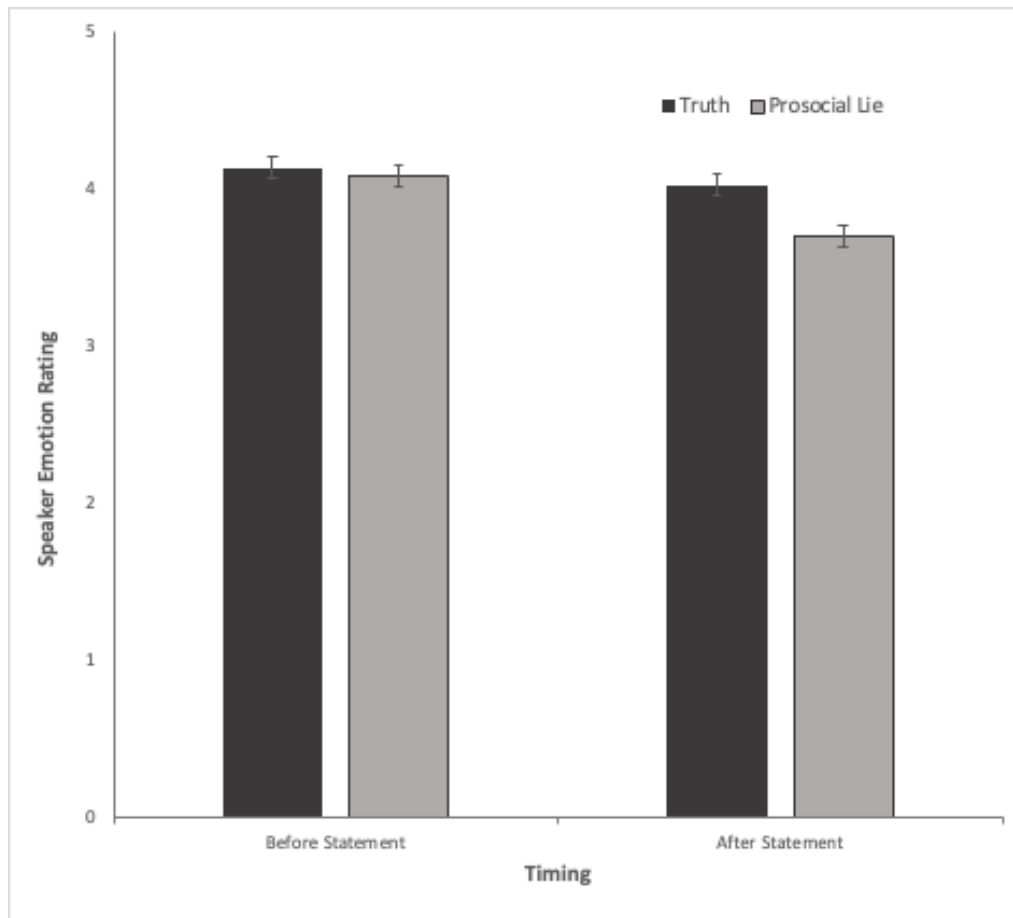
Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	3.95	3.84 – 4.06	<.001
ToM	-0.05	-0.13 – 0.02	.180
Timing (T)	0.06	-0.07 – 0.18	.393
Listener knowledge (LK)	0.12	-0.01 – 0.25	.063
Statement type (ST)	0.05	-0.08 – 0.18	.492
Cognitive empathy (CE)	0.04	0.02 – 0.07	<.001

T x LK	-0.05	-0.23 – 0.12	.546
T x ST	-0.53	-0.72 – -0.35	<.001
LK x ST	0.01	-0.18 – 0.19	.950
T x CE	-0.01	-0.04 – 0.02	.431
LK x CE	-0.00	-0.03 – 0.02	.754
ST x CE	-0.01	-0.04 – 0.02	.525
T x LK x ST	-0.28	-0.54 – -0.02	.033
T x LK x CE	0.01	-0.03 – 0.04	.666
T x ST x CE	0.01	-0.03 – 0.05	.535
LK x ST x CE	-0.01	-0.05 – 0.03	.522
T x LK x ST x CE	-0.00	-0.06 – 0.05	.926

Adults' speaker emotion ratings with affective empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	3.95	3.84 – 4.06	<.001
ToM	-0.03	-0.11 – 0.04	.405
Timing (T)	0.06	-0.07 – 0.18	.377
Listener knowledge (LK)	0.12	-0.00 – 0.25	.059
Statement type (ST)	0.04	-0.09 – 0.17	.555
Affective empathy (AE)	0.03	0.01 – 0.05	.004
T x LK	-0.06	-0.23 – 0.12	.528
T x ST	-0.53	-0.71 – -0.35	<.001
LK x ST	0.01	-0.18 – 0.19	.941
T x AE	-0.02	-0.04 – 0.00	.091
LK x AE	-0.01	-0.03 – 0.01	.157
ST x AE	0.01	-0.01 – 0.03	.520
T x LK x ST	-0.28	-0.54 – -0.02	.032
T x LK x AE	0.02	-0.01 – 0.05	.207
T x ST x AE	0.01	-0.02 – 0.04	.695
LK x ST x AE	-0.01	-0.04 – 0.02	.589
T x LK x ST x AE	-0.01	-0.05 – 0.03	.720

Appendix F



Children's speaker emotion ratings as a function of statement type and timing for truths and lies. *Note that higher ratings represent more negative the speaker perceived emotion. Error bars represent 95% CIs for each condition.*

Appendix G

Trampoline Story Structure in Each Knowledge Condition

	Listener Ignorant	Listener Knowledgeable
Introduction	You and your friend are in your friend's yard. Your friend's dad just set up a new trampoline. Your friend has not even tried it yet, and tells you that the trampoline is going to be really bouncy. You like trampoline that bounce.	You and your friend are in your friend's yard. Your friend's dad just set up a new trampoline. Your friend has not even tried it yet, and tells you that the trampoline is going to be really bouncy. You like trampolines that bounce.
Listener knowledge context	Your friend goes inside to get a snack, and tells you to go ahead and jump on the trampoline.	Your friend lets you try jumping first and stands next to the trampoline.
Negative event	You try to bounce. The trampoline does not bounce and doesn't work very well so you cannot jump very high.	You try to bounce. The trampoline does not bounce and doesn't work very well so you cannot jump very high.
Listener knowledge statement	You get off the trampoline and your friend returns with a snack. Your friend does not see that the trampoline does not bounce.	Your friend can see that the trampoline does not bounce.

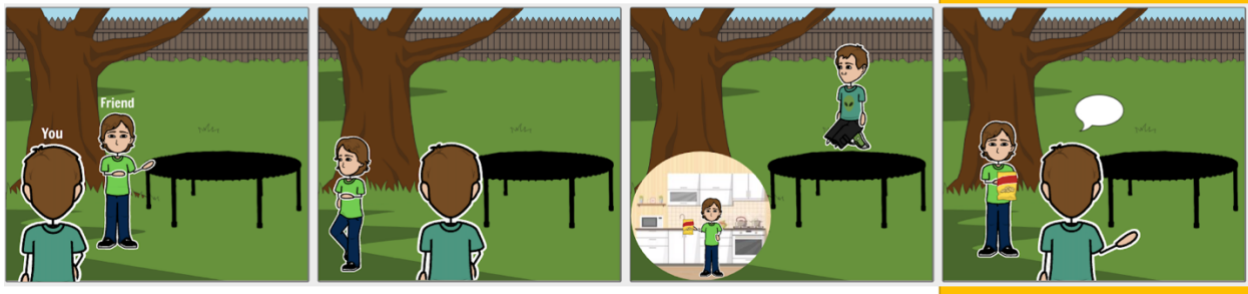
Appendix H

Trampoline Story (Listener Ignorant Condition) with Pictures



Story 1 – I: Imagine that **you** are in the story. After you finish reading the story, answer the questions.

You and your friend are in your friend's yard. Your friend's dad just set up a new trampoline. Your friend has not even tried it yet, and tells you that the trampoline is going to be really bouncy. You like trampolines that bounce. Your friend goes inside to get a snack, and tells you to go ahead and jump on the trampoline. The trampoline does not bounce and doesn't work very well so you cannot jump very high. You get off the trampoline and your friend returns with a snack. Your friend does not see that the trampoline does not bounce.



Rate how likely you would say the following if you were in this situation:

In this situation, would you:	Definitely not	Probably not	Maybe	Probably, yes	Yes, definitely
Tell the truth by saying: "I don't like this trampoline."	1	2	3	4	5
Tell the truth by saying: "This trampoline does not bounce."	1	2	3	4	5
Tell a white lie by saying: "I like this trampoline."	1	2	3	4	5
Tell a white lie by saying: "This trampoline bounces."	1	2	3	4	5
Say an unrelated statement: "It is a great day."	1	2	3	4	5

Appendix I

	Knowledgeable Listener	Ignorant Listener
Story 1 – Trampoline	You and your friend are in your friend's yard. Your friend's dad just set up a new trampoline. Your friend has not even tried it yet, and tells you that the trampoline is going to be really bouncy. You like trampolines that bounce. Your friend lets you try jumping first and stands next to the trampoline. You try to bounce. The trampoline does not bounce and doesn't work very well so you cannot jump very high. Your friend can see that the trampoline does not bounce.	You and your friend are in your friend's yard. Your friend's dad just set up a new trampoline. Your friend has not even tried it yet, and tells you that the trampoline is going to be really bouncy. You like trampolines that bounce. Your friend goes inside to get a snack, and tells you to go ahead and jump on the trampoline. The trampoline does not bounce and doesn't work very well so you cannot jump very high. You get off the trampoline and your friend returns with a snack. Your friend does not see that the trampoline does not bounce.
Story 2 – Kite	You and your friend are at your friend's house. Your friend's dad just finished putting together a new kite. Your friend has not even tried it yet, and tells you that the kite is going to fly high. You like kites that fly. You and your friend go to the park together to fly the kite. The kite won't get off the ground and it won't fly at all. Your friend can see that the kite does not work well and does not fly.	You and your friend are at your friend's house. Your friend's dad just finished putting together a new kite. Your friend has not even tried it yet, and tells you that the kite is going to fly high. You like kites that fly. You and your friend decide to fly the kite at the park. Before leaving the house, your friend looks for a hat, and tells you to take the kite to the park. At the park, you try the kite. The kite won't get off the ground and it won't fly at all. Your friend comes to the park. Your friend does not see that the kite does not fly.
Story 3 – Sleepover	You are sleeping over at your friend's house. Your friend bought a new movie. You and your friend have not watched the movie before. Your friend tells you that it is going to make you laugh. You like movies that make you laugh. You and your friend watch the movie together and eat popcorn. The movie was not funny at all. You and your friend do not laugh during the entire movie. Your friend knows that the movie was not funny. The movie was finished.	You are sleeping over at your friend's house. Your friend bought a new movie. You and your friend have not watched the movie before. Your friend tells you that it is going to make you laugh. You like movies that make you laugh. Your friend fell asleep before the movie starts. You watch the movie and eat popcorn. The movie was not funny at all. You did not laugh during the entire movie. When the movie was over, your friend woke up. Your friend does not know that you did not laugh during the movie.

Story 4 – Basketball	You and your friend are at basketball practice. Your friend has a new basketball, and hasn't tried it yet. Your friend takes it out of the box and tells you that the ball is going to bounce really well. You like basketballs that bounce. You and your friend try out the new basketball together. The new ball does not work well and does not bounce. Your friend can see that the basketball does not bounce.	You and your friend are at basketball practice. Your friend has a new basketball, and hasn't tried it yet. Your friend takes it out of the box and tells you that the ball is going to bounce really well. You like basketballs that bounce. Your friend ties his/her shoes in the change room, and tells you to go ahead and try out the new ball on the basketball court. The new ball does not work well and does not bounce. Your friend comes onto the basketball court. Your friend does not see that the new ball does not bounce.
Story 5 – Pool Donut	You and your friend go to the pool to swim. Your friend just finished blowing up a new pool donut. Your friend hasn't tried it yet, and tells you that the pool donut is going to be awesome at floating. You like pool donuts that float. You try the pool donut first. Your friend watches you in the pool donut. The pool donut does not work well and sinks to the bottom of the pool. You take the pool donut out of the pool. Your friend sees that the pool donut does not float.	You and your friend go to the pool to swim. Your friend just finished blowing up a new pool donut. Your friend hasn't tried it yet, and tells you that the pool donut is going to be awesome at floating. You like pool donuts that float. Your friend changes into his/her swimsuit in the change room, and tells you to go ahead and take the pool donut to try it out in the pool. The pool donut does not work well and sinks to the bottom of the pool. You take the pool donut out of the pool. Your friend comes out of the change room, and does not see that the pool donut does not float.
Story 6 – Glow-in-the-dark Toys	You are at your friend's house building a fort. Your friend has new glow-in-the-dark toys and hasn't even tried them yet. Your friend takes the toys out of the box and tells you that the toys will glow really bright in the dark. You like toys that glow in the dark. You and your friend turn off the light to play with the glow-in-the-dark toys inside the fort. The toys do not glow in the dark and do not work well. Your friend can see that the toys do not glow in the dark.	You are at your friend's house building a fort. Your friend has new glow-in-the-dark toys and hasn't even tried them yet. Your friend takes the toys out of the box and tells you that the toys will glow really bright in the dark. You like toys that glow in the dark. Your friend leaves the room to get a snack. You turn off the light to play with the glow-in-the-dark toys. The toys do not glow in the dark and do not work well. You turn the light back on. Your friend comes back into the room with a snack. Your friend does not see that the toys do not glow in the dark.

Appendix J

Study 2 – Individual differences model for children

Children's endorsement ratings with cognitive empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	3.28	2.46 – 4.09	<.001
Age	-0.01	-0.09 – 0.07	.797
English first language	-0.00	-0.39 – 0.39	.996
ToM	0.02	-0.08 – 0.12	.717
Cognitive empathy (CE)	-0.02	-0.13 – 0.08	.657
Statement type (ST)	-1.09	-1.32 – -0.85	<.001
Statement content (SC)	0.68	0.45 – 0.92	<.001
ST x CE	-0.05	-0.19 – 0.10	.545
SC x CE	0.06	-0.09 – 0.21	.415
ST x SC	-1.10	-1.43 – -0.77	<.001
ST x SC x CE	-0.03	-0.24 – 0.18	.788

Children's endorsement ratings with affective empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	3.26	2.46 – 4.06	<.001
Age	-0.01	-0.08 – 0.06	.789
English first language	0.02	-0.37 – 0.41	.929
ToM	0.03	-0.07 – 0.13	.571
Affective empathy (AE)	-0.02	-0.09 – 0.05	.608
Statement type (ST)	-1.08	-1.32 – -0.85	<.001
Statement content (SC)	0.68	0.45 – 0.92	<.001
ST x AE	-0.03	-0.13 – 0.07	.554
SC x AE	-0.00	-0.11 – 0.10	.969
ST x SC	-1.11	-1.44 – -0.77	<.001
ST x SC x AE	0.04	-0.11 – 0.19	.593

Appendix K

Study 2 – Individual differences model for adults

Adults' endorsement ratings with cognitive empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	2.79	2.50 – 3.08	<.001
Gender	-0.13	-0.28 – 0.02	.086
ToM	-0.08	-0.14 – -0.03	.004
Cognitive empathy (CE)	-0.07	-0.19 – 0.05	.264
Listener knowledge (LK)	0.36	0.20 – 0.51	<.001
Statement type (ST)	-0.30	-0.46 – -0.15	<.001
Statement content (SC)	1.21	1.05 – 1.36	<.001
LK x CE	0.04	-0.11 – 0.20	.595
ST x CE	0.17	0.01 – 0.32	.035
LK x ST	-0.56	-0.78 – -0.34	<.001
SC x CE	0.01	-0.14 – 0.17	.856
LK x SC	0.00	-0.21 – 0.22	.978
ST x SC	-1.67	-1.88 – -1.45	<.001
LK x ST x CE	-0.05	-0.27 – 0.17	.656
LK x SC x CE	-0.02	-0.24 – 0.20	.857
ST x SC x CE	-0.07	-0.29 – 0.15	.535
LK x SC x ST	-0.04	-0.35 – 0.27	.798
LK x SC x ST x CE	-0.02	-0.33 – 0.29	.882

Adults' endorsement ratings with affective empathy

Predictors	<i>B</i>	95% CI	<i>p</i>
(Intercept)	2.80	2.53 – 3.08	<.001
Gender	-0.14	-0.27 – -0.00	.048
ToM	-0.07	-0.12 – -0.02	.011
Cognitive empathy (CE)	-0.18	-0.30 – -0.06	.002
Listener knowledge (LK)	-0.30	-0.45 – -0.15	<.001
Statement type (ST)	0.36	0.20 – 0.51	<.001
Statement content (SC)	1.21	1.05 – 1.36	<.001
LK x CE	0.10	-0.05 – 0.26	.204
ST x CE	0.08	-0.08 – 0.23	.327
LK x ST	-0.56	-0.78 – -0.34	<.001
SC x CE	0.19	0.04 – 0.35	.014
LK x SC	-1.67	-1.88 – -1.45	<.001
ST x SC	0.00	-0.21 – 0.22	.978
LK x ST x CE	-0.13	-0.35 – 0.10	.265

LK x SC x CE	-0.23	-0.45 – -0.01	.038
ST x SC x CE	-0.03	-0.25 – 0.19	.790
LK x SC x ST	-0.04	-0.35 – 0.27	.798
LK x SC x ST x CE	0.04	-0.27 – 0.36	.783