CHILDREN’S UNDERSTANDING OF INTENTIONAL CAUSATION IN MORAL REASONING ABOUT HARMFUL BEHAVIOUR

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
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Abstract  

When evaluating a situation that results in harm, it is critical to consider how a person’s prior intention may have been causally responsible for the action that resulted in the harmful outcome. This thesis examined children’s developing understanding of intentional causation in reasoning about harmful outcomes, and the relation between this understanding and mental-state reasoning.  

Four-, 6-, and 8-year-old children, and adults, were told eight stories in which characters’ actions resulted in harmful outcomes. Story types differed in how the actions that resulted in harm were causally linked to their prior intentions such that: (1) characters wanted to, intended to, and did perform a harmful act; (2) they wanted and intended to perform a harmful act, but instead, accidentally brought about the harmful outcome; (3) they wanted and intended to perform a harmful act, then changed their mind, but accidentally brought about the harmful outcome; (4) they did not want or intend to harm, but accidentally brought about a harmful outcome. Participants were asked to judge the characters’ intentions, make punishment judgments, and justify their responses. Additionally, children were given first- and second-order false-belief tasks, commonly used to assess mental-state reasoning.  

The results indicated that intention judgment accuracy improved with age. However, all age groups had difficulty evaluating the intention in the deviant causal chain scenario (Searle, 1983), in which the causal link between intention and action was broken but a harmful intention was maintained. Further, the results showed a developmental pattern in children’s punishment
judgments based on their understanding of intentional causation, although the adults’
performance did not follow the same pattern. Also, younger children referred to the characters’
intentions less frequently in their justifications of their punishment judgments.

The results also revealed a relation between belief-state reasoning and intentional-
causation reasoning in scenarios that did not involve, or no longer involved, an intention to harm.
Further, reasoning about intentional causation was related to higher-level understanding of
mental states. The implications of these findings in clarifying and adding to previous research on
the development of understanding of intentional causation and intentions in moral reasoning are
discussed.
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Chapter 1: Introduction

1.1 General Overview

This thesis examines children’s understanding of intentional causation when reasoning about others’ moral behaviours. Theoretically, one evaluates and makes judgments about another’s moral action based on whether the action was caused by a prior intention. There are two primary aims of this thesis. One goal is to illustrate children’s understanding of the causal relation between intentions and actions and to show how this understanding influences their evaluation of others’ moral actions. A second goal is to examine the relation between children’s understanding of intentional causation in moral reasoning and their understanding of others’ mental states. This second goal is motivated by the categorization of intention as a mental state and by previous hypotheses of a relation between theory-of-mind understanding and moral judgment (Leslie, Knobe, & Cohen, 2006; Sokol, Chandler, & Jones, 2004). In addition, this thesis compares children’s reasoning and adults’ reasoning with the broader goal of examining the development of children’s understanding of these issues. These aims are all addressed in one study.

1.2 Introduction to Theory-of-Mind and Moral-Rule Reasoning

Successful participation in the social world requires an understanding of one’s own and others’ mental states. To effectively interpret human behaviour and interact with others, people need to be able to reason about mental states, including beliefs, desires, emotions, and intentions. Research on the development of mental-state reasoning has largely been conducted by people working in the area of “theory of mind” which focuses on children’s understanding of themselves and others as psychological beings, whose mental states differ. Theory-of-mind researchers have, over the past few decades, assembled a mass of information about children’s mental-state reasoning and how this developing ability influences their social understanding. However, social
understanding involves more than just the ability to reason about mental states. Interpretation of human behaviour and social interaction also requires knowledge of the social rules and conventions that regulate everyday interactions. Importantly, children’s social understanding involves both theory-of-mind skills and knowledge of the rules and roles that form the structure of their social world (Wellman & Miller, 2006). Development in each of these social-cognitive domains provides a foundation that enables children to participate effectively in the social world. Although there has been considerable research on the development of theory-of-mind and of social-rule understanding, the domains have largely been studied independently. Because of the importance of both domains to children’s social understanding, examining the relation between the two and their simultaneous contribution to development is important for providing information about children’s social-cognitive abilities. This is especially important in the elementary years, as children are entering formal education settings where instruction and activity are highly social in nature and require certain levels of social-cognitive skill for successful participation.

Another set of rules that is often a focus of educators and caregivers of young children is the set of rules that guides moral reasoning and moral behaviour. Moral rules involve issues of justice, violation of others’ rights, and harm to others (Turiel, 1983), and reasoning about these rules involves evaluating situations and making judgments about what is morally right and wrong. Like children’s theory of mind, moral character begins its developmental course before children enter the formal education system, and grows extensively during their elementary school years (DeVries, 2001; Lake, 2004). Also, like reasoning about social rules, children’s reasoning about moral rules and their theory of mind have been intensively but independently investigated in social-cognitive development research, with relatively little experimental work connecting moral-rule reasoning and theory-of-mind understanding. Children’s moral reasoning and theory-
of mind understanding should be significantly related, because judging moral behaviour involves interpreting and explaining actions based on people’s mental states – what they know, want, feel, and think. In other words, moral judgment requires one not only to consider the events and the outcomes but to consider the mental states involved. Moral judgment of behaviour depends on whether individuals wanted or intended to cause a harmful outcome, or know that they were causing a harmful outcome, regardless of how the outcome occurred. Thus, accurate moral judgment requires an ability to understand mental states and reason about how mental states motivate and cause behaviour. Traditional assessments of theory of mind, such as false-belief tasks, require individuals to simultaneously maintain representations of someone else’s mental state and of their own knowledge of reality, even though they may be inconsistent, and predict that person’s behaviour. Higher-level false-belief tasks involve simultaneous and additional recursive reasoning about mental representations, asking individuals to concurrently maintain more than one mental representation while reasoning about or evaluating behaviour. Because moral reasoning involves maintaining representations of one or more mental states and of reality, the ability to judge moral behaviour has potential relations with lower and higher levels of theory-of-mind understanding depending on the complexity of the situation and the combinations of mental states involved.

Children’s reasoning about moral rules involves using their knowledge of a person’s mental states not only to explain behaviour but also to make evaluative decisions. Previous research has shown that 3-year-old children can use information about others’ desires to inform their moral reasoning (Helwig, Zelazo, & Wilson, 2001). And by 5 years of age, children can consider others’ beliefs when making moral judgments (Wainryb & Ford, 1998). Also important to the evaluation of moral behaviour is an understanding of the intention that motivates and guides specific action. However, the concept of intention is complex, and research that examines
links between intention and moral reasoning often uses differing working definitions of the intention concept. As a result, the available evidence of young children’s use of intention information in their moral reasoning is not consistent (e.g., Berndt & Berndt, 1975; Grueneich, 1982; Keasey, 1977). The primary aim of the current study is to examine children’s developing understanding of the concept of intention and their use of this understanding to reason about moral rules. In particular, this study focuses on children’s understanding of intentional causation, or the causal relation between the mental state of intention and the action, when evaluating situations involving moral issues. Also, because of the theoretical links between theory-of-mind and moral reasoning, this study examines the relation between reasoning about moral intentions and reasoning about mental states. More specifically, this study examines the link between the understanding of intentional causation in moral reasoning and first- and second-order false-belief understanding.
Chapter 2: Theoretical background

2.1 Intentional Causation

2.1.1 Intentional Causation in Moral Reasoning. True evaluation of moral behaviours entails determining the causal connection between the agent’s initial intention and the action that resulted in the outcome. That is, moral judgment involves recognizing whether the agent’s intention causes the action that causes the outcome. Judgments of responsibility, punishment, and praise should be based on whether the action that resulted in the outcome was intentionally caused (Shaver, 1985). This is demonstrated in the criminal court system by the practice of deliberating the connection between the defendant’s intent and his or her actions prior to making a judgment of responsibility for the outcome.

Conscious deliberation of the causal link among intentions, actions, and outcomes is not always evident in one’s reasoning about social behaviour (Pizarro, Uihlmann, & Bloom, 2003). Often, individuals consider only the intention and the outcome, or only the action and the outcome when reasoning about issues of responsibility or blame. However, reasoning about just one or two of the components does not provide an accurate evaluation of whether behaviour was intentionally caused. All components and the causal relation between them must be considered for an accurate evaluation. An outcome should be evaluated as intentional only if the action that caused the outcome was motivated and caused by a prior intention.

2.1.2 Defining Intentional Causation. For behaviour to be considered truly intentional, the goals of the actions need to be represented as mental states (Adams, 2006). Prior intentions are mental states formed prior to the actions they are connected to and depend on one’s beliefs and desires, which provide reasons and motivation for behaviour (Searle, 1983). Actions towards these goals need to be caused by these represented intentions and the outcomes need to be causally related to the mental representations of the goals (Adams, 2006). If the causal link
among mental representations, goals, and actions is not present, then the behaviour may achieve a desired but unintentional outcome (Adams, 2006). “Intentional causation” describes this causal relation between an intentional state and its conditions of satisfaction (Searle, 1983). The propositional content of an intentional state determines the conditions that must be realized to satisfy the mental state (Searle, 2001). Since intentions have a world-to-mind direction of fit, satisfaction of the intentional state depends on the events of the world coming to match the propositional content (Searle, 1980). However, since intentions also have mind-to-world direction of causation (Searle, 1980), intentions are not satisfied unless the intention itself causes the action that is represented in the propositional content of the intention (Searle, 2001). Thus, although certain events must occur for a prior intention to be fulfilled, it is not truly fulfilled unless the events are caused by actions that are represented in the propositional content of the intention. Searle refers to this as the causal self-referentiality of intention – since the propositional content of intention includes the representation of the intention, intentions must be carried out as originally mentally represented in order to be fulfilled (Searle, 1983). Specific event outcomes are thus necessary but insufficient in satisfying the conditions set by the prior intention.

2.1.3 Differentiating Between Prior Intentions and Intentions-In-Action. According to Searle (1981), prior intentions are different from intentions-in-action. Prior intentions motivate behaviour, describe the contents of behaviour, and cause intentions-in-action (Searle, 1983). Intentions-in-action are representations that characterize current action, accompany every action and are directly associated with what one is presently doing (Searle, 1983). They are not formed in advance but present physical movement to create action (Searle, 1983). Without intentions-in-action, movement is simply movement and not action (Astington, 1999). Thus, when referring to the causal link between prior intentions and actions that are necessary for evaluation of
behaviour, it is just as appropriate to refer to the causal link between prior intentions and intentions-in-action. Intention-in-action occurs regardless of whether there is a prior intention (Malle & Knobe, 1997) and may or may not be related to the initial representation of the plan of action.Actions necessarily contain intentions-in-action but are not necessarily caused by prior intentions (Searle, 1980). According to Searle (1980), intentional action is the condition of satisfaction of an intention-in-action. However, prior intentions cause intentions-in-action and the conditions of satisfaction of intentions-in-action are represented in the propositional content of the prior intention. Thus, to meet the conditions of satisfaction of a prior intention as described by Searle (1983), a fulfilled intention must consist of an action that is caused by an intention-in-action and physical behaviour that matches the propositional content of the prior intention.

When evaluating the intention underlying behaviour, one must consider the causal relation among prior intentions, intentions-in-action or action, and outcomes. Intentions-in-action provide an intention component to action but accurate judgment of the intention underlying behaviour should theoretically take into consideration the prior intention, which is mentally represented prior to action. Intentions-in-action present current action and thus need to be considered, but evaluation of behaviour should theoretically be different if the intention-in-action does not match the propositional content of the prior intention. An action that is performed intentionally is not the same as an action that is carried out as intended (Searle, 1980). In the criminal code of Canada, one of the ways that different types of murder offences are differentiated depends on whether the act was planned and deliberate or committed “in the moment” (Department of Justice, 1985). It can be argued that evaluation and judgment of moral behaviour should also differ depending on whether the outcome resulted from an action that was caused by a prior intention or an action that was committed “in the moment” and caused by an intention-in-action that is not caused by any prior representation.
2.2 Metarepresentational Understanding of Intention

To evaluate the causal connection between intentions and intentions-in-action, one must understand that the two are separate and functionally different representations. There are multiple theoretical views that describe the development of mental-state understanding and how representational abilities of individuals influence behaviour and reasoning about actions (e.g., Flavell, 1988; Perner, 1991; Wellman & Woolley, 1990). For instance, Flavell (1988) describes a view in which children develop from recognizing that they are somehow cognitively connected to external objects and events to recognizing that the same objects and events can be mentally represented by people in different ways. That is, children come to realize that people can represent the same object or event in ways that contradict reality or that contradict others’ representations (Flavell, 1988). Another view describes the development of children’s ability to reason about mental representations in domains, moving from desire reasoning to belief-desire reasoning (Wellman & Woolley, 1990). Still another view and the one used as a context for this study’s design, metarepresentation, describes the development of children’s ability to represent themselves or another person representing a situation (Perner, 1991). Metarepresentation has previously been hypothesized to be related to the understanding of intentional causation (Astington, 2001; Lee, 1995; Mull, 2001; Perner, 1991). Under the theory of metarepresentation, Perner (1991) suggests that 3-year-old children can only represent the situation itself. That is, although they can talk about “thinking” and “knowing”, they do not understand that mental states can represent or misrepresent reality. Three-year-old children represent an intention as a concrete situation, rather than a mental state that can be manipulated, and evaluate the outcome based on whether the event achieved what was represented in the concrete intention. Thus, a 3-year-old child who watches a person reach for a ball represents that the person is trying to get the ball and will evaluate the person’s success in obtaining the ball. However, this 3-year-old child does not
understand that the person reaching for the ball may or may not have had a prior intention to obtain the ball and thus cannot evaluate the person’s success in achieving their intention. There is an intended state and an action but not a separate concept of the intention to act. They do not understand that they or others can represent intentions as mental states that represent an intended action, but are separate from the situation. Perner (1991) suggests that children who have a metarepresentational understanding of intention can separate the intention to act as a mental state and the action itself.

Astington (2001) also argues that to understand the separation and thus, the causal link between intentions and intentions-in-action, one must have a metarepresentational understanding of intention. Without this ability to perceive the separation between intentions and actions, it is not possible for children to attribute an intention to another person and predict the person’s action based on their intention, or recognize the possibility of a causal link between intentions and actions. Children who do not have a metarepresentational understanding of intention also have difficulty distinguishing between intention states and desires states (Astington, 2001). This is because children who cannot metarepresent confound desires and intentions as goal states and represent them as one and the same situation. Children who cannot metarepresent do not recognize prior intentions as separate mental states and determine whether intentions or desires are fulfilled simply by evaluating whether the event fulfills the goal state, regardless of the specific action. Thus, distinguishing between desires and intentions is important for evaluating whether an outcome was intentionally caused. Both intentions and desires can be seen as motivational attitudes for action (Astington, 2001), but whereas desires refer to specific outcomes, prior intentions refer to a more deliberative activity (Malle & Knobe, 2001). There is greater commitment to action with an intention (Bratman, 1987). This differentiation is an important one when evaluating the direct intention of a particular action. Conflating desires (what
one wants to occur) and prior intentions (what one plans) confounds the two mental states, risking inaccurate judgment of whether outcomes of actions are intentionally caused. To illustrate, Searle describes a “deviant causal chain” (1983) in which a person’s desire is ultimately satisfied but not in the way in which he or she initially intended or planned. In an often-cited philosophical example (adapted from Chisholm, 1966), a man who wants to kill his rich uncle so that he can inherit the fortune hits a pedestrian with his car while preoccupied with rehearsing his plan to shoot his uncle. The pedestrian the man hits happens to be his uncle, and so the man’s desire was clearly satisfied but because his plan was to shoot his uncle, it cannot be said that his intention was fulfilled. The deviant causal chain involves a desired outcome occurring as a result of an action that took place without a prior intention. It provides an example of a situation in which a metarepresentational understanding of mental states allows for the differentiation between intentions and desire, which makes it more possible for one to evaluate the causal link between intentions and actions.

2.3 Summary of Theoretical Background

The theoretical background literature presented in this section provides rationale for the aims of the current study. To accurately evaluate moral behaviour, one must appreciate that intentions are mental states that cause action but are separate from action. Prior intentions contain a representation of the conditions of satisfaction for the intention to be fulfilled and are different from intentions-in-action. Intentional action occurs when the conditions of satisfaction for the intention-in-action are satisfied but if the intention-in-action does not meet the conditions of satisfaction for the prior intention, it cannot be said that the action was intended (Searle, 1980). Thus for this study, it is necessary to examine children’s understanding of intentional causation by incorporating conditions that manipulate the satisfaction of the conditions for prior intentions and that allow for reasoning about the causal link between intentions and actions. Also, Perner
(1991) and Astington (2001) argue that metarepresentational understanding of mental states is necessary for children to understand the causal link between intentions and actions, and the separation between desires and intentions. Children who cannot metarepresent do not understand others’ mental states as representations and potentially confound others’ goal states. Thus, it is also necessary to clearly differentiate desires and intentions in the task to allow for assessment of children’s ability to reason about moral behaviours using intentions rather than general goal states. However, a review of the empirical literature is first necessary and follows in the next chapter.
Chapter 3: Empirical Background

3.1 Overview of the Chapter

This section presents empirical literature describing research that has been conducted to examine the development of children’s understanding of intention, the development of metarepresentational understanding, the relation between intention understanding and metarepresentational understanding of mental states, and the intersection between intention reasoning and moral-rule reasoning. More specifically, this section first outlines research that describes the developing understanding of the intention concept, beginning in infancy. The purpose of tracing the development of intention understanding is to note the attribution of intention understanding to young infants and to highlight the view that a more complex understanding of the intention concept is required for moral reasoning. Research on the development of metarepresentational understanding of mental states is presented next, including children’s ability to differentiate intentions from desires. This is followed by research examining the relation between metarepresentational understanding of belief, a commonly assessed theory-of-mind ability, and intention understanding. The last part of this section presents research that assesses the relation between intention understanding and moral reasoning in both adult and child populations.

3.2 Early Development of Intention Understanding

There has been extensive research on the beginnings of early intention understanding in infancy and early childhood. Early understanding of simple intentions involves recognizing that intentions are motivational states that are somehow connected to action. From infancy, researchers have explored early understandings of self as an intentional agent and early abilities to attribute intention to others. Using gaze, preference, and habituation-dishabituation paradigms to investigate infants’ perception of and response to observable intentional actions by adults,
researchers have suggested that infants as young as 6 months react appropriately to adults’ displays of goal-directed intentionality. Evidence from a number of studies suggest that starting around 6 months of age, infants perceive human actions as goal-directed; dishabituating to novel goals and not novel actions or movements (e.g., Phillips & Wellman, 2005; Woodward, 1998; Woodward, Sommerville, & Guajardo, 2001). They are able to differentiate between goal-directed and non-goal-directed actions. Ten-month-old infants have been shown to dishabituate to interruptions in human movement that occur before the goal is achieved but not if the goal is achieved, demonstrating their sensitivity to the intentional structure of actions (Baldwin & Baird, 2001). Twelve-month-old infants have been shown to be able to use information about adults’ emotional expression as intentional cues to predict their actions (Phillips, Wellman, & Spelke, 2002). Further, beyond assessing infants’ perception of the intentions underlying action using gaze and habituation methods, a recent study examined infants’ reproduction of basic components of action goals and found that 7-month-olds were sensitive to the goal-directedness in adults’ actions and selectively imitated actions based on the goal-directedness they observed (Hamlin, Hallinan, & Woodward, 2008). This line of evidence suggests that infants as young as 6 months of age demonstrate an ability to detect and use basic intention information and by the end of their first year, infants are sensitive to the goal-directed intentionality in actions (Wellman & Miller, 2006; Woodward, 1998).

Intention understanding continues to develop with age as older infants and young toddlers show progressive ability to detect and use information about intentions embedded in actions and in language. By 18 months of age, infants were found to be able to reproduce the intended actions of adults after observing their potentially successful and failed attempts at the intended action (Meltzoff, 1995). Although the infants never saw the actions successfully modelled, when given the chance they imitated the potentially successful goal-directed actions more than the failed
ones. Infants inferred the intentions of the adults and imitated the intended action as opposed to the movement that resulted in a failed attempt. By 18 months, infants were also found to use adults’ verbal cues to infer intention and imitate adults’ intentional actions but not accidental ones (Carpenter, Akhtar, & Tomasello, 1998). When adults vocally marked their actions as accidental or intentional, infants were found to imitate adults’ intentional actions significantly more than their accidental actions. At 36 months of age, toddlers were able to infer adults’ action intentions by observing their emotional reactions to events and subsequently produce actions based on their inferences (Meltzoff’s study as cited in Meltzoff, Gopnik, & Repacholi, 1999). In ambiguous situations, 36-month-old toddlers were able to reason backwards from an emotional reaction to what the adult was trying to do and clarify the meanings of the adults’ behaviour (Meltzoff’s study as cited in Meltzoff et al., 1999).

The evidence suggests that infants and young toddlers are able to detect intentions and reproduce actions based on their observations and inferences. However, this early understanding of intentions appears to be intimately connected with their perception of action (Woodward, 2009). They may not yet understand intention as a mental state that exists prior to action and motivates specific action but is separate from the action itself. As hypothesized previously, a metarepresentational understanding of intention can help children to understand intentional causation by allowing them to separate the intention as a mental representation apart from the action it causes. When children are able to see intentions as independent of actions rather than a generalized goal state, they are better able to understand the possibility of a causal link between intentions and actions. Successful social interactions that involve reasoning about intentions underlying behaviour require an understanding of this more complex concept of intentional causation. Thus, the early ability to detect and use intention information attributed to infants and young toddlers is not sufficient for social interaction as their experiences become more complex.
and involve more individuals, a wider variety of behaviours, and more complex mental-state reasoning.

3.3 Metarepresentational Understanding of Belief

Individuals with a metarepresentational understanding of mental states are able to reason about their own and others’ mental states as entities separate from behaviour, and are thus able to recognize mental states as representations that are causally responsible for action (Astington, 2001; Perner, 1991). The development of a metarepresentational understanding of intention has not been well-researched (Astington, 2001). In the area of theory-of-mind research, metarepresentational understanding of belief states has been much more of a focus.

As children age, they begin to show an understanding of mental states as metarepresentations. This is most commonly shown in research on children’s false-belief understanding where children between the ages of 3 and 5 have been found to understand that people can have false beliefs about the world and act on those false beliefs (Wimmer & Perner, 1983). In other words, they can understand that people can have belief representations that differ from a matter of fact or reality. Children who pass assessments of false-belief understanding recognize that there is a separation between people’s mental representations of belief and reality. They understand that people act based on their representation of the world, even when their representations are inaccurate (Astington, 2001). Thus, children who have a metarepresentational understanding of belief can attribute a false belief to another person and can predict the person’s action based on that false belief (Astington, 2001). Similarly then, children who have a metarepresentational understanding of intention should be able to attribute an intention to another person and to predict the person’s action based on their intention. Also, children with a metarepresentational understanding of intention should be able to distinguish between intention states and desire states, which are both motivational states that are often conflated.
3.4 Differentiating Intentions from Desires

Several studies looking at children’s ability to differentiate between intentions and desires have asked them to discriminate between intended and accidental actions in real scenarios and in stories. However, in some of these studies, children can succeed on the tasks by matching a goal with an outcome without having to discriminate between the intention and the desire (Astington, 2001; e.g., Shultz & Wells, 1985). This is because the tasks in these studies are set up such that children can think of intentions and desires as goal states (Astington, 2001). Children consider the action to be intentional if there is a match between the goal and the outcome, and to be accidental if there is a mismatch (Astington, 1991). In other words, it is possible in these tasks for children to evaluate an outcome as intentional if it matched what the person initially wanted, and not necessarily what the person initially intended. Thus, goal-outcome matching tasks do not provide the necessary information pertinent to understanding children’s ability to differentiate between intentions and desires. Instead, to assess metarepresentational understanding of intention, tasks are needed in which intention and desire states are separated so that they cannot be solved just by considering desire information.

Other studies have used tasks that separate intentions and desires, eliminating the possibility that a goal-outcome matching strategy can be used. Using a task that did not explicitly state the character’s goals or desires, but illustrated scenarios in which a character performs an intentional action and scenarios in which a character performs an accidental action, Lee (1995) found that 4- and 5-year-old children were able to identify the character who was acting intentionally. In another study designed to look at children’s understanding of the deviant causal chain, Feinfeld, Lee, Flavell, Green, and Flavell (1999) found that 4- but not 3-year-old children were able to distinguish between intentions and desires. However, the stories in this study described a character who changed his desire from his initial desire to follow the instructions of
someone else. Because the character had two desire states that were not related to the same end goal, it was not clear how the results showed that children differentiated between desires and intentions (Asembling, 2001).

3.4.1 Schult’s Work (2002). In order for a task to show children’s differentiation between desires and intentions, the two mental states need to be related to each other in a manner such that they both motivate an individual to act towards the same end goal. To illustrate, a study conducted by Schult (2002) used stories resembling the structure of a deviant causal chain to examine children’s differentiation between a character’s desire and intention that were related to the same end goal. She told the children four stories, one in which both the character’s desire and intention were satisfied, one in which neither were satisfied, and two in which one but not the other was satisfied. Children were asked whether the character did what he or she planned to do and whether or not the character got what he or she wanted. Schult found that although 4- and 5-year-old children did have some understanding of the distinction between intentions and desires, their understanding of intentional causation was still developing. This was especially true for the 4-year-olds, who had difficulty with stories in which the intention was not fulfilled but the desire was satisfied. They were able to identify that the desire was satisfied but were much less able to correctly state that the intention was unfulfilled. And, although they did not have as much difficulty with the stories in which the intention was fulfilled but the desire was not satisfied, they still could not very accurately state that the characters did that which they had planned to do.

Seven-year-old children, on the other hand, responded accurately in all of the conditions. From this study, it appears that 4-year-old children had difficulty with understanding the causal relation between intentions and actions. They seemed to have understood the plan of the subject of the stories, but did not consider that information when determining whether the consequential action satisfied the intention (Schult, 2002). This result is inconsistent with the argument that children
that have a metarepresentational understanding of mental states, and are able to differentiate
between intentions and desires, can reason about the causal link between intentions and actions.
Perhaps, metarepresentational understanding of intention is necessary for differentiating between
intentions and desires, but this understanding does not develop with a metarepresentational
understanding of belief which is typically found in children around the ages of 4 to 5. Although
Perner (1991) argues for synchronous development of representational ability in all domains
around the age of 4 years, some argue that representational ability develops independently in
different domains (e.g., Bartsch & Wellman, 1995). It is also possible that although
metarepresentational understanding is necessary for differentiating between intentions and
desires, understanding intentional causation and the deviant causal chain might require higher-
level or additional recursive reasoning of mental states.

Schult’s study (2002) provides insight into children’s developing understanding of
intentional causation, but it is important to note that the agent in the story was not ultimately
responsible for the outcome as in the original deviant causal chain (Astington, 2001). The stories
in Schult’s study (2002) described characters who desired and intended to perform actions to
achieve specific outcomes but the outcomes were achieved through another character’s actions.
For example, one of the stories described a boy who wanted and intended to make himself some
soup but when he went into the house to do so, his mom had already prepared the soup for him.
Thus, his desire was satisfied but his intention was not fulfilled. However, the desired outcome
was not caused by the agent’s own actions as in the deviant causal chain. In order to truly
examine children’s ability to differentiate intentions from desires, a task that is structured to
accurately represent the deviant causal chain may be necessary to illustrate children’s ability to
reason about the connections among one person’s desires, intentions, and consequential actions.
3.4.2 Phillips, Baron-Cohen, and Rutter’s Work (1998). While the previously described studies examined children’s reasoning about another person’s intentions and desires, Phillips, Baron-Cohen, and Rutter (1998) examined children’s ability to differentiate between their own intentions and desires using a task originally designed by Shultz and Wells (1985). Facing different coloured cans, some of which contained prizes, children were asked to indicate which coloured can they wanted to aim for while the experimenter controlled whether a prize fell out of the can once it was hit. The child’s desire was to get the prize and his or her intention was to hit the target. Desire and intention matched in two conditions and did not match in two other conditions. In one of the unmatched conditions, children hit their intended target but did not get a prize, and in the other unmatched condition children did not hit their intended target but the can they hit contained a prize. At the end of each trial, children were asked about which target they meant to shoot. Responses from 5-year-old children were, overall, more accurate than those of 4-year-old children, and within the 4-year-old group, children gave accurate responses in the intention-unfulfilled but desire-satisfied condition, and inaccurate responses in the intention-fulfilled but desire-unsatisfied condition. Four-year-old children in this study recognized that their desires were fulfilled despite not doing that which they had meant to do, but did not accurately report their intention when it did not result in a prize. To add to these findings, Schult (2002) conducted a similar study with 3-year-old children and found that they performed significantly worse than 4- and 5-year-old children when the intention was not fulfilled but the desire was satisfied. Three-year-old children who missed their intended target yet still found a prize maintained that they were trying to hit that particular target. It appeared that the 3-year-old children were using a simple desire-outcome matching strategy, giving responses about their intentions that coincided with the desired outcome (Schult, 2002).
3.4.3 Summary. From this review of experimental research that considers desires and intentions as significantly separate mental states that mediate one’s actions, it appears that children’s ability to differentiate between intentions and desires emerges at 3 to 4 years of age and continues to develop in the early elementary school-age years. Also, it appears that children’s differentiation of their own intentions from desires can be observed at an earlier age than their differentiation of others’ intentions from desires.

Assessing the ability to differentiate between desires and intentions and the ability to separate intentions and actions in the context of reasoning about outcomes is an important step in uncovering the development of the understanding of intentional causation. As argued previously, being able to identify the causal link between intentions and actions is fundamental to reasoning about responsibility for the moral consequences of behaviour. Interestingly, even though children’s metarepresentational abilities were not directly assessed, the research reviewed in this section is inconsistent with the argument that metarepresentational understanding of mental states allows children to differentiate between intentions and desires and to reason accurately about the causal link between intentions and actions. Hence, an important next step is to explore the research that compares children’s understanding of intentions and intentional causation with children’s metarepresentational understanding of belief – an ability that is commonly assessed by researchers interested in children’s metarepresentational understanding of mental states and more generally, mental-state reasoning.

3.5 Relation Between Intention Understanding and Metarepresentational Understanding of Belief

3.5.1 Mull’s Work (2001). There has been prior research examining the relation between the understanding of intentions and of intentional causation, and false-belief understanding as a proxy of a representational understanding of mental states. However, much of the research has not been able to clearly establish or describe the relation. Mull (2001) used two experiments to
investigate children’s intention understanding and their theory of mind. In one experiment, she compared 5- to 9-year-old children’s understanding of the mental states underlying intentional acts with their age, and their false-belief understanding. In this experiment, children were given three intention measures: one which examined when children realize that knowledge of an action is required for that action to be considered intentional; one which required children to infer an agent’s intention based on the agent’s behaviour; and one which asked children to reason about an agent’s intention based on the agent’s age. In the second experiment, Mull (2001) explored the same relationships with 3- to 9-year-old children, as well as the role of language abilities in their intention understanding. Children were also given four first-order false-belief tasks. Mull (2001) found that children who performed well on false-belief tasks did not necessarily perform well on the intention measures. She suggested that although children may understand beliefs to be representational, they may not understand intentions to be representational (Mull, 2001). The results of this study also suggested that it is not until children are 8 to 9 years of age that they have a full mentalistic conception of intentional acts (Mull, 2001). Thus, although it had previously been suggested that understanding false belief indicates that a child has a metarepresentational understanding of mental states, this study proposed that understanding false belief may only indicate that a child has a representational understanding of belief (Mull, 2001). Interestingly, the results from this study are consistent with the previously mentioned possibility that the development of metarepresentational understanding may not be synchronous for all mental states or domains.

3.5.2 Phillips, Baron-Cohen, and Rutter’s Work (1998). Previous research specifically investigating the relation between the understanding of intentional causation and false-belief understanding has found that children who were able to reason about the deviant causal chain passed standard first-order false-belief tasks (Phillips et al., 1998). However, Phillips and her
colleagues examined kindergarten-age children’s understanding of their own intentional states. Although children’s differentiation between their own desires and intentions was assessed, reasoning about a conflict in their own mental states may not require the same metarepresentational understanding as reasoning about a conflict in another person’s mental states. Also, reasoning about conflict in individuals’ own mental states might only require representation of the updated mental state and not require simultaneous representation of multiple mental states. It is possible that evaluating the causal link among others’ desires, intentions, actions, and outcomes where there is a potential conflict between two mental states requires more recursive reasoning about representations, and may be related to higher-order mental-state understanding.

3.5.3 Lee’s Work (1995). In another set of studies, Lee (1995), examined 3- to 5-year-old children’s representational understanding of intention using a number of story tasks, some of which required reasoning about deviant causal chains. Lee began with tasks that examined children’s ability to report their own prior intentions. She then tested children’s ability to attribute intentions to the agent in a series of stories accompanied by pictures. Some of the tasks could be solved using a goal-outcome strategy, some of the tasks described unfulfilled intentions where goal-outcome matching strategies could not be used, and some of the tasks required the ability to reason about deviant causal chains. Lee (1995), similar to Astington (2001) and Searle (1983), argued that recognition of intentional causation requires that one has a mental representation of the prior intention. To examine her hypothesis, Lee used two verb forms in her test questions thought to map onto non-representational understanding and representational understanding. For instance, “trying to” was used in the test question asking about intentions-in-action and “meant to” was used in the question asking about representational understanding of prior intentions. In addition, to test the hypothesis that intention understanding requires representational ability, Lee
compared children’s performance on the intention tasks with their performance on two standard false-belief tasks. The findings from Lee’s (1995) study showed that children of all ages were successful in identifying intentions-in-action but had difficulty reasoning in tasks requiring them to recognize prior intentions. Despite an improvement in performance in children between the ages of 4 and 5 for deviant causal chain and unfulfilled intention tasks, even the 5-year-olds performed poorly on tasks thought to tap into an understanding of intentional causation. However, 81% of the 5-year-old children succeeded on the false-belief task, suggesting that they have an understanding of metarepresentation but still may not have an understanding of the causal self-referentiality of intentions (Lee, 1995). Relations between children’s performance on intention and false-belief tasks were generally inconsistent, existing only for specific groups and specific tasks (Lee, 1995). Lee (1995) suggested that unlike the representational understanding of belief, the understanding of intention might be more affected by situational factors. Again, the results from this research suggest that although metarepresentation might be necessary for understanding intentions as mental states, the ability to reason about intentional causation may not develop in concert with representational understanding of belief, or may require more recursive reasoning about representations of mental states.

3.5.4 Sokol, Chandler, and Jones’ Work (2004). In contrast to research that compared children’s performance on deviant causal chain tasks and their performance on first-order false-belief tasks, Sokol, Chandler, and Jones (2004) compared children’s ability to differentiate between desires and intentions and their interpretive theory-of-mind abilities. Sokol and his colleagues hypothesized that the ability to reason about deviant causal chains, and differentiate between intentions and desires, was related to an interpretive theory of mind. Interpretive theory of mind refers to the ability to actively recognize interpretive diversity and is argued to be a higher-order theory-of-mind skill than understanding false belief (Sokol et al., 2004). Children
with an interpretive theory of mind actively appreciate that people can, and do, interpret one and the same object or event differently (Sokol et al., 2004). Previous research has found that children around 7 or 8 years of age are typically successful on different interpretive theory-of-mind tasks (Carpendale & Chandler, 1996). Sokol and his colleagues presented 5- to 7-year-old children with a deviant causal chain task that asked them to differentiate between intentions and desires, and compared their performance on this task with their performance on the “droodle” task, which requires children to make diverse attributions about others’ beliefs about ambiguous visual stimuli (Sokol et al., 2004). The results showed that children’s success on the interpretive theory-of-mind task predicted their ability to differentiate between intentions and desires, suggesting that as children’s interpretive theory of mind develops—not simply their false-belief understanding—so does their comprehension of the distinction between intentions and simple desires (Sokol et al., 2004). Thus, although this study did not compare reasoning about intentional causation with metarepresentational understanding, the results suggest that understanding intentional causation is related to higher-order mental-state understanding.

3.5.5 Summary. The research that has examined the relation between mental-state understanding and intentional causation has demonstrated a theoretical interest in the link between the two domains but has yet to establish a clear and consistent description of the relation between the two developing social-cognitive abilities. The current study aims to add to the literature by using tasks that clearly represent the possible causal links among desires, prior intentions, intentions-in-actions, and outcomes, and by using first- and second-order false-belief tasks to represent children’s metarepresentational ability and higher-order mental-state reasoning. Sokol et al., (2004) used interpretive theory-of-mind tasks to test the relation between children’s understanding of the distinction between intentions and desires and a higher-order theory of mind. However, there has not been research on children’s understanding of intentional causation
and their second-order false-belief understanding, which requires more recursive reasoning of mental representations than first-order false belief. Further, there has not been research on children’s understanding of intentional causation in moral reasoning and the relation between that understanding and mental-state understanding.

3.6 Intention Understanding and Moral-Rule Reasoning

3.6.1 Adults’ Understanding of Intentional Causation in Moral Reasoning. Although there has not been research on children’s understanding of intentional causation in moral reasoning, there has been empirical work in this area with adults. The relation between intention understanding and moral responsibility has been an ongoing discussion in philosophy and adult psychology literature (e.g., Haidt, 2001; Shaver, 1985; Weiner, 1995). One notable discussion concerns the nature of adults’ moral reasoning. While some researchers argue that moral reasoning is largely intuitive and judgment is unconscious in nature (e.g., Greenwald & Banaji, 1995), others argue for more rationalist models of moral reasoning and focus on the conscious deliberation and cognitive abilities required (e.g., Turiel & Neff, 2000). Within the rationalist theories, descriptions of moral responsibility often include criteria such as that an act be intended, controllable, and singly caused for the person to be responsible (Pizarro et al., 2003; Shaver, 1985; Weiner, 1995). However, although reasoning about the causal link among prior intentions, actions, and outcomes is arguably important to rationalist theories, it has not often been included as a component of the deliberative moral reasoning that adults engage in. One study that did examine adults’ rational deliberation of the causal link, conducted by Pizarro, Uhlmann, and Bloom (2003), demonstrated that adults’ blame and praise for moral acts were reduced when cause, intention, and outcome factors were present but not linked together in the usual causal manner. The authors asked adults to judge agents’ actions that were causally-deviant – that is, actions that were caused and intended by the agents but were not caused in the intended way. In
one variation of their experiment, they also asked adults to respond to causally-deviant acts either in a rational, deliberative manner or in an intuitive manner. For this variation, adults were asked to compare the actions of the agents in causally-deviant and causally-normal scenarios by rating which of the actions were more morally blameworthy and to judge which of the agents were worse individuals. The results of this study showed that adults did not ascribe full moral responsibility for causally-deviant acts and did not judge the acts or the agents as harshly as for acts that did fulfill the normal causal chain (Pizarro et al., 2003). The results also showed that adults reduced their blame for causally-deviant actions more when they were asked to use their intuitions to judge the action first, than when they were asked to answer the questions as rationally as possible first (Pizarro et al., 2003). Thus, adults understood that individuals who commit causally-deviant moral acts should not be held as responsible as those who commit causally-normal moral acts. Interestingly, this understanding was more influenced by their intuitions than rational deliberative processes. However, despite the role that moral intuitions played in adults’ judgments, it was apparent from this study that adults did reason about intentional causation and attenuated their ascriptions of moral responsibility based on whether the causal links among intentions, actions, and outcomes were intact.

3.6.2 Children’s Intention Understanding in Moral Reasoning. The relation between understanding intentional causation and moral rule reasoning has yet to be established in children’s development. Thus, the development of this social-cognitive process is unclear and a comparison with adults’ reasoning cannot be made. However, there has been important theoretical and experimental work done on children’s use of intention information in their moral evaluations. Piaget (1932) claimed that children as young as 3 or 4 years of age are able to differentiate between intentional and involuntary violations of the moral code. He noted, however, that children first engage in this theoretical type of moral reasoning when responding to
real situations in which they are directly involved as compared with hypothetical situations, and that only children over the age of 7 years consider the role of intention in evaluating others’ behaviour (Piaget, 1932). Further, younger children tend to rely on information about consequences in their judgment (Piaget, 1932).

Early experimental work on children’s use of information about goal states in their evaluation of moral acts found that children can account for others’ motives in their reasoning around the age of 3 years (Nelson, 1980; Yuill, 1984). However, in these studies, moral evaluation centred around the judgment of the character’s personality or satisfaction with the outcome rather than the character’s responsibility for the act based on their motive. In order for children to succeed at using motive information at this younger age, information about motives needed to be explicitly presented and salient (Nelson, 1980; Yuill, 1984). Also, these studies examined children’s recognition of motives rather than intentions. Although both are related to the performance of action, having a motive to act is not the same as intending to act. Motive alone does not necessarily mean that there is intent. Motive provides reason and incentive for action but intention refers to a representation of a plan of action. In a court system, motives alone are not sufficient for a decision about responsibility. Thus, the results from these studies may not be indicative of 3-year-olds’ ability to account for intentions in moral actions.

Other studies have reported that after the age of 5 to 6 years, children become increasingly aware of and report intentionality when judging their own and others’ moral behaviours, and at around 8 years of age are increasingly likely to integrate information about intention with information about motives and consequences (Berndt & Berndt, 1975; Grueneich, 1982; Keasey, 1977). Younger children understand motives as reasons for action and the accidental-intentional distinction, but when evaluating another person, they tend to use information about motives rather than intention information (Berndt & Berndt, 1975). Younger
children also use intention significantly more frequently to reference actions when exposed to self-oriented situations compared with other-oriented situations (Keasey, 1977). With development, however, children around 8 years of age not only begin to understand and use intentions in their moral evaluations of their own and others’ acts, they begin to use integration rules to combine intention and outcome information in their reasoning (Grueneich, 1983).

More recent research has shown that elementary school-age children begin to integrate information about intentions and outcomes in their moral judgment. While younger children around 3 years of age base their moral judgment and assignment of responsibility exclusively on information about the outcome, older children from 5 to 7 years of age evaluate moral behaviour by using intention information and an integration of intention and outcome information (Helwig et al., 2001; Zelazo, Helwig, & Lau, 1996). In one study, Zelazo and his colleagues examined children’s evaluation of actions causing physical harm (Zelazo et al., 1996). They presented 3-, 4-, and 5-year-old children with stories containing different combinations of intentions, actions, and outcomes, and asked the children to judge the acceptability of the actions and to assign a level of punishment. By examining children’s responses to each story combination, they found that whereas 3- and 4-year-old children tended to use either information about outcomes or intentions to evaluate the action, 5-year-old children used an integration of the information to make their judgments. In a similar study, Helwig and his colleagues examined children’s evaluation of psychological harm as opposed to physical harm (Helwig et al., 2001). Children who were 3, 5, and 7 years of age were told stories containing combinations of benevolent versus harmful intentions and positive versus negative outcomes and were asked to rate the acceptability of the actions in the stories and assign punishment to the characters. The results showed that even though 3-year-old children were able to consider others’ perspectives and simple intentions in their evaluations, it was not until 7 years of age that children were more consistently integrating
information about intentions and outcomes to formulate rules by which they evaluated the actions. A conclusion that can be drawn from both these studies is that between 5 and 7 years of age, compared with younger children and depending on the context, children become more likely to assign punishment for moral violations based on an integration of information about whether the intention was positive or negative with information about whether the outcome was positive or negative (Helwig et al., 2001; Zelazo et al., 1996). This evidence demonstrates a developmental pattern of intention understanding in children’s moral reasoning. Similar to the research on children’s developing understanding of simple intentions, this research examining intention understanding in moral reasoning shows that preschoolers have an appreciation for intentional states and their connection to action. However, it is only later, in their primary years, that they begin to be aware of how evaluations of behaviour might differ because of the specific relations between intentions and outcomes. This line of research presents insight into children’s use of intention information in their moral evaluation but since mental-state understanding was not assessed, it does not directly address the questions about the relation between the development of metarepresentational understanding and intention understanding in moral reasoning. However, this research does indicate that the ability to integrate intention information with other components involved in moral reasoning occurs later, in the primary years, and points to the possibility that the ability to integrate the dimensions of information required to reason about intentional causation in moral situations might also occur later, after the age at which metarepresentational understanding is acquired. Thus, it is possible that understanding intentional causation in moral reasoning might require abilities beyond basic metarepresentation.

3.6.3 Leslie, Knobe and Cohen’s Work (2006). Leslie and his colleagues (2006) conducted a research study to examine children’s metarepresentational ability and their understanding of intentions in moral situations by assessing their ability to reason about mental
states based on outcomes, containing a moral valence, not directly caused by a person or their actions (Leslie et al., 2006). Instead of asking children to assign judgment by inferring the intentionality behind an outcome, children were asked to evaluate another’s person intentionality based on the occurrence of a positive or negative side effect of an outcome. The authors suggested that children who have a metarepresentational understanding of mental states should be able to grasp the concept of someone who “cares that” a side effect will happen. That is, with a metarepresentational understanding of mental states, children should be able to make inferences about a person’s propositional attitude (e.g., care) towards propositional content (e.g., side effect) (Leslie et al., 2006). With an understanding that a person can “care that” or “not care that” a side effect will happen, children should be able to reason about whether side effects of actions were intentionally caused. From the results of their study, the authors suggested that by 4 years of age, children evaluate the situation similar to adults (Knobe, 2003) and judge that a side effect of a person’s action was purposeful if the consequences were harmful despite the person having renounced his intention and indicated that he did not care about the consequences. The children based their attributions of intentional action on the moral valence of the side effect rather than the stated intention (Leslie et al., 2006). Further, their responses were related to whether they understood the idea that the agent did not care about the side effect (Leslie et al., 2006). The authors concluded that the side-effect effect, where people tend to regard morally bad side effects as intentional and morally good side effects as unintentional (Knobe, 2003), can be found in children around 4 years of age, suggesting that even young children show a similar asymmetry in moral judgment found in adults (Knobe, 2003).

Although the relation between children’s metarepresentational understanding of mental states and their judgment of intentionality was not directly assessed using separate measures, the authors suggest that even children who can represent that someone else can “care that” or “not
care that” an outcome will occur judge intentionality based on the moral valence of the outcome rather than the person’s initial propositional attitude. Thus, although it is likely that mental-state reasoning and intention understanding in moral reasoning are related, this study suggests the possibility that there are other factors that influence intention judgments, such as the moral valence of an outcome. These findings add to the discussion regarding the nature of moral reasoning and the factual and non-factual factors that influence one’s judgment of behaviour. Both the courts of law and theory-of-mind research assume that judgment of moral behaviours involves reasoning about matters of fact (Leslie et al., 2006). However, it is possible that reasoning about intention states in moral reasoning engages consideration of non-factual information, such as the valence of the outcome or the emotions of those involved. Thus, aside from the challenge of determining the relation between the ability to reason about mental states and the ability to judge intention information in moral reasoning, another challenge is to clarify other possible factors that might influence intention judgments in moral reasoning.

3.6.4 Relation Between Intention Understanding and Mental-State Understanding:

Shiverick and Moore’s Work (2007). Research that has examined the role of mental-state understanding in moral evaluation has revealed the complexity of the relation and the need for further empirical work. Shiverick and Moore (2007) investigated the relation between predicting another person’s evaluation of an underlying prior intention and consideration of second-order mental states. The authors suggested that being able to predict a person’s judgment of another person’s behaviour required the ability to reason about mental states embedded within other mental states (e.g., one person’s belief about another person’s intention). They asked 5-, 7-, and 10-year-old children to predict an observer’s belief about another person’s prior intention in socio-moral situations where the observer’s awareness of the person’s intentions and the observer’s awareness of person’s action were varied. Participants evaluated the person, and
attributed beliefs and evaluative judgments to the observer. The results from this study showed that 5-year-old children relied on other story cues, rather than the stated prior intentions to infer an observer’s belief about another person’s intention. Thus, despite understanding that a person’s interpretation of another’s intentions does influence that person’s evaluations (Shiverick & Moore, 2007), this resulted in inaccurate belief attributions and moral judgments that did not correspond to the valence of the prior intention. The authors hypothesized that these children were influenced by the intention-in-action that cued them to make negatively-valenced intention attributions. Kindergarten-age children had a basic awareness that different evaluations of the same situation were possible but focused their evaluations on the aspect of intention that was tied to the action rather than the prior intention (Shiverick & Moore, 2007). Older children attributed judgments to the observer based on more accurate beliefs about the intention attributed to the observer showing use of second-order mental-state reasoning (Shiverick & Moore, 2007). However, traditional assessments of second-order mental state understanding were not used in this study and a comparison between the abilities found in this study and the ability to succeed in established tests of theory-of-mind understanding cannot be made. Further, to truly conclude that children used representational understanding of mental states to make evaluative judgments, it needed to be shown that children understood that the observers’ beliefs about another person’s prior intention were important to their evaluations and not the intention-in-action or action. This distinction was not the focus of this study and thus was not directly manipulated even though the results suggested the possibility that younger children were using intentions-in-action in their belief attributions rather than prior intentions. Nonetheless, this study reinforces the idea that there is a connection between the development of mental-state understanding and moral reasoning and prompts further study of not just the presence of a relation but the more specific nature of the relation.
3.7 Summary

For a few decades, researchers have been interested in children’s social-cognitive and theory-of-mind development, and their developing ability to participate in a social world consisting of conventions and moral rules. Despite the interest and theoretical discussions about the connection between the domains, there is relatively little empirical evidence describing the nature of the relation between early theory-of-mind development and children’s moral reasoning. Specific to the developing understanding of the mental state of intention and children’s use of intention information in moral reasoning, research has revealed that even preschoolers can respond to basic questions about intentionality in relation to issues of right and wrong. However, this ability does not reflect an ability to integrate information about intentions and outcomes or an understanding of intentional causation in their moral reasoning. It appears that only later do children start to understand and accurately reason about mental states, and embedded mental states, when evaluating behaviour and thus have the cognitive potential to recognize the causal relation among prior intentions, intentions-in-action or actions, and outcomes. Although the relation between understanding intentional causation and moral-rule reasoning has not been shown, the more recent work on young children’s ability to reason about intentions in moral situations demonstrates the complexity of the relation and already prompts further investigation. Better appreciation of the development of intention understanding in children’s moral reasoning is especially important in the early elementary years. Without this appreciation, knowledge of how children develop their ability to evaluate the responsibility linked to moral behaviours is incomplete. Since researchers, educators, and caregivers of young children are concerned about the development of social responsibility and moral character, a more comprehensive and accurate understanding of children’s use of information about intentions in their moral rule evaluations is
imperative. Intentional causation is one aspect of intention understanding that is perhaps closely linked to children’s moral understanding but its role has yet to be examined.
Chapter 4: The Current Study

4.1 Overview of the Study

One goal of the present study is to examine children’s developing understanding of intentional causation when evaluating situations in which moral rules are violated. Children and adults were asked to reason about the causal relation among intentions, actions, and outcomes in stories in which characters desire and intend to cause harm to other characters. Following each story, children were asked to judge the characters’ intentions, make judgment decisions about punishing the characters’ actions, and justify their punishment ratings. In contrast to some previous studies that have investigated children’s understanding of intentional causation, the stories in this study clearly asked participants to distinguish between desires and intentions, and to reason about the causal relation between mental states and actions using an accurate representation of the deviant causal chain in one of the story conditions.

The moral-intention task, designed specifically for this study, consisted of four types of stories. Each story version manipulated specific factors to produce different combinations of the causal relation among prior intentions, actions, and outcomes to address questions about one’s understanding of intentional causation in moral contexts. In the original version, the character’s desire caused a prior intention that caused an action that caused a harmful outcome. In the deviant causal chain version, the character had a desire and prior intention to harm but caused the harmful outcome accidentally. In the changed intention version, the character had a desire and prior intention to harm but changed his desire and prior intention to harm at the last minute, but accidentally caused the initially desired harmful outcome. In the control version, the character had no desire or prior intention to cause harm but accidentally caused a harmful outcome.
4.2 Hypotheses

4.2.1 First Goal. Based on previous research that has shown improvement in 3- to 4- to 5-year-old children’s metarepresentational understanding, and improvement in children’s integration of intention and outcome information in their moral reasoning through their elementary school-aged years, it was hypothesized that there would be a developmental trend shown in the responses and that the understanding of intentional causation would be more sophisticated in older children. Older participants were expected to better differentiate between desires and intentions, better reason about prior intentions and intentions-in-action, and more selectively assign purposeful intent to characters based on whether the characters’ prior intention caused the action that resulted in the harmful outcome. Thus, older age groups were predicted to be more accurate in their judgments of the characters’ intentions in all the story versions. Particularly, older age groups were predicted to be significantly more accurate than younger age groups with judging versions in which the prior intention to harm is present but the causal link between intentions and actions is broken.

Older participants were also hypothesized to more selectively assign punishment, and assign higher levels of punishment to the character whose prior intention caused the action that resulted in the harmful outcome relative to the character whose accidental action caused the outcome. Thus, it was expected that older age groups would recognize the broken causal link in the changed intention and control stories and assign similar levels of punishment for characters’ actions in these versions. It was expected that older age groups would also recognize the broken causal link in the deviant causal chain version and assign relatively lower levels of punishment in this story version compared with the original version. However, because the prior intention to harm is maintained by the character in the deviant causal chain story and has the potential to influence moral judgment, it was expected that punishment levels would be higher relative to the
changed intention and control stories regardless of participants’ responses about the intentions of the characters.

It was also predicted that the oldest children would respond in a manner most similar to the adult group with respect to judging the characters’ intentions and actions. Also, the story version in which the character intended to perform a harmful act but then changed his or her mind was included to further assess children’s understanding of prior intention and its causal link to action. It was predicted that children who were truly able to distinguish between mental states and who understood the causal link between prior intentions and actions would not judge the outcomes in these stories as intentionally caused by the characters.

4.2.2 Second Goal. Another goal of this study was to assess the relation between children’s understanding of intentional causation during moral reasoning and their mental-state reasoning. To assess the hypothesis that metarepresentational understanding of mental states is related to understanding intentional causation (Astington, 2001; Perner, 1991), standard false-belief tasks, commonly used to assess children’s theory of mind, were used. First-order false-belief tasks require individuals to make inferences about someone’s false belief about a matter of fact. The task requires that individuals simultaneously maintain representations of someone else’s mental state and of their own knowledge of reality, even though they are inconsistent, and predict the person’s behaviour. Thus, success on first-order false-belief tasks depends on individuals’ ability to predict the other person’s behaviour based on their representation of the person’s belief state even though it differs from their own knowledge state about reality. It was predicted that there would be a relation between first-order false-belief performance and performance on the original and control versions of the moral-intention task because reasoning about these versions of the stories requires that individuals identify another person’s prior intention as a mental state, maintain a representation of it, and be knowledgeable about the outcome while judging the
person’s action. The moral-intention task was designed to have individuals determine whether the person’s prior intention was causally responsible for the outcome and on that determination, accurately judge the person’s action. To be successful on the original and control versions of this task, individuals needed to mentally represent the person’s prior intention and assess the representation against their knowledge of the action that resulted in the outcome.

It was also predicted that there would be a relation between second-order false-belief performance and children’s performance on the deviant causal chain and changed intention versions of the moral-intention task. Second-order false-belief tasks ask individuals to make inferences about someone’s false belief about someone else’s belief. Success on second-order false-belief tasks requires that individuals maintain representations of someone’s false belief and someone else’s true belief to predict subsequent action. Thus, second-order false-belief understanding involves simultaneous and additional recursive reasoning about mental representations, allowing individuals to concurrently maintain more than one mental representation while reasoning about or evaluating behaviour. The relations between second-order false-belief understanding and performance on the deviant causal chain and changed intention versions of the moral-intention task were hypothesized because these versions involve differentiating between two mental states before reasoning about the satisfaction or dissatisfaction of the mental states. To evaluate the person’s action that caused an outcome, individuals needed to represent both the person’s desire and prior intention as separate mental states and reason about whether the action satisfied the content represented in the prior intention. For success on both of these versions, children needed to separate desire states and intention states and understand that desires and intentions do not necessarily have to have the same outcome. Desires can be satisfied even when prior intentions are not fulfilled and intentions can be fulfilled even when desires are not satisfied.
The empirical literature that was reviewed in the previous chapter prompts investigation of the relations among the understanding of intentions and intentional causation in moral reasoning, metarepresentational understanding, and higher-level reasoning of mental states. This study incorporates assessments of second-order false-belief understanding to specifically add to the ongoing discussion about these relations and about the broader relation between the development of children’s moral reasoning and their theory-of-mind development.

4.3 Summary

The objectives of this study were to examine children’s developing understanding of intentional causation when reasoning about moral behaviours, and to explore the relation between this ability and their metarepresentational understanding of mental states. Moral reasoning requires evaluation of others’ behaviours based on attributed intentional states and thus has social-cognitive parallels with theory-of-mind understanding. Also, both moral reasoning and theory of mind develop considerably in the early childhood and elementary school-age years. Although links among intention understanding, moral reasoning, and theory-of-mind development have been hypothesized and studied, the nature of the relations are not clear. Further, recent research has suggested that despite having social-cognitive parallels, there may be an asymmetry in children’s moral reasoning that is not present in reasoning about neutral social situations (Leslie et al., 2006). A similar asymmetry has been observed in adults’ moral judgment where adults have been found to judge intentionality differently for morally significant actions compared with neutral actions (Knobe, 2003; Malle, 2006). Because the current study compares children’s understanding of intention in moral situations and their ability to reason about false beliefs, which arguably are about a matter of fact, the findings can contribute to the ongoing discussion about moral asymmetry in children’s intention judgments.
Chapter 5: Method

5.1 Participants

A sample of 91 children was recruited from Toronto area daycare centres and schools. The sample consisted of 39 children in junior kindergarten (3;10 to 5;5, $M = 54.92$ months, $SD = 5.07$ months), 26 children in the first grade (6;0 to 7;1, $M = 78.42$ months, $SD = 3.57$ months), and 26 children in the third grade (8;5 to 9;4, $M = 106.23$ months, $SD = 3.09$ months). The age groups were selected based on important transitions in theory-of-mind understanding (Perner & Wimmer, 1985; Wimmer & Perner, 1983). Normally-developing children whose language abilities were sufficient to engage in the basic requirements of the task were eligible to participate. All children who returned a signed consent form were tested. Where permitted, children were compensated with a small non-monetary reward for their participation.

To establish a reasonable standard to which children’s performance could be compared, a sample of 21 adults over the age of 18 from the local community was also recruited to participate. Any adult whose language abilities were sufficient to engage in the basic requirements of the task was eligible to participate. Adults were informed that the study was designed for use with children.

5.2 Experimental Tasks

5.2.1 Moral-Intention Reasoning Task (See Appendix A for Scripts and Appendix B for Illustrations). The moral-intention reasoning task was designed specifically for this study and was comprised of eight different illustrated short stories with corresponding sets of questions. Each of the eight stories consisted of four versions (see Table 1 for an example of a story in all four versions and the corresponding questions).
### Example of a Moral-Intention Story in all Four Versions and the Corresponding Questions

<table>
<thead>
<tr>
<th>Story version</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original</strong></td>
<td>“This is Jane and this is Sally. They are in the same art group. Today they are painting pictures. Jane doesn’t like Sally. She wants to ruin the picture that Sally painted. Jane decides she is going to dump blue paint all over Sally’s picture. So, Jane leans over, gets the blue paint, and dumps it all over Sally’s picture. The picture is ruined.”</td>
</tr>
<tr>
<td><strong>Deviant causal chain</strong></td>
<td>“This is Jane and this is Sally. They are in the same art group. Today they are painting pictures. Jane doesn’t like Sally. She wants to ruin the picture that Sally painted. Jane decides she is going to dump blue paint all over Sally’s picture. As Jane is leaning over to get the blue paint, her arm knocks over the paint jar, spilling the blue paint all over Sally’s picture. The picture is ruined.”</td>
</tr>
<tr>
<td><strong>Changed intention</strong></td>
<td>“This is Jane and this is Sally. They are in the same art group. Today they are painting pictures. Jane doesn’t like Sally. She wants to ruin the picture that Sally is painting. Jane decides she is going to dump blue paint all over Sally’s picture. As Jane is leaning over to get the blue paint, she changes her mind and decides not to ruin Sally’s picture. So Jane turns around to return to her seat. But, on her way back, her arm knocks over the paint jar, spilling blue paint all over Sally’s picture. The picture is ruined.”</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>“This is Jane and this is Sally. Jane and Sally are friends. They are in</td>
</tr>
</tbody>
</table>
the same art group and today they are painting pictures. Jane wants to paint a picture of the ocean and decides to get some blue paint. As she is leaning over to get the blue paint, her hand knocks over the blue paint jar, spilling blue paint all over Sally’s picture. The picture is ruined.”

Questions

“What did Jane want to do at the beginning of the story?” (desire content comprehension question)
“Did Jane ruin Sally’s picture on purpose?” (intention judgment question)
“Sally’s picture was ruined. Should Jane get in trouble for what happened?” (punishment judgment question)
“How much trouble should Jane get into?” (punishment judgment question)
“Why should Jane get into trouble?” (yes to #3) (justification question)
“Why shouldn’t Jane get into trouble?” (no to #3) (justification question)

In the original version of the story, a character wants and intends to perform an act that will cause harm to another character. In this story, the harmful outcome is achieved by an action that is a result of the first character’s prior intention. The deviant causal chain story also describes a situation where a character wants and intends to perform an action that will cause harm to another character but the harmful outcome occurs by accident and not as a result of the first character’s prior intention. The third story, changed intention, again describes a character who wants and intends to perform an act that will cause harm to a second character but the
character changes his or her mind about performing the harmful act. However, the initially desired harmful outcome is caused accidentally. A final control version of the story describes a character who does not have a harmful desire or intention but a harmful outcome accidentally occurs as a result of his or her action.

The eight different stories were designed so that they were similar in length and in the severity of the outcomes. Using eight different stories that were reasonably matched in language, length, and content allowed for randomization and order-balancing of the stories over multiple trials while providing participants with variety and avoiding potential boredom or confusion among versions. Following each story, participants were asked to respond to a set of questions (refer to Table 1) about the desire content of the story, their judgment of the characters’ intentions, and their judgment of the punishment that characters should receive for their actions based on an illustrated 5-point scale (see Appendix C for an illustration of the 5-point scale). After responding to these questions, participants were asked to justify their answers by explaining why they thought the characters should or should not be punished.

5.2.2 Scoring for the Moral-Intention Reasoning Task. Each desire content comprehension, intention judgment, and punishment judgment question of the moral-intention reasoning task was scored separately. Participants needed to pass each desire content question before proceeding with the trial. Intention judgment responses were given a score of 0 (inaccurate) or 1 (accurate). Accuracy scores for the intention judgment responses depended on the story version. For the original version, an “on purpose” judgment was scored as accurate. Based on this study’s theoretical arguments, a “not on purpose” judgment was scored as accurate for the deviant causal chain, changed intention, and control versions. Punishment judgments were given a score of 0 if the participant did not think the character should be punished. If the
participant did think that the character should be punished, their judgments were scored based on
the illustrated 5-point scale presented to them.

5.2.3 First-Order False-Belief Tasks (See Appendix D for scripts). In each of the first-
order false-belief tasks, children were asked a test question that required them to take another’s
perspective. For the Change in Location task, the experimenter showed children two toy dolls,
one girl and one boy holding a ball. The boy doll was shown to put his ball in a box and then
leave the room. While he was out of sight, the girl doll was shown to take the ball from the box,
play with it, and then put it away in a bag. After the girl doll leaves, the boy doll was then shown
to return and for the test question, children were asked where the boy will look for his ball, and
why he will look there. Children were scored as either being correct or incorrect based on
whether they said that the boy will look in the box or in the bag. They were also asked two
memory control questions including where the boy had put the ball before he left the room and
where the ball really is.

For the Unexpected Contents task, the experimenter showed children a crayon box and
asked what was inside. After children responded with “crayons”, they were shown that there was
actually a small toy mouse inside. After the mouse was put back into the box, children were
asked what was inside the box as a memory control question. For the test question, children were
then asked what a friend who hadn’t seen inside the box and hadn’t opened the crayon box would
think was inside the box, and why the friend was going to think that. Children were scored as
either being correct or incorrect based on whether they said that the friend was going to think
there were crayons or a toy mouse inside the box.

5.2.4 Second-Order False-Belief Tasks (See Appendix E for scripts). For both second-
order false-belief tasks, toy props were used to tell children stories about two characters who
were independently aware that an object was transferred from one location to another location.
Both characters were aware of the object’s true location, but Character A had a mistaken belief about Character B’s belief about the location of the object. Character A thought that Character B thought that the object was still in the old location. For the test question, children were asked where Character A would think that Character B would look for the object and to justify their response by explaining why they chose the location that they did. They were also asked memory control questions and assessed for their first-order false-belief understanding prior to the test question. Children were scored on whether they recognized Character A’s mistaken belief – that is, whether they said that Character A would think that Character B would look in the old location or the new location for the object. This score reflected children’s ability to hold more than one mental state representation in mind as they reasoned about what one character thought about another character’s thoughts.

5.2.5 Scoring for the First- and Second-Order False-Belief Tasks. A score of 0 (fail) or 1 (pass) was given for each first-order and second-order false-belief task based on whether children responded correctly or incorrectly. Children needed to pass the control questions for each task in order to receive a passing score. Children’s responses to the justification questions were examined but not used in the analyses since they were not of theoretical or empirical importance to this study’s objectives.

5.3 Design

This study used a within-subjects design where all adults were given all versions of the moral-intention task and children were given all versions of the moral-intention task and false-belief tasks as indicated below in the description of the procedure. Participants were randomly assigned to one of four orders of the moral-intention task, with the constraint of having approximately equal age distribution. The sequence of the eight stories in each of the four orders was initially randomized with the limitation that one story from each version was given in each of
the two blocks. Thus, participants received four stories of different versions in the first block and
four stories of different versions in the second block. Children also received first-order false
belief tasks in between the two blocks of the moral-intention task and if they passed both, they
received second-order false-belief tasks after the second block of the moral-intention task.

5.4 Procedure

Permission to conduct the study was obtained from daycare centre supervisors and
teachers and informed consent for children to participate was obtained from parents or guardians.
After assent was obtained from children and consent was obtained from adult participants, they
were given a general overview of the session. Participants were then shown the illustrated five-
point scale for answering the question about the story character’s level of punishment. The
explanation of the five-point scale was standardized across participants and their understanding
of the use of the scale was ensured before continuing with the session.

Following the introduction, participants heard eight different moral-intention stories (two
of each version) accompanied by pictures, presented in two blocks. Stories were repeated to
ensure participants’ comprehension. If participants did not respond to the desire content
comprehension question correctly after two story repetitions, then that particular story trial was
discontinued. After passing the comprehension question, participants were asked to make a
judgment of whether the character’s action was done “on purpose” and to make a judgment of
whether or not the character should be punished. Based on their responses as to whether the
character should be punished, participants were asked about the level of punishment they would
assign on the 5-point scale.

In addition to the moral-intention reasoning task, child participants were given up to four
false-belief tasks. All children started with the two first-order tasks, counterbalanced for order.
According to the theory-of-mind literature, children generally experience success on first-order
tasks before second-order tasks (e.g. Astington, Pelletier, & Homer, 2002). In keeping with this literature, children who did not pass first-order false-belief tasks were not given second-order tasks. Those who were successful were given the second-order false-belief tasks, also counterbalanced for order. For each false-belief task, the experimenter presented the story to the child along with its corresponding control and test questions. First-order false-belief tasks were presented in between the two blocks of the moral-intention reasoning task and second-order false-belief tasks were presented after the second block of the moral-intention reasoning task. Also in keeping with the theory-of-mind literature that describes the development of false-belief understanding, adults were not asked to participate in any false-belief tasks as adults typically do not have any difficulty passing these tasks.

All sessions with child participants were audio-taped to allow for verification of responses. Adults’ responses were transcribed as they were provided and thus, sessions with adults were not audio-taped. Testing sessions lasted between 30 and 45 minutes.
Chapter 6: Moral-Intention Task Justifications Coding

6.1 Overview of the Chapter

Participants’ justifications from the moral-intention task were transcribed verbatim and were coded using a scheme that was devised to explore key theoretical components of interest to this study. The preliminary scheme was revised using a random selection of 30 percent of the total number of responses. It was then piloted with research colleagues and re-revised. The final coding scheme consisted of three stages, described below (see also the Moral-Intention Justification Coding Manual in Appendix F).

6.2 Stage One Coding

The first stage of the coding scheme accounted for specific components of interest in the participants’ responses. These included the mental states of desire, prior intention, and intention-in-action, action, outcome, and normative evaluation. An “other” category was also included to capture responses that were not sufficiently elaborated to code in any of the other categories, for a total of seven possible categories that were coded in the first stage (see Table 2 for a summary of component categories).

Table 2

*Summary of the Components of Interest in Stage One of Justification Coding*

<table>
<thead>
<tr>
<th>Component</th>
<th>Example</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desire</td>
<td>“He wanted to do it.”</td>
<td>Present in justification = 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absent in justification = 0</td>
</tr>
<tr>
<td>Prior intention</td>
<td>“He did it on purpose.”</td>
<td>Present in justification = 1</td>
</tr>
<tr>
<td></td>
<td>“It was an accident.”</td>
<td>Absent in justification = 0</td>
</tr>
<tr>
<td></td>
<td>“He planned to do it.”</td>
<td></td>
</tr>
</tbody>
</table>
Intention-in-action  “He was trying to do it.”  Present in justification = 1
 “He wasn’t doing what he planned to do.”  Absent in justification = 0
 Action  “He spilled milk.”  Present in justification = 1
 Absent in justification = 0
 Outcome  “The picture was ruined.”  Present in justification = 1
 Absent in justification = 0
 Normative evaluation  “He did something bad”  Present in justification = 1
 “He should not have done that”  Absent in justification = 0
 Other  “I don’t know”  Present in justification = 1
 Absent in justification = 0

For each component, the participants’ justifications were coded as containing (score of 1) or not containing the component (score of 0). The goal of the first stage was to document the frequency with which each participant referred to the components of interest in their justification responses. It was predicted that older participants would more frequently refer to the characters’ prior intentions when justifying their responses as to why or why not the character should be punished.

6.3 Stage Two Coding

The second stage of coding involved classifying participants’ responses into rule categories that described the primary reason for participants’ justifications. Participants’ responses were considered as a whole and the focus of the justification was determined using ten categories of rules (see Table 3 for a summary of the rule categories).
Table 3

*Summary of the Rule Categories Used in Stage Two of Justification Coding*

<table>
<thead>
<tr>
<th>Rule categories</th>
<th>Example of a reason for justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Why the character should or should not be punished)</td>
<td></td>
</tr>
<tr>
<td><strong>One-component rules</strong></td>
<td></td>
</tr>
<tr>
<td>Desire only</td>
<td>Should be punished because of what the character wanted to happen</td>
</tr>
<tr>
<td>Prior intention only</td>
<td>Should not be punished because of what the character initially planned on doing</td>
</tr>
<tr>
<td>Intention-in-action only</td>
<td>Should be punished because of what the character tried to do</td>
</tr>
<tr>
<td>Action only</td>
<td>Should not be punished because of what the character did or did not do</td>
</tr>
<tr>
<td>Outcome only</td>
<td>Should be punished because of what happened</td>
</tr>
<tr>
<td>Normative evaluation only</td>
<td>Should not be punished because the character did not do anything wrong</td>
</tr>
<tr>
<td>Other</td>
<td>Justification does not match any other rule</td>
</tr>
<tr>
<td><strong>Two-component rules</strong></td>
<td></td>
</tr>
<tr>
<td>Desire and outcome</td>
<td>Should be punished because the character wanted to cause harm and harm occurred</td>
</tr>
<tr>
<td>Prior intention and intention-in-action</td>
<td>Should not be punished because the character initially intended harm but caused harm accidentally</td>
</tr>
</tbody>
</table>
Desire and intention | Should be punished because the character wanted to cause harm and caused harm intentionally

The rule categories were created based on this study’s key theoretical concepts and either encompassed one component of interest or two components of interest. One-component rules included a desire-only rule, a prior intention-only rule, an intention-in-action-only rule, an action-only rule, an outcome-only rule, a normative evaluation-only rule, and an other rule that captured responses that did not belong in any other category. Two-component rules included a desire-outcome rule, a prior intention-intention-in-action rule, and a desire-intention rule. Each of the participants’ responses was assigned to one rule category. The goal of the second stage of coding was to examine the pattern of rule use among the different participant groups in their reasoning about why characters should or should not be punished. Consistent with the observation that older, compared with younger, children are able to integrate multiple pieces of information and better use intention information to make moral judgments (Helwig et al., 2001; Zelazo et al., 1996), it was predicted that one-component rules would be used more frequently by younger children and two-component rules, especially the ones containing an intention component, would be used more frequently by older participants.

6.4 Stage Three Coding

Participants’ use of intentional language in their justifications was coded in the third stage. The first step of this stage was to code for the presence of intentional language. For this study, intentional language was defined as any word or phrase that would indicate that the participant thought the characters had intended or had not intended the action that caused the outcome. Thus, characters’ intentions could have been directly stated, or indicated by participants’ choice of words or phrases that implied intention. The presence of intentional
language was assigned a score of 1 and the absence of intentional language was assigned a score of 0. The second step of this stage was to code for whether the intentional language stated by the participant was explicit or implicit. The absence of intentional language was given a score of 0, the presence of implicit intentional language was given a score of 1, and the presence of explicit intentional language, regardless of whether there was also implicit language, was given a score of 2. A statement was coded as containing explicit intentional language if the intention was directly expressed, and was coded as containing implicit intentional language if the intention was understood through what was expressed but not directly stated. Examples of implicit intentional language included participants’ use of words that contained an intentional valence, such as “shoved” or “crushed”, to refer to characters’ actions. A list of examples of explicit and implicit intentional language was generated, piloted with colleagues, and included in the coding manual (see Table 4 for examples of explicit and implicit intentional language used in participants’ justifications).

Table 4

*Examples of Explicit and Implicit Intentional Language*

<table>
<thead>
<tr>
<th>Explicit intentional language</th>
<th>Implicit intentional language</th>
</tr>
</thead>
<tbody>
<tr>
<td>“on purpose”</td>
<td>“shoved” (intentional)</td>
</tr>
<tr>
<td>“accidentally”</td>
<td>“wrecked” (intentional)</td>
</tr>
<tr>
<td>“trying to”</td>
<td>“dumped” (intentional)</td>
</tr>
<tr>
<td>“meant to”</td>
<td>“destroyed” (intentional)</td>
</tr>
<tr>
<td>“intentionally”</td>
<td>“tripped” (unintentional)</td>
</tr>
<tr>
<td>“premeditated”</td>
<td>“slipped” (unintentional)</td>
</tr>
</tbody>
</table>
6.5 Reliability

All justifications were first coded by the experimenter. An independent coder who was not familiar with the study was then trained on the coding system and coded a random selection of approximately 20 percent of the participants’ responses for reliability. Cohen’s kappa calculated for inter-rater reliability for the presence or absence of the components in stage one was 0.99. Cohen’s kappa calculated for the reliability of rating the rule categories in stage two was 0.97. Finally, Cohen’s kappa calculated for inter-rater reliability for the presence of intentional language, and for whether the intentional language was explicit or implicit was 0.99 and 0.98, respectively.
Chapter 7: Results from Intention Judgments and Punishment Judgments

7.1 Overview of the Chapter

This results section first describes a re-evaluation of the participant sample and redefinition of the inclusion criteria to improve the validity of between-group analyses. The section then outlines participants’ performance on the intention judgment question of the moral-intention task, including correlations between trials, performance based on story version order, performance based on story version, age group, gender, and performance against chance. The description of the analyses of participants’ punishment judgments is presented next, including analyses of the relation between trials, performance based on story version order, and performance based on story version, age group, and gender. The false-belief task results are then presented, followed by the analyses of the relations between false-belief task performance and intention judgments from the moral-intention task, and false-belief task performance and punishment judgments from the moral-intention task.

7.2 Participants

For the purpose of improving the validity of between-group comparisons, data analyses were conducted and reported for a sample of 92 participants. Post-hoc inclusion criteria were devised to create groups with more equal numbers of participants to allow for more valid comparisons. A 12-month range was used to define the junior kindergarten (4;3 to 5;3), grade one (6;3 to 7;3), and grade three (8;3 to 9;3) groups, and each group was separated by a 12-month span. The group of adults was not altered by any post-hoc criteria. The final sample consisted of 24 “4-year-old” children (4;3 to 5;2, $M = 55.46$, $SD = 2.47$, 12 females, 12 males), 22 “6-year-old” children (6;4 to 7;1, $M = 79.32$, $SD = 3.09$, 10 females, 12 males), 25 “8-year-old” children (8;5 to 9;3, $M = 106.00$ months, $SD = 2.92$, 15 females, 10 males), and 21 adults over the age of 18 (11 females, 10 males).
7.3 Intention Judgments from the Moral-Intention Task

Participants’ judgments of story characters’ intentions were scored as accurate or inaccurate. As mentioned in the methods chapter, “on purpose” was scored as accurate for the original story version and “not on purpose” was scored as accurate for the deviant causal chain, changed intention, and control versions.

7.3.1 Correlations Between Accuracy of Intention Judgments Across the Two Trials.
Correlation analyses were conducted to examine participants’ intention judgment accuracy across the two trials. The analyses revealed that participants’ responses were moderately to highly correlated across the two trials (original version, $\Phi_r = .49, p < .01$; deviant causal chain version, $\Phi_r = .45, p < .01$; changed intention version, $\Phi_r = .82, p < .01$; control version, $\Phi_r = .85, p < .01$). Thus, a composite accuracy score and an average accuracy was calculated for each participant and used in subsequent analyses.

7.3.2 Performance Based on Story Version, Age, and Gender. There was no effect of story order and thus, further analyses were collapsed across story version orders (see Appendix G for details of the analysis). Figure 1 shows the mean intention judgment accuracy scores for each story version for each age group and Table 5 shows a summary of the mean intention judgment accuracy scores and standard deviations for each story version for each age group.
Figure 1. Participants’ intention judgment accuracy by age group for each story version (with standard errors).

Table 5

Mean (and Standard Deviation) Intention Judgment Accuracy for Each Story Version for Each Age Group

<table>
<thead>
<tr>
<th>Age</th>
<th>Original</th>
<th>Deviant causal chain</th>
<th>Changed intention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>.96 (.14)</td>
<td>.19 (.32)</td>
<td>.33 (.46)</td>
<td>.40 (.47)</td>
</tr>
<tr>
<td>6 years</td>
<td>.95 (.21)</td>
<td>.50 (.38)</td>
<td>.93 (.18)</td>
<td>.98 (.11)</td>
</tr>
<tr>
<td>8 years</td>
<td>1.00 (.00)</td>
<td>.70 (.35)</td>
<td>1.00 (.00)</td>
<td>1.00 (.00)</td>
</tr>
<tr>
<td>Adult</td>
<td>1.00 (.00)</td>
<td>.71 (.44)</td>
<td>1.00 (.00)</td>
<td>1.00 (.00)</td>
</tr>
</tbody>
</table>

The 8-year-olds and adults reached ceiling levels of accuracy for three of the four story versions resulting in a lack of variability in their responses. Thus, 8-year-olds and adults were not included in the analysis of variance (ANOVA). A mixed ANOVA was conducted on the results from the 4- and 6-year-old children with age and gender as between-subject variables, with the
average accuracy of their intention judgments for each story version as the within-subject
variable. The results indicated a main effect of story version, $F(3, 126) = 39.02, p < .01$, and an
interaction between story version and age, $F(3, 126) = 13.01, p < .01$. This analysis also revealed
a significant effect of age, $F(1, 42) = 35.13, p < .01$ with the 4-year-old group ($M = .47, SD = .17$)
being significantly less accurate in their intention judgments than the 6-year-old group ($M = .85,
SD = .17$). Post-hoc analyses (LSD, $p < .05$) revealed that there were differences in the accuracy
of the children’s intention judgments between all of the story versions except for the changed
intention ($M = .64, SD = .36$) and control versions ($M = .69, SD = .35$), where the accuracies of
the intention judgments were not different from each other. Overall, average judgment accuracy
was higher for the original version ($M = .96, SD = .18$) than all the other story versions, and
accuracy for the deviant causal chain ($M = .35, SD = .35$) was lower than all the other story
versions. To examine the interaction between story version and age, a one-way ANOVA with
post-hoc analysis (LSD, $p < .05$) was conducted and indicated that there was no difference
between the two age groups in the accuracy of their intention judgments for the original story
version. However, for the deviant causal chain version, the changed intention version, and the
control versions, the 4-year-olds were significantly less accurate than the 6-year-olds.

A one-way ANOVA with post-hoc analysis was conducted to examine the effect of age
on participants’ intention judgment accuracy for the deviant causal chain story version. The
results revealed a significant effect of age, $F(3, 88) = 10.26, p < .01$, with the 4-year-olds being
less accurate than all the other age groups. There was no significant difference between the other
age groups in their intention judgment accuracy for the deviant causal chain version.

7.3.3 Comparison of Performance by Each Age Group. To further illustrate the
differences in performance within each age group, paired t-tests were conducted to compare the
accuracy of intention judgments for pairs of story versions for each age group. Because the 8-
year-olds and the adults reached ceiling accuracy for their intention judgments for the original, changed intention, and control versions, t-tests were only conducted to examine the differences between their accuracy for the deviant causal chain version compared with the other story versions (see Table 6 for a summary of the results).

Table 6

*Paired T-test Results for the Comparison of Intention Judgment Accuracies Across Story Versions for Each Age Group*

<table>
<thead>
<tr>
<th>Version</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4-years-old</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Original</td>
<td></td>
<td>8.55**</td>
<td>5.93**</td>
<td>5.12**</td>
</tr>
<tr>
<td>2. Deviant causal chain</td>
<td></td>
<td>-2.29*</td>
<td>-3.12**</td>
<td></td>
</tr>
<tr>
<td>3. Changed intention</td>
<td></td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6-years-old</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Original</td>
<td></td>
<td>4.39**</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>2. Deviant causal chain</td>
<td></td>
<td>-5.79**</td>
<td>-6.20**</td>
<td></td>
</tr>
<tr>
<td>3. Changed intention</td>
<td></td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8-years-old</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Original</td>
<td></td>
<td>4.24**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Deviant causal chain</td>
<td></td>
<td>-4.24**</td>
<td>-4.24**</td>
<td></td>
</tr>
<tr>
<td>3. Changed intention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The analyses revealed that the 4-year-olds’ judgment accuracy was significantly higher for the original version than the deviant causal chain, changed intention, and control versions. Their accuracy was also significantly higher for the changed intention and control versions compared with the deviant causal chain version. The results for the 6- and 8-year-olds, and adults, revealed that their judgment accuracies were significantly lower for the deviant causal chain version as compared with the original, changed intention, and control story versions. These results indicated that all age groups had the most difficulty with accurately judging the intentions of the character in the deviant causal chain story.

7.3.4 Performance Against Chance. Analyses were conducted to determine if participants were performing better than chance when judging story characters’ intentions. T-tests against chance revealed that the 4-year-old group was significantly above chance in their accuracy of intention judgments for the original version, \(t(23) = 15.91, p < .01\) and significantly below chance in their accuracy for the deviant causal chain version, \(t(23) = -4.73, p < .01\). Four-year-olds were not significantly different from chance in their accuracy of intention judgments for the changed intention version, \(t(23) = -1.78, p = .08\), and for the control version, \(t(23) = -1.10, p = .29\). Six-year-old children were significantly above chance in their accuracy for the original version, \(t(21) = 10.0, p < .01\), the changed intention version, \(t(21) = 11.53, p < .01\), and the control version, \(t(21) = 21.0, p < .01\). However, their accuracy was not different from chance in the deviant causal
chain version, \( t(21) = .00, p = 1.00 \). Both the 8-year-old and the adult groups reached ceiling levels with their intention judgment accuracy for the original, changed intention, and control versions and were significantly above chance in their accuracy of intention judgments for the deviant causal chain version, \( t(25) = 2.83, p < .01 \) and \( t(20) = 2.26, p < .01 \), respectively.

7.3.5 Summary. The results from examining participants’ intention judgments showed that older participants were more accurate than younger participants, with the 8-year-olds and adults reaching ceiling levels of accuracy for the original, changed intention, and control story versions. The deviant causal chain version appeared to present the most difficulty for all participants since all participants recorded lower accuracy scores for that particular story version. However, the 8-year-old children and adults were still above chance levels in their intention judgment accuracy for the deviant causal chain story.

7.4 Punishment Judgments from the Moral-Intention Task

Participants’ judged the level of punishment that characters should receive on an illustrated 5-point scale, ranging from 1 ("a little trouble") to 5 ("a lot of trouble"). If the participants did not think the character should be punished, then their punishment judgment was given a score of 0.

7.4.1 Correlations Between Punishment Ratings Across the Two Trials. Correlation analyses conducted to examine participants’ punishment judgment ratings across the two trials of the same story version indicated that their responses were moderately related (original version, Pearson’s \( r = .48, p < .01 \); deviant causal chain version, Pearson’s \( r = .51, p < .01 \); changed intention version, Pearson’s \( r = .79, p < .01 \); control version, Pearson’s \( r = .50, p < .01 \)). An average judgment rating was calculated for each participant and used in subsequent analyses.

7.4.2 Performance Based on Story Version, Age, and Gender. There was no effect of story order and thus, further analyses were collapsed across story version orders (see Appendix G
for details of the analysis). Figure 2 shows the average punishment judgment ratings for each story version for each age group and Table 7 shows a summary of the mean punishment ratings and standard deviations for each story version for each age group.

**Figure 2.** Participants’ average punishment judgment ratings by age group for each story version (with standard errors).

**Table 7**

*Mean (and Standard Deviation) Punishment Judgment Ratings for Each Story Version for Each Age Group*

<table>
<thead>
<tr>
<th>Age</th>
<th>Original</th>
<th>Deviant causal chain</th>
<th>Changed intention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>4.23 (.98)</td>
<td>3.50 (1.58)</td>
<td>3.21 (1.66)</td>
<td>2.73 (1.79)</td>
</tr>
<tr>
<td>6 years</td>
<td>3.70 (1.21)</td>
<td>2.11 (1.42)</td>
<td>1.14 (1.36)</td>
<td>.70 (.81)</td>
</tr>
<tr>
<td>8 years</td>
<td>3.56 (.93)</td>
<td>1.30 (1.00)</td>
<td>.36 (.57)</td>
<td>.18 (.48)</td>
</tr>
<tr>
<td>Adult</td>
<td>4.17 (.62)</td>
<td>2.17 (1.44)</td>
<td>.29 (.62)</td>
<td>.00 (.00)</td>
</tr>
</tbody>
</table>
A mixed ANOVA was conducted with participants’ judgment ratings for each story version, averaged across the two trials, as the within-subject variable, and age and gender as between-subject variables. This analysis revealed a significant main effect of story version, \( F(3, 252) = 189.98, p < .01 \), a significant effect of gender, \( F(1, 84) = 5.24, p = .03 \), and a significant effect of age, \( F(3, 84) = 31.64, p < .01 \). The analysis also indicated a significant interaction between story version and age, \( F(9, 252) = 8.79, p < .01 \). In further analyses (LSD, \( p < .05 \)), it was found that the average judgment rating for each of the story versions was significantly different from each other, with the original version (\( M = 3.91, SD = .98 \)) recording higher punishment judgments than the other versions, followed by the deviant causal chain version (\( M = 2.26, SD = 1.33 \)), the changed intention version (\( M = 1.25, SD = 1.17 \)), and finally the control version (\( M = .90, SD = 1.05 \)). Male participants (\( M = 2.27, SD = .80 \)) assigned higher levels of punishment than females (\( M = 1.89, SD = .80 \)). Also, the average judgment of 4-year-olds (\( M = 3.42, SD = .79 \)) was significantly higher than all the other age groups, and the judgment of the 6-year-olds (\( M = 1.87, SD = .79 \)) was significantly higher than the 8-year-olds (\( M = 1.37, SD = .81 \)), but the judgment rating of the 6-year-olds and adults (\( M = 1.66, SD = .79 \)), and the judgment rating of the 8-year-olds and adults were not different from each other. A one-way ANOVA with post-hoc analysis was conducted to examine the interaction between story version and age (see Table 8 for a summary of the mean differences between age groups).
Table 8

*Mean Differences in Punishment Judgment Ratings Between Age Groups for Each Story Version*

<table>
<thead>
<tr>
<th>Age</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>ns</td>
<td>.67*</td>
<td>ns</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>ns</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td>- .61*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deviant causal chain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>1.39*</td>
<td>2.20*</td>
<td>1.33*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>.81*</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td>- .87*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changed intention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>2.07*</td>
<td>2.85*</td>
<td>2.92*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>.78*</td>
<td>.85*</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>4 years</td>
<td>______</td>
<td>2.02*</td>
<td>2.55*</td>
<td>2.73*</td>
</tr>
<tr>
<td>6 years</td>
<td>______</td>
<td>ns</td>
<td>.70*</td>
<td></td>
</tr>
<tr>
<td>8 years</td>
<td>______</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>______</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$

It was found that for the original version, 4-year-olds’ and adults’ average judgments were significantly higher than 8-year-olds’ average judgment but there was no difference between 4- and 6-year-olds’ judgments, between 4-year-olds’ and adults’ judgments, between 6- and 8-year-olds’ judgments, or between 6-year-olds’ and adults’ judgments. For the deviant causal chain version, it was found that 4-year-olds’ judgment was significantly higher than all other age groups, and that 6-year-olds’ and adults’ judgments were significantly higher than 8-year-olds’ judgment. However, 6-year-olds’ and adults’ judgments were not different from each other. For the changed intention version, the judgment rating of the 4-year-olds was significantly higher than all the other age groups. The judgment rating of the 6-year-olds was also higher than the ratings of the 8-year-olds and adults but the judgment ratings of the 8-year-olds and adults were not different from each other. Finally, for the control version, 4-year-olds’ average judgment was significantly higher than the 6- and 8-year olds, and adults, and 6-year-olds’ average judgment was significantly higher than adults’ judgment but there were no differences between the other age groups.

7.4.3 Comparison of Performance by Each Age Group. To further illustrate the differences in punishment judgments within each age group, paired t-tests were conducted to compare the average punishment judgments between story versions for each age group (see Table 9 for a summary of the results).
Table 9

*Paired T-test Results for the Comparison of Punishment Judgments Across Story Versions for Each Age Group*

<table>
<thead>
<tr>
<th>Version</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-years-old</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Original</td>
<td>_____</td>
<td>2.21*</td>
<td>2.54*</td>
<td>4.32**</td>
</tr>
<tr>
<td>2. Deviant causal chain</td>
<td>_____</td>
<td>ns</td>
<td>2.28*</td>
<td></td>
</tr>
<tr>
<td>3. Changed intention</td>
<td>_____</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Control</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-years-old</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Original</td>
<td>_____</td>
<td>4.82**</td>
<td>8.04**</td>
<td>10.46**</td>
</tr>
<tr>
<td>2. Deviant causal chain</td>
<td>_____</td>
<td>3.23**</td>
<td>5.41**</td>
<td></td>
</tr>
<tr>
<td>3. Changed intention</td>
<td>_____</td>
<td>2.24*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Control</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-years-old</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Original</td>
<td>_____</td>
<td>8.69**</td>
<td>15.52**</td>
<td>15.89**</td>
</tr>
<tr>
<td>2. Deviant causal chain</td>
<td>_____</td>
<td>4.95**</td>
<td>4.84**</td>
<td></td>
</tr>
<tr>
<td>3. Changed intention</td>
<td>_____</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Control</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The comparison analyses indicated that 4-year-olds’ average punishment judgment of the original version was higher than their judgment of the deviant causal chain, changed intention, and control versions. The average judgment rating of the 4-year-olds was also significantly higher for the deviant causal chain version than for the control version. For the 6-year-olds and the adults, their average punishment judgment of the original version was higher than all the other story versions, their punishment of the deviant causal chain version was higher than the changed intention and control versions, and their punishment of the changed intention version was higher than their punishment of the control version. The 8-year-olds’ average punishment judgment was higher for the original version compared with all the other story versions, and was higher for the deviant causal chain version compared with the changed intention and control versions.

### 7.4.4 Punishment Judgments Based on Intention Judgment Responses

To illustrate differences in participants’ punishment judgments independent of their intention judgments, separate ANOVA’s were conducted with punishment judgments for each story version as the dependent variable and age as the independent variable. Intention judgments, corresponding to punishment judgments for each story version, were entered as covariates. The results showed an effect of age on punishment judgments for all of the story versions, after controlling for intention judgments (original, $F(3, 87) = 3.74, p = .01$; deviant causal chain, $F(3, 87) = 4.27, p < .01$;
changed intention, $F(3, 87) = 3.57, p = .02$; control, $F(3, 87) = 5.00, p < .01$). Post-hoc analyses (LSD, $p < .05$) revealed that for the original version, the 4-year-olds and adults judged significantly higher than then 8-year-olds. For the deviant causal chain version, the 4-year-olds assigned higher judgment ratings than the 6- and 8-year-olds, and the adults assigned higher judgment ratings than the 8-year-olds. For the changed intention and control versions, the 4- and the 6-year-olds assigned higher punishment ratings than the 8-year-olds and the adults.

Comparing the results of this analysis and the results of the analysis of punishment judgments without holding intention judgments as covariates indicated that intention judgments explained the differences between 4-year-olds and adults, and 6-year-olds and 8-year-olds for the deviant causal chain story. The comparison also showed that intention judgments explained the differences between 4-year-olds and 6-year-olds for the changed intention and control stories.

### 7.4.5 Summary

The results from examining participants’ punishment judgments showed that with increased age, children appeared to be differentiating among the story versions and assigning punishment based on the integrity of the causal link among intentions, actions, and outcomes, and on the presence of a harmful prior intention. Both 6- and 8-year-olds appeared to recognize the apparent broken causal link in the changed intention and control versions compared with the original version, and appeared to discriminate between the deviant causal chain version in which a harmful prior intention was maintained compared with the changed intention and control versions in which there was not a harmful prior intention. Four-year-old children did not appear to show this ability to differentiate between the story versions. Four-year-old children assigned higher levels of punishment for all the story versions compared with all the other age groups and their punishment ratings showed differentiation only between the original story and the other versions, and between the control story and the deviant causal chain story. Interestingly, the results from the adult participants indicated that they followed the same developmental
pattern as the child participants for the changed intention and control stories where the intention to harm was not present, but assigned higher levels of punishment for the original and deviant causal chain stories than the 8-year-old children. Thus, their results appeared to be more similar to the results obtained from the 6-year-old children than the 8-year-old children.

The results of entering intention judgments as covariates to assess whether age differences in punishment judgments could be explained by their intention judgments showed a similar developmental pattern where the younger age groups assigned higher levels of punishment than the older age groups. The 4- and the 6-year-olds appeared to be more similar in their punishment judgments for the changed intention and control story versions after accounting for their intention judgments. However, after holding intention judgments constant, the adults still did not follow the developmental pattern observed in children and assigned higher punishment ratings than the 8-year-olds for the original and deviant causal chain stories.

7.5 False-Belief Task Performance

Participants were given a pass or fail score on each of the first- and second-order false-belief tasks. As mentioned in the method section, participants’ justifications that were obtained during the false-belief tasks were examined but not formally analyzed as these responses were not of theoretical or empirical interest to this study.

7.5.1 Comparison of Performance Across Trials. Correlation analyses were conducted to examine the relation between participants’ performance on the two trials of the first-order false-belief task and the two trials of the second-order false belief task. The results show that scores on the two first-order tasks were significantly correlated, Phi $r = .75$, $p < .01$ and scores on the two second-order tasks were also significantly correlated, Phi $r = .79$, $p < .01$. These results support the creation of composite first- and second-order false-belief scores that were then averaged
across trials for use in subsequent analyses. Table 10 shows the resultant mean first- and second-order false-belief scores for each age group.

Table 10

Mean (and Standard Deviation) False-Belief Scores at Each Age

<table>
<thead>
<tr>
<th>Age</th>
<th>First-order false belief (max. = 1)</th>
<th>Second-order false belief (max. = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>.69 (.44)</td>
<td>.10 (.25)</td>
</tr>
<tr>
<td>6 years</td>
<td>.93 (.23)</td>
<td>.77 (.37)</td>
</tr>
<tr>
<td>8 years</td>
<td>1.00 (.00)</td>
<td>1.00 (.00)</td>
</tr>
<tr>
<td>Total</td>
<td>.87 (.31)</td>
<td>.63 (.46)</td>
</tr>
</tbody>
</table>

7.5.2 First-Order False-Belief Performance. An ANOVA with average first-order false belief performance as the dependent variable and age and gender as independent variables revealed a significant main effect of age, $F(2, 65) = 7.70, p < .01$. There was no effect of gender or any interaction between age and gender. First-order false-belief scores were significantly higher for the 6- and 8-year-olds as compared with the 4-year-olds (LSD, $p < .05$), but were not significantly different between the 6- and 8-year-olds. These results are consistent with previous research on children’s performance on first-order false-belief tasks (Wellman, Cross, & Watson, 2001).

7.5.3 Second-Order False-Belief Performance. An ANOVA with average second-order false-belief performance as the dependent variable and age and gender as independent variables indicated a significant main effect of age, $F(2, 65) = 79.42, p < .01$. There was no effect of gender or any interaction between age and gender. Post-hoc analysis revealed that the 8-year-
olds’ average second-order false-belief score was significantly higher than those of the 6- and 4-year-olds, and the 6-year-olds average score was significantly higher than that of the 4-year-olds (LSD, $p < .05$). These second-order false-belief performance results are also consistent with results from previous research (e.g., Astington et al., 2002).

### 7.6 False-Belief Task Performance and Moral-Intention Task Performance

To examine the relation between children’s reasoning about belief states and children’s understanding of intentional causation in moral-rule reasoning, correlation and regression analyses were conducted using children’s false-belief task scores and their intention judgments and punishment judgments from the moral-intention task.

#### 7.6.1 Correlation Between False-Belief Performance, Average Intention Judgment Accuracies and Average Punishment Judgments

A series of correlation analyses among intention judgments and punishment judgments for each story version, false-belief scores, age, and gender were conducted to examine the relations between the variables. See Table 11 for a summary of the correlations between the variables.
Table 11

*Correlations Among Intention and Punishment Judgments for Each Story Version, False-Belief Scores, Age, and Gender*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td></td>
<td>-0.08</td>
<td>0.42**</td>
<td>0.81**</td>
<td>0.12</td>
<td>-0.26*</td>
</tr>
<tr>
<td>2. Gender</td>
<td></td>
<td>-0.11</td>
<td>-0.11</td>
<td>0.19</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>3. First-order false belief</td>
<td></td>
<td>0.56**</td>
<td>0.16</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Second-order false belief</td>
<td></td>
<td>0.22</td>
<td>-0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Intention judgment accuracy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Punishment judgment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Deviant causal chain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td></td>
<td>-0.08</td>
<td>0.42**</td>
<td>0.81**</td>
<td>0.52**</td>
<td>-0.57**</td>
</tr>
<tr>
<td>2. Gender</td>
<td></td>
<td>-0.11</td>
<td>-0.11</td>
<td>-0.27*</td>
<td>0.21</td>
<td></td>
</tr>
<tr>
<td>3. First-order false belief</td>
<td></td>
<td>0.56**</td>
<td>0.27*</td>
<td>-0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Second-order false belief</td>
<td></td>
<td>0.48**</td>
<td>-0.57**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Intention judgment accuracy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Punishment judgment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For all story versions, age was correlated with first- and second-order false-belief scores but gender was not correlated with first- or second-order false-belief scores. First-order false-belief scores were also related to second-order false-belief scores. In addition to these results, for the original story version, age was correlated with punishment judgment. For the deviant causal chain story, age was correlated with intention judgment accuracy and punishment judgment. Also for the deviant causal chain story, gender, first-order false-belief scores, and second-order false-belief scores were correlated with intention judgment accuracy, and second-order false-belief scores were correlated with punishment judgment. For the changed intention and control stories,
age, first-order false-belief scores, and second-order false-belief scores were all correlated with both intention judgment accuracy and punishment judgment.

7.6.2 Prediction of Intention and Punishment Judgments by False-Belief Performance. Because the 8-year-old group reached ceiling levels of accuracy on their intention judgments and on their false-belief performance, regression analyses were conducted with the results from the 4- and 6-year-old groups with average intention judgment accuracies for each story version as the predicted variables and false-belief performance as the predictor variables. A separate set of regression analyses was conducted with all three age groups with average punishment judgments for each story version as the predicted variables and false-belief performance as the predictor variables. The effect of age was accounted for in the first step of all of the models. The results of the regression analyses for children’s intention judgment indicated that performance on false-belief was not related to their intention judgment accuracy. However, the regression analyses for children’s punishment judgment indicated that successful performance on second-order false-belief had a predictive relation with lower punishment judgment ratings for the changed intention and control story versions (see Tables 12 and 13).

Table 12
Prediction of Children’s Punishment Judgments for the Changed Intention Version by False-Belief Performance

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Total $R^2$</th>
<th>$R^2$ change</th>
<th>$F$ change</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$r_{part}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>.46</td>
<td></td>
<td>58.42**</td>
<td>-.71</td>
<td>-7.64**</td>
<td>-.68</td>
</tr>
<tr>
<td>2</td>
<td>First-order false belief</td>
<td>.51</td>
<td>.05</td>
<td>3.52*</td>
<td>-.07</td>
<td>-.11</td>
<td>-.01</td>
</tr>
<tr>
<td></td>
<td>Second-order false belief</td>
<td></td>
<td></td>
<td>1.45</td>
<td>2.36*</td>
<td></td>
<td>.20</td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$
Table 13

**Prediction of Children’s Punishment Judgments for the Control Version by False-Belief Performance**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Total $R^2$</th>
<th>$R^2$ change</th>
<th>$F$ change</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$r_{part}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>.44</td>
<td>53.54**</td>
<td>-.64</td>
<td>-7.32**</td>
<td>-.66</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>First-order false belief</td>
<td>.49</td>
<td>.05</td>
<td>3.58*</td>
<td>-.08</td>
<td>-.15</td>
<td>-.01</td>
</tr>
<tr>
<td></td>
<td>Second-order false belief</td>
<td></td>
<td></td>
<td>-1.35</td>
<td>-2.37*</td>
<td>-.21</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$

**Summary.** The results from examining the relation between participants’ intention judgments and punishment judgments with their performance on the false-belief task indicated false-belief performance was not related to intention judgment accuracy. However, second-order false-belief performance had a predictive relation with lower punishment judgment for the changed intention and control story versions.
Chapter 8: Results from Moral-Intention Justifications

8.1 Overview of the Chapter

The goal of the analyses of participants’ justifications of why story characters should or should not be punished was to examine whether there were developmental differences in the information from the stories that participants used to form their explanations, and whether there were developmental differences in their use of intentional language. In the first part of this chapter, the rationale for re-organizing the justification component categories is described and age group differences in reference to the justification components are presented. The second part of this results section outlines the redefinition of the justification rules coded in stage two of the coding process, and presents the differences in the use of justification rules by each age group. The final section of this chapter presents the developmental differences in participants’ use of intentional language in their justification responses.

8.2 Justification Components from Stage One Coding

8.2.1 Exclusion of Justification Component Categories. Justification components were coded for whether participants made reference to them in their responses to why story characters should or should not be punished. The seven component categories in the coding scheme were evaluated for their frequency of use in participants’ justifications. The reasoning for this evaluation was to improve the validity of the analyses by excluding component categories with especially low frequencies, indicating that the components were not representative of the justifications that participants were providing. There were 732 justifications provided by the 92 participants (eight stories for each participant). Four participants did not provide justifications for four separate stories and thus these responses were missing. For inclusion in the final set of analyses, each component category had to be used in at least 20 percent of the total responses. Thus, to be included in the final analyses, components had to be used at least 147 times by the
participants as a group. Table 14 shows a summary of the number of times each component was used by each age group. The set of components used in the final set of analyses included prior intention, intention-in-action, action, and outcome.

Table 14

Number of Times Components were Used by Participants in Each Age Group

<table>
<thead>
<tr>
<th>Age</th>
<th>Desire</th>
<th>Prior intention</th>
<th>Intention-in-action</th>
<th>Action</th>
<th>Outcome</th>
<th>Normative evaluation</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>6</td>
<td>33</td>
<td>133</td>
<td>134</td>
<td>118</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>6 years</td>
<td>17</td>
<td>80</td>
<td>76</td>
<td>85</td>
<td>70</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>8 years</td>
<td>15</td>
<td>123</td>
<td>107</td>
<td>100</td>
<td>79</td>
<td>31</td>
<td>8</td>
</tr>
<tr>
<td>Adult</td>
<td>12</td>
<td>141</td>
<td>76</td>
<td>63</td>
<td>40</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>275</td>
<td>392</td>
<td>382</td>
<td>307</td>
<td>74</td>
<td>25</td>
</tr>
</tbody>
</table>

8.2.2 Age Group and Story Version Differences in Participants’ Justification

Components. A composite score for each component category was created using the total number of times that each participant used each component across the two trials of each story version. Thus, participants received a maximum score of two for each story version. The components were then examined separately because of a priori interest in participants’ reference to each component and not the interaction between components. Four (component reference in each story version) x 4 (age) x 2 (gender) mixed ANOVA’s were conducted with each component. It was found that for the prior intention component, there was a main effect of story version, $F(3, 240) = 3.93, p = .02$, and a main effect of age, $F(3, 80) = 20.25, p < .01$. Post-hoc analyses (LSD, $p < .05$) revealed that there were significantly more references to prior intention in the control story version ($M = 1.21, SD = .77$) than the original version ($M = .92, SD = .80$). Also, 4-year-olds ($M$
= .40, SD = .55) made significantly fewer references to prior intention in their justifications than all the other age groups, and both 6- (M = .93, SD = .54) and 8-year-olds (M = 1.23, SD = .55) made significantly fewer references to prior intention as compared with the adults (M = 1.68, SD = .54).

For the intention-in-action component, main effects for version, F(3, 240) = 7.02, p < .01, and age, F(3, 80) = 5.20, p < .01, were found as well as an interaction between version and age, F(9, 240) = 3.30, p < .01. Further analyses (LSD, p < .05) revealed that significantly more references were made to the intention-in-action component in the original version (M = 1.23, SD = .81) than the changed intention (M = .98, SD = .77) and control versions (M = .82, SD = .81), and more references were made to the intention-in-action component in the deviant causal chain (M = 1.17, SD = .68) version compared with the changed intention and control versions. Also, 4-year-olds (M = 1.42, SD = .52) made significantly more references to the intention-in-action component compared to the 6-year-olds (M = .84, SD = .51) and 8-year-olds (M = 1.03, SD = .52), and the adults (M = .90, SD = .51).

To examine the interaction, a one-way ANOVA with post-hoc analysis was conducted between the number of references to intention-in-action in each story version and age groups. The mean number of references made by each age group for each story version are summarized in Table 15 and the significant mean differences are shown in Table 16.
Table 15

Mean (and Standard Deviation) References to the Intention-In-Action Component for Each Age Group for Each Story Version (maximum score = 2)

<table>
<thead>
<tr>
<th>Age</th>
<th>Original</th>
<th>Deviant causal chain</th>
<th>Changed intention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>1.50 (.78)</td>
<td>1.54 (.72)</td>
<td>1.42 (.83)</td>
<td>1.20 (.89)</td>
</tr>
<tr>
<td>6 years</td>
<td>1.14 (.71)</td>
<td>.59 (.67)</td>
<td>.77 (.81)</td>
<td>.95 (.84)</td>
</tr>
<tr>
<td>8 years</td>
<td>1.32 (.80)</td>
<td>1.20 (.71)</td>
<td>.96 (.73)</td>
<td>.80 (.76)</td>
</tr>
<tr>
<td>Adult</td>
<td>.95 (.86)</td>
<td>1.43 (.75)</td>
<td>.81 (.81)</td>
<td>.43 (.68)</td>
</tr>
</tbody>
</table>

Table 16

Mean Differences in References to the Intention-In-Action Component Between Age Groups for Each Story Version

<table>
<thead>
<tr>
<th>Age</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Original</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>ns</td>
<td>ns</td>
<td>.55*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>ns</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deviant causal chain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>.95*</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>-.61*</td>
<td>-.84*</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For the action component, the ANOVA analyses also revealed effects of story version, $F(3, 240) = 6.85, p < .01$, and age, $F(3, 80) = 6.84, p < .01$, and an interaction between story version and age, $F(9, 240) = 2.07, p = .03$. Post-hoc analyses (LSD, $p < .05$) revealed that participants made significantly more references to the action component in the original story version ($M = 1.25, SD = .81$) compared with the changed intention ($M = .98, SD = .76$) and control versions ($M = .80, SD = .79$), and in the deviant causal chain version ($M = 1.08, SD = .74$) compared with the control version. Also, it was found that 4-year-olds ($M = 1.43, SD = .51$) referred to the action component significantly more than the 6-year-olds ($M = .95, SD = .50$) and 8-year-olds ($M = .97, SD = .51$), and adults ($M = .75, SD = .50$). Post-hoc analysis of a one-way ANOVA to examine the interaction between story version and age revealed the results as shown by the mean differences summarized in Table 17 (see Table 18 for a summary of the mean references to the action component by each age group for each story version).
Table 17

*Mean (and Standard Deviation) References to the Action Component for Each Age Group for Each Story Version (maximum score = 2)*

<table>
<thead>
<tr>
<th>Age</th>
<th>Original</th>
<th>Deviant causal chain</th>
<th>Changed intention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>1.50 (.78)</td>
<td>1.54 (.72)</td>
<td>1.42 (.83)</td>
<td>1.25 (.85)</td>
</tr>
<tr>
<td>6 years</td>
<td>1.22 (.69)</td>
<td>.68 (.72)</td>
<td>1.00 (.82)</td>
<td>.95 (.84)</td>
</tr>
<tr>
<td>8 years</td>
<td>1.32 (.80)</td>
<td>1.04 (.73)</td>
<td>.92 (.70)</td>
<td>.72 (.74)</td>
</tr>
<tr>
<td>Adult</td>
<td>.95 (.86)</td>
<td>1.10 (.80)</td>
<td>.62 (.80)</td>
<td>.33 (.58)</td>
</tr>
</tbody>
</table>

Table 18

*Mean Differences in References to the Action Component Between Age Groups for Each Story Version*

<table>
<thead>
<tr>
<th>Age</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td><em>ns</em></td>
<td><em>ns</em></td>
<td>.55*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td><em>ns</em></td>
<td><em>ns</em></td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td><em>ns</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deviant causal chain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>.86*</td>
<td>.50*</td>
<td>.45*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td><em>ns</em></td>
<td><em>ns</em></td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td><em>ns</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Finally, for the outcome component, main effects for story version, $F(3, 240) = 15.83$, $p < .01$, and age $F(3, 80) = 6.86$, $p < .01$, were found. Post-hoc analyses (LSD, $p < .05$) showed that there were more references to the outcome component in the original version ($M = 1.21$, $SD = .83$) compared with the deviant causal chain ($M = .71$, $SD = .73$), changed intention ($M = .68$, $SD = .73$), and control versions ($M = .67$, $SD = .74$). Also, 4-year-olds ($M = 1.23$, $SD = .55$) made significantly more references to the outcome component compared with 6- ($M = .79$, $SD = .53$) and 8-year-olds ($M = .77$, $SD = .55$), and adults ($M = .48$, $SD = .54$).

To examine the predictive relation between age group and use of the components in participants’ justifications, a series of linear regressions was conducted with total numbers of references made by participants to each component as the predicted variables and age group as the predictor variable. See Table 19 for a summary of the results of the regression analyses showing predictive relations between older participants and more references to prior intention in
their justifications, and between younger participants and more references to intention-in-action, action, and outcome components.

Table 19

*Prediction of Participants’ References to the Justification Components by Age Group*

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Total $R^2$</th>
<th>$F$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$r_{part}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Prior intention component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td>.35</td>
<td>46.91**</td>
<td>.31</td>
<td>6.85**</td>
<td>.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intention-in-action component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td>.05</td>
<td>4.06*</td>
<td>-.09</td>
<td>-2.02*</td>
<td>-.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Action component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td>.13</td>
<td>12.44**</td>
<td>-.15</td>
<td>-3.53**</td>
<td>-.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outcome component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td>.16</td>
<td>16.08**</td>
<td>-.18</td>
<td>-4.01**</td>
<td>-.40</td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$

Separate linear regressions conducted with the justification components separated by story version revealed that age did not predict references to the intention-in-action component in the deviant causal chain and changed intention story versions. Also, age did not predict references to the action component in the changed intention version or predict references to the outcome component in the original story version.

8.2.3 Summary. The results from the analysis of the justification components participants used in their responses showed that older age groups were more likely to refer to the prior intention component and younger age groups were more likely to refer to the intention-in-action, action, and outcome components. Four-year-old children referred to the prior intention
component the least compared with all the other age groups and adults referred to the prior intention component the most. There were also more references to the prior intention component in the control story version compared with the original story version. All of the other components were referred to most frequently in the original story version.

8.3 Justification Rules from Stage Two Coding

8.3.1 Redefinition of Justification Rules. The reasons behind redefining the justification rules for use in the final analyses were two-fold. Similar to the justification components used in stage one, one reason was to decrease the possibility that infrequently-used rules would misrepresent the results. Redefining the rules would thereby improve the validity of the analyses. Another reason was to allow for a more direct examination of the broader rule categories that were of specific theoretical interest to this study. Previous research has found that young children tend to use one-component rules to reason about moral intentions but with age, children begin to use multi-component rules in their reasoning (e.g., Helwig et al., 2001). Rule categories in this study were already defined as one-component or two-component rules. Thus, a one-component and a two-component rule category were created. However, upon examination of the frequencies, an intention rule and an action rule were separated from the one-component rule category because of a priori interest in participants’ identification of story characters’ intentions in their responses, and because these specific rules were used in more than 20 percent of total justification responses. Also, because of a priori theoretical interest in participants’ differentiation of prior intentions from intentions-in-action, this two-component rule was separated from the two-component rule category. Table 20 shows a summary of the redefinition of the rule categories coded in stage two into the broader rule categories used for the final set of analyses. Table 21 illustrates the frequencies of each of the rules used by participants in each age group.
Table 20

Redefinition of Justification Rule Categories for Final Analyses

<table>
<thead>
<tr>
<th>Initial rule categories</th>
<th>Recoded rule categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One-component rules</td>
</tr>
<tr>
<td>Desire only</td>
<td>One-component rule</td>
</tr>
<tr>
<td>Prior intention only</td>
<td>Intention rule</td>
</tr>
<tr>
<td>Intention-in-action only</td>
<td>One-component rule</td>
</tr>
<tr>
<td>Action only</td>
<td>Action rule</td>
</tr>
<tr>
<td>Outcome only</td>
<td>One-component rule</td>
</tr>
<tr>
<td>Normative evaluation only</td>
<td>One-component rule</td>
</tr>
<tr>
<td>Other</td>
<td>One-component rule</td>
</tr>
<tr>
<td></td>
<td>Two-component rules</td>
</tr>
<tr>
<td>Desire and outcome</td>
<td>Two-component rule</td>
</tr>
<tr>
<td>Prior intention and intention-in action</td>
<td>Prior intention and intention-in –action rule</td>
</tr>
<tr>
<td>Desire and intention</td>
<td>Two-component rule</td>
</tr>
</tbody>
</table>
Table 21

Frequency of Rule-Use by Each Age Group

<table>
<thead>
<tr>
<th>Age</th>
<th>One-component rule</th>
<th>Intention rule</th>
<th>Action rule</th>
<th>Two-component rule</th>
<th>Prior intention and intention-in-action rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>24</td>
<td>32</td>
<td>131</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6 years</td>
<td>48</td>
<td>63</td>
<td>52</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>8 years</td>
<td>55</td>
<td>76</td>
<td>25</td>
<td>7</td>
<td>37</td>
</tr>
<tr>
<td>Adult</td>
<td>19</td>
<td>95</td>
<td>13</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>146</td>
<td>266</td>
<td>221</td>
<td>16</td>
<td>83</td>
</tr>
</tbody>
</table>

8.3.2 Use of Justification Rules by Each Age Group. A 5 (rule category) x 4 (age group) chi square analysis, conducted to examine the relation among the proportions of each rule category that was used by participants from each age group in their justification responses\(^1\), revealed a significant chi square, \(\chi^2(12, N = 732) = 264.40, p < .01\). A 95 percent confidence interval was calculated for each proportion of each rule category that was used by each age group to examine the specific differences in the use of the justification rules. Table 22 presents a summary of the proportions of each rule category that was used by each age group and the corresponding 95 percent confidence intervals.

\(^1\)The rules used in participants’ justification responses across the two trials for each story version could not be combined because of the variety of responses given by each participant. Thus, to avoid over-representation of the performance of each age group, this study examined the proportion of each rule category that was used by each age group rather than the proportion of children in each age group that used each rule category.
Table 22

Proportions (and Corresponding 95 Percent Confidence Intervals) of Each Justification Rule Category Used by Each Age Group

<table>
<thead>
<tr>
<th>Age</th>
<th>One-component rule</th>
<th>Intention rule</th>
<th>Action rule</th>
<th>Two-component rule</th>
<th>Prior intention and intention-in action rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>.16 (.10 - .22)</td>
<td>.12 (.08 - .16)</td>
<td>.59 (.53 - .66)</td>
<td>0 (0)</td>
<td>.01 (-.01 - .04)</td>
</tr>
<tr>
<td>6</td>
<td>.33 (.25 - .41)</td>
<td>.24 (.19 - .29)</td>
<td>.24 (.18 - .29)</td>
<td>.31 (.09 - .54)</td>
<td>.10 (.03 - .16)</td>
</tr>
<tr>
<td>8</td>
<td>.38 (.30 - .46)</td>
<td>.29 (.24 - .34)</td>
<td>.11 (.07 - .15)</td>
<td>.44 (.19 - .68)</td>
<td>.45 (.34 - .55)</td>
</tr>
<tr>
<td>Adult</td>
<td>.13 (.08 - .18)</td>
<td>.36 (.30 - .42)</td>
<td>.06 (.03 - .09)</td>
<td>.25 (.04 - .46)</td>
<td>.45 (.34 - .55)</td>
</tr>
</tbody>
</table>

The analyses revealed that the one-component rule was used similarly by the 4-year-olds and the adults, and the 6- and 8-year-olds. However, the one-component rule did not include the intention rule and the action rule. The intention rule was used similarly by the 6- and 8-year-olds, and the 8-year-olds and the adults but was used less by the 6-year-olds compared with the adults, and less by the 4-year-olds compared with all the other age groups. The action rule was used most frequently by the 4-year-olds, followed by the 6-year-olds, followed by the 8-year-olds and adults. The two-component rule was not used at all by 4-year-old children, and there were no differences in the use of the rule by 6- and 8-year-old children, and adults. Finally, for the prior intention and intention-in-action rule, it was used similarly and more frequently by 8-year-olds and adults compared with the 4-year-olds and 6-year-olds.

To examine the proportion of one-rule components and two-rule components that were used by each age group, the three one-rule components and the two two-rule components were collapsed for a second chi square analysis. A 2 (rule category) x 4 (age group) chi square analysis conducted to examine the relation among the proportions of the two collapsed rule categories.
used by each age group in their justification responses revealed a significant chi square, $\chi^2(3, N = 732) = 62.09, p < .01$. Ninety-five percent confidence intervals were calculated for each proportion to examine the specific differences (see Table 23 for a summary of the proportions of each rule category that was used by each age group and the corresponding 95 percent confidence intervals).

Table 23

*Proportions (and Corresponding 95 Percent Confidence Intervals) of the Justification Rules Collapsed into One-Component and Two-Component Categories Used by Each Age Group*

<table>
<thead>
<tr>
<th>Age</th>
<th>One-component rule</th>
<th>Two-component rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>.30 (.28 - .31)</td>
<td>.01 (0 - .02)</td>
</tr>
<tr>
<td>6</td>
<td>.26 (.24 - .28)</td>
<td>.13 (.10 - .17)</td>
</tr>
<tr>
<td>8</td>
<td>.25 (.23 - .26)</td>
<td>.44 (.39 - .49)</td>
</tr>
<tr>
<td>Adult</td>
<td>.20 (.19 - .22)</td>
<td>.41 (.36 - .46)</td>
</tr>
</tbody>
</table>

The results revealed that the collapsed one-component rule was used similarly and more frequently by 4-, 6-, and 8-year-old children compared with adults. The comparison of the usage of the collapsed two-component rule showed that it was used similarly by 8-year-olds and adults, but 4-year-olds used the rule less frequently than all the other age groups and 6-year-olds used the rule less frequently than 8-year-olds and adults.

8.3.3 Summary. The analysis of the frequency that each justification rule was used by each age group revealed that the prior intention and intention-in-action rule, and the collapsed two-component rule were used most frequently by the 8-year-olds and adults, followed by the 6-year-olds, and then the 4-year-olds. The intention rule was used less frequently by the 4-year-olds
compared with all the other age groups, and the action rule and the collapsed one-component rule were used most frequently by the 4-year-old children.

8.4 Intentional Language from Stage Three Coding

8.4.1 Age Group and Version Differences in the Use of Intentional Language. Intentional language was coded as being present or absent in each of the participants’ justification responses. Thus, participants received a maximum score of two for each story version. A mixed ANOVA was conducted with intentional language used in justifications in the different story versions as a within-subject variable and age and gender as between-subject variables. The results revealed a main effect of age, $F(3, 80) = 19.53, p < .01$, and an interaction between age and story version, $F(9, 240) = 2.15, p = .03$. Further analyses (LSD, $p < .05$) showed that all age groups were significantly different from each other in their use of intentional language in their responses. More specifically, 4-year-olds ($M = 1.05, SD = .38$) used less intentional language than all other age groups, 6-year-olds ($M = 1.36, SD = .37$) used less than 8-year-olds ($M = 1.65, SD = .38$) and adults ($M = 1.89, SD = .37$), and 8-year-olds used less than adults. A one-way ANOVA with post-hoc analysis was also conducted to examine the interaction between age and story version. Table 24 presents a summary of the mean use of intentional language by each age group for each story version and Table 25 presents a summary of the mean differences in the use of intentional language between age groups for each story version.
Table 24

*Mean (and Standard Deviation) Use of Intentional Language for Each Age Group for Each Story Version (maximum score =2)*

<table>
<thead>
<tr>
<th>Age</th>
<th>Original</th>
<th>Deviant causal chain</th>
<th>Changed intention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>1.29 (.81)</td>
<td>.92 (.78)</td>
<td>1.00 (.88)</td>
<td>.70 (.80)</td>
</tr>
<tr>
<td>6 years</td>
<td>1.55 (.60)</td>
<td>1.00 (.82)</td>
<td>1.50 (.67)</td>
<td>1.41 (.80)</td>
</tr>
<tr>
<td>8 years</td>
<td>1.64 (.57)</td>
<td>1.64 (.57)</td>
<td>1.60 (.58)</td>
<td>1.68 (.48)</td>
</tr>
<tr>
<td>Adult</td>
<td>1.81 (.40)</td>
<td>1.90 (.30)</td>
<td>1.90 (.30)</td>
<td>1.95 (.22)</td>
</tr>
</tbody>
</table>

Table 25

*Mean Differences in the Use of Intentional Language Between Age Groups for Each Story Version*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>ns</td>
<td>ns</td>
<td>-.52*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>ns</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Deviant causal chain</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1. 4 years</td>
<td>_____</td>
<td>ns</td>
<td>- .72*</td>
<td>-.99*</td>
</tr>
<tr>
<td>2. 6 years</td>
<td>_____</td>
<td>- .64*</td>
<td>-.90*</td>
<td></td>
</tr>
<tr>
<td>3. 8 years</td>
<td>_____</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Adult</td>
<td>_____</td>
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### Changed intention

<table>
<thead>
<tr>
<th>Age Group</th>
<th>1.4 years</th>
<th>2.6 years</th>
<th>3.8 years</th>
<th>4. Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 years</strong></td>
<td>-50*</td>
<td>-60*</td>
<td>-90*</td>
<td>ns</td>
</tr>
<tr>
<td><strong>6 years</strong></td>
<td>ns</td>
<td>-40*</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>8 years</strong></td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

### Control

<table>
<thead>
<tr>
<th>Age Group</th>
<th>1.4 years</th>
<th>2.6 years</th>
<th>3.8 years</th>
<th>4. Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 years</strong></td>
<td>-71*</td>
<td>-98*</td>
<td>-1.25*</td>
<td>ns</td>
</tr>
<tr>
<td><strong>6 years</strong></td>
<td>ns</td>
<td>-54*</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>8 years</strong></td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
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</thead>
</table>

*p < .05*

A linear regression with participants’ use of intentional language as the predicted variable and age as the predictor variable showed that there was a significant relation between older participants and the increased use of intentional language in their justifications, β = .08 (t = 6.53, p < .01), F(1, 86) = 42.58, p < .01, R² = .33, r_part = .58. Separate linear regressions conducted to examine the use of intentional language in each of the story versions confirmed that age group was a significant predictor of use in every version.

### 8.4.2 Age Group and Version Differences in the Type of Intentional Language Used

A 3 (language type) x 4 (version) x 4 (age) x 2 (gender) mixed ANOVA was conducted to assess the effects of age group, gender and story version on participants’ use of explicit and implicit intentional language in their justifications. Thus, the results that were of specific interest were the interactions between language type and the other factors in the analysis. The results revealed a significant language type by age interaction, F(6, 168) = 22.55, p < .01, and language type by version interaction, F(6, 504) = 5.85, p < .01.
Further analyses were conducted to examine the interactions (see Table 26 for a summary of the means and standard deviations).

Table 26

*Mean (and Standard Deviation) Use of Explicit and Implicit Intentional Language for Each Story Version for Each Age Group*

<table>
<thead>
<tr>
<th>Age</th>
<th>Original</th>
<th>Deviant causal chain</th>
<th>Changed intention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explicit</td>
<td>Implicit</td>
<td>Explicit</td>
<td>Implicit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 years</td>
<td>.29 (.62)</td>
<td>1.00 (.83)</td>
<td>.29 (.55)</td>
<td>.63 (.77)</td>
</tr>
<tr>
<td></td>
<td>.50 (.72)</td>
<td>.17 (.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>.82 (.85)</td>
<td>.73 (.83)</td>
<td>.64 (.79)</td>
<td>.36 (.58)</td>
</tr>
<tr>
<td></td>
<td>1.09 (.87)</td>
<td>.32 (.65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 years</td>
<td>1.00 (.76)</td>
<td>.64 (.70)</td>
<td>1.28 (.79)</td>
<td>.36 (.64)</td>
</tr>
<tr>
<td></td>
<td>1.52 (.71)</td>
<td>.16 (.37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>1.48 (.75)</td>
<td>.29 (.64)</td>
<td>1.81 (.51)</td>
<td>.10 (.44)</td>
</tr>
<tr>
<td></td>
<td>1.86 (.48)</td>
<td>.10 (.44)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A one-way ANOVA with post-hoc analysis (LSD, $p < .05$), showed that for the original story version, 4-year-olds used less explicit intentional language in their justifications than all the other age groups, and 6- and 8-year-olds used less explicit intentional language than adults. Also for the original story version, 4-year-olds used more implicit intentional language than adults. For the deviant causal chain version, 4- and 6-year-olds used less explicit intentional language than 8-year-olds and adults, and 8-year-olds used less explicit intentional language than adults. Also for the deviant causal chain version, 4-year-olds used more implicit intentional language than adults. For the changed intention story version, 4-year-olds used less explicit intentional language in their justifications than all the other age groups, and 6-year-olds used less explicit intentional language than adults. Also for the changed intention version, 4-year-olds used more implicit intentional language in their justifications than 8-year-olds and adults. Finally for the control
version, 4-year-olds used less explicit intentional language than all the other age groups, and 6-year-olds used less than 8-year-olds and adults. There were no differences in the use of implicit intentional language in justifications between age groups for the control version. In summary, when examining the trend of total use of explicit and implicit intentional language across story versions between age groups using a one-way ANOVA, older age groups tended to use more explicit intentional language (see Table 27 for a summary of the mean use of explicit and implicit intentional language across story versions).

Table 27

<table>
<thead>
<tr>
<th>Age</th>
<th>Explicit intentional language (max. = 8)</th>
<th>Implicit intentional language (max. = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>1.38 (2.30)</td>
<td>2.50 (1.77)</td>
</tr>
<tr>
<td>6 years</td>
<td>3.5 (2.22)</td>
<td>1.95 (1.56)</td>
</tr>
<tr>
<td>8 years</td>
<td>5.16 (1.91)</td>
<td>1.40 (1.22)</td>
</tr>
<tr>
<td>Adult</td>
<td>6.86 (1.42)</td>
<td>.67 (1.11)</td>
</tr>
<tr>
<td>Total</td>
<td>4.16 (2.83)</td>
<td>1.65 (1.57)</td>
</tr>
</tbody>
</table>

Further, linear regression analyses conducted with total use of explicit and implicit intentional language as the predicted variables and age group as the predictor variable revealed that there was a significant relation between age and both the use of explicit intentional language, $\beta = .34 (t = 7.85, p < .01), F(1, 90) = 61.67, p < .01, R^2 = .41, r_{part} = .64$, and implicit intentional language, $\beta = -.12 (t = -4.15, p < .01), F(1, 90) = 17.23, p < .01, R^2 = .16, r_{part} = -.40$, in participants’ justification responses. However, it is important to remember that the presence of explicit language determined the code for the justification response. Thus, although younger
participants appeared to use more implicit intentional language than older participants, it is possible that older participants’ use of implicit intentional language was not captured because of their use of explicit intentional language in their responses.

Paired sample t-tests conducted to examine the interaction between language type and story version revealed that significantly less explicit intentional language was used for justification responses for the original version \((M = .88, SD = .85)\) compared with the changed intention, \((M = 1.07, SD = .87)\), \(t(91) = -2.02, p = .05\), and control story versions, \((M = 1.23, SD = .87)\), \(t(91) = -4.01, p < .01\), and less explicit intentional language was used for the deviant causal chain \((M = .99, SD = .88)\) and changed intention versions compared with the control version, \(t(91) = -2.91, p < .01, t(91) = -2.10, p = .04\), respectively. The results also revealed that more implicit intentional language was used for justifications for the original story version \((M = .67, SD = .79)\) compared with the deviant causal chain \((M = .37, SD = .64)\), \(t(91) = 3.25, p < .01\), changed intention \((M = .42, SD = .65)\), \(t(91) = 2.51, p = .01\), and control versions \((M = .18, SD = .47)\), \(t(91) = 5.24, p < .01\), and more implicit intentional language was used for the deviant causal chain and changed intention versions compared with the control version, \(t(91) = 2.39, p = .02, t(91) = 3.27, p < .01\), respectively.

8.4.3 Summary. The results from the analysis of the use of intentional language in participants’ justification responses indicated that each younger participant group used less intentional language than each older participant group. Also, each older age group used more explicit intentional language in their responses. Finally, the results showed that more explicit language was used for the changed intention and control story versions and more implicit language was used for original and deviant causal chain story versions.
Chapter 9: Discussion of the Results

9.1 Overview of the Chapter

This thesis aims to describe the development of children’s understanding of intentional causation in moral reasoning about harmful behaviours, and to examine the relation between this understanding and children’s mental-state reasoning. This chapter highlights the results from this study and first discusses children’s and adults’ judgments of the intentions of the characters and their punishment judgments in the different story versions. A discussion of this study’s findings of the relation between children’s understanding of intentional causation in moral reasoning and their belief-state reasoning follows. This chapter then highlights the findings from the justifications provided by participants in response to why the story characters should or should not be punished for the event outcomes, starting with a discussion of the differences between age groups in their references to the various components of interest. This is followed by a discussion of the differences between age groups in their use of the various rule categories to formulate their justification responses. Finally, age group differences in the use of intentional language and in the type of intentional language used in participants’ justification responses are discussed.

9.2 Understanding Intentional Causation in Moral Reasoning

9.2.1 Developmental Change in Intention Judgments. The findings from this study revealed developmental change in participants’ accuracy in judging the intentions of the story characters (i.e., judging whether the story character performed his or her action “on purpose”). Unfortunately, because there was a lack of variability in the responses of the 8-year-olds and the adults for the original, changed intention, and control story versions, statistical comparisons could not be made for these versions with all of the age groups and the intention judgments of the older participants can only be used as reference points for discussion. However, statistical comparisons were made with all of the age groups for the deviant causal chain version. Also,
statistical comparisons were made with the results from the 4- and 6-year-olds for the original, changed intention, and control versions, and observations were made for the performance of the 4- and 6-year-olds compared with the performance of the 8-year-olds and adults.

It was apparent that four-year-old children were less accurate overall in their intention judgment accuracy. With regards to their performance in each of the story versions, it appeared that 4-year-old children had more difficulty judging the intentions of the characters in all of the story versions except for the original version. This is different than all the other age groups that had more difficulty only with the deviant causal chain story version. Six- and 8-year-old children and adults were just as accurate with their intention judgments for the original version as for the changed intention and control story versions. Further, whereas 8-year-old children and adults were above chance in their intention judgment accuracy for the deviant causal chain version, the accuracy of the 4-year-olds was below chance and the accuracy of the 6-year-olds was at chance. With regards to the other story versions, the accuracies of all the age groups were above chance except for the 4-year-old children, whose intention judgment accuracy for the changed intention and control story versions was only at chance. Thus, 4-year-old children in this study appeared to have the most difficulty with accurately judging the intentions of the story characters and even though the result was not significant, 6-year-old children were observably less accurate with the deviant causal chain version than the older age groups. By 8 years of age, despite having some difficulty with the deviant causal chain story, participants were able to understand intentional causation in reasoning about the moral behaviours in the stories in this study.

These findings are consistent with the hypothesis that there would be age-related improvement in participants’ ability to accurately judge others’ intentions in moral situations. Four-year-old children tended to attribute purposeful intent to characters in the original and deviant causal chain stories, and were at chance at reporting that characters did not perform
actions on purpose in the changed intention and control stories. The changed intention and control stories described situations in which the causal link between prior intentions and actions was either clearly broken or not present to begin with. This suggests that the 4-year-old children in this study might have used general goal states (please refer to chapter 3.4 for a discussion of goal states) and outcomes to make their intention judgments. It is possible that the 4-year-olds conflated desires and intentions into one goal state and used the goal state, or the negative valence of the outcome, or both, to reason about the character’s intent. Using either goal states or outcomes, or a combination of both, to make intention judgments would result in the expectation that purposeful intent would be attributed to characters in all of the stories, especially the original, deviant causal chain, and changed intention stories since these stories contained harmful goal states and harmful outcomes. These findings are consistent with previous research that suggests that 3- to 4-year-old children use goal-outcome matching strategies to determine whether an event was intentional (e.g., Schult, 2002; Shultz & Wells, 1985). The findings are also consistent with previous research that suggests that 3- to 4-year-old children have some basic understanding of intentions and use this information in their moral reasoning, but are not yet able to integrate information about intentions and outcomes to make judgments (e.g., Helwig et al., 2001). Four-year-old children in this study appeared to have difficulty reasoning about characters’ intentions when moral evaluation required consideration of combinations of mental states, actions, and outcomes. Perhaps preschool- and young kindergarten-age children have difficulty with reasoning about complex combinations of mental states because they are not yet able to metarepresent. Thus, they are not yet able to recognize intentions as mental states that are different from desires and separate from action. However, because the relation between metarepresentational understanding of mental states and understanding intentional causation in moral reasoning was not clearly established (see section 9.4), it is also possible that these
younger children do not yet have the social-cognitive ability to reason about combinations of mental states and event outcomes.

Six-year-old children in this study were able to separate the desire and prior intention in the changed intention story version, and recognized the broken causal link between prior intentions and actions in both the changed intention and control stories. As a result, they were able to accurately report that characters did not perform their actions on purpose in these situations. The 6-year-old children had more difficulty with the deviant causal chain scenario where the causal link between the prior intention and action was broken but the outcome satisfied the character’s desire and the motive of the prior intention. Although metarepresentational understanding of mental states is expected in 6-year-old children, theoretically allowing them to separate desires, intentions, and actions, and children around this age have been shown to be able to reason about intentional causation (Sokol et al., 2004), the 6-year-olds in this study had difficulty judging the intentions of the characters in the deviant causal chain stories. This finding is inconsistent with a theoretical position that metarepresentational understanding of mental states is sufficient for reasoning about the causal link among prior intentions, actions, and outcomes. Instead, this finding, along with the results from the 4-year-old children, suggests that metarepresentational understanding may be related to the improvement in reasoning about intentions but additional social-cognitive skill supports children’s ability to accurately reason about intentional causation. The relation between metarepresentational understanding and the understanding of intentional causation found in this study is further discussed in a subsequent section of this thesis (section 9.4).

9.2.2 The Challenge of the Deviant Causal Chain. Despite confirming the hypothesis that older age groups in this study would be more accurate in their intention judgments of all of the story versions, all of the age groups were less accurate in their intention judgments for the
deviant causal chain story version compared with the original, changed intention, and control versions. There was a difference in the accuracy of intention judgments for the deviant causal chain version compared with the other story versions for every age group. Together with the findings that indicate that 4- and 6-year-olds were performing below and at chance with their judgment accuracy, respectively, the results suggest that the deviant causal chain story version was the most challenging version for participants. Thus, the deviant causal chain story in which the character maintained a prior intention to harm but the causal link among the prior intention, action, and outcome was broken appeared to elicit more differences in participants’ judgments compared with the other versions.

All participant age groups appeared to have more difficulty with accurately judging the intentions of the characters in the deviant causal chain stories. One possible reason for the challenge presented by deviant causal chain scenarios is that intuitive emotions about “right” and “wrong” may conflict with rational deliberation (Pizarro et al., 2003). Thus, even despite recognizing that the causal link is broken in a deviant causal chain, and that the story character did not act as he or she intended, some participants may have responded intuitively and judged the character’s intention based on the presence of a harmful prior intention. This may have been especially true of 4- and 6-year-old children but this may have been also true for some of the 8-year-olds and adults as illustrated by their intention judgment accuracy for the deviant causal chain story compared with the other story versions. Another possible reason for the challenge presented by deviant causal chain scenarios is that older participants may have rationalized that characters’ intentions-in-actions and actions would not have been possible if the characters did not have the harmful prior intentions to begin with. Perhaps this rationalization is also driven by intuitive reactions to the negative valence of the harmful prior intention and outcome, but it is possible that some older participants may have linked the likelihood of the action occurring with
the presence of the harmful intention and considered actions to be intentional because the actions were unlikely to have occurred in the absence of prior intentions to harm.

9.3 Judgment of Moral Actions Involving the Understanding of Intentional Causation

9.3.1 Developmental Change in Punishment Judgments. As expected, overall punishment levels decreased for the story versions in which the causal link among prior intentions, actions, and outcomes was broken. More specifically, participants assigned less punishment for characters’ actions in the deviant causal chain story compared with the original story, the changed intention story compared with the deviant causal chain story, and the control story compared with the changed intention story. Although it was hypothesized that punishment levels would be similar for the changed intention and control versions, the finding that the changed intention stories elicited harsher overall judgment is not surprising. Further examination of this finding revealed that the difference was driven by the responses of the 6-year-olds and adults. Compared with the control story version, the changed intention story began with a harmful desire and harmful prior intention. It is possible that the judgment ratings of these two age groups were more influenced by the presence of the characters’ initial mental states compared with the other age groups. This is a possibility despite both of their understanding of intentional causation in the changed intention story, which is evident from their intention judgment accuracy scores.

Four-year-old children generally assigned higher punishment judgment ratings than all the other age groups and the judgment ratings of the 6-year-olds were higher than those of the 8-year-olds, but the ratings of the 6-year-olds and adults and the 8-year-olds and adults were not different from each other. This overall result is a potential indicator of the selectivity of different age groups with their punishment ratings. Although all children showed a decreasing trend in their punishment ratings from the original to deviant causal chain to changed intention to control story versions, they appeared to more discerningly assign punishment with increased age. This
finding is consistent with the hypothesized developmental trend that older children would more selectively assign punishment for characters’ actions depending on the integrity of the causal link among prior intentions, actions, and outcomes, and potentially, the presence of the prior intention to harm. When comparing children’s ratings of the different versions within their age groups, 4-year-olds judged the original version different from the other story versions and the deviant causal chain version different from the control version. The 6-year-olds, however, also differentiated between the deviant causal chain and the changed intention versions, and the changed intention and control versions in their judgment ratings. The 8-year-olds were similar to the 6-year-olds in differentiating their punishment judgment ratings between story versions with the exception of the changed intention and control versions where their ratings were not different. Both the 6- and 8-year-olds judged the deviant causal chain stories where the characters maintained their intentions to harm more harshly than the changed intention stories where the characters’ harmful intentions changed. However, 8-year-old children judged the changed intention and control story versions similarly. It is possible that 8-year-olds appreciated that the actions in both the changed intention and control story versions were not caused by the characters’ prior intentions and that the characters in these stories no longer had a prior intention to harm when they performed the actions. Thus, as age increased, children appeared to be more able to appreciate differences in the causal relation among prior intentions, actions, and outcomes in the different story versions, understand changes in mental states, and use this information in their punishment judgments. Previous research has shown that children who were able to integrate intention and outcome information to make moral judgments were better able to purposefully assign punishment for actions (Zelazo et al., 1996). Similarly, it appeared that older children in this study who were able to separate and reason about prior intentions, actions, and
outcomes were more purposeful in rating the punishment that characters should receive in each story version.

9.3.2 Adults’ Punishment Judgments. Interestingly, the punishment judgments from the adults in this study did not follow the developmental trend observed in the child participant groups. Adults assigned lower punishment for characters’ actions in the changed intention and control versions compared to the 4- and 6-year-olds, and their punishment ratings for these two versions were not different from the 8-year-olds. However, they assigned higher punishment for characters’ actions in the original and deviant causal chain versions compared to the 8-year-olds, but their punishment ratings for these two stories were not different from the 6-year-olds. Thus, the adults appeared to judge characters’ actions similarly to the 6-year-old group for the original and deviant causal chain stories. This result occurred despite the similarity in the adults’ and 8-year-olds’ intention judgment accuracy. These two groups were not different in their intention judgments and both were relatively accurate in judging characters’ intentions in the original and deviant causal chain versions compared with the 4- and 6-year-old groups.

One possible explanation for adults’ harsher punishment of characters’ actions in the original and deviant causal chain story versions is that despite understanding intentional causation in moral reasoning, adults may be significantly influenced by the negative valence of harmful prior intentions and negative outcomes. Perhaps, years of experience and social learning from real moral dilemmas and the negative consequences associated with moral violations are incorporated into adults’ moral reasoning and influence rational deliberation (Haidt, 2001). Adults have been observed to use both rational deliberation and intuitive reasoning in their moral judgment (Pizarro et al., 2003). Despite understanding that moral actions should not be punished as harshly if they are not directly caused by a prior intention, adults use their intuitive feelings of moral responsibility to assign punishment rather than rational deliberation (Pizarro et al., 2003).
It is also possible that adults assign harsher punishment for actions by individuals who have harmful intentions because adults attribute a particular personality to these individuals and consider the personality to be stable. Research has shown that there is developmental change in personality trait understanding, and that the use of personality trait attribution to predict others’ behaviours increases with age (Alvarez, Ruble, & Volger, 2001). Children around the ages of 5 and 6 years do not consider personality traits to be stable and tend to use information about their evaluation of others, rather than trait inferences, to predict behaviour across different situations (Alvarez et al., 2001; Rholes & Ruble, 1984). Children who are older than 9 years and adults, however, do consider personality traits to be stable and use personality attributions to predict future behaviours (Alvarez et al., 2001; Gnepp & Chilamkurti, 1988). Thus, the adults in this study may have attributed stable, negative personality traits to characters who had harmful prior intentions which influenced their punishment judgments of the characters’ actions.

It has also been suggested that there is an asymmetry in adults’ intention judgments of moral actions and that they are significantly influenced by negative moral consequences (Malle, 2006). Adults show a tendency to consider an immoral action intentional even if it may not be strictly defined as intentional (Malle, 2006). Interestingly, it has been suggested that 4-year-old children are also influenced by negative moral consequences and demonstrate a similar asymmetry in their intention judgments of immoral actions (Leslie et al., 2006). The 4-year-olds in this study assigned higher punishment ratings in all of the story versions compared with the other age groups. Thus, it appeared that the 4-year-old children were also significantly influenced by the negative valence of the harmful prior intentions and outcomes in the stories. However, young children do not have as much experience with moral dilemmas as adults, or understand trait attribution like adults, and may not be influenced by the moral valence of the stories for the same reasons. Perhaps the influence that negative moral consequences has on young children is
more related to early learning about social and moral rules and not as much related to experience with reasoning about moral dilemmas and consequences. As children develop, they begin to integrate learned information about social and moral rules with their advancing social-cognitive abilities to help them understand mental states and engage in more rational deliberation about the factual information in moral dilemmas. Thus, it is possible that young children are initially influenced by the negative valence of moral actions because of what they learn about others’ evaluations of moral rule violations, older children appreciate the facts associated with the moral situation and reason based on more factual information, and adults are influenced by the negative valence of moral actions because of their years of social and emotional experience with real-world moral dilemmas and consequences of those dilemmas.

Another potential explanation for the pattern of adults’ punishment judgments found in this study is that adults experience more cognitive dissonance than older children when making their punishment judgments following their intention judgments. This may be especially true for the deviant causal chain story version where the accurate response was that the action was not intentional but because the prior intention to harm was maintained by the character, participants may have felt conflicted about assigning a punishment rating for the character’s action. Adults have shown a tendency to believe in a just world where people generally “get what they deserve” (Callan, Ellard, & Nicol, 2006; Lerner, 1980). Callan et al. (2006) showed that adults engage in immanent justice reasoning where they infer others’ deservingness of consequences without any rational basis. Adults base their deservingness of fortuitous outcomes on others’ prior behaviours even though the fortuitous outcomes and past behaviours are not causally related (Raman & Winer, 2002). Thus, for adults who believe in a just world, decreasing the sense of injustice and accompanying distress may require anticipatory reasoning about the deserved punishment of individuals who have performed prior negative actions. Compared with the older children in this
study, adults may have more harshly punished the actions of the characters in the original and
deviant causal chain stories because they believed that characters who maintained harmful desires
and intentions should be significantly punished for the negative outcomes. It is also possible that
the adults attempted to reduce the cognitive dissonance associated with knowing that the
character in the deviant causal chain story maintained a harmful desire and harmful prior
intention and acknowledging that the character’s action that resulted in the harmful outcome was
not caused intentionally. In other words, the adults’ punishment judgments of the characters’
actions in the deviant causal chain stories were related to their need to reduce the distress
associated with reporting that the action was not caused intentionally, but still considering the
characters’ actions as punishable because a negative outcome occurred and because the
characters maintained harmful desires and harmful intentions.

Piaget (1932) theorized that immanent justice reasoning can also be observed in early
childhood. In fact, Piaget (1932) proposed a developmental stage-like pattern to immanent justice
reasoning and suggested that as children become older, they abandon their belief in a just world
and moral realism, and engage in more scientific-like reasoning to solve moral dilemmas.
However, this theory has since been challenged with research showing that adults also engage in
immanent justice reasoning (e.g., Callan et al., 2006; Raman & Winer, 2002). The findings from
this study suggest the possibility that 4-year-old children and adults were influenced by their
beliefs in a just world in their punishment judgments, and 6- and 8-year-old children engaged in
more scientific-like reasoning to assign theirs. Perhaps older children do not abandon their belief
in a just world but are more inclined to use their developing social-cognitive skills to reason
about social and moral issues, resulting in more scientific-like reasoning. Adults on the other
hand, use their social-cognitive skills to reason and hence there was a significant difference in
their punishment judgments for the changed intention and control stories compared with the 4-
year-old group, but combine rational deliberation with their belief in a just world to reason about the deservingsness of punishment for individuals who hold desires and prior intentions to harm others.

9.3.3 Gender Differences in Punishment Judgments. Although there is conflicting theory and evidence regarding gender differences in moral reasoning and moral judgment (e.g., Jaffee, & Hyde, 2000), the findings from this study showed that males assigned higher punishment ratings for characters’ actions compared with females. However, this finding did not interact with the story versions and thus was not specific to reasoning about intentional causation.

9.4 Relation Between Reasoning About Moral Intention and Reasoning About False Belief

9.4.1 First- and Second-Order False-Belief Performance. Children performed as expected on both first- and second-order false-belief tasks. The results showing that 6- and 8-year-old children performed significantly better than 4-year-old children on first-order false belief and that 8-year-old children performed significantly better than 4- and 6-year-old children on second-order false belief is consistent with previous theory-of-mind research (Astington et al., 2002; Wellman et al., 2001).

9.4.2 Relation Between Intention Judgments and Reasoning About False Belief. Based on a theory of metarepresentational understanding of mental states and previous research on the relation between mental-state understanding and reasoning about intentional causation, it was predicted that performance on first-order false belief would be related to intention and punishment judgments for the original and control story versions. The results of this study did not confirm this hypothesis and children’s false-belief performance was not related to the accuracy of their intention judgments for any of the story versions. The analyses were conducted with the 4- and 6-year-old children because of the lack of variability in the intention judgments and false-belief scores of the 8-year-old children. This is not an unreasonable analysis since previous
research on the development of children’s false-belief understanding indicates that success on first-order false-belief tasks is typical around the ages of 4 to 5 years (Wimmer & Perner, 1983), and success on second-order false-belief tasks is typical around the ages of 6 to 7 years (Astington et al. 2002, Perner & Wimmer, 1985).

The results suggest that metarepresentational understanding of belief and higher-level reasoning about belief states are not related to children’s use of information about intentional causation to judge others’ intentions. It is possible that reasoning about representations of belief is not related to reasoning about representations of intention. This has previously been suggested by Mull (2001) and is consistent with the view that children’s understanding of mental representations develops in domains (Wellman & Woolley, 1990). Perhaps mental-state understanding is related to the understanding of intentional causation but a metarepresentational understanding of belief is not representative of a metarepresentational understanding of intention. It is also possible that reasoning about the mental states involved in intentional causation to judge intention does not employ the same set of cognitive skills as using a metarepresentational understanding of mental states to reason about actions. Likewise, it is possible that the two tasks were not related because judging the intentions of the story characters did not involve an evaluation or prediction of action as required by the false-belief tasks. For the intention judgments, participants were simply asked to judge whether the character performed an action on purpose or not on purpose and were not asked to reason about the result of the intention state. In other words, participants were asked to use their representations of the characters’ prior intentions and their knowledge of the characters’ actions to respond to the intention judgment question, but they were not asked to predict or evaluate the actions caused by the intention state. In the false-belief tasks, participants were asked to use their representations of the characters’ beliefs and to use their knowledge of reality to predict the characters’ actions. Thus, the two tasks
may not use parallel reasoning skills even though they both require reasoning about mental representations.

9.4.3 Relation Between Punishment Judgments and Reasoning About False Belief. The results from the analyses of the relations between children’s punishment judgments and their false-belief performance revealed that second-order false-belief performance was related to lower punishment judgments for the changed intention and control story versions, partially satisfying this study’s hypothesis. The finding of a relation between second-order false-belief understanding and punishment judgment suggests that mental-state reasoning is related to understanding intentional causation when the information about the causal link between intention and action is required to evaluate the action. Different from judging characters’ intentions, judging punishment levels required participants to use their representations of characters’ prior intentions and their knowledge of the characters’ actions to assign a level of punishment. It is possible that the punishment judgment task is more similar to the demands of the false-belief task than the intention judgment task, increasing the potential for a relation to be found.

Like the predictions for the intention judgments, it was expected that children’s level of punishment judgments for the original and control story versions would be related to their performance on first-order false-belief tasks, and children’s level of punishment judgments for the deviant causal chain and changed intention story versions would be related to their performance on second-order false-belief tasks. However, first-order false-belief performance was not related to children’s punishment judgments for any of the story versions, and the relations between second-order false-belief performance and children’s punishment judgments were not as expected. Although a relation between metarepresentational understanding of intention and intentional causation understanding has been hypothesized (Astington, 2001; Perner, 1991), the finding of the relation between second-order, and not first-order, false-belief
performance and lower punishment judgment suggests that using information about intentional causation to assign punishment levels requires mental-state reasoning that is beyond or unrelated to a metarepresentational understanding of mental states. Rather, the finding suggests that understanding intentional causation is related to higher-level mental-state reasoning. It is possible that reasoning about the causal link between intention and action to make moral judgments requires more complex representational ability than initially expected. This is potentially true even for stories, such as the control version, in which the integrity of the causal link is more obvious and requires arguably simpler mental-state reasoning. It is also possible that the link between second-order false-belief performance and punishment judgments can be explained by a relation between a higher level of cognitive ability required to engage in recursive reasoning in second-order false-belief tasks compared with first-order false-belief tasks, and a higher level of cognitive ability required to use information about intentional causation to assign punishment ratings. However, additional research assessing children’s cognitive level or executive function skills is necessary to examine this hypothesis.

Unexpectedly, second-order false-belief performance was related to children’s punishment judgments for the changed intention and control story versions, and not for the deviant causal chain and changed intention versions as hypothesized. This result can potentially be explained by considering the nature of the events in the versions of the reasoning task. Whereas the false-belief task concerned a matter of fact, the moral-intention task concerned matters of fact and matters of right and wrong. The false-belief task asked children to maintain a representation of and reason about someone’s false belief about someone else’s true belief. To be successful on the task, children had to simultaneously maintain these recursive representations of factual beliefs and predict the other person’s behaviour. The changed intention and control versions of the moral-intention task are comparable to the false-belief task because they required
children to reason about a character’s action that caused a harmful outcome but was not causally related to the character’s intention. Because the character’s intention was not harmful and there was no causal link between the character’s intention and action that caused the harmful outcome, children were reasoning about a matter of fact – that the outcome occurred accidentally. However, for both the original and deviant causal chain versions of the moral-intention task, there was an additional moral component to the scenarios. Children were required to maintain a representation of the character’s prior intention and integrate it with their knowledge of the outcome to evaluate the character’s action, but were also prompted to acknowledge the moral nature of the event. The original story version described a character having a harmful desire and harmful prior intention, and an action that resulted in a harmful outcome. The deviant causal chain story version described a character maintaining a harmful desire and prior intention, even though the action that resulted in a harmful outcome was not causally related to the prior intention. Thus, it is possible that the moral valence of the original and deviant causal chain stories elicited reasoning regarding whether the character’s action was right or wrong and the changed intention and control story versions elicited more factual reasoning about whether the actions were intentional.

9.4.4 Summary. Although it was expected that metarepresentational understanding of belief states would be related to reasoning about intentional causation, the findings from this study suggest that understanding intentional causation in moral reasoning requires a higher level of mental-state reasoning or involves an alternate reasoning process. Metarepresentational understanding was not related to children’s ability to appreciate the separation among desires, prior intentions, and actions and make evaluations. However, the ability to engage in recursive reasoning of mental states appears to be related to understanding and reasoning about the causal link among prior intentions, and intentions-in-action and actions, as observed in this study’s
changed intention and control story versions. These findings suggest that metarepresentational understanding of mental states may not be the prerequisite ability to the understanding of intentional causation as previously suggested (Astington, 2001; Perner, 1991), but that reasoning about intentional causation may require more advanced social-cognitive skills, such as additional recursive reasoning or simultaneous reasoning about represented mental states. Further, these findings suggest that understanding intentional causation in moral reasoning may not only require more advanced mental-state reasoning skills, but also alternate social-cognitive abilities to appreciate and process situations with morally-significant components.

Alternatively, these findings might suggest that younger children may not recognize or understand all the components that have been hypothesized to be necessary to determine whether an action was performed intentionally. Previous research has shown that adults define intentionality by the presence of a desire for the outcome, a belief that the act will cause the outcome, an intention or plan to perform the act, an awareness of the act during the act itself, and the skill or ability to execute the act in a controlled manner (Malle, 2006; Malle & Knobe, 1997). It is possible that young children are not yet able to recognize all the various components or do not yet have the cognitive ability to simultaneously process the components to make an accurate intention judgment about the characters’ actions. Additional research that assesses the development of children’s understanding of intention in moral reasoning using a task that manipulates the presence and absence of these components is necessary to examine this possibility.

The findings from this study also suggest that there may be a difference in the social-cognition involved in reasoning about moral rules and in reasoning about neutral situations that do not attach a moral valence. The reasoning of the youngest and the oldest participants in this study appeared to be influenced by the morally-significant information in the stories that do not
appear to be explicable by rational deliberative processes alone. Research with both adult and child populations has shown that reasoning about morally-significant situations has yielded different results than expected in ascriptions of intentionality and assignment of judgment (Leslie et al., 2006; Malle, 2006). As mentioned previously in this thesis, it has been suggested that children who have a metarepresentational understanding of mental states judge that a side outcome resulting from an action is intentionally caused if the side outcome is harmful (Leslie et al., 2006). Thus, although children may have an understanding of intentions as mental representations that are separate from actions and outcomes, they are influenced by the moral valence of the side outcome (Leslie et al., 2006). Leslie et al. (2006) proposed two alternate hypotheses for the underlying mechanisms for the side-effect effect. It may be that there is a parameter for the moral valence of outcomes in intention attributions, or there is an innate ability to process information about moral situations and associated mental states to determine if the outcome was morally wrong and on that basis, make a judgment about whether the action was performed intentionally (Leslie et al., 2006). The findings from this study cannot support one hypothesis over another but do indicate that even higher-level reasoning about belief representations does not predict performance on a reasoning task about intentional causation that contains morally-significant intentions and outcomes. Thus, it is possible that the versions of the moral-intention task that contained a stronger moral valence elicited different reasoning than the versions that did not contain the same moral valence.

Also as mentioned previously in this thesis, adults have been shown to present with a moral asymmetry in their ascriptions of intention when the consequences were negative or harmful (Malle, 2006), and to base their moral judgment on intuitive reasoning versus rational deliberation (Callan et al., 2006). Malle (2006) provides a number of potential models to explain the asymmetry in intentionality ascriptions including: one that consists of a component of moral
“badness” that biases intention ascriptions; one that describes different uses or concepts of intentionality depending on whether the situation is a cognitive task or an evaluative task; one that proposes that attention to the salience of moral stimuli might override attention to the cognitive aspects of the situation; and one that suggests that people’s intentionality judgments are sensitive to the narrow or broad scope of how the specific intentions can be fulfilled. The first three models can be used to explain some of the findings from this study. Being influenced by a component of moral “badness”, treating the moral-intention task as an evaluative rather than a cognitive task, and attending to the salience of moral information can all be reasonable explanations for the pattern of intention judgments and punishment judgments found in this study. However, the fourth model does not provide as reasonable an account for this study’s findings. Presumably, the scope of the intentions in the stories in the moral-intention task were well-defined because the criteria for satisfaction of the prior intentions were described. Thus, it is not likely that variability in participants’ intention judgments and punishment judgments were influenced by the vagueness of scope of the intentions in the stories from this study’s task.

Although this study did not compare participants’ understanding of intentional causation in moral reasoning with their understanding of intentional causation in reasoning about neutral social situations, the results suggest that moral reasoning about the causal link among prior intentions, actions, and outcomes was influenced by morally-significant information, that for some, appeared to dominate judgments of intention and judgments of punishment. This was especially true for the youngest and the oldest participants. Further, the results were not consistent with the hypothesized relations between understanding intentional causation and metarepresentational understanding of belief or recursive reasoning of belief states. It is possible that understanding intention generally requires different social-cognitive skills than understanding belief but more likely, the moral valence associated with the deviant causal chain
and original stories in this study’s task elicited consideration of information that was different from the more factual information associated with reasoning about belief states. Additional research that directly compares the development of understanding intentional causation in moral reasoning and the development of understanding intentional causation in emotionally-neutral situations is necessary to further comprehend the differences between reasoning about the two situations and to explain the bases for the differences.

9.5 Moral-Intention Task Justifications

9.5.1 Age Group Differences in the Use of Justification Components. The primary purpose of examining participants’ references to the various components involved in the understanding of intentional causation in moral reasoning was to assess for age group differences. Thus, justification components of interest to this study (i.e., prior intention, intention-in-action, action, outcome) were coded and analyzed for the frequency of use by the different age groups.

The findings showed that there was a relation between older age groups and more references to prior intentions in their justifications of their punishment judgments, and a relation between younger age groups and more references to the intention-in-action, action, and outcome components in their justifications of their punishment judgments. More specific analyses of age group differences revealed a developmental trend for all the components. Four-year-old children made fewer references to the prior intention component than all the other age groups. This finding is consistent with expectations and previous research that shows that older children are increasingly able to consider others’ intentions in their moral reasoning, and increasingly able to identify prior intentions as mental representations that motivate and cause actions (Berndt & Berndt, 1975; Schult, 2002). Also, significantly more references to the prior intention component were made in the control story version compared to the original story version. Thus, the story version in which the character did not have a harmful prior intention but a harmful outcome
accidentally occurred elicited more references to the prior intention component. It is possible that participants were more likely to refer to the neutral prior intention in the control story because it was a fact that the character did not have a harmful prior intention despite the harmful outcome. However, for the original story version, participants may have been more likely to use other components to justify their responses because all of the components contained a negative moral valence that potentially increased participants’ likelihood in referring to them in their justifications of their judgment decisions. This result potentially provides additional evidence that reasoning about situations that contain morally-significant information is unlike reasoning about situations that contain information that is not morally-significant, and individuals may be more likely to reference others’ intentions in explaining their judgment decisions when the intention is clearly not to harm.

Overall, 4-year-olds made more references to the intention-in-action, action, and outcome components than all the other age groups. However, the age group differences for the intention-in-action and action components were qualified by an interaction with the story versions that showed that younger age groups, especially the 4- and 6-year-olds, made more references to the intention-in-action and action components compared with the older age groups in the different story versions. Although not formally hypothesized, this finding is also not surprising since previous research has shown that younger children use action and outcome information to reason about moral situations (Zelazo et al., 1996). Thus, the findings from this study show a developmental pattern in the use of different pieces of intentional causation information in participants’ justifications for their punishment judgments. Younger participants appeared to be more likely to refer to intention-in-action, action, and outcome components, and older participants appeared to be more likely to refer the prior intention component.
9.5.2 Age Group Differences in the Use of Justification Rules. Consistent with the hypothesis that younger participants would be more likely to use one-component rules in their justifications than older participants, the findings from this study showed that the one-component rule was used more frequently by 4-year-olds compared with all the other age groups. Further, because this study also separated one- and two-component rules for analyses based on a priori interest, the findings show specific differences in the frequencies that types of one- and two-component rules were used by different ages. Although the intention rule was a one-component rule, it was not used as frequently by 4-year-olds as it was by all the other participant groups to justify their judgment responses. The action rule tended to be more frequently used by the younger participants to formulate their justifications. These findings suggest that older participants extracted information about prior intentions when formulating their justifications and were able to express the information as part of their primary reasoning for punishing characters’ actions. In contrast, information about characters’ actions appeared to be more salient for younger participants who showed a greater tendency to use information about the actions in their verbal reasoning. Also, consistent with the hypothesis that the two-component rule involving prior intentions and intentions-in-action would be used more frequently by older participants, older age groups recorded a greater use of the two-component rule and the prior intention and intention-in-action rule compared with the 4- and 6-year-olds. Thus, the understanding and use of information about intentional causation in moral reasoning was not only observed in older participants’ intention judgments that were directly elicited using forced-choice questions, but also in their justification responses that were elicited with open-ended questions.

These findings describe a developmental pattern in the use of intention information in individuals’ explanations of their moral judgments. As previously discussed, the 4-year-olds assigned higher levels of punishment for the story characters’ actions than all the other age
groups, and the 6-year-olds assigned higher levels of punishment than the 8-year-olds. Also, the 6- and 8-year-olds, and adults appeared to discriminate between the different story versions in their punishment judgments more than the 4-year-olds. Thus, the ability of older participants to use justification rules involving intentions and the differences in participants’ moral judgment ratings appear to demonstrate a pattern of developmental change. It is possible that there is a relation between expressing a recognition or appreciation of the characters’ intentions and individuals’ moral judgment. However, this study did not address this possibility. Perhaps, a study using more direct methods or specific questioning to capture the patterns of information that individuals use to formulate their justifications would produce different findings, and clarify any relation that may be present between the “rules” that individuals use to devise their justification responses and the judgment they assign to others’ moral actions. Further, the adults in this study did not follow a developmental pattern in their assignment of punishment and were more similar in their ratings to the 6-year-olds than 8-year-olds. Thus, although they used the intention rule, and the prior intention and intention-in-action rule more frequently, there appears to be a separation between the developmental pattern of participants’ moral judgment and the developmental pattern of the rules they use to justify their moral judgments. Again, it is possible that although adults are able to reason rationally about the intentions of others, their moral judgment is influenced by factors, such as social experience with moral consequences and personality trait attribution. As a result, any hypothesized relation between their use of justification rules and their moral judgment may not have the same characteristics as the potential relation in children.

9.5.3 Age Group Differences in the Use of Intentional Language. A developmental pattern was also found in the assessment of the differences between age groups in their use of intentional language in their punishment justification responses. Overall, age had a predictive relation with
intentional language use and each older age group in this study was found to use more intentional language in their justifications than each younger age group. However, when examining the age group differences within each story version, it was found that 4- and 6-year-olds were not different in their use of intentional language in the original and deviant causal chain versions but 4-year-olds used less intentional language than 6-year-olds in the changed intention and control versions. Perhaps compared with 4-year-olds, 6-year-olds were more likely to use intentional language to justify their responses in the story versions in which the prior intention was more clearly not to harm. It is possible that by 6 years of age and beginning with situations in which the prior intention is clearly not malevolent, children are better able to use intentional language to report their reasons for why they think others should or should not be punished for a harmful outcome. Also, 8-year-olds and adults were not different from each other in their use of intentional language when examining each of the story versions. This result is consistent with one of this study’s predictions and indicates that, compared with the other age groups, 8-year-olds were most like the adult participants in their use of intentional language. Overall, these findings on the use of intentional language in participants’ justification responses are consistent with the developmental trend observed in the judgment of intentions. It appears that the use of intentional language in individuals’ explanations of punishment judgments accompanies an understanding of intention and intentional causation in moral reasoning. However, further and more direct assessment of the use of intentional language and the understanding of intention in moral judgment is needed to clarify the relation.

An examination of the age group differences in the type of intentional language used in participants’ justification responses revealed that each younger participant group used less explicit intentional language and appeared to use more implicit intentional language than each older participant group in their justification responses. This pattern was generally consistent
when examining each of the story versions for the type of intentional language used by participants in each age group. Although it is possible that older participants’ use of implicit intentional language was masked by their use of explicit intentional language and thus not clearly captured, this finding is an indication of a developmental pattern in the use of explicit intentional language in individuals’ explanation of events. Perhaps, more advanced social-cognitive and language skills encourage a developmental change in individuals’ ability to consider and reference intentions explicitly. Or perhaps, use of explicit language in the justification responses is an indication of a more advanced cognitive skill since it involves extraction and expression of the intention as the reason for the punishment judgment. Further, examination of the type of intentional language used in each of the story versions by the participant groups as a whole revealed that the control story version recorded greater use of explicit intentional language and lower use of implicit intentional language compared with the other story versions. Together, with the findings that the control story elicited more references to the prior intention component and earlier use of intentional language by 6-year-olds, this result provides further support for the suggestion that a scenario that involves a clearly broken link among prior intention, action, and outcome, and that does not contain a moral valence elicits greater, and perhaps easier, reference to the prior intention in participants’ judgment explanations. However, these are preliminary findings and additional research is necessary to more clearly define the nature and direction of the relation between the use of intentional language in reasoning responses and the understanding of intention concepts in reasoning. A better appreciation of the relation between intentional-language use and intention understanding, especially in children, can provide valuable information about the process of intention-reasoning development and the role of language in the process.
9.5.4 Summary. The findings from examining participants’ punishment justification responses illustrate developmental patterns in their use of different elements of information from the scenarios, and in their use of language to explain their judgment decisions. As hypothesized, the reference to prior intentions and the use of a prior intention and intention-in-action rule increased with age. Older participants, beginning at 6 years of age and by 8 years of age, were more able to recognize the relevance of the causal link between intentions and actions, and report prior intentions in their explanations of why characters’ actions should or should not be punished. Older participants also used more intentional language and more explicit intentional language to describe their reasoning. At around 6 to 8 years of age, children began to use more intentional language in specific scenarios. However, adults were able to use intentional language more generally and were more explicit in their references.
Chapter 10: General Discussion and Conclusions

10.1 Summary of Main Findings

This thesis examines children’s developing understanding of intentional causation in their moral reasoning and the relation between this understanding and their mental-state reasoning abilities. The findings from this thesis reveal a developmental trend in the understanding of intentional causation and show that 4-year-old children have difficulty accurately judging others’ intentions when the valence of the outcome is negative. By 6 years of age, children are more aware that a broken causal link among intentions, actions, and outcomes implies that an outcome was not caused intentionally and are more accurate in judging others’ intentions, but still have difficulty with situations in which the character maintains a harmful prior intention and the broken causal link is not quite as apparent. By 8 years of age, children are able to accurately judge others’ intentions by assessing the integrity of the causal link among intentions, actions, and outcomes. However, even these older children and adults appear to have some difficulty with the deviant causal chain scenario in which a harmful intention is maintained but the causal link among intentions, actions, and outcomes is broken.

A developmental pattern was also found in children’s punishment judgments. Older participants were more discriminatory in their punishment assignments and assigned decreasing levels of punishment in greater decrements based on the integrity of the causal link among intentions, actions, and outcomes. In other words, older children demonstrated a better recognition of the differences in the causal link among intentions, actions, and outcomes and decreased their level of punishment judgment accordingly. The adult participants showed the same developmental pattern for the changed intention and the control story versions but assigned punishment in the original and deviant causal chain versions more similarly to the 6-year-olds than the 8-year-olds. Since the original and deviant causal chain stories contain a greater moral
valence than the other story versions, this finding is a possible indication of the influence of adults’ experience with real-life moral dilemmas, their social learning of the consequences of moral violations, and their ability to attribute stable, potentially negative, personality traits to individuals with harmful intentions. Or perhaps this finding is an indication of the developmental changes in the reasoning processes where children are able to use more advanced social-cognitive skills as their ability to reason about the facts of a situation develops, but adults employ both these skills and their experience to reason about the facts and social-moral content of a situation in making their conclusions.

Participants’ punishment judgments for the changed intention and control story versions were related to their performance on second-order false-belief tasks. The relation between performance on the moral-intention task and mental-state reasoning using the false-belief task was not as expected but indicated the possibility that understanding intentional causation in moral reasoning is related to higher levels of mental-state reasoning and not simply metarepresentation. The findings also indicated that reasoning about intentional causation in situations with moral outcomes may be different from reasoning about situations with a neutral valence.

The examination of participants’ punishment justification responses revealed that references to prior intentions and use of information about the connection between prior intentions and intentions-in-actions were more frequently found with each older age group. Younger participant groups were found to more frequently use information about actions and outcomes, and rules that contained one information component to explain their punishment judgment. Further, intentional language was used more frequently by each older age group in the study, and each older age group used more explicit intentional language in their responses compared with each younger age group.
10.2 Implications of this Thesis

10.2.1 Extension of Previous Research on Intentional Causation and Moral Reasoning.

This thesis adds information about the developing understanding of intentional causation in the context of moral reasoning to the existing literature on children’s and adults’ understanding of intentional causation, and on their use of intention information in their moral reasoning. The findings from this study indicate that understanding intentional causation in moral reasoning occurs at around 6 years of age, which is similar to findings from previous research examining children’s reasoning about intentional causation in a situation that is neutral (Schult, 2002; Sokol et al., 2004). Thus, even though participants in this study were reasoning about situations with a moral valence, the basic understanding of intentional causation appears to emerge at around the same age. However, the addition of moral valence to the situations did appear to influence the reasoning process for all participants, especially for the adults. All participants had difficulty with the deviant causal chain scenarios in which harmful intentions were maintained. This suggests that reasoning about intentional causation in situations with a moral valence may not be completely comparable to reasoning about situations with a neutral valence.

The findings from this study also indicate that reasoning about intentional causation in situations with a moral valence is possible at around the same age as when children are able to integrate intention information with other relevant pieces of information to make moral judgments (Helwig et al., 2001; Zelazo et al., 1996). This confirms that reasoning about intention, a critical mental state to consider in moral judgment, is not quite as advanced in 4-year-old children, compared with older children, even though children around 4 years of age are able to report the intentions of others when asked (Zelazo et al., 1996). Further, this thesis proposes that there are changes between childhood and adulthood that do not follow a clear developmental pattern in how information about intention and intentional causation is processed in moral
reasoning and judgment. Whereas 8-year-old children appear to process information about intentional causation in a rational manner to make moral judgments, adults appear to understand intentional causation but use alternate, perhaps morally-charged, information to make moral judgments. Consistent with philosophy and adult psychology research that report a moral asymmetry in adults’ reasoning about intentions when confronted with morally-charged situations (Malle, 2006), adults in this study appeared to be influenced by the moral valence of the situation in their reasoning. This is also consistent with previous research that showed that adults understand intentional causation and judge actions that do not satisfy the causal link between intentions and actions less harshly than those that do, but do so using intuitive rather than rational deliberative processes (Pizarro et al., 2003). Thus, through illustrating the differences in the judgment responses of the three child groups and the adult group, this thesis provides additional evidence of this phenomenon and presents the possibility that reasoning about moral intention changes developmentally, but not in a linear manner.

10.2.2 Description of Developmental Patterns. The findings from this study describe developmental patterns in reasoning about intentional causation in moral situations, and in the intentional language that is used to explain punishment judgments once they are made. Further, although adults reached ceiling levels of accuracy in their intention judgments for three of the four story versions, the comparison of children’s performance with the performance of adults provides a depiction of developmental change. Six-year-old children were shown to begin to use information about intentional causation in their moral reasoning, and similar to adults, 8-year-old children were shown to consistently use information about intentional causation in their moral reasoning. Eight-year-old children were also shown to use intentional language and explicit intentional language as frequently as adults. On the other hand, 4-year-old children did not show an understanding of intentional causation information in their moral reasoning and used
intentional language less frequently than all the other age groups. However, they assigned the highest levels of punishment and appeared to punish story characters with the least discrimination among the different story versions compared with the other age groups. Thus, this thesis provides an illustration of some of the changes that occur in the childhood years, and between the childhood and adult years, with respect to individuals’ understanding of intentional causation and how their understanding is used in their moral reasoning and explanation of their moral judgments.

10.2.3 Extension and Clarification of Theory. Although there have been previous suggestions that understanding intentional causation is related to a metarepresentational understanding of mental states (Astoningto, 2001; Perner, 1991), the findings from this study do not support this view. The findings from this study add to previous theoretical suggestions that understanding intention and intentional causation are not simply related to metarepresentational understanding (Lee, 1995; Mull, 2001), and may be related to higher levels of mental-state reasoning (Sokol et al., 2004). Although this thesis cannot confirm whether the ability to reason about intentional causation requires simultaneous reasoning of mental states or a higher level of cognitive ability or both, this thesis suggests that there is a relation between higher level belief-state reasoning and reasoning about the causal link between intention states and intentions-in-action that are associated with actions. However, when a moral valence is added to the situation, even higher level belief-state reasoning is not related to reasoning about intentional causation information. This evidence extends the theoretical suggestion that reasoning about situations with a moral valence, compared with reasoning about situations with a neutral valence, may involve alternate or additional processes (Leslie et al., 2006), and suggests a possible role for more advanced social-cognitive ability in helping to process the load of information required to make moral evaluations and judgments.
10.3 Limitations and Suggestions for Future Research

10.3.1 The Developmental Story. Although this thesis describes a developmental pattern for reasoning about intentional causation in moral reasoning and the use of intentional language in individuals’ explanations, the findings only describe the performance of age groups and not a continuum of ages. Further, the punishment judgments recorded from the 8-year-old group and the adults provide an interesting depiction of some of the developmental changes between the two age groups but do not provide information about the change that occurs in the years between the two age groups. Examining the use of intentional causation information in intention judgment and moral judgment by individuals between 8 years of age and adulthood would provide more detailed information about when changes in reasoning occur. Further, to examine the theory that social learning and experience with real moral issues over time influences reasoning and the use of rational, cognitive thinking, an assessment of the performance and experiences of individuals in their later childhood and adolescent years is necessary. Perhaps, a longitudinal design to assess actual changes in individuals’ use of intentional causation information in their moral reasoning and their actual learning experiences with moral dilemmas and consequences would provide a more descriptive depiction of a pattern of development. Alternatively, a longitudinal study that assesses the relation between changes in children’s understanding of intentional causation in moral reasoning and changes in their understanding of how personality traits influence behaviour would also clarify patterns of development and the influence of the already established developmental change in trait understanding (Alvarez et al., 2001) on moral reasoning.

Also, it appears that the understanding of intentional causation in moral reasoning undergoes a change between 6 and 8 years of age. Unfortunately, the intention judgments for the 8-year-olds and adults, and the false-belief scores for the 8-year-olds, were at ceiling levels of accuracy and statistical analyses of group differences were somewhat limited. An examination of
the performance of children from 6 to 8 years of age would be valuable in completing the
description of a pattern of development. Thus, future research that involves a greater and more
continuous age range of individuals, and uses a task that captures the variability in the
understanding of intentional causation in moral reasoning for a greater age range, along with their
respective social and learning experiences is suggested.

10.3.2 Clarifying the Roles of Mental-State Reasoning, Moral-Specific Reasoning, and
Cognitive Ability. As mentioned previously, it is unclear from this study whether higher levels of
mental-reasoning, higher levels of cognitive ability, or both are involved in individuals’ ability to
reason about intentional causation and to reason about intentional causation in moral situations.
This thesis indicated that higher-level reasoning about belief representations is related to
understanding intentional causation when the situation does not contain a moral valence. This
study did not assess individuals’ moral development, moral orientation, or cognitive ability. It is
possible that one, or a combination of these factors, significantly affects the ability to reason
about intentional causation in moral situations. Future research that examines these factors and
the influence of these factors on individuals’ intention judgments, punishment judgments, and use
of intentional language can assist in unravelling the involvement of moral-specific, cognitive-
based, intuitive, and rational processes on intention understanding in moral reasoning. This line
of research can also potentially contribute to the ongoing theoretical discussion about the
involvement of different social-cognitive abilities, such as executive functioning or socio-
emotional functioning, in moral reasoning in children and in adults.

10.3.3 Reasoning About Moral Situations Compared with Neutral Situations. Since the
task in this study did not include neutral situations, a direct comparison of individuals’
understanding of intentional causation in moral reasoning and in reasoning about neutral events
cannot be made. However, because of the ongoing discussion about the observed differences in
individuals’ use of rational and intuitive processes to reason about moral and neutral situations, a direct comparison of the differences in reasoning about the two situations is an important goal for future research. To examine the differences in the understanding of intentional causation in both types of situations using the task presented in this thesis, comparable stories with the same manipulations of the causal link among intentions, actions, and outcomes but with neutral valences can be created. Another interesting manipulation of the moral-intention task would be to create another set of stories with the same manipulations to the causal link among intentions, actions, and outcomes but with prosocial prior intentions and positive outcomes rather than harmful prior intentions and harmful outcomes. In combination with information about individuals’ social learning experiences, moral development, and cognitive ability, a comparison of children’s and adults’ performance on a set of all of these tasks could potentially provide rich information about the development of the reasoning processes that support the understanding of intentional causation across a range of moral and non-moral situations, with positive, negative, and neutral valences.

10.3.4 The Relation Between Reasoning and Verbal Explanations of Reasoning. Parallels in patterns of development between punishment judgments and the justifications provided for the judgments were not investigated in this thesis. It is possible that there are relations between individuals’ moral evaluations and judgments and their explanations of their reasoning. This thesis obtained punishment judgments using forced-choice questions and justifications using open-ended questions. As a result, the justification responses could not be reliably mapped onto individuals’ punishment ratings. Perhaps, a convergence on the method used to obtain responses for both questions could provide results in a way that does show a relation. Future research that could clarify the presence and direction of a relation between the two could assist in describing
the connection between individuals’ moral judgment and their verbal explanations of their moral reasoning.

10.4 General Conclusions

Everyday social interaction requires individuals to understand and consider others’ mental states when interpreting or judging behaviours and actions (Yuill & Perner, 1988). This thesis examined the development of the understanding of the mental state of intention in individuals’ judgment of moral behaviours. Specifically, because moral reasoning involves understanding the causal link between the intention state and the intention-in-action or action, this thesis assessed individuals’ reasoning about intentional causation in situations that involved harmful outcomes. The first goal of this thesis was to examine the development of the understanding of intentional causation in moral reasoning. The results showed developmental patterns in the use of intentional causation information in children’s intention judgments and punishment judgments, and suggested explanations for the differences observed in the responses of the adults compared with the responses of children of varying ages. The second goal was to examine the relation between this understanding and mental-state reasoning ability. Although the results were not as expected, a number of possible explanations were provided for the relations that were found, and the support that the results provided to ongoing discussions about the differences between reasoning about social situations with and without a moral valence was considered. As described in the introduction, reasoning about mental states and reasoning about moral rules are both important social-cognitive skills, especially in child development. Altogether, this thesis adds to the current literature on the development of intention understanding and moral reasoning, and to the understanding of the connection between mental-state reasoning and moral-rule reasoning.
References


Appendices

Appendix A: Moral-Intention Reasoning Task Scripts

A.1 Story 1

Original Version:

This is Jane and this is Sally. They are in the same art group. Today they are painting pictures.

Jane doesn’t like Sally. She wants to ruin the picture that Sally painted. Jane decides she is going to dump blue paint all over Sally’s picture. So, Jane leans over, gets the blue paint, and dumps it all over Sally’s picture. The picture is ruined.

Deviant Causal Chain Version:

This is Jane and this is Sally. They are in the same art group. Today they are painting pictures. Jane doesn’t like Sally. She wants to ruin the picture that Sally painted. Jane decides she is going to dump blue paint all over Sally’s picture. As Jane is leaning over to get the blue paint, her arm knocks over the paint jar, spilling the blue paint all over Sally’s picture. The picture is ruined.

Changed Intention Version:

This is Jane and this is Sally. They are in the same art group. Today they are painting pictures. Jane doesn’t like Sally. She wants to ruin the picture that Sally is painting. Jane decides she is going to dump blue paint all over Sally’s picture. As Jane is leaning over to get the blue paint, she changes her mind and decides not to ruin Sally’s picture. So Jane turns around to return to her seat. But, on her way back, her arm knocks over the paint jar, spilling blue paint all over Sally’s picture. The picture is ruined.

Control Version:

This is Jane and this is Sally. Jane and Sally are friends. They are in the same art group and today they are painting pictures. Jane wants to paint a picture of the ocean and decides to get some blue
paint. As she is leaning over to get the blue paint, her hand knocks over the blue paint jar, spilling blue paint all over Sally’s picture. The picture is ruined.

Questions:

1. What did Jane want to do at the beginning of the story?
2. Did Jane ruin Sally’s picture on purpose?
3. Sally’s picture was ruined. Should Jane get in trouble for what happened?
4. How much trouble should Jane get into?
5. (yes to #3) Why should Jane get into trouble?
5. (no to #3) Why shouldn’t Jane get into trouble?

A.2 Story 2

Original Version:

This is Robert and this is John. They are at the beach building sandcastles. Robert doesn’t like John. He wants to break the sandcastle that John built. Robert decides he is going to stomp on John’s sandcastle. So, Robert walks over to John’s sandcastle and stomps all over it. John’s sandcastle crumbles to the ground.

Deviant Causal Chain Version:

This is Robert and this is John. They are at the beach building sandcastles. Robert doesn’t like John. He wants to break the sandcastle that John built. Robert decides he is going to stomp on John’s sandcastle. As Robert is walking over to John’s sandcastle, a rock trips him up and he falls right on top of John’s sandcastle. John’s sandcastle crumbles to the ground.

Changed Intention Version:

This is Robert and this is John. They are at the beach building sandcastles. Robert doesn’t like John. He wants to break the sandcastle that John built. Robert decides he is going to stomp on John’s sandcastle. As Robert is walking over to John’s sandcastle, he changes his mind and
decides not to break John’s sandcastle. So Robert turns around to walk back to his sandcastle. But, as he is turning around, a rock trips him up and he falls right on top of John’s sandcastle. John’s sandcastle crumbles to the ground.

**Control Version:**

This is Robert and this is John. Robert and John are friends. They are at the beach building sandcastles. Robert wants to build another tower and decides to get more sand. As Robert is going to get more sand, a rock trips him up and he falls on top of John’s sandcastle. John’s sandcastle crumbles to the ground.

**Questions:**

1. What did Robert want to do at the beginning of the story?
2. Did Robert break John’s sandcastle on purpose?
3. John’s sandcastle was broken. Should Robert get in trouble for what happened?
4. How much trouble should Robert get into?
5. (yes to #3) Why should Robert get into trouble?
5. (no to #3) Why shouldn’t Robert get into trouble?

**A.3 Story 3**

**Original Version:**

This is Jenny and this is Sarah. They are wearing their best clothes for picture day today. Jenny doesn’t like Sarah. She wants to ruin Sarah’s shirt so Sarah looks bad for her picture. Jenny decides she is going to throw grape juice all over Sarah’s shirt at lunchtime. Jenny walks over to Sarah with a cup of grape juice and throws the grape juice all over Sarah’s shirt. Sarah’s shirt is ruined.

**Deviant Causal Chain Version:**
This is Jenny and this is Sarah. They are wearing their best clothes for picture day today. Jenny doesn’t like Sarah. She wants to ruin Sarah’s shirt so Sarah looks bad for her picture. Jenny decides she is going to throw grape juice all over Sarah’s shirt at lunchtime. As Jenny is walking over with the cup of juice, the wet floor makes her slip and she drops the cup of grape juice right in front of Sarah. The grape juice ends up all over Sarah’s shirt. Sarah’s shirt is ruined.

**Changed Intention Version:**

This is Jenny and this is Sarah. They are wearing their best clothes for picture day today. Jenny doesn’t like Sarah. She wants to ruin Sarah’s shirt so Sarah looks bad for her picture. Jenny decides she is going to throw grape juice all over Sarah’s shirt at lunchtime. As Jenny is walking over with the cup of juice, she changes her mind and decides not to ruin Sarah’s shirt. So Jenny turns around to sit down at a table. But, as she is turning around, the wet floor makes her slip and she drops the cup of grape juice right in front of Sarah. The grape juice ends up all over Sarah’s shirt. Sarah’s shirt is ruined.

**Control Version:**

This is Jenny and this is Sarah. Jenny and Sarah are friends. They are wearing their best clothes for picture day today. Their turn to take pictures is after lunch. At lunch, Jenny wants to eat with Sarah and decides to carry her food over towards where Sarah is sitting. As Jenny is about to sit down, the wet floor makes her slip and she drops a cup of grape juice on Sarah. The grape juice ends up all over Sarah’s shirt. Sarah’s shirt is ruined.

**Questions:**

1. What did Jenny want to do at the beginning of the story?

2. Did Jenny ruin Sarah’s shirt on purpose?

3. Sarah’s shirt was ruined. Should Jenny get in trouble for what happened?

4. How much trouble should Jenny get into?
5. (yes to #3) Why should Jenny get into trouble?

5. (no to #3) Why shouldn’t Jenny get into trouble?

A.4 Story 4

Original Version:

This is Eric and this is Tony. Tony is wearing his brand new running shoes today. Eric doesn’t like Tony. He wants to get Tony’s shoes dirty. Eric decides he is going to push Tony into a mud puddle so that Tony’s shoes will get all muddy. So, Eric runs over to Tony and pushes him into the mud puddle. Tony ends up in the mud puddle and his shoes get all dirty.

Deviant Causal Chain Version:

This is Eric and this is Tony. Tony is wearing his brand new running shoes today. Eric doesn’t like Tony. He wants to get Tony’s shoes dirty. Eric decides he is going to push Tony into a mud puddle so that Tony’s shoes will get muddy. As Eric is running over to Tony, a tree branch trips him up and he falls into Tony. Tony lands in the mud puddle and his shoes get all dirty.

Changed Intention Version:

This is Eric and this is Tony. Tony is wearing his brand new running shoes today. Eric doesn’t like Tony. He wants to make Tony’s shoes dirty. Eric decides he is going to push Tony into a mud puddle so that Tony’s shoes will get muddy. As Eric is running over to Tony, he changes his mind and decides not to make Tony’s shoes dirty. So Eric starts to run away. But, as Eric is running past Tony, a tree branch trips him up and he falls into Tony. Tony lands in the mud puddle and his shoes get all dirty.

Control Version:

This is Eric and this is Tony. Eric and Tony are friends. Tony is wearing his brand new running shoes today. Eric and Tony are walking to school together when Eric realizes that they are late. Eric wants to be on time and decides he is going to run to school. As Eric starts to run a tree
branch trips Eric and he falls right into Tony. Tony lands in a mud puddle and his shoes get all dirty.

Questions:
1. What did Eric want to do at the beginning of the story?
2. Did Eric make Tony’s shoes dirty on purpose?
3. Tony’s shoes were all dirty. Should Eric get in trouble for what happened?
4. How much trouble should Eric get into?
5. (yes to #3) Why should Eric get into trouble?
5. (no to #3) Why shouldn’t Eric get into trouble?

A.5 Story 5

Original Version:

This is Cindy and this is Jason. They are playing in the park. Cindy doesn’t like Jason. She wants to make Jason all dirty before he goes home. Cindy decides she is going to dump a bucket of dirt on Jason’s head. So, Cindy goes to the bridge over where Jason is standing and dumps a bucket of dirt on Jason’s head. The dirt goes all over Jason. Jason is all dirty.

Deviant Causal Chain Version:

This is Cindy and this is Jason. They are playing in the park. Cindy doesn’t like Jason. She wants to make Jason all dirty before he goes home. Cindy decides she is going to dump a bucket of dirt on Jason’s head. As Cindy is going to the bridge over where Jason is standing, her shoelaces trip her up and she drops the bucket of dirt over the bridge. The dirt goes all over Jason. Jason is all dirty.
**Changed Intention Version:**

This is Cindy and this is Jason. They are playing in the park. Cindy doesn’t like Jason. She wants to make Jason all dirty before he goes home. Cindy decides she is going to dump a bucket of dirt on Jason’s head. As Cindy is going to the bridge over where Jason is standing, she changes her mind and decides to not make Jason all dirty. But, as Cindy is turning around, her shoelaces trip her up and she drops the bucket of dirt over the bridge. The dirt goes all over Jason. Jason is all dirty.

**Control Version:**

This is Cindy and this is Jason. Cindy and Jason are friends. They are playing in the park. Cindy wants to make a fort and decides she needs some dirt. As Cindy is walking on the bridge bringing back the bucket of dirt, her shoelaces trip her up and she drops the bucket of dirt over the bridge. The dirt goes all over Jason. Jason is all dirty.

**Questions:**

1. What did Cindy want to do at the beginning of the story?
2. Did Cindy make Jason all dirty on purpose?
3. Jason was all dirty. Should Cindy get in trouble for what happened?
4. How much trouble should Cindy get into?
5. (yes to #3) Why should Cindy get into trouble?
5. (no to #3) Why shouldn’t Cindy get into trouble?

*4.6 Story 6*

**Original Version:**

This is Jimmy and this is Karen. They are playing soccer outside at recess time. Jimmy doesn’t like Karen. He wants to make Karen all wet before she goes inside. Jimmy decides he is going to push Karen into a puddle while she is running during the game.
So, Jimmy runs towards Karen and pushes her into a puddle. Karen lands in the puddle and is all wet.

**Deviant Causal Chain Version:**

This is Jimmy and this is Karen. They are playing soccer outside at recess time. Jimmy doesn’t like Karen. He wants to make Karen all wet before she goes inside. Jimmy decides he is going to push Karen into a puddle while she is running during the game. As Jimmy is running towards Karen sand flies into his eyes. The sand makes him not able to see and he falls into Karen. Karen lands in the puddle and is all wet.

**Changed Intention Version:**

This is Jimmy and this is Karen. They are playing soccer outside at recess time. Jimmy doesn’t like Karen. He wants to make Karen all wet before she goes inside. Jimmy decides he is going to push Karen into a puddle while she is running during the game. As Jimmy is running towards Karen, he changes his mind and decides not to make Karen all wet. So Jimmy starts to run away. But, as Jimmy is running past Karen, sand flies into his eyes. The sand makes him not able to see and he falls into Karen. Karen lands in the puddle and is all wet.

**Control Version:**

This is Jimmy and this is Karen. Jimmy and Karen are friends. They are playing soccer outside at recess time. Jimmy wants to score a goal and decides he is going to run after the ball. As Jimmy is running after the ball, sand flies into his eyes. The sand blinds him and he falls into Karen. Karen falls into a puddle and is all wet.

**Questions:**

1. What did Jimmy want to do at the beginning of the story?
2. Did Jimmy make Karen all wet on purpose?
3. Karen was all wet. Should Jimmy get in trouble for what happened?
4. How much trouble should Jimmy get into?

5. (yes to #3) Why should Jimmy get into trouble?

5. (no to #3) Why shouldn’t Jimmy get into trouble?

A.7 Story 7

Original Version:

This is Jill and this is Allison. They are building snowmen in the school playground. Jill doesn’t like Allison. She wants to break the snowman that Allison is building. Jill decides she is going to push Allison’s snowman over. So, Jill runs over and pushes Allison’s snowman. Allison’s snowman topples over and breaks on the ground.

Deviant Causal Chain Version:

This is Jill and this is Allison. They are building snowmen in the school playground. Jill doesn’t like Allison. She wants to break the snowman that Allison is building. Jill decides she is going to push Allison’s snowman over. As Jill is running over to Allison’s snowman, ice on the ground makes her slip and fall into Allison’s snowman. Allison’s snowman topples over and breaks on the ground.

Changed Intention Version:

This is Jill and this is Allison. They are building snowmen in the school playground. Jill doesn’t like Allison. She wants to break the snowman that Allison is building. Jill decides she is going to push Allison’s snowman over. As Jill is running over Allison’s snowman, she changes her mind and decides to not break Allison’s snowman. So Jill turns around to run back to her snowman. But, as she is turning around, the ice makes her slip and fall into Allison’s snowman. Allison’s snowman topples over and breaks on the ground.
Control Version:
This is Jill and this is Allison. Jill and Allison are friends. They are building snowmen in the school playground. Jill wants to make her snowman bigger and decides to get more snow. As Jill is going to get more snow, the ice makes her slip and fall into Allison’s snowman. Allison’s snowman topples over and breaks on the ground.

Questions:
1. What did Jill want to do at the beginning of the story?
2. Did Jill break Allison’s snowman on purpose?
3. Allison’s snowman was broken. Should Jill get in trouble for what happened?
4. How much trouble should Jill get into?
5. (yes to #3) Why should Jill get into trouble?
5. (no to #3) Why shouldn’t Jill get into trouble?

A.8 Story 8

Original Version:
This is Bobby and this is John. They are writing stories at school. Bobby doesn’t like John. He wants to ruin John’s story. Bobby decides he is going to dump chocolate milk all over John’s story. So, Bobby leans over, takes his chocolate milk, and dumps it all over John’s story. John’s story is ruined.

Deviant Causal Chain Version:
This is Bobby and this is John. They are writing stories at school. Bobby doesn’t like John. He wants to ruin John’s story. Bobby decides he is going to dump chocolate milk all over John’s story. As Bobby is leaning over to get his chocolate milk, his arm knocks over his glass, spilling the chocolate milk all over John’s story. John’s story is ruined.

Changed Intention Version:
This is Bobby and this is John. They are writing stories at school. Bobby doesn’t like John. He wants to ruin John’s story. Bobby decides he is going to dump chocolate milk all over John’s story. As Bobby is leaning over to get his chocolate milk, he changes his mind and decides not to ruin John’s story. So Bobby turns around to return to his seat. But, on his way back, his arm knocks over the glass, spilling the chocolate milk all over John’s story. John’s story is ruined.

**Control Version:**

This is Bobby and this is John. Bobby and John are friends. They are writing stories at school. Bobby wants to get a drink and decides to reach over to get his chocolate milk. As he is leaning over to get his chocolate milk, his hand knocks over his glass, spilling chocolate milk all over John’s story. John’s story is ruined.

**Questions:**

1. What did Bobby want to do at the beginning of the story?
2. Did Bobby ruin John’s story on purpose?
3. John’s story was ruined. Should Bobby get in trouble for what happened?
4. How much trouble should Bobby get into?
5. (yes to #3) Why should Bobby get into trouble?
5. (no to #3) Why shouldn’t Bobby get into trouble?
Appendix B: Moral-Intention Reasoning Task Illustrations

B.1 Story 1 – Original

Deviant Causal Chain
Changed Intention

Control
B.2 Story 2 – Original

Deviant Causal Chain
Changed Intention

Control
B.3 Story 3 – Original

Deviant Causal Chain
B.4 Story 4 – Original

1

2

3

4

Deviant Causal Chain

1

2

3

4
Changed Intention

1

2

3

4

Control

1

2

3

4
B.5 Story 5 – Original

Deviant Causal Chain
Changed Intention

1. Two children are standing on a low platform, holding a toy plane. One child is lifting the other child up to reach the plane.
2. One child is holding the toy plane while the other child is below, looking up.
3. The child below is reaching out for the toy plane, which is still being held by the child above.
4. The child below is standing on the ground, looking at the toy plane, which is still being held by the child above.

Control

1. Two children are standing on a low platform, holding a toy plane. One child is lifting the other child up to reach the plane.
2. One child is holding the toy plane while the other child is below, looking up.
3. The child below is reaching out for the toy plane, which is still being held by the child above.
4. The child below is standing on the ground, looking at the toy plane, which is still being held by the child above.
B.6 Story 6 – Original

Deviant Causal Chain
Changed Intention

Control
B.7 Story 7 – Original

Deviant Causal Chain
Changed Intention

Control
B.8 Story 8 – Original

Deviant Causal Chain
Changed Intention

1
2
3
4

Control

1
2
3
4
Appendix C: 5-Point Judgment Scale from the Moral-Intention Reasoning Task

Note:

The 5-point judgment scale that was used in the study was larger with more differentiation in illustration size between each level.

A Little Trouble

A Lot of Trouble
Appendix D: First-Order False-Belief Task Scripts

D.1 Change in Location

I'm going to tell you a story about a boy and a girl. Listen carefully. I’m going to ask you some questions after the story ends, okay? The boy has a ball. He puts it away in his box. He goes upstairs. While he's gone the girl takes the ball out of the box. She plays with it, and then she puts the ball away. She puts it away in the bag. Then the girl goes outside. The boy comes back. He wants to play with his ball.

Questions:

Where will the boy look for the ball?

PROMPT ONLY IF NEEDED: [repeat test question if necessary]

Will he look in the box, or in the bag?

Memory check:

Where did he put the ball before he went upstairs?

Reality check:

Where is the ball really?

Justification:

Why will he look in the box/bag [repeat child’s answer]?
D.2 Unexpected Contents

Look at this (showing a crayon box). What's in here? Let's open it and have a look inside (reveal toy mouse). What is it (talk briefly about toy mouse)? I just put her in this box to keep her safe. Well, let's put her back into the box.

Questions:

(When box is closed) – What's in the box?

_______ (friend's name) hasn't seen inside this box. What will s/he think is inside it before s/he opens it?

PROMPT ONLY IF NEEDED: [Repeat test question if necessary]

Will s/he think there's a toy mouse inside it? Or will s/he think there are crayons inside it?

Justification question:

Why will s/he think that?
Appendix E: Second-Order False-Belief Task Scripts

E.3 Second Order – 1

This is a story about two friends, Sarah and John. This is Sarah and this is John. John has a brand new book that his mother just bought for him. Sarah wants to read John’s new book but John does not want to let her. John’s mom calls him to help her set the table for dinner. John puts his new book underneath his bed and leaves the room. While John is gone, Sarah takes John’s new book from underneath his bed and reads the first five pages. Then she puts it in John’s night table drawer. But John finishes helping his mom and comes back. He sees Sarah put his new book in his night table drawer. John watches Sarah but Sarah does not see John.

Questions:

Where did John put his new book before he went to help his mom?

Where did Sarah put the book after she read it?

Does John know where the book is now?

First-order false-belief question:

Does Sarah know that John knows where the book is?

(Story continues)

Later on, John tells Sarah that he is going to let her read his new book. So, John goes to get his book for her.

Second-order false-belief question:

Where does Sarah think that John will look for his book?

Justification question:

Why does Sarah think this?
E.2 Second Order – 2

This is a story about a brother and sister, Andrew and Molly. This is Molly and this is Andrew. They are visiting with their grandparents today. Both Molly and Andrew are doing their homework in the kitchen. This is Molly and Andrew’s grandmother. Molly and Andrew’s grandmother wants to reward the children for doing their homework. She shows the children that there is a chocolate bar in the cupboard and tells them that they can share the chocolate bar once they have finished their homework. Then she leaves to go to the grocery store. Andrew really likes chocolate and wants to keep the chocolate bar for himself. So, while Molly takes a break from her homework and leaves the kitchen to go to the bathroom, Andrew takes the chocolate bar from the cupboard and hides it in the drawer. But Molly returns from the bathroom and sees Andrew hiding the chocolate bar. Molly watches Andrew but Andrew does not see Molly.

Questions:

Where was the chocolate bar before Molly went to the bathroom?

Where did Andrew put the chocolate bar after Molly left the kitchen?

Does Molly know where the chocolate bar is now?

First-order false-belief question:

Does Andrew know that Molly knows where the chocolate bar is now?

Second-order false-belief question:

Where does Andrew think that Molly will look for the chocolate bar?

Justification question:

Why does Andrew think this?
Appendix F: Moral-Intention Justification Coding Manual

Moral Intention – Justification Coding Manual

General Instructions:
• You will be reading participants’ responses to one of the following questions:
  o “Why should he or she get into trouble?”
  o “Why shouldn’t he or she get into trouble?”
• Code each response for stages 1, 2, and 3. Complete all three stages of coding for each response before moving on to the next response.

Notes:
• The participants’ were responding to questions after hearing short stories about characters that:
  o Wanted or did not want to cause harm to another character,
  o Intended or did not intend to cause harm to another character,
  o Acted or did not act to cause harm to another character.
• The question that the participants were asked depended on their response to a previous question about whether or not the character should get into trouble.
• Desires are different from intentions – what a character wanted to do is different from what a character planned or intended to do (e.g., you may want something specific to happen but there could be many possibilities as to how you plan or intend to achieve what you want)

Coding Stage 1

• Assess each response for each of the following components.
  o If the response contains the component, enter “1” on the coding sheet under the corresponding component label.
  o If the response does not contain the component, enter “0” on the coding sheet under the corresponding component label.
• When coding each component, include statements that describe the presence of and lack of the component (there are not separate components for when the character did or did not want/did or did not intend something) – when coding for the desire component, include statements that represent “did want” and “did not want” and when coding for the intention component, include statements the represent “did it intentionally”, “did not do it intentionally”, “did it on purpose”, “did it by accident”, etc.
• Similarly, when coding each component, include both positive (e.g., good) and negative (e.g., bad) statements – there are not separate components for a good or bad desire or a good or bad intention or a good or bad outcome
### Coding Stage 1

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Desire</td>
<td>The participant describes what the character wants or wanted to do.</td>
</tr>
<tr>
<td>PI</td>
<td>Prior Intention</td>
<td>The participant refers to the character’s initial intention or plan regardless of whether it was fulfilled or not.</td>
</tr>
<tr>
<td>IA</td>
<td>Intention-in-Action</td>
<td>The participant refers to the character’s intention during the action or the attempt at action. This may be different from what the character planned or intended at the beginning. Or the participant separates the intention during the action from the character’s initial intention.</td>
</tr>
<tr>
<td>A</td>
<td>Action</td>
<td>The participant describes specifically what the character is doing or did.</td>
</tr>
<tr>
<td>O</td>
<td>Outcome</td>
<td>The participant refers to the outcome or the consequence of the event.</td>
</tr>
<tr>
<td>NE</td>
<td>Normative evaluation</td>
<td>The participant makes reference to what he or she thinks should or shouldn’t have happened based on his or her interpretation of a moral or social convention.</td>
</tr>
<tr>
<td>OT</td>
<td>Other</td>
<td>The participant does not make reference to any of the components.</td>
</tr>
</tbody>
</table>
**Coding Stage 2**

- Code for the rule that describes the primary reason for the participants’ justification.
- Participants’ responses for whether they thought the character should get into trouble are included for your reference.
- If only one component was coded in Stage 1, then the rule is simply the one that includes the component
  - e.g., “desire” is the only component coded in stage 1 – rule should be “desire only”
- If more than one component was coded in Stage 1, then consider the primary reason behind the participant’s justification
  - e.g., despite multiple components coded in the response, is the participant’s decision on whether or not the character should get into trouble based on what the character initially wanted? = “desire only”

If there are 2+ components coded in Stage 1

What is the primary reason given for decision about whether the character should get into trouble?

- Desire
- Intention
- Intention in-action
- Action
- Outcome
- Normative evaluation
- Outcome
- Desire/evaluation
- Intention/Intention-in-action
- Intention
- Intention in-action
- Match
- Mismatch
- Match
- Mismatch
- Mismatch
- Mismatch

- Consider the justification as a whole and evaluate participants’ responses based on the primary reason for their justification
  - e.g., focus on the outcome, focus on the intention, focus on match or mismatch between intention and outcome, focus on the match or mismatch between intention and intention-in-action, focus on the match or mismatch between desire and intention
- Select only one rule for each response and enter the code on the coding sheet.
# Coding Stage 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Primary Reason for Justification</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because of what the character wanted or did not want to happen</td>
<td>Desire only</td>
</tr>
<tr>
<td>2</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because of what the character initially intended or planned to do or did not intend or plan to do</td>
<td>Intention only</td>
</tr>
<tr>
<td>3</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because of what the character tried to do or did not try to do</td>
<td>Intention-in-Action only</td>
</tr>
<tr>
<td>4</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because of what the character did or did not do</td>
<td>Action only</td>
</tr>
<tr>
<td>5</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because of what happened or did not happen</td>
<td>Outcome only</td>
</tr>
<tr>
<td>6</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character broke or did not break a moral/social convention</td>
<td>Normative evaluation only</td>
</tr>
<tr>
<td>7</td>
<td>Should be punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character wanted to cause harm and harm occurred</td>
<td>Desire and Outcome match or mismatch</td>
</tr>
<tr>
<td></td>
<td>-because the character didn’t want to cause harm and harm did not occur (implication that outcome resulted from desire)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character wanted to cause harm even though harm did not occur</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character did not want to cause harm even though harm did occur</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because even though the character wanted to cause harm, harm did not occur</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because even though the character did not want to cause harm, harm occurred</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Should or punished or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character wanted to cause harm and intended to cause harm</td>
<td>Desire and Intention match or mismatch</td>
</tr>
<tr>
<td></td>
<td>-because the character did not want to cause harm but did not intend to cause harm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character did not want to cause harm and harm was not intended</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character did not want to cause harm but harm was intended</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Should or should not be punished:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character intended to cause or planned to harm and acted as intended</td>
<td>Initial Intention and Intention-In-Action match or mismatch</td>
</tr>
<tr>
<td></td>
<td>-because the character didn’t intend to cause or plan to harm and acted as initially intended</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character intended to cause harm but did not act as initially intended (because the action was not harm-intending even though harm was initially intended)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-because the character did not intend to cause harm but the action itself was harm-intending (because the action was harm-intending even though harm was not initially intended)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Primary reason for whether the character should get into trouble does not match any other rule</td>
<td>Other</td>
</tr>
</tbody>
</table>
**Coding Stage 3**

- There are two parts to coding Stage 3. Examine the language used in each response and code for whether the response contains intentional language and if so, whether the language explicitly indicates intention. Intentional language can be used to indicate both intent and lack of intent.
  - Enter “1” on the coding sheet under “Language” if the response contains language that indicates intention or lack of intention.
  - Enter “0” on the coding sheet under “Language” if the response does not contain any language that indicates intention or lack of intention.

- If intentional language is present in the response:
  - Enter “1” on the coding sheet under “Explicit” if the intention was explicitly stated,
  - Enter “0” on the coding sheet under “Explicit” if the intention was not explicitly stated.
  - If “0” is entered indicating that the intention was not explicitly stated, write the phrase or statement that indicates intention in the space under “Intent”

- Examples of *explicit* intentional language include:
  - On purpose, purposely
  - By accident, accidentally
  - Mean to, meant to
  - Intended, intentional, intentionally, intention
  - Planned, planning
  - Deliberate, deliberately
  - Trying to, tried to
  - Premeditated
Appendix G: Analysis of Intention Judgment Accuracy and Punishment Judgment Ratings Based on Order of Story Versions

G.1. Intention Judgments

An alpha level of .05 was utilized for all statistical tests. A 4 (intention judgment for each story version) x 4 (story version order) x 4 (age) x 2 (gender) Analysis of Variance (ANOVA) revealed no significant effect of story version order, $F(3, 60) = 2.32, p = .09$, and no significant interactions between order and story version, $F(9, 180) = 2.27, p = .20$, order and gender, $F(3, 60) = .60, p = .62$, order and age, $F(9, 60) = .57, p = .82$, order and age and gender, $F(7, 60) = .39, p = .91$, order and story version and gender, $F(9, 180) = .79, p = .63$, order and story version and age, $F(27, 180) = .82, p = .72$, or order and story version and age and gender $F(21, 180) = .60, p = .92$. Thus, there was no order effect and further analyses were collapsed across story version orders.

G.2 Punishment Judgments

A 4 (punishment judgment for each story version) x 4 (story version order) x 4 (age) x 2 (gender) mixed ANOVA conducted with participants’ punishment judgment ratings revealed no significant effect of story version order, $F(3, 60) = .76, p = .52$, and no significant interactions between order and performance on the story versions, $F(9, 180) = .75, p = .67$, order and age, $F(9, 60) = .25, p = .99$, order and gender $F(3, 60) = 1.52, p = .22$, order and age and gender, $F(7, 60) = .77, p = .62$, order and story version and age, $F(27, 180) = .56, p = .96$, order and story version and gender, $F(9, 180) = .73, p = .68$, or order and story version and age and gender, $F(21, 180) = .48, p = .97$. Thus, there was no order effect and further analyses of the punishment judgments were collapsed across story version orders.