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Children favor knowledgeable people in information-seeking contexts, but does this preference extend to negative event contexts when other resources are available to resolve problems? This study addressed whether children prioritized knowledge or wealth to decide who is best suited to help someone in need. Sixty-four 5- to 8-year-olds heard two vignettes in which two bystanders (i.e., knowledgeable versus wealthy) witnessed a target character experience a negative event (i.e., physical injury, unfair rule). Children were asked which bystander should assist the target and which should supervise the situation. Children also evaluated how bystanders could help the target and how much each bystander should offer help. Across ages, children indicated that the knowledgeable bystander should provide aid, supervise, and should help more than the wealthy bystander. Children referenced how knowledge could produce solutions and with age, were better able to make knowledge- rather than wealth-related predictions about helpful behavior. Although children made positive trait attributions for both bystanders, children indicated that it would be particularly bad if the knowledgeable bystander failed to help, which suggests that children may hold knowledgeable people more accountable than wealthy people. These findings shed light on how children decide who is helpful and draw connections between children's reasoning about knowledge, wealth, and morality.

WHO HELPS BEST? CHILDREN'S EVALUATION OF KNOWLEDGEABLE VERSUS  
WEALTHY INDIVIDUALS IN NEGATIVE EVENT CONTEXTS

by

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## DEDICATION

*For my grandfather, Uro Harry Marble.*

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## CHAPTER I: INTRODUCTION

It is well-established that children recognize various indicators of a person's ability to serve as a source of information in learning-related contexts, such as whether that person demonstrates knowledge (Harris et al., 2018; Mills, 2013). In addition to these contexts, children (and adults) rely on people for assistance in other social situations, such as when a negative event occurs. Although emergency situations may not present an opportunity to be selective about who helps, there are situations in which a decision must be made about whom to ask for assistance with a negative outcome. For example, an adult who experiences discrimination at a public establishment and wants help to address this incident may consider whether to call the police, consult a lawyer, or contact local media. Adults may decide which of these resources to consult for help based on the assets and strategies that each potential helper offers to resolve the negative event, but it is unclear how judgments about the helpfulness of authority, knowledge, or other resources develop.

In this dissertation, I examined children's decisions about which of two people would be better qualified to assist someone who experiences a negative event that is morally relevant. Specifically, this dissertation addressed how 5- to 8-year-olds decide whether a knowledgeable person or a wealthy person is the best source of help for someone who experiences an injury or an unfair rule, including the extent to which children perceive that each of these people is obligated to help someone in need. Children's decisions about who to rely on for help in these contexts may be informed by their experiences seeking help from others to learn new information, but these connections have not been fully explored (Marble & Boseovski, 2020). Although children are sensitive to positive and negative outcomes in both learning and moral

decision-making contexts (e.g., Boseovski et al., 2017; Killen et al., 2011), children's evaluations of who has the competence and knowledge to resolve negative events remains unclear.

The current research focused on the transition from early to middle childhood due to age-related increases in children's understanding of knowledge (e.g., Lockhart et al., 2021; Sobel & Letourneau, 2015) and coordination of information to evaluate moral issues during this time (e.g., social relationships, type of harm, Arsenio, 1988; Wainryb & Turiel, 1993; see Appendix C for information about a companion study that was not completed due to the COVID-19 pandemic). Young children readily recognize blatant physical harm as a moral issue, but between 3 and 10 years of age, deepen their understanding of more complex issues such as unfair resource distribution and violations of civil liberties (e.g., Elenbaas, 2019; Helwig & Jasiobedkza, 2001; Smetana et al., 2013). Children's judgments about who should help with these concerns may be influenced by what someone knows and how they respond to issues.

Previous research on children's perceptions of two specific characteristics, knowledge, and wealth, suggests that these cues may be particularly relevant to investigate in negative event contexts during early and middle childhood. Between 4 and 6 years of age, children's understanding of knowledge and preference for people who demonstrate knowledge may contribute to a perception that knowledgeable people should share what they know for the sake of helping others in these contexts. In addition, young children sometimes associate positive characteristics with knowledge, including an expectation of "goodness" (e.g., Cain et al., 1997; Heyman et al., 1992; Laupa, 1991). In contrast, children's early positive perceptions of wealthy individuals shift across development to include negative stereotypes between 6 and 10 years of age (e.g., Elenbaas & Killen, 2019; Roussos & Dunham, 2016). However, children continue to

expect that resource-rich people will share their abundance with someone in need (e.g., Ahl & Dunham, 2019; Kahn, 1992) and believe that rich people are competent (e.g., Sigelman, 2012).

Children's impressions of knowledge and wealth have been investigated separately. This dissertation extends that work with a direct comparison of both cues to move the field of moral reasoning forward by highlighting potential connections with children's perceptions of competence and children's assumptions about people in positions of high status in society and their social responsibilities (Terrizzi et al., 2020). Children's early awareness of connections between wealth and positions of high status in society may be linked conceptually with the value children place on knowledge, such that both characteristics are interpreted as prestigious or powerful (Chudek et al., 2012; Enright et al., 2020). Below, I situate children's understanding of knowledge and wealth, and children's evaluations of knowledgeable versus wealthy people, in a broader literature on moral development. Age-related patterns from these literatures inform how children might use knowledge and wealth cues across moral decision-making contexts.

### **Children's Reasoning About Negative Events: Themes from Moral Development**

One focus for this dissertation was whether children would leverage bystander characteristics to evaluate potential help when harm is salient (i.e., physical) versus subtle (i.e., potential psychological harm). Given that children recognize potential harm as a moral issue (Smetana et al., 2013) and rely on other people for help across a variety of situations (e.g., learning, comfort, physical needs), the current study addresses two cues (i.e., knowledge and wealth) and two contexts (i.e., physical, and psychological harm) that may influence children's judgments about who is most qualified to help in a negative event context. Children recognize a variety of harmful acts that are committed by transgressors (e.g., bullying, Arsenio, 1988; Arsenio & Kramer, 1992) and there are age-related changes in children's evaluations of such

harm based on the type of negative act (e.g., Helwig et al., 2001; Killen et al., 2011). Physical events are easily understood across early and middle childhood whereas children's reasoning about issues involving civil liberties may become more sophisticated with age as children better understand psychological harm (Smetana et al., 2013; Wainryb & Turiel, 1993). In children's everyday lives, harmful events do not always involve a transgressor, such as when children injure themselves. There is little research on children's reasoning about what should be done to resolve negative events that do not involve a transgressor or to decide who is qualified to assist in response to these problems. However, age-related changes in children's reasoning about physical and psychological transgressions provide indirect evidence of potential age-related differences in children's reasoning about how to resolve these negative events.

One context that was examined in this dissertation involved a physical injury. It is well-established that by 3 years of age, children recognize behaviors that result in physical harm as unacceptable (e.g., hitting, Smetana et al., 2013; Turiel, 1983). Physical incidents may be more familiar or interpretable for young children compared to issues that involve psychological consequences. For example, between 3 and 5 years of age, children are more likely to refer to physical harm than relational harm (e.g., issues of trust) or property damage when asked to generate "bad" acts (e.g., Tisak & Block, 1990). By 7 years of age, children make increasingly comprehensive moral judgments about behaviors that are explicit and easily identifiable; their qualitative evaluations of negative events center on concerns for the welfare of others as well as avoidance of harm (e.g., Davidson et al., 1983). By the time they reach middle childhood, children increasingly endorse punishment for those who cause physical harm (e.g., Smetana & Ball, 2019; Zelazo et al., 1996).

In some physical harm contexts and with age, children consider additional factors to judge those involved in the event. Key developments in social cognitive abilities during this time may influence these person judgments and children's consideration of different solutions for negative events (e.g., executive function in social decision-making contexts, Boseovski & Marcovitch, 2012; Richardson et al., 2012; theory of mind in moral contexts; Killen et al., 2011). For example, 7-year-olds, but not 5-year-olds, distinguish situations in which a maintenance worker's failure to fix playground equipment was the result of personal negligence from situations in which the worker was instructed not to fix it by his boss and give harsher evaluations of the former (Schleifer et al., 1983). In addition, 7-to 8-year-olds are more likely than 9- to 14-year-olds to indicate that a person is obligated to help a hurt child regardless of whether that person has a conflict with stopping to render aid (e.g., needed to be somewhere else), but there are no age differences in children's ability to recognize that it would be wrong to ignore an injured child (Nucci & Turiel, 2009).

This latter finding suggests that regardless of the sophistication in children's judgments of actors involved in negative events, children might easily identify issues of welfare in injury events and expect any person to be competent enough to render aid in these situations. In contrast, psychological harm events involve additional interpretation of intentions, consequences, or the context in which the harm occurred (Helwig et al., 1995). Therefore, development in social cognitive abilities between early and middle childhood may be particularly important for children's reasoning about whether harm has occurred and what type of intervention or solution is needed to address psychological harm.

Another context that was examined in this dissertation involved an unfair rule (i.e., potential violation of civil liberties) that would cause potential psychological distress. In contrast

to physical harm, children's understanding of the issues central to rights violations (e.g., welfare, fairness, and equality) continues to develop throughout middle childhood (e.g., Rizzo & Killen, 2016; Wainryb & Turiel, 1993). Children's reasoning about these issues is considered more context-dependent than children's understanding of physical events because of the coordination between behavior, mental states, and outcomes that these issues require (e.g., Helwig, 1997; Kahn, 1992). In turn, children may be better able to reason about appropriate solutions for rights violations during middle childhood compared to early childhood: physical injury or harm events can be resolved directly by rendering aid or calling for help whereas issues of civil liberties may involve abstract or symbolic concepts that vary across situations (Helwig & Prencipe, 1999).

Children's ability to reason about harm that involves concepts rather than physical events may be less sophisticated before 7 to 8 years of age. For example, 6-year-olds recognize that violations of rights and freedoms cause psychological harm (Helwig & Turiel, 2002), but continue to endorse authority figures' restrictions to these rights and evaluate prohibitions of freedom of speech and religion more positively than 8- and 10-year-olds (Helwig, 1997). In contexts in which a law conflicts with one's personal rights (e.g., a vaccine mandate conflicts with the desire to make one's own medical decisions), 6-year-olds do not distinguish this law from other socially beneficial laws and judge violations of either as unacceptable (Helwig & Jasiobedzka, 2001). This tendency may be driven by children's early understanding that those with knowledge are qualified to make or enforce rules (e.g., Laupa, 1991). Between 6 and 8 years of age, children justify authority figures' restrictions to freedoms less frequently (e.g., Helwig, 1997). In addition, 8- and 10-year-olds tend to focus on abstract concepts of fairness and equality when they evaluate certain unjust laws (e.g., discrimination; Helwig & Jasiobedzka, 2001). In addition to young children's difficulty with reasoning about violations that involve



symbolic or abstract concepts, these children may be unsure how knowledge could be used to produce alternative outcomes for these scenarios.

The indirect link between children's understanding of knowledge and their moral reasoning suggests that children use information about the people involved in morally relevant situations to evaluate behavior. These characteristics may help children make more nuanced judgments about who should help in negative event contexts. In a direct comparison of knowledge versus wealth, children's early understanding of knowledge may facilitate reasoning about the help that a knowledgeable bystander could offer in these contexts; it is less clear how children's perceptions of wealth and wealthy people would influence expectations for wealthy bystanders.

### **Children's Understanding of Wealth**

Children's understanding of the use and exchange of money is tenuous throughout early and middle childhood, which might make connections between wealth and problem-solving unclear to children. However, children hold positive views of wealthy people that involve inferences about competence and the social desirability of affiliating with a wealthy person, particularly before 7 years of age. In turn, these views could prompt children to endorse a wealthy person as capable of resolving a negative event. Four- to 6-year-olds recognize several cues that identify who is wealthy and who is not (e.g., state of clothing, house, or toys; Shutts et al., 2016), but it remains unclear whether children's understanding of certain objects of wealth (e.g., resources, money) factors into their expectations for how wealthy people behave.

In terms of general cognitive development, children need to master some numerical concepts to understand acts that involve money (e.g., buying and selling; see Scheinholtz et al., 2011; Webley, 2005). For example, children need to recognize that money is symbolic, and that

numerical quantity does not change when physical objects such as coins are grouped together in different ways without adding or subtracting items (i.e., conservation; Piaget 1965). These developmental abilities emerge around the transition from early to middle childhood, but children's concept of how money is used in exchange for goods or services is not accurate until 7 or 8 years of age (Berti & Bombi, 1981; Furth, 1980; Strauss, 1952). Seven- and 8-year-olds lack knowledge of broader economic systems (e.g., influences on prices, concepts of banking and investment) but understand that money is used instrumentally and in specific amounts to obtain desired quantities of goods or services (see Leiser, 1983). In contrast, 5- and 6-year-olds tend to view the exchange of money for goods as a social script and do not grasp that the physical amount of money matters in these transactions (Furth, 1980). These younger children may interpret the exchange of money in purchasing transactions as a social ritual (Leiser, 1983), disconnected from other uses for money (e.g., offering to pay on behalf of someone else, bribery).

There is limited understanding of children's conceptualization of money beyond this research on the development of numerical concepts and strategies to include economics in education (e.g., Scheinholtz et al., 2011). However, children's performance on resource allocation tasks may inform indirectly children's reasoning about monetary solutions to resolve certain events. Indeed, numerical knowledge is related to preschoolers' decisions about how to share fairly, often in contexts in which researchers use toys or stickers to represent resources. For example, knowledge of the cardinal principle (i.e., the last number counted represents the total number in a set) predicted preschoolers' fair sharing of toys and children's use of more rather than less advanced sharing strategies, above and beyond age (e.g., immediate division of resources into two equal amounts rather than allocation of one item at a time until all items are

gone, Chernyak et al., 2016). This connection between numerical cognition and sharing suggests that children's numerical knowledge could also factor into other decision-making contexts, including children's assessment of how a wealthy person should use resources to resolve a problem. Children's ability to generate ideas about what to do with those resources to address dilemmas may have a role in expected age-related differences in their reasoning about wealthy people (e.g., sharing is not the only way to use money).

Age-related changes in the ability to reason about how to respond to "neediness" may also inform potential connections between wealth and children's judgments about how it can be used to ameliorate negative events. In the context of donation behavior, 8-year-olds and children who engaged in more moral reasoning about a less fortunate peer were more likely to donate their own stickers to that peer than 4-year-olds and children who engaged in less moral reasoning (Ongley et al., 2014). By middle childhood, children can identify the owner of an item and already understand that items can be transferred from an owner to another person (e.g., gift-giving; Blake & Harris, 2009; Nancekivell et al., 2013). These findings suggest that children may view the use of money as an extension of gift-giving or donation in a helping scenario. In contexts in which children are asked to evaluate whether a wealthy person should offer resources to help ameliorate a negative event, young children (e.g., 5- and 6-year-olds) may not be able to coordinate considerations of ownership, prosocial behavior, and limited understanding of relevant numerical concepts to reason about how those resources should be used. In contrast, children's early appreciation of knowledge may scaffold their ability to connect knowledge with competence and problem-solving.

## **Children's Understanding of Knowledge**

An extensive literature on children's evaluation of knowledge in learning-related contexts suggests that knowledge is easily understood by preschool and is a powerful cue across many social situations (Heyman & Legare, 2013; Marble & Boseovski, 2020; Mills, 2013). In negative event contexts, this early understanding of knowledge may facilitate children's ability to identify how knowledgeable people can use what they know to provide assistance. Between 3 and 5 years of age, children prefer to learn from knowledgeable people rather than those who lack knowledge (Einav & Robinson, 2011; Mills, 2013). Preschoolers also identify a range of knowledge cues, such as basic perceptual access that allows someone to "know" about a hidden object (Robinson et al., 2014) and more sophisticated cues such as expertise (e.g., Lutz & Keil, 2002). For example, 3- and 4-year-olds recognize that doctors are better sources of information about medication and illness than children's own mothers (Toyama, 2017). Moreover, 4- and 5-year-olds direct their questions to people who demonstrate relevant rather than irrelevant knowledge (e.g., Aguiar et al., 2012).

Across middle childhood, children might come to view a knowledgeable person as more informed and better able to provide appropriate solutions relative to a wealthy individual. Children's ability to distinguish between different types of knowledge in their evaluations of expertise illustrates one way that their understanding of knowledge improves during this period (Keil et al., 2008; Landrum & Mills, 2015). At this age, children seek information from the person with the most relevant knowledge even when doing so is costly (Rowles & Mills, 2019) and increasingly prioritize knowledge over other powerful cues, such as group-based characteristics (e.g., gender, Boseovski et al., 2016; accent, Corriveau et al., 2013). By middle to late childhood, children's appreciation of knowledge seems to motivate affiliation with less

familiar knowledgeable people for the sake of learning new information (e.g., Marble & Boseovski, 2019). For example, 6- to 8-year-olds indicate that they would prefer to learn from an expert, regardless of whether that expert violates gender norms or belongs to the children's gender outgroup (Boseovski et al., 2016). With age, children may be better able to prioritize knowledge, regardless of other social considerations.

This age-related pattern aligns with other improvements in children's ability to identify nuances in knowledge (e.g., Landrum & Mills, 2015) and with general cognitive development related to children's own understanding of knowledge acquisition (e.g., Sobel & Letourneau, 2015). For example, 5- to 7-year-olds' judgments of how much information can be learned do not differ based on the pedagogical strategies available to a learner (e.g., an expert source, one's own access to relevant learning materials, or trial and error) whereas 8- to 11-year-olds expect a learner to acquire more knowledge when they learn from an expert, regardless of the domain of information (Lockhart et al., 2021). Children's metacognitive awareness of learning processes during this transition to middle childhood (e.g., Simons et al., 2020) may promote positive views of knowledge. Young children have a rudimentary awareness of their own knowledge relative to more experienced individuals (e.g., older children who have been in school for longer; Taylor et al., 1994) and have a limited ability to monitor their own progress with acquiring new knowledge until approximately 8 years of age (Flavell, 1979; Roebers, 2017).

These metacognitive developments may also relate to children's ability to reason about how other people could use what they know to produce solutions for negative outcomes.

Children's familiarity with knowledge acquisition and limitations in knowledge may scaffold reasoning about how a knowledgeable person could problem-solve a negative event. With age, the combination of more nuanced understanding of knowledge, cognitive development that

promotes understanding of symbolic concepts, and improved understanding of psychological harm, may make 7- to 8-year-olds more likely than younger children to appreciate how knowledge can be used to address a variety of negative events. Although this pattern of development might suggest that children would endorse knowledgeable over wealthy individuals to provide assistance in negative event contexts, children's positive or negative impressions of people who are knowledgeable or wealthy may also influence these endorsements.

### **Children's Impressions of Wealthy and Knowledgeable People**

Children's impressions of wealthy and knowledgeable people as "good" or "bad" may influence expectations for whether these people respond in helpful ways to morally salient negative events. Children form positive impressions of both knowledgeable and wealthy people during early childhood, but these impressions differ across middle childhood (e.g., Heyman & Dweck, 1998; Mistry et al., 2021). With regard to wealth, 4- to 6-year-olds indicate that rich people are "nicer" than those who are not rich (e.g., Li et al., 2014) and are also more likely to perceive a rich person than a poor person to be competent, regardless of children's own status (Sigelman, 2012). At this age, children believe that money is obtained through work (see Webley, 2005); children may be inclined to view wealthy people as particularly hard-working or smart (Hussak & Cimpian, 2015; Sigelman, 2012), which could promote the impression that these individuals excel at problem-solving. Children also indicate that they would preferentially affiliate with wealthy over non-wealthy peers (Shutts, 2015), which may further bias young children in favor of wealthy "helpers."

In one study that illustrates the variety of positive inferences that young children make based on wealth cues, 4- to 6-year-olds were asked to make a series of judgments about a high-wealth child and a low-wealth child (Shutts et al., 2016). Children were presented with two

pictures of other children whose wealth was indicated by the state of their possessions (e.g., high-wealth = new clothing; low-wealth = torn clothing, Study 2). Then, children were asked to make inferences about the wealth of these targets (e.g., which one owned a new, brand-name doll), their competence (e.g., which one colored an apple the correct color), and their popularity (e.g., which one had the most friends). Overall, children matched the high-wealth target with the more positive outcome across all three items (e.g., high-wealth = new doll, correct coloring, and most friends). These researchers also found that 5- to 9-year-olds demonstrated a social preference for a high-wealth child (Study 3).

Impressions of wealthy people undergo a notable shift during middle and late childhood such that children use negative stereotypes about rich people (Mistry et al., 2015; Sigelman, 2012). Therefore, children may come to believe that wealthy people will not help others due to negative impressions of character, regardless of children's inferences about competence. For example, 8- to 14-year-olds make attributions such as "selfish" and "entitled" for rich people (e.g., Elenbaas & Killen, 2019). Children's changing perceptions of the rich may be influenced by societal views (e.g., the middle class is viewed most favorably in the United States, Durante et al., 2017; Mistry et al., 2021). In fact, children from middle- and upper-socioeconomic status groups demonstrate some of the same negative stereotypes about rich people as children from lower-wealth backgrounds (e.g., Elenbaas & Killen, 2019). Despite these negative attributions, children maintain that wealthy people should and will contribute resources to those with less in some circumstances (e.g., Ahl & Dunham, 2019, Study 3). Therefore, children may predict that a wealthy person will help someone who experiences a negative event, but only when the most appropriate solution is a monetary one that children can understand. This dissertation extends the

research on children's impressions of wealthy people to address children's reasoning about a wealthy person's competence in response to a specific event.

In contrast to wealth, children maintain positive views of knowledgeable people. Children associate knowledge with other positive characteristics (e.g., prosocial behavior, Cain et al., 1997; Stipek & Daniels, 1990) and 5- to 8-year-olds perceive some overlap between being knowledgeable and being a "good person" (e.g., Heyman & Dweck, 1998; Heyman et al., 1992). Therefore, children may be likely to prioritize knowledge in response to negative event contexts, both for a knowledgeable person's ability to respond with a solution and because of children's positive views of knowledgeable people. In one particularly relevant study that provides indirect evidence that children have positive expectations for knowledgeable people, 5- to 10-year-olds (Kindergarten, second grade, and fourth grade students) were presented with two potential advisors: one was described as someone who would always try to help others and make them happy (i.e., moral advisor), and the other was described as someone who was very smart and knew about a lot of things but did not care about others' feelings (i.e., science advisor; Danovitch & Keil, 2007). Then, children were presented with a dilemma that was either scientific or moral in nature (e.g., how to design a stable block tower versus whether to respect someone's privacy). Children were asked which advisor should be consulted to resolve each type of dilemma.

With age, children were more likely to select an advisor based on the domain of the dilemma and its match with an advisor's skill set (e.g., the science advisor for the block tower dilemma; Experiment 1). The occasional errors that 7- to 10-year-olds made suggest that children may expect or prefer knowledgeable people to have other positive characteristics: these children were more likely to select the moral advisor for the scientific dilemma than the science advisor for the moral dilemma when they made "incorrect" advisor selections. A follow up study



revealed that 5- to 8-year-olds were particularly likely to endorse positive, social traits (e.g., caring, nice, fair) as necessary qualities for a knowledgeable person who provides advice about a scientific dilemma (e.g., building a rocket; Experiment 3), which suggests that children might expect knowledgeable people to be particularly helpful.

### **Current Study**

In this study, 5- to 8-year-olds evaluated whether a knowledgeable bystander or a wealthy bystander would be better able to help someone in need in two contexts (i.e., physical injury; unfair rule). The main predictions are presented below; additional predictions are in Table 1.

Given that children evaluate knowledge and wealth cues and form impressions of knowledgeable and wealthy people that influence reasoning in social contexts, children were asked who should be consulted for help (i.e., provide assistance) and who should be “in charge” of dispatching that assistance (i.e., supervise) to examine whether children differentiate between these different levels of helping. Based on age-related improvement in children’s understanding of knowledge and its potential connections to reasoning about abstract concepts, 7- to 8-year-olds were expected to endorse the knowledgeable bystander to provide assistance and supervise assistance for someone in need. Five- to 6-year-olds are familiar with what it means to be knowledgeable and therefore were expected to endorse the knowledgeable bystander to provide assistance, based on young children’s preference to consult knowledgeable people for information (Harris, 2007; Mills, 2013). Based on younger children’s positive perceptions of wealthy individuals (e.g., socially desirable or superior, Gülgöz & Gelman, 2017; Shutts et al., 2016), 5- to 6-year-olds were expected to prefer the wealthy bystander for supervision of assistance.

These age-related differences in children’s understanding of knowledge and perceptions of wealthy people were also expected to produce an age by bystander type interaction for children’s evaluations of how much each bystander “should” help and how bad it would be if each bystander did not help. It was expected that 7- to 8-year-olds would indicate that a knowledgeable person “should definitely help” the target and that it would be “very bad” if this person did not help. Seven- to 8-year-olds were expected to say that “it did not matter” if the wealthy bystander helped and it would only be “a little bad” if this person did not offer help because the wealthy individual would be viewed as less qualified than the knowledgeable person to provide assistance. In contrast, 5- to 6-year-olds were expected to indicate that both bystanders “should definitely help” and were not expected to rate the severity of a failure to help based on knowledge versus wealth: these children were expected to indicate that it would be “very bad” for either bystander to fail to help because these children would be focused on the negative outcome of the situation (i.e., the need for help; Nelson, 1980). It was also anticipated that an age by context (i.e., physical injury or civil liberties violation) interaction would emerge for these bystander evaluations such that 5- to 6-year-olds would endorse lower levels of obligation (i.e., “doesn’t matter”) and severity (i.e., “a little bad”) for bystanders in the civil liberties context compared to the physical injury context, given their difficulty understanding psychological harm; 7- to 8-year-olds were expected to recognize harm in both contexts and provide endorse higher levels of obligation and severity than 5- to 6-year-olds.

**Table 1 Additional Predictions for Secondary Measures**

Measure	Prediction with justification
Behavioral predictions	Age by bystander type interaction: In light of age-related improvement in children’s understanding of knowledge and

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	<p>numerical concepts, 7- to 8-year-olds were expected to predict the target strategies for both bystanders, regardless of context (i.e., wealth-related strategies for wealthy bystanders, knowledge-related strategies for knowledgeable bystanders). Based on young children's tendency to over-generalize the competence of wealthy people, 5- to 6-year-olds were expected to predict knowledge-related helping strategies for both bystanders.</p>
Morality and status items	<p>Age-related perceptions of wealthy people and children's association of knowledge with moral "goodness" (e.g., Cain et al., 1997) were expected to influence children's evaluations of each bystander: 7- to 8-year-olds were expected to endorse and provide more positive ratings than 5- to 6-year-olds for the knowledgeable individual on each of these dimensions.</p>
Trait attributions	

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## CHAPTER II: METHOD

### Participants

Seventy 5- to 8-year-olds participated in this study. Data from six participants were unusable due to Internet connectivity issues during the testing session ( $n = 3$ ), experimenter error ( $n = 1$ ), family member interference during the testing session ( $n = 1$ ), and refusal to respond to questions ( $n = 1$ ). The final sample included 64 5- to 8-year-olds (34 girls,  $M = 84.70$  months,  $SD = 14.00$  months). Forty-seven of these participants were contacted from a preexisting volunteer database of families who had expressed interest in participating in child development research; these participants lived in the Triad and surrounding community. Due to the COVID-19 pandemic, the remaining 17 participants were recruited by word of mouth (e.g., emailing, calling, and Facebook messaging friends and family to share an informational study flyer with their friends and neighbors; 13 of these participants lived out-of-state).

Fifty-six guardians reported race and ethnicity information for their children. Among these participants, guardians identified 71.4% as White, 10.7% Black or African American, and 10.7% Asian; 7.1% selected more than one racial identity or identified as “other.” In addition, 5.5% of these participants were identified as Hispanic or Latinx by their guardians. Information about participants’ households was also collected. Parent education was reported for 54 participants; 87.1% of these households included at least one parent with a bachelor’s degree or higher (range: “did not finish high school” to “graduate, professional degree”). Annual household income was reported for 50 participants; approximately 88% of these households reported an income greater than or equal to the median for the United States (\$67,521; range: “\$15,000 to \$25,000” to “more than \$120,000”).

Testing sessions took place virtually on the platform Zoom and lasted about 15 minutes. The experimenter screen-shared images to accompany the stories used in the study. Given the virtual nature of data collection, guardians were asked to report their child's usage of Zoom and other video chat programs. Fifty families reported this information; 94% of these participants had used Zoom (specifically) prior to the testing session and 100% had experience with at least one other video chat platform (e.g., FaceTime, Google Hangouts).

The research team obtained consent from parents or legal guardians while scheduling the online session ( $n = 55$ ) or verbally for those parents who encountered difficulty with the electronic form or did not have access to a printer or scanner ( $n = 9$ ). In addition, 7- and 8-year-olds were provided with a written assent form and were offered the opportunity to ask the experimenter about the assent form prior to testing. These children were given the option to provide assent via electronic signature ( $n = 51$ ) or verbally ( $n = 13$ ) to accommodate households with the access issues described above or children who needed assistance from an experimenter.

### **Materials**

Images from two online stock image databases (Dreamstime and Vecteezy) were used to create the stimuli for this study. Adobe Illustrator was used to manipulate characters (e.g., create the same skin tone across characters) and scenes (e.g., remove irrelevant objects from backgrounds) to control for similarity of stimuli across tasks. Each completed scene was exported to PowerPoint format and screen-shared with participants during the testing session. To generate a table of contents, follow these instructions:

### **Design**

This study used a mixed design with age in months as a continuous predictor and story type as a within-subjects variable (2: civil liberties violation, physical injury). Simulation work

with the use of generalized estimating equations to conduct mixed logistic regressions for non-developmental research suggested a sample size of about 72 to 74 (Tang, 2020). Previous research on children's evaluations of wealth cues and resource allocation tasks (e.g., Shutts et al., 2016) and expertise evaluations (e.g., Boseovski et al., 2017) was also consulted. Due to the nature of the present design, which includes only one between groups comparison for additional analyses, a sample size of 64 5- to 8-year-olds was selected.

### **Procedure**

Three experimenters (all female) were trained to conduct these testing sessions. Each participant engaged in a one-on-one Zoom session with one experimenter. The testing session began with a brief warm up to ensure that Zoom audio and screen-share were working for both the participant and the experimenter. The experimenter introduced herself and told the participant that she was going to show them cartoons on the screen. Next, the experimenter started the screen share with an image of the lab logo (several cartoon ducks walking) and asked the participant to describe what was on the screen. If the participant did not see the logo or could not be heard by the experimenter, she provided troubleshooting instructions to the participant or the participant's guardian. Then, the experimenter told the participant that she would share some stories and ask a few questions about the people in the stories, but that there were no right or wrong answers to the questions. Due to the virtual setting, the experimenter activated slide animations to help maintain participants' attention and to simulate pointing gestures typically used during in-lab procedures.

The experimenter introduced two bystanders and described them as wealthy or knowledgeable, (i.e., wealthy: "Mia/Mason has a lot of money. (S)he has more money than most other people, but (s)he only knows about some things. Mia/Mason can buy new clothes and (s)he

takes a lot of trips, but Mia/Mason doesn't read very much;" knowledgeable:

"Hannah/Henry knows about a lot of things. (S)he knows more than most other people, but (s)he only has some money. Hannah/Henry can teach herself himself new things and (s)he reads a lot of books, but Hannah/Henry doesn't buy very many things."). See Appendix A for the full introduction and story content; the details included in the description of the wealthy person were adapted from Shutts et al. (2016) and the details included in the description of the knowledge person were adapted from the broad literature on children's evaluations of expertise, then revised to match the level of description provided by the wealth cues. These introductions were followed by two forced-choice comprehension checks to ensure that children differentiated between the wealthy bystander and the knowledgeable bystander (e.g., "Which one has a lot of money?"). All participants passed the comprehension checks without repetition of these introductions, except for one participant (7-year-old) who required one repetition of the information to answer the comprehension checks correctly.

After the introduction of the bystanders, participants heard two stories about a target character who experienced a morally salient event. In one story, the target character experienced a civil liberties violation (i.e., a discriminatory rule at the post office that prevented them from mailing a letter) and in the other story, a different target character experienced a physical injury (i.e., fell and hurt their knee while walking at the park alone; Appendix A). The same two bystanders were described as witnessing each of these events. The order of bystander introductions and the presentation order of these stories were counterbalanced across participants.

Participants responded to several questions in a fixed block order following each story. For each of the measures described below, forced-choice answer options were presented in a

randomized order. Measures that were followed with an open-ended prompt to allow participants the opportunity to justify their selections are noted below. Two experimenters each coded 100% of these qualitative responses independently and categorized participants' responses as: reference to bystander attribute (i.e., knowledge or wealth), moral principles, trait attribution/evaluative judgment, reference to status, or other (e.g., "I don't know"). See Table 4 for this rubric and sample statements.

### **Bystander Endorsements**

These measures consisted of two forced-choice questions: "Which one should [Target] ask for help?" (assistance endorsement) and "Which one should be in charge to help [Target]?" (supervision endorsement). Participants received a score of 0 if they selected the wealthy bystander and a score of 1 if they selected the knowledgeable bystander. Participants were asked to justify their bystander selection for both questions.

The presentation order of these bystander endorsements was fixed for the first 32 participants because the assistance endorsement was the primary item of interest. After this initial data collection, a preliminary analysis of qualitative data indicated that some of the 5- and 6-year-olds may have engaged in response alternation (i.e., they endorsed one bystander for assistance and then endorsed the opposite bystander for supervision, stating that this division of labor would provide the opportunity for both bystanders to "help"). Therefore, children were asked the supervision judgment before the assistance judgment question for the remaining 32 participants (see Results).

### **Behavioral Predictions and Evaluations**

Participants answered an open-ended behavioral prediction for each bystander (e.g., "What do you think Mia/Hannah will do next in this story?"). This question was followed by a



forced-choice question that asked children to select between a “buying” strategy and a “knowledge” strategy to help the target resolve his or her situation (e.g., “Would Mia buy Jade Band-Aids from the store or know how to check Jade’s leg for other injuries?”). This question was not administered to participants who stated one of these two behaviors in their initial open-ended response, which varied in number across story and bystander type (range: 5 to 18 participants). Participants received a score of 0 if they spontaneously stated or selected the strategy that did not match the bystander’s resource or ability (e.g., selecting the “buying” strategy for the knowledgeable bystander) and a score of 1 if they spontaneously stated or selected the strategy that matched (e.g., selecting the “buying” strategy for the wealthy bystander).

At this approximate mid-point of the session for each story, the experimenter administered a reminder about each bystander before she asked participants the additional behavioral evaluation questions below (e.g., “Remember, Hannah knows about a lot of things. How much...”). These reminders occurred in each story to ensure that the youngest participants (5-year-olds) continued to distinguish between the wealthy and knowledgeable bystander across stories since an introduction to the bystanders only occurred once at the beginning of the session.

Participants responded to two additional forced-choice questions to evaluate the potential behavior of each bystander separately. A pilot study was conducted to inform these measures (see Appendix B). Participants were asked for each bystander: “How much does Mia *have* to help Jade?” Participants received a score of 0 if they indicated that “it doesn’t matter if she helps” and a score of 1 if they indicated that “she should definitely help” for this obligation judgment. Then, participants were asked to justify their selection. Participants were also asked for each bystander: “How bad would it be if Mia did *not* help Jade?” (severity judgment).

Participants received a score of 0 if they indicated that it would be “a little bad” and a score of 1 if they indicated that it would be “very bad.” Participants were not asked to provide a justification for this judgment.

The order in which participants were asked about the wealthy versus the knowledgeable bystander for the behavioral predictions and evaluations was counterbalanced. After both stories were administered, participants responded to two additional sets of questions.

### **Morality and Status Items**

Participants responded to four exploratory items to examine additional connections between children’s perceptions of status and morality for these bystanders: “Which one do other people want to be like?” (status), “Which one has the hardest job?” (status), “Which one is the best at sharing?” (morality), and “Which one tells the truth the most?” (morality). Participants received a score of 0 if they selected the wealthy individual and a score of 1 if they selected the knowledgeable individual. These items were presented in a randomized order. The two status items were adapted from previous research regarding children’s understanding of social status (Enright et al., 2020; Gülgöz & Gelman, 2017; Lease et al., 2002; Liben et al., 2001). The two morality items were adapted from the types of behaviors used across the broad literature regarding children’s evaluations of moral transgressions.

### **Trait Attributions**

Participants were asked whether they thought each bystander was nice, mean, or “in the middle” (always presented as the third answer choice; the other two choices were randomized). During piloting (see Appendix B), the third answer choice was presented as “not nice or mean” and several younger children had difficulty understanding this option (e.g., participants would respond “not nice” which was not clearly the choice of “not nice or mean” or an attempt to

endorse “mean”). Therefore, this answer choice was modified. Participants who selected the “nice” or “mean” option were asked a follow up question regarding the degree of “niceness/meanness” (e.g., “Is Hannah very nice or a little nice?”). Participants were given a score of 0 if they rated a bystander as “very mean,” 1 for “a little mean,” 2 for “in the middle,” 3 for “a little nice,” and 4 for “very nice.” The presentation order of bystanders for the trait attribution items was counterbalanced across participants.

### CHAPTER III: RESULTS

Chi-square tests of independence were conducted to compare the demographic composition of database-recruited participants to those participants recruited via other methods; these two groups did not differ demographically (age  $p = .71$ , gender  $p = .26$ , parent education  $ps > .39$ , household income  $p = .50$ , race and ethnicity  $ps > .50$ ). Therefore, all remaining analyses are presented collapsed across both groups. In addition, a one-way analysis of variance (ANOVA) was used to examine potential differences between the participants who received the assistance endorsement question before the supervision endorsement question and vice versa. Participants' responses to each forced-choice measure were summed across the two stories to create one score (range: 0 to 2) for the purposes of this comparison. A separate ANOVA was conducted for each main measure using the question order as a between-subjects factor; participants' responses did not differ based on bystander endorsement order (endorsements  $ps > .81$ , behavioral predictions  $ps > .12$ , obligation judgments  $ps > .13$ , severity judgments  $ps > .50$ , supplemental items  $ps > .32$ , trait attributions  $ps > .12$ ).

Several of the measures for this study involved binary outcomes and therefore the data were analyzed using generalized estimating equations (GEE; Zeger et al., 1988) with a logistic regression model in SPSS. The number of cases per participant and the specific predictors are described for each of the relevant measures below (age in months was standardized). Model comparisons are not presented because GEE does not have a likelihood function that allows for model comparisons and GEE can be considered a method rather than a model type (Agresti, 2011; QICC is offered as an approximate model fit index in SPSS but there are no guidelines regarding thresholds to meet the "smaller is better" suggestion). The significant versus non-

significant effects reported below did not change when three-way interaction terms were included in GEE for those measures where a three-way interaction was possible (i.e., behavioral predictions, obligation judgments, and severity judgments) and the three-way interactions were not significant for any measure (predictions  $p = .64$ , obligation  $p = .32$ , severity  $p = .50$ ).

Although the selection of all variables in this study was theoretically motivated, three-way interactions were not predicted; only the two-way interaction terms were retained in the analyses reported below. All qualitative responses were coded by two raters independently. Initial Cohen's kappa coefficients ranged from moderate to strong reliability (range  $K = .60$  to  $.90$ ; McHugh, 2012); disagreements were resolved through discussion.

### **To What Extent Did Children Prioritize Knowledge Over Wealth in Their Judgment of Who Was Qualified to Help?**

#### **Bystander Endorsements**

Descriptive statistics are presented by age and story type in Table 2. Children's endorsements of either the wealthy bystander (0) or the knowledgeable bystander (1) in each story (i.e., civil liberties violation and physical injury) were included in these GEE analyses, resulting in two cases for each participant. Age in months, story type, and the interaction term of these two variables were entered as predictors for each analysis (Table 3).

For the assistance endorsement, there was no significant main effect of age or story type, nor a significant interaction between these variables ( $ps > .11$ , see Table 3). A  $t$ -test against chance performance (.5 out of 1) was conducted to examine whether children endorsed one or the other bystander systematically. Across ages, children endorsed the knowledgeable bystander as the person who should help the target in both stories: civil liberties  $t(63) = 4.98, p < .001, d = .43$ ; physical injury  $t(63) = 2.61, p = .005, d = .48$ .

For the supervision endorsement, there was no significant main effect of age or story domain, nor a significant interaction between these variables ( $ps > .36$ , see Table 3). Across ages, children systematically endorsed the knowledgeable bystander as the person who should be in charge in both stories: civil liberties,  $t(63) = 3.53$ ,  $p < .001$ ,  $d = .46$ ; physical injury  $t(63) = 2.91$ ,  $p = .005$ ,  $d = .47$ .

**Table 2 Means and Standard Deviations for the Bystander Endorsements by Age Group and Story**

Measure	5- to 6-year-olds		7- to 8-year-olds	
	Civil liberties	Physical injury	Civil liberties	Physical injury
	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>
Assistance judgment	.78 (.42)	.66(.48)	.75(.44)	.66(.48)
Supervision judgment	.63(.49)	.66(.48)	.78(.42)	.69(.47)

*Note.* Means reflect bystander selection; wealthy = 0 and knowledgeable = 1.

**Table 3 Logistic Regression Analysis for Bystander Endorsements**

Measure	Predictor	Parameter estimates				
		$\beta$	$SE \beta$	Wal	df	$p$
Assistance endorsement	Intercept	-.65	.26	6.04	1	.014
	Age in months	-.06	.26	0.06	1	.81
	Story type	-.54	.35	2.40	1	.12
	Age X Story	.23	.36	0.41	1	.52
Supervision endorsement	Intercept	-.72	.27	7.25	1	.007
	Age in months	-.07	.26	.08	1	.79
	Story type	-.18	.37	.24	1	.62
	Age X Story	-.36	.40	.82	1	.37



## **Bystander Endorsement Justifications**

Example justifications are presented in Table 4. Overall, the most frequent justification participants used to support their bystander selection for both endorsement items referred to knowledge or a lack of knowledge (e.g., “She would know a lot of good reasons why that rule isn’t fair...” or “Because [Knowledgeable] knows more about a lot of stuff than [Wealthy].”). This justification was used by 48.4% and 46.9% of participants (civil liberties and physical injury) for the assistance justification and 43.8% and 54.7% of participants (civil liberties and physical injury) for the supervision justification. For the assistance endorsement, the next most frequent category was “other” (included children stating they did not know as well as off-topic responses, see Table 4), civil liberties: 23.4%; physical injury: 29.7%), followed by a reference to wealth (civil liberties: 14.1%; physical injury: 20.3%), and inferences about bystander traits (civil liberties: 9.4%; physical injury: 3.1%); two participants made inferences about bystander status and one participant referred to moral principles, both in the civil liberties vignette (3.1% and 1.6%).

For the supervision endorsement, the next most frequent category overall after references to knowledge was also the “other” category (civil liberties: 23.4%; physical injury: 17.2%), but 18.8% of children referred to bystander wealth in the physical injury story (12.5% for civil liberties). These categories were followed by inferences about bystander traits (civil liberties: 12.5%; physical injury: 4.7%), inferences about bystander status (civil liberties: 4.7%; physical injury: 3.1%), and reference to moral principles (civil liberties: 3.1%; physical injury: 1.6%). Separate chi-square tests for each endorsement measure indicated that these justifications did not differ across age groups for either judgment (assistance  $ps > .15$ , supervision  $ps > .11$ ; Holm-corrected alpha level for age = .025). There was a marginal difference by story type for the

assistance endorsement ( $p = .06$ ) and this difference was significant for the supervision endorsement,  $\chi^2 (25, N = 64) = 95.38, p < .001$  (Holm-corrected alpha level for story = .05).

Although the overall frequency of references to traits was low, children referred to traits more in their responses for the civil liberties story than the physical injury story (12.5% vs. 4.7%) and referred to wealth more in their responses for the physical injury story than the civil liberties story (18.8% vs. 12.5%).

**Table 4 Qualitative Rubric Used for Coding Participant Justifications with Description and Sample Responses**

Code	Description and sample responses
Reference to knowledge	Statements about the ability of the bystander to resolve a situation because they know what to do, know how something works, or know who to speak with to get additional assistance. Includes comparative statements such as one bystander knowing more about X than the other. “Because she [Knowledgeable Bystander] might know a lot about post offices and how to fix the rule.”
Reference to wealth	Statements about the financial ability for the bystander to pay for a service, pay to fix a problem; includes comparative statements such as one bystander having greater financial capability than the other. “Just in case they need to buy something, she [Wealthy Bystander] can buy it.”

Reference to morality/moral principles	<p>Statements that reflect general morals such as labeling a rule as unfair or discriminatory, or indicating that it would be wrong to ignore/neglect physical injury.</p> <p>“Because it’s urgent to help people in need.”</p>
Trait attribution/evaluative statement	<p>Statements that use evaluative trait labels such as “nice” and “mean” to describe the bystander or the bystander’s behavior, or “rich people” or “smart people” in general.</p> <p>Statements about the person/personality.</p> <p>“Because she’s [Knowledgeable Bystander] smart and I think she likes to help people...”</p>
Reference to status/power	<p>Statements that the bystander can direct or demand that other people follow his or her instructions or requests. Statements might include themes of authority, suggest that other people are obligated to respect or follow the bystander, or that knowledge/wealth would be used to change the situation.</p> <p>“Because he’s [Knowledgeable Bystander] the boss.”</p>
Other	<p>Statements that are off topic (see sample response); includes no responses, shrugs, and “I don’t know;” responses that are descriptive but don’t have enough detail to infer another meaning.</p> <p>“It doesn’t really matter after, just that Jades okay. But because I’ve fallen a lot and I know it hurts and it sends a</p>

shock of pain through your body and it takes it long time to heal.”

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## **How Did Children Predict and Evaluate the Potential Behavioral Responses of Each Bystander?**

### **Behavioral Predictions**

Children made a prediction for each bystander separately. Children’s endorsements of a knowledge-based strategy or a buying-based strategy in each story (i.e., civil liberties violation and physical injury) and for each bystander (i.e., wealthy and knowledgeable) were included in these GEE analyses, resulting in four cases for each participant. Age in months, story type, bystander type, and each two-way interaction term were entered as predictors for this analysis (Table 5).

This analysis revealed two significant two-way interactions. See Figure 1a and 1b. There was a significant interaction between age in months and bystander type,  $\beta = .55$ , Wald  $\chi^2 = 7.04$ ,  $p = .008$ . With age, children made more target predictions for the knowledgeable bystander than the wealthy bystander (Figure 1a). Paired samples *t*-tests were used to probe this interaction, which revealed that 7.5- to 8-year-olds (i.e., 7.5- to 8.9-year-olds) made more target predictions for the knowledgeable bystander ( $M = 1.76$ ,  $SD = 0.52$ ) than the wealthy bystander ( $M = 1.44$ ,  $SD = 0.71$ ),  $t(24) = 2.14$ ,  $p = .04$ ,  $d = .75$ . Five- to 7-year-olds’ (i.e., 5.0- to 7.4-year-olds) target predictions did not differ significantly by bystander type: knowledgeable  $M = 1.31$ ,  $SD = 0.77$ , wealthy  $M = 1.44$ ,  $SD = 0.64$ ,  $t(38) = -1.04$ ,  $p = .30$ ,  $d = .77$ .

There was also a significant interaction between bystander type and story type,  $\beta = 1.30$ , Wald  $\chi^2 = 6.34$ ,  $p = .012$ . Due to the categorical nature of these variables, a chi-square test was

used to probe this interaction. This analysis revealed that children's predictions differed by story type for the knowledgeable bystander,  $\chi^2(1, N = 64) = 6.97, p = .008$ : as a group, children were more likely to make the target prediction (i.e., knowledge-based strategy) for the knowledgeable individual in the civil liberties story than in the physical injury story (Figure 1b). Children's predictions did not differ by story type for the wealthy bystander,  $\chi^2(1, N = 64) = 0.57, p = .45$ . The GEE analyses did not reveal an age by story type interaction nor any additional significant main effects or interactions (marginal effect of story type  $p = .06$ ; all other  $ps > .12$ ).

In an additional analysis to examine whether children's predictions for each bystander were systematic by age in each context as predicted,  $t$ -tests against chance performance (score of .5) were conducted. Five- and 6-year-olds systematically predicted a knowledge-based strategy for the knowledgeable bystander but only in the civil liberties domain,  $M = .75, SD = .44, t(31) = 3.22, p = .003, d = .44$ ; they made unsystematic predictions for this bystander in the physical injury domain,  $M = .63, SD = .49, t(31) = 1.44, p = .16, d = .49$ . Five- to 6-year-olds systematically predicted a buying-based strategy for the wealthy bystander but only in the physical injury domain,  $M = .84, SD = .37, t(31) = 5.27, p < .001, d = .37$ ; they made unsystematic predictions for the wealthy bystander in the civil liberties domain,  $M = .66, SD = .48, t(31) = 1.83, p = .08, d = .48$ .

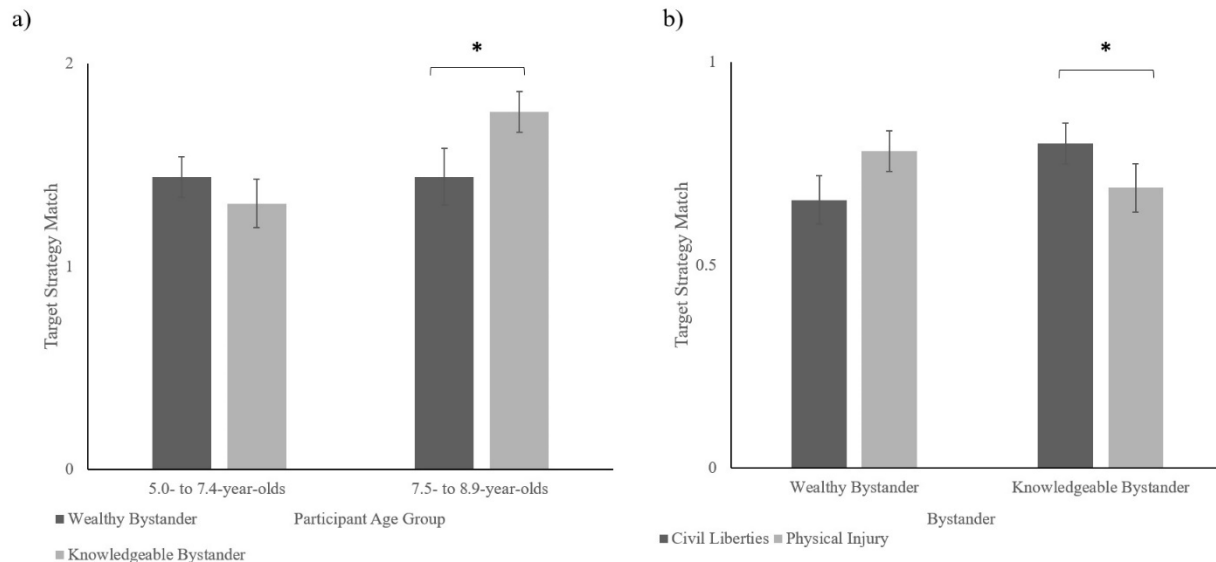
Seven- and 8-year-olds systematically predicted that a knowledgeable bystander would use a knowledge-based strategy across both domains: civil liberties  $M = .84, SD = .37, t(31) = 5.27, p < .001, d = .37$ ; physical injury  $M = .75, SD = .44, t(31) = 3.22, p = .003, d = .44$ . These children made systematic predictions for the wealthy bystander only in the physical injury domain:  $M = .72, SD = .46, t(31) = 2.71, p = .011, d = .48$ ; they made unsystematic predictions

for the wealthy bystander in the civil liberties domain:  $M = .66$ ,  $SD = .48$ ,  $t(31) = 1.83$ ,  $p = .08$ ,  $d = .48$ .

**Table 5 Logistic Regression Analysis for Behavioral Predictions**

Parameter estimates					
Predictor	$\beta$	$SE \beta$	Wald		
			$\chi^2$	df	$p$
Intercept	-.82	.28	8.72	1	.003
Age in months	-.43	.28	2.28	1	.13
Story type	-.67	.36	3.48	1	.06
Bystander type	-.46	.34	1.79	1	.18
Age X Story	-.23	.30	.58	1	.45
Age X Bystander	.55	.21	7.04	1	.008
Story X					
Bystander	1.30	.51	6.34	1	.012

**Figure 1 Mean Target Strategy Match for Children’s Behavioral Predictions by a) Age Group and Bystander, and b) Bystander and Story Type**



Children made an obligation judgment and a severity judgment for each bystander separately. Children chose between two forced-choice responses for these judgments (0 = doesn’t matter/a little bad, 1 = definitely should/very bad). These responses for each bystander and each story were included, resulting in four cases per participant for each GEE reported below. Age in months, story domain, bystander type, and each two-way interaction term were entered as predictors in each analysis (Table 6).

For the obligation judgments, this analysis revealed a significant effect of bystander type: children were more likely to indicate that the knowledgeable bystander should help than the wealthy bystander,  $\beta = 1.98$ , Wald  $\chi^2 = 7.51$ ,  $p = .006$ . There were no additional significant predictors or interaction terms ( $ps > .22$ , see Table 6). Therefore, these obligation judgments were collapsed across context to examine whether both 5- to 6-year-olds and 7- to 8-year-olds were systematic in their obligation judgments for both bystanders. *T*-tests against chance



performance (score of 1) indicated that all children systematically indicated that both bystanders should “definitely” help: 5- to 6-year-olds knowledgeable  $M = 1.78$ ,  $SD = 0.55$ ,  $t(31) = 8.00$ ,  $p < .001$ ,  $d = 0.55$  and wealthy  $M = 1.38$ ,  $SD = 0.75$ ,  $t(31) = 2.82$ ,  $p = .008$ ,  $d = .75$ ; 7- to 8-year-olds knowledgeable  $M = 1.94$ ,  $SD = 0.25$ ,  $t(31) = 21.56$ ,  $p < .001$ ,  $d = .25$  and wealthy  $M = 1.41$ ,  $SD = 0.76$ ,  $t(31) = 3.04$ ,  $p = .005$ ,  $d = .76$ .

For the severity judgments, this analysis revealed a significant effect of bystander type: children were more likely to indicate that it would be “very bad” if the knowledgeable bystander did not help than if the wealthy bystander did not help,  $\beta = 0.90$ , Wald  $\chi^2 = 5.89$ ,  $p = .02$ . There were no additional significant predictors or interaction terms (age by story type interaction  $p = .07$ , all other  $ps > .37$ , see Table 6). *T*-tests against chance performance (score of .5) were used to examine whether children’s severity judgments for each bystander were systematic by age in each context. See Figure 2. Across ages, children systematically indicated that it would be “really bad” if the knowledgeable bystander did not help the target across contexts: 5- to 6-year-olds civil liberties,  $M = .75$ ,  $SD = .44$ ,  $t(31) = 3.22$ ,  $p = .003$ ,  $d = .44$ , physical injury  $M = .81$ ,  $SD = .40$ ,  $t(31) = 4.46$ ,  $p < .001$ ,  $d = .40$ ; 7- to 8-year-olds civil liberties  $M = .81$ ,  $SD = .40$ ,  $t(31) = 4.46$ ,  $p < .001$ ,  $d = .40$ , physical injury  $M = .81$ ,  $SD = .40$ ,  $t(31) = 4.46$ ,  $p < .001$ ,  $d = .40$ . Only 7- to 8-year-olds systematically indicated that it would be “really bad” if the wealthy bystander did not help the target, and only in the physical injury story,  $M = .69$ ,  $SD = .47$ ,  $t(31) = 2.25$ ,  $p = .03$ ,  $d = .47$ ; civil liberties  $M = .50$ ,  $SD = .50$ ,  $t(31) = 0.00$ ,  $p = 1.00$ ,  $d = .51$ . Five- to 6-year-olds did not provide systematic severity judgments in either context: civil liberties and physical injury both  $M = .59$ ,  $SD = .50$ ,  $t(31) = 1.06$ ,  $p = .30$ ,  $d = .50$ .

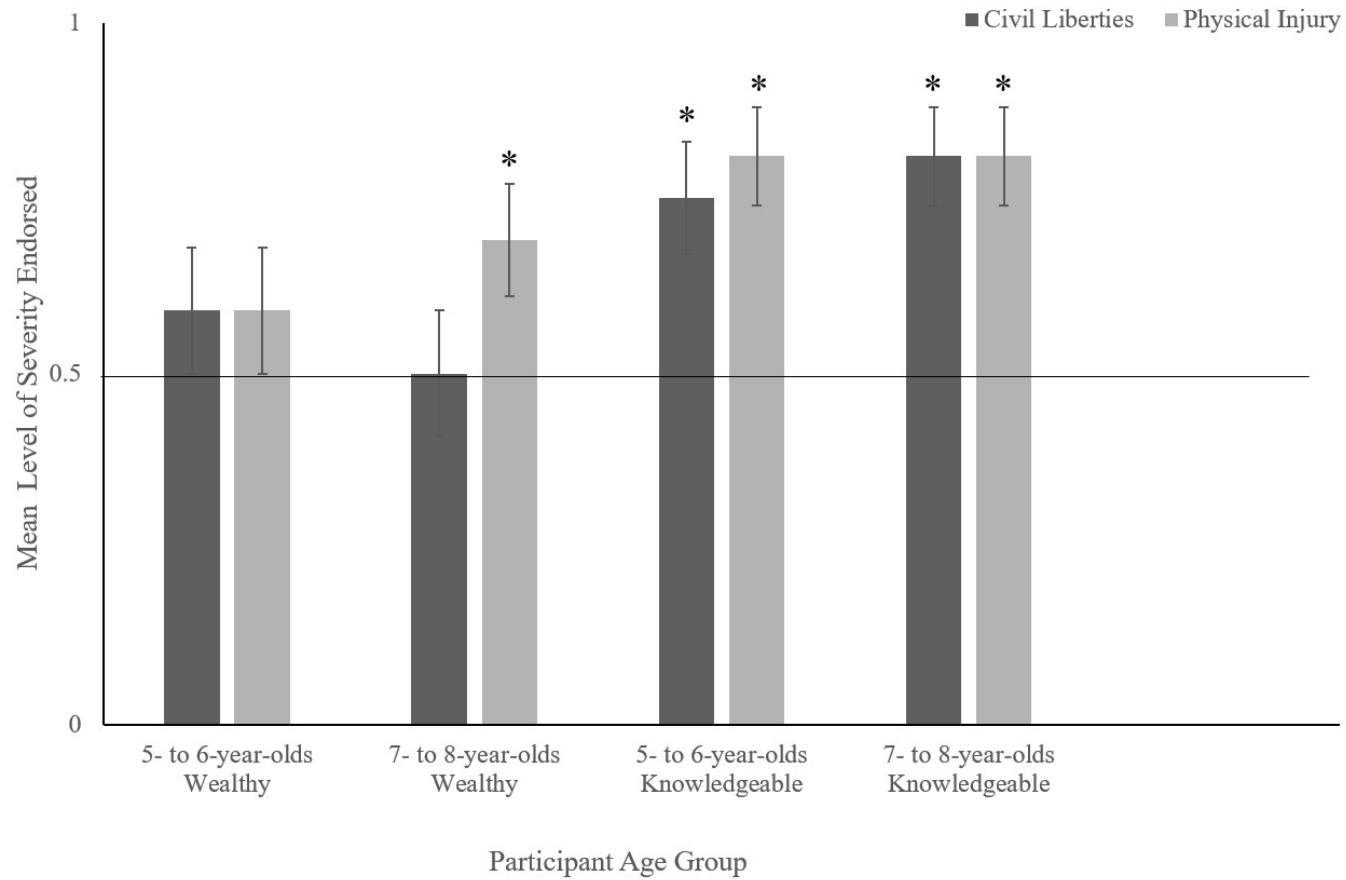
**Table 6 Logistic Regression Analysis for Behavioral Evaluations**

Measure	Predictor	Parameter estimates				
		Wald				
		$\beta$	$SE \beta$	$\chi^2$	df	$p$
Obligation judgment	Intercept	-3.00	.72	17.54	1	<.001
	Age in months	-.86	.71	1.45	1	.23
	Story type	.39	.73	.28	1	.60
	Bystander type	1.98	.72	7.51	1	.006
	Age X Story	.25	.41	.37	1	.54
	Age X Bystander	.71	.60	1.40	1	.24
	Story X Bystander	-.01	.75	.00	1	.99
Severity judgment	Intercept	-1.48	.33	20.53	1	<.001
	Age in months	-.22	.25	.76	1	.38
	Story type	.19	.40	.24	1	.62
	Bystander type	.90	.37	5.89	1	.015
	Age X Story	.44	.24	3.32	1	.07

Age X Bystander	.16	.31	.28	1	.60
Story X Bystander	.19	.48	.16	1	.69

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**Figure 2 Mean Level Severity Endorsed (for Failure to Act) by Age Group, Bystander, and Story Type**



## Obligation Judgment Justifications

The same coding scheme was used to code these justifications (Table 4). Separate chi-square analyses for each vignette revealed that children's obligation justifications for each bystander differed within each vignette, civil liberties  $\chi^2 (1, N = 64) = 41.41, p = .003$ ; physical injury  $\chi^2 (1, N = 64) = 31.46, p < .001$  (Holm-corrected alpha level remained .05). With regard to the knowledgeable bystander, 42.2% and 34.4% (civil liberties and physical injury) of children referred to this person's knowledge as the main reason that he or she was obligated to help the target. In addition, 25% and 26.6% made an appeal to moral principles (e.g., "it's the right thing to do"), 25% and 26.6% were coded as "other," 6.3% and 10.9% made inferences about bystander traits, and one participant referred to the bystander's status in the civil liberties vignette.

In contrast, children often referred to wealth in their obligation justifications for the wealthy bystander (civil liberties: 28.1%; physical injury: 28.1%), but these references included a mixture of positive and negative predictions (e.g., positive, wealthy bystander should definitely help: "because she might have enough money to get a lawyer and go to court;" negative, it does not matter if wealthy bystander helps: "she's very wealthy and she might not want to help buy the post things or change the rule"). This category was followed by "other" as the next most frequent justification (which included "I don't know" and off-target responses, see Table 4), which was the most frequent justification type for this bystander in the physical injury story (civil liberties: 25.0%; physical injury: 31.3%). Children also referenced knowledge (i.e., a lack of knowledge, 12.5% and 14.1%), made appeals to moral principles for this bystander (20.3% and 26.6%), and in the civil liberties story, made inferences about bystander traits (10.9%) and

status (3.1%). Children's justifications did not differ by age (knowledgeable  $ps > .41$ , wealthy  $ps > .43$ ). Children were not asked to justify severity judgments.

### **Did Children Have Generally Positive Views of Both Bystanders?**

#### **Morality and Status Items**

These items were separated into two subsets for exploratory analyses. The two items that were intended to measure perceptions of status were collapsed into one composite score (range: 0 – 2) and the two items that were intended to measure perceptions of morality/moral character were collapsed into a second composite score (range: 0 – 2). Descriptive statistics are in Table 7. An independent samples  $t$ -test was used to compare age groups on each composite score. These were followed by  $t$ -tests against chance performance (score of 1) to examine whether children in each age group systematically endorsed the wealthy (0) or knowledgeable (2) bystander across items.

For the status score, 5- to 6-year-olds and 7- to 8-year-olds did not differ in their bystander selections for the status items,  $t(62) = -0.18$ ,  $p = .86$ ,  $d = .71$ . All children systematically endorsed the knowledgeable bystander as higher status than the wealthy bystander on these items; 5- to 6-year-olds  $t(31) = 2.51$ ,  $p = .018$ ,  $d = .63$ ; 7- to 8-year-olds  $t(31) = 2.26$ ,  $p = .03$ ,  $d = .78$ . For the morality score, 5- to 6-year-olds and 7- to 8-year-olds did not differ in their bystander selection for the morality items,  $t(62) = -1.95$ ,  $p = .06$ ,  $d = .64$ . Only 7- to 8-year-olds systematically endorsed the knowledgeable bystander for morality items,  $t(31) = 5.93$ ,  $p < .001$ ,  $d = .51$ ; 5- to 6-year-olds were unsystematic,  $t(31) = 1.65$ ,  $p = .11$ ,  $d = .75$ .

#### **Trait Attributions**

Descriptive statistics are in Table 7. An independent samples  $t$ -test was conducted on the attribution of each bystander to compare responses across age groups. Five- to 6-year-olds and 7-

to 8-year-olds did not differ in their trait attributions of the wealthy bystander,  $t(62) = -.32, p = .75, d = 1.17$ . Both age groups viewed the wealthy bystander as neutral-to-nice. Five- to 6-year-olds and 7- to 8-year-olds differed significantly in their trait attributions of the knowledgeable bystander,  $t(62) = -2.38, p = .02, d = .84$ . Although both age groups also provided positive attributions of the knowledgeable bystander, 7- to 8-year-olds had more positive views than 5- to 6-year-olds.

**Table 7 Means and Standard Deviations for the Morality Items, Status Items, and Trait Attributions by Age**

Measure	5- to 6-year-olds	7- to 8-year-olds
	<i>M(SD)</i>	<i>M(SD)</i>
Status and morality items:		
Status 1 – Job	.69(.47)	.66(.48)
Status 2 – Like	.59(.50)	.66(.48)
Status composite	1.28(.63)	1.31(.78)
Moral 1 – Truth	.72(.46)	.91(.30)
Moral 2 – Share	.50(.51)	.63(.49)
Moral composite	1.22(.75)	1.53(.51)
Trait attributions:		
Knowledgeable bystander	3.19(.97)	3.69(.69)
Wealthy bystander	2.72(1.25)	2.81(1.12)

*Note:* Means for the status and morality items reflect bystander selection; wealthy = 0 and knowledgeable = 1. Status and morality composites reflect a range from 0 to 2. Means for the trait attribution reflect a 5-point scale from “very mean” = 0 to “very nice” = 4.



## CHAPTER IV: DISCUSSION

The findings from this study indicate that children prioritized others' knowledge relative to wealth to ameliorate negative events. Five- to 8-year-olds endorsed a knowledgeable bystander over a wealthy bystander to provide and supervise assistance for someone in need, regardless of whether physical injury or psychological harm were involved. Qualitative data suggest that these children understood knowledge better than wealth, but children's trait attributions suggest that children held positive impressions of both bystanders. Despite these attributions, children were more likely to judge that the knowledgeable bystander "should" help, that it would be "bad" if this bystander did not offer help and endorsed the knowledgeable bystander for supplemental morality and status items. Although the expected age-related differences did not emerge for these bystander endorsements and evaluations, children increasingly made target predictions with age about how each bystander would help, particularly for the knowledgeable bystander. Taken together, these findings demonstrate novel connections between children's reasoning about knowledge, wealth, and their reasoning about those involved in morally salient events.

Children viewed the knowledgeable person as an asset in these negative event contexts, which mirrors their prioritization of knowledge in certain social learning situations (e.g., Boseovski et al., 2016; Koenig & Jaswal, 2011). A combination of personal experience and early familiarity with relying on knowledgeable people to learn about the world (Kruglanski et al., 2005) may have been sufficient to motivate endorsement of the knowledgeable bystander to help someone in need. Indeed, parents reported generally high education levels in this sample.

However, children's explicit references to knowledge in their justifications across measures and increasing ability with age to identify target strategies for a knowledgeable bystander suggest that children understood knowledge better than wealth in these negative event contexts. In fact, children may have disregarded wealth and evaluated the more familiar resource—knowledge—to make comparisons between these bystanders.

Consistent with this interpretation, children referred to the knowledgeable bystander's ability to "know what to do" across their justifications. Children rarely referenced traits or other reasons why they thought the knowledgeable bystander "should" help (i.e., obligation judgment) or why they endorsed the knowledgeable bystander for assistance and supervision of aid. In fact, qualitative data reflect a tendency for children to assume that the knowledgeable bystander was "smarter" than the wealthy bystander. Some children reasoned that it "did not matter" if the wealthy bystander offered help because "[he] doesn't really have anything to do with this, all he has is money..." or "[Wealthy bystander] is just jealous of [Knowledgeable bystander] because [Knowledgeable bystander] has lots of ideas." It is possible that the introductory descriptions for each bystander highlighted differences in competence, but the wealthy bystander was described as somewhat knowledgeable rather than completely incompetent. If children focused on the relative levels of knowledge between these bystanders, it would also explain the lack of predicted age-related changes on the supervision endorsement. In addition to their familiarity with knowledge, children in this age range perceive wealthy individuals to be competent (e.g., Shutts et al., 2016; Sigelman, 2012) and knowledge may have been more salient than any "pro-wealth" bias or belief that wealthy people are "in charge" (e.g., Ahl & Dunham, 2019; Enright et al., 2020) such that children across ages used knowledge to reason about both endorsements.

Although children recognized which bystander would “know what to do” and may have understood knowledge better than wealth as a group, there were age-related differences in children’s translation of knowledge to specific helping behaviors. Partially consistent with predictions, 7- to 8-year-olds systematically identified the target knowledge-based strategy for the knowledgeable bystander across contexts. However, 5- to 7.4-year-olds (i.e., 5- to 7-year-olds) were less likely than 7.5- to 8-year-olds to identify knowledge-based strategies for the knowledgeable bystander, which suggests that children may have used an alternative strategy to reason about how these bystanders could help the target in need. One possibility is that children reasoned about whether strategies were a “familiar” social response.

Consistent with this interpretation, children’s responses within each story context revealed that many 5- to 6-year-olds endorsed buying a Band-Aid for both bystanders in the physical injury story. The use of Band-Aids to “fix” injuries is a common experience for children and may have been the easiest for children to identify as a quick solution for an injury. Across ages, children referred to bandages and casts in their bystander endorsements in the physical injury story. In addition, 5- to 6-year-olds selected the knowledge-based strategy in the civil liberties context for the wealthy bystander: that strategy involved speaking with someone “to change the rule”—an intervention on behalf of the target that may have been interpreted as a socially competent response for this situation. Programs about bullying prevention and intervention shared with children as early as preschool sometimes contain similar intervention messages (e.g., seek help from an authority figure; Perren & Alsaker, 2006). Five- to 6-year-olds in this study may have assumed that most people (i.e., regardless of being “knowledgeable”) would “know” about these potential social norms in each context, even if children viewed the knowledgeable bystander as the most competent to help overall.

It is somewhat surprising that the age-related increase in children's target knowledge-based strategy matches was driven by 7.5- to 8-year-olds, given that 4-year-olds readily identify similar strategies as part of the knowledge base for experts such as doctors (e.g., fixing a broken leg, Lutz & Keil, 2002). The description of this bystander as generally knowledgeable rather than the use of a label to denote specific expertise may have prevented children from making connections between the knowledge-based strategy and the knowledgeable bystander. This finding suggests that there is a meaningful difference between children's ability to identify knowledge and reason about how to use knowledge to achieve a goal across contexts. Taken together with the overall preference for a knowledgeable rather than a wealthy helper on the endorsement items, the findings from this study also suggest that young children's tendency to view wealthy people as competent or "smart" may be context-specific and depend on who else is present as a comparison point.

Children's disregard of a wealthy bystander as a helper may have also been driven by these negative event contexts, which did not elicit reasoning about status concepts. Despite children's familiarity with the association between wealth and social status in other contexts (e.g., ability to direct behavior, Enright et al., 2020; Shutts, 2015), children in this study were least likely to refer to an assumption that the wealthy person could tell other people "what to do" to explain how the wealthy bystander would help. In general, only six children who referred to wealth in their bystander endorsement justifications could elaborate on a specific use for it. In the civil liberties context specifically, children may have had to integrate reasoning about status or even immoral uses for money in order to endorse a wealthy helper. For example, children's reasoning about a monetary donation or an act of bribery that would have helped the target are both concepts that might require children to engage in higher level reasoning about morality

(e.g., Ongley et al., 2014; Reyes-Jaquez & Koenig, 2021). Given that 4- to 6-year-olds fail to recognize “corruption-related” concepts and tend to focus on the outcome (e.g., someone getting what they want would make them happy), it is perhaps unsurprising that bribery themes emerged in fewer than five participants’ justifications about the wealthy bystander (e.g., “because he could tell the post office people not to do that rule and like give them money to stop doing that rule”). In instances when these explanations emerged, they were consistent with this focus on the positive outcome that these behaviors would produce (e.g., target’s ability to mail a letter).

It was expected that 5- to 6-year-olds in this study would focus on the outcomes of each negative event more than 7- to 8-year-olds, which would promote age-related differences in the extent to which children evaluated how much each bystander “should” help. In contrast to these predictions, children as a group indicated that both bystanders “should definitely help” the target. In addition, about one-quarter of these children referenced moral principles to justify their obligation judgments. These findings suggest that children interpreted these negative events as morally salient. In fact, 7- to 8-year-olds systematically indicated that it would be “really bad” for both bystanders to fail to help the target in the physical injury story; some children referenced the urgency to help a physical injury (i.e., “it’s an emergency,” “she’s really hurt”). Given this focus on the welfare of the target, it is somewhat surprising that children did not reason about moral principles more frequently to evaluate bystanders as potential helpers. However, children tend to view behavior that would require “giving” to be less obligatory than acts that simply require someone to refrain from a negative behavior (e.g., do not steal; Kahn, 1992). Despite low rates of reference to moral principles, children’s obligation and severity judgments for both bystanders provide evidence that children took these events seriously.

The extent to which children interpreted bystanders' reactions to these events as a moral imperative remains unclear from these findings. Although children endorsed the knowledgeable bystander more than the wealthy bystander on exploratory morality and status items, children focused on the differences between the knowledgeable and wealthy bystanders to explain the extent to which each "should" help. It is unlikely that children simply dismissed the wealthy bystander as the alternative helper based on impressions of "bad" character because children provided generally positive trait attributions for both bystanders. This pattern suggests that although children are attentive to positive and negative outcomes in moral scenarios to evaluate transgressors (e.g., Nelson, 1980; Zelazo et al., 1996), these novel contexts directed attention to the potential helpers and their resources, but more work is needed to determine how much children's impressions versus understanding of knowledge and wealth contribute to moral judgments about these individuals.

It is worth noting that 7- to 8-year-olds made more positive trait attributions of the knowledgeable bystander than 5- to 6-year-olds, consistent with a strengthening tendency to view others positively during middle childhood (Boseovski, 2010). This age-related difference did not emerge for the wealthy bystander, perhaps due to age-related increases in children's awareness of negative stereotypes about rich people (e.g., Elenbaas & Killen, 2019). Given that children tend to make associations between competence, knowledge, trustworthiness, and "good" character (e.g., Cain et al., 1997; Harris, 2007; Heyman & Dweck, 1998), one speculative interpretation of these trait attributions alongside children's obligation and severity judgments, and supplemental morality and status responses, is that children had heightened "moral expectations" for the knowledgeable bystander. The lack of a clear relationship between the wealthy bystander and the target may have contributed to weaker expectations that the wealthy

bystander “should” help (e.g., Engelmann & Tomasello, 2019; Engelmann et al., 2012; Lenz & Paulus, 2021). In other morally relevant contexts, children believe that people in positions of authority (i.e., high status) are “in charge” (e.g., Laupa, 1991) and that these individuals have knowledge (e.g., “a teacher is smart,” “guard has training,” Laupa, 1991). Although adults recognize that both knowledge and wealth carry a level of prestige or power (e.g., knowledge confers skill and wealth confers resources; Chudek et al., 2012; Henrich & Gil-White, 2001), developmental research has not fully explored how these status related impressions fit in with children’s trait attributions or other impressions of knowledgeable people to guide children’s judgments about whether to prioritize others’ knowledge across contexts. Below, I elaborate on this point and consider directions for future research.

### **Current Study in the Context of a Conceptual Framework**

It is important to understand how children’s perceptions of knowledgeable people fit within a broader social and moral landscape to inform the developmental trajectory of children’s decisions about who to trust in both information- and help-seeking contexts (Marble & Boseovski, 2020). It is proposed that children form a conceptual category for certain types of competent people (Figures 3 and 4). Based on this perspective, children develop a favorable perception of knowledgeable people and expect them to have other positive characteristics. With age, children gain knowledge about social conventions (e.g., rules and norms), morality (e.g., distinguish between “right” and “wrong”), and other person-oriented knowledge (e.g., traits) that may inform these perceptions.

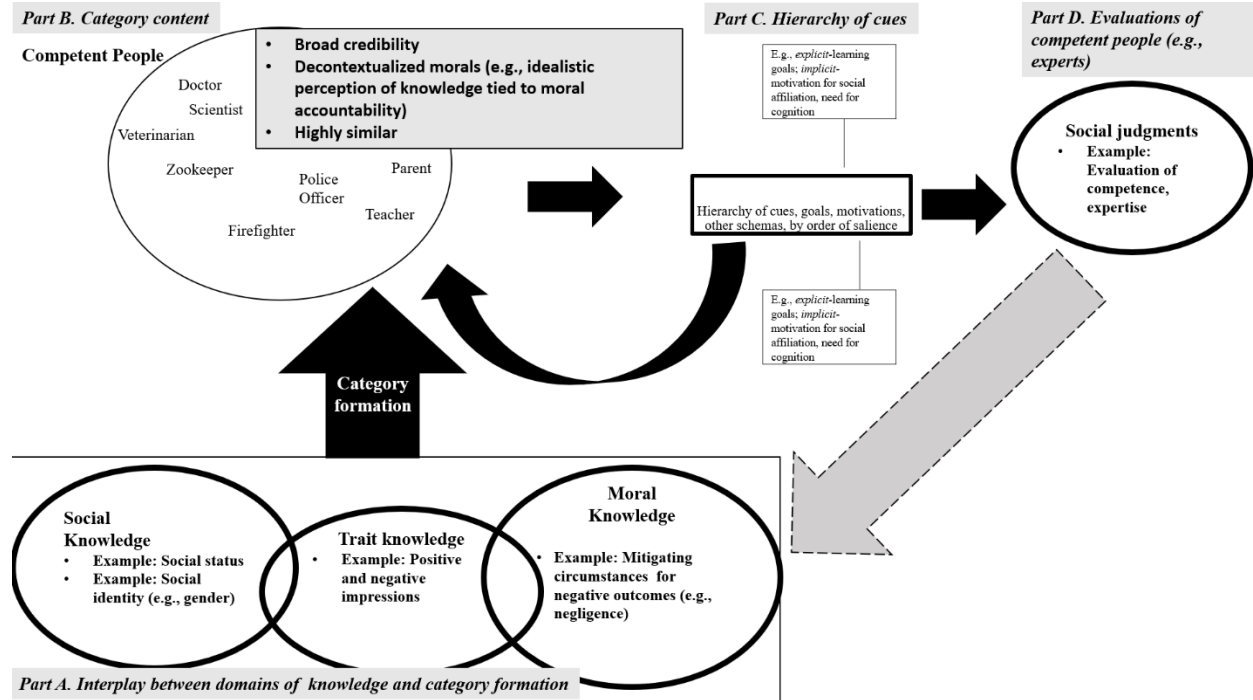
Specifically, some aspects of children’s social and moral knowledge might elicit motivations, biases, or goals that may or may not be relevant to form a judgment about a knowledgeable person’s testimony or behavior. In turn, a hierarchy of cues based on information

that is available in the moment (e.g., during a social learning situation versus a morally salient event) may influence children's evaluation of a specific knowledgeable person (e.g., that knowledgeable person's reliability as a source of information or the behavior displayed by this person and whether it is appropriate for the context at hand; Figures 3 and 4, Part C). See Appendix C for a companion study that could not be included in the final dissertation due to COVID-19. This study addresses whether developmental biases and stereotypes about specific occupations offer insight into this potential hierarchy of cues that influence these judgments.

During early childhood, children's conceptualization of what it means to have knowledge may exert direct influence on children's evaluations of knowledgeable people because children would be less able to attend to several cues at once to inform their judgments. In contrast, older children's expectations for knowledgeable people might become more context-dependent (Figure 4, Part B). The interplay of information about the knowledgeable person (e.g., social identity), characteristics of the situation (e.g., severity of any negative outcomes), and change in the salience of some cues across development (e.g., decline of an ingroup preference; increase in negative stereotypes about high-status individuals) may explain patterns in children's evaluations of knowledgeable people as source of information and models for social behavior.

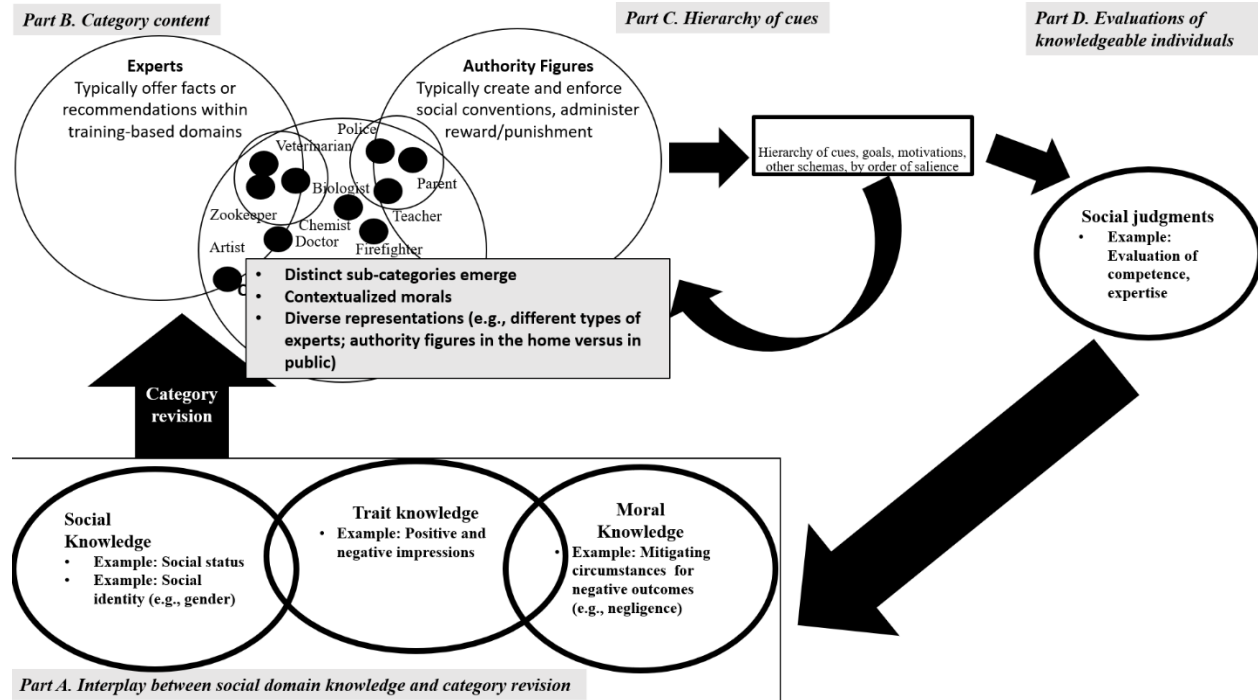


**Figure 3 Proposed Theoretical Framework Variant for Younger Children**



*Note:* Adapted from Marble & Boseovski (2020)

**Figure 4 Proposed Theoretical Framework Variant for Older Children**



*Note:* Adapted from Marble & Boseovski (2020)

## **Future Directions and Limitations**

Future research should consider children's evaluations of knowledge alongside cues to status and power. This work would clarify the extent to which children associate knowledge with status, given that developmental status research uses measures that address decision-making power and evaluations of skills (e.g., Charafeddine et al., 2015; Chudek et al., 2012; Gülgöz & Gelman, 2017). For example, children could be presented with scenarios in which the goal is to choose the best leader to reach a specific goal (e.g., solve a public problem) and asked which type of person would be best qualified to meet that goal, with possible leaders varying in their level of knowledge, position within a social hierarchy or dominance over others, likeability, and resources. This work would also clarify current operationalizations of status to better understand the role it has in children's decisions about who to trust for guidance across a variety of social situations. One potential limitation of the present study with regard to these two goals is that children were from relatively high socioeconomic status households with well-educated parents. Given that children associate group identities with status (Shutts, 2015) and recognize their own financial status (Hazelbaker et al., 2018), future research will need to consider how children's own experiences influence their perceptions of overlap between these concepts. This research should also include other cues to status that simultaneously categorize individuals into groups (e.g., social categories). The findings from the present study provide a foundation for future work in this regard: in the absence of potential bias from other group cues, children favored a knowledgeable helper across two negative event contexts. See Appendix C for a discussion on this topic in relation to a companion study.

Another potential limitation of the present study is that children were asked to make behavioral evaluations of each bystander separately and the obligation and severity judgments do

not provide concrete evidence that children reasoned about differences in level of moral obligation between these bystanders. Although children's qualitative responses suggest that some children engaged in moral reasoning in their consideration of who "should help," future research should include additional measures that could address whether children believe that some people are more obligated than others to respond in a prosocial manner for the sake of others' welfare. In the present study, the length of the testing session was of particular concern due to the virtual format used to collect data (see Appendix D for discussion of these challenges), but additional measures that have been used with cost manipulations to address similar research questions may be helpful. For example, children indicate that actors are less expected to help others in some high-costs scenarios (Kahn, 1992). However, there are situations in which children may not prioritize personal cost if a person's resources, characteristics, or social role is perceived to entail moral obligations (e.g., doctors take a Hippocratic oath). These differences in setting conditions may intersect with the characteristics described above to influence children's evaluations of knowledgeable (versus other) people.

### **Conclusion**

Overall, children preferred knowledge over wealth to resolve morally salient issues, which provides insight into the foundation upon which children build trust in knowledgeable people. Children's more advanced understanding of knowledge compared to wealth influenced their reasoning about knowledgeable and wealthy people as potential helpers in novel negative event contexts. These findings suggest that an early understanding of knowledge may promote trust in knowledgeable people across contexts, and not only for assistance to learn new information. In turn, this appreciation of knowledge might reinforce positive impressions of knowledgeable people. Taken together, these findings inform how children's judgments of

others' characteristics and resources influence their decision-making about how to respond to harmful events. These findings suggest new connections between children's perceptions of knowledge, wealth, and morality that move the field of social learning forward.

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## APPENDIX A: EXAMPLE STORY CONTENT (FEMALE PARTICIPANT VERSION)

### **Introduction** (order of bystander presentation counterbalanced):

This is Mia. Mia has a lot of money. She has more money than most other people, but she only knows about some things. Mia can buy new clothes and she takes a lot of trips, but Mia doesn't read very much.

This is Hannah. Hannah knows about a lot of things. She knows more than most other people, but she only has some money. Hannah can teach herself new things and she reads a lot of books, but Hannah doesn't buy very many things.

### **Physical injury vignette**

This is Jade, another person. She is at the park to walk around by herself today, but while she is looking around at the trees and squirrels, she falls down and hurts her knee. Hannah and Mia are both at the park and they both see Jade fall down. They both see that Jade is hurt and needs help.

### **Civil liberties vignette**

This is Abby, another person. She is at the post office to mail a letter, but she sees a sign with a new rule that says people her age are not allowed to mail letters. Hannah and Mia are both at the post office and they both know this rule is not fair. They both see that Abby needs help to mail her letter.

## APPENDIX B: INFORMATION ABOUT THE PILOT WORK USED TO INFORM THIS STUDY

Two pilot studies were conducted to inform this dissertation as well as additional complementary projects ( $N = 68$ ). In one of these studies, a sample of 4- to 10-year-olds ( $n = 34$ ) was asked to identify a variety of characteristics that they associated with experts (e.g., doctor) and authority figures (e.g., police). This study was designed to gauge whether children associated positive characteristics with specific types of knowledgeable people and included characteristics aimed at the concept of moral obligation (i.e., that certain people “have to” help others). Children were presented with a set of six people, which included a randomly selected mixture of experts and authority figures. Children were asked to identify which people from the set have specific knowledge (e.g., about which foods are good to eat), traits (e.g., “nice”), or engage in specific actions (e.g., helping others). Children could select as many or as few of the six individuals as they wanted for each question. Four- to 6-year-old participants received a training task with a set of animals to ensure that they understood the task instructions. Older children did not require training. Children’s responses to the trait and action questions were used to inform dependent measures related to the concept of obligation.

In the other pilot study, an additional sample of 4- to 8-year-olds ( $n = 34$ ) heard a story in which someone made a mistake and children were asked a variety of questions about this behavior and possible actions that could rectify the mistake. The primary goal of this study was to inform the material that would be age-appropriate for the companion study vignettes (see Appendix C), but it included a variety of open-ended and forced-choice measures to inform the final selection of dissertation measures. Across studies, these pilot data suggested that some 4-



year-olds might not understand some of the target phrases that were planned for the obligation and severity judgments (e.g., “has to” help). In addition, there was later uncertainty regarding the ability of 4-year-olds to participate via Zoom in the event the session took longer than 15 minutes. Therefore, the final sample for the dissertation included 5- to 8-year-olds.

## APPENDIX C: EXPANSION OF THE DISSERTATION COMPANION STUDY

This section will present a companion study that was originally planned as part of the dissertation. Partial data from this companion study are reported here to inform additional discussion of future directions for research. The dissertation study focused on children's perceptions of knowledgeable people compared to wealthy people, and the extent to which children's understanding of knowledge and wealth influence children's evaluations of who should help in a negative event context. Another type of negative event that has been examined in the moral development literature involves accidental transgressors, or individuals who cause harm unintentionally (e.g., Killen et al., 2011). This research has focused on an actor's mental state at the time a negative outcome is produced. For example, some of these studies have addressed the level of responsibility or negligence of the actor (e.g., Mulvey et al., 2020; Schleifer et al., 1983) or the extent to which the actor wanted to cause harm for the target (e.g., Nelson, 1980; Zelazo et al., 1996).

Recent research demonstrates that children's reasoning about intentions is related to how children evaluate the actions of others in group-based contexts that involve moral issues (e.g., fair distribution of resources, unfair advantages of one group over another; Glidden et al., 2021). In addition, children consider social group identities such as race and gender in their reasoning about group dynamics and moral behavior (e.g., whether it is wrong to exclude someone from the friend group based on race; see Mulvey, 2016). This research suggests that children are sensitive to intersections between social and moral issues. Despite this evidence that children's reasoning about morals, social groups, and intentions factor into their evaluations of people in certain scenarios, these relations have not been investigated in the context of children's

impressions of knowledgeable people. During early childhood, stereotypes about social groups coupled with less sophisticated understanding of intentionality may cause children to judge socially unfamiliar experts (e.g., a knowledgeable person who belongs to the child's gender outgroup) unfairly when these experts make mistakes. In contrast, children may be particularly forgiving of social ingroup members who are in important social roles but who demonstrate incompetence in those roles. A better understanding of these connections would inform when and why children disregard or accept social stereotype information in their reasoning about others and provide further insight into competence-related stereotypes.

In this study, I examined whether 4- to 8-year-olds' gender stereotypes about expertise influenced children's judgments of expert competence and children's evaluations of mistakes as intentional and harmful. On the one hand, children show an early regard for knowledge and expertise, which may promote positive impressions of knowledgeable people regardless of any negative outcomes produced by their mistakes. On the other hand, certain negative events may make children's social group biases salient and result in particularly negative judgments of an outgroup member's mistake, intentionality of their action, and overall competence.

Gender was of particular interest in this study for two main reasons. First, gender has a pervasive effect on children's perceptions of who is most likely to pursue certain activities or occupations (e.g., Liben et al., 2001; Mulvey et al., 2017; Ndobu, 2013; Weisgram et al., 2010; Weisgram et al., 2014). In some contexts, children continue to prefer same-gender individuals (e.g., to learn something new, Boseovski et al., 2016) despite a decrease in preferences for ingroup members by 7 years of age (Aboud, 2008). Second, children make inferences about competence or intelligence based on gender (e.g., Bian et al., 2017) and use gender to reason about who has authority in certain social settings (e.g., decision-making power; Charafeddine et

al., 2020; Mandalaywala et al., 2020). The workplace atmosphere may be one context that taps into competence and authority or power concepts. Children are aware of which jobs are occupied disproportionately by men and that these jobs are considered higher status relative to jobs occupied by a female majority (e.g., Liben et al., 2001). Therefore, the current study focused on children's perceptions of female experts who make mistakes in stereotypically masculine occupations and how children evaluate these experts relative to male experts in these professions.

Competence-related stereotypes may also be particularly relevant in workplace contexts in which children may need to evaluate knowledge or expertise. By middle childhood, children report that men are more likely to be highly intelligent compared to women (e.g., Bian et al., 2017; Hammond & Cimpian, 2021; Powlishta, 1995). A significant number of girls pursue masculine-oriented changes in their identity during middle childhood (e.g., identify as “tomboys,” see Halim et al., 2011) and yet begin to show a decreasing interest in stereotypically masculine vocational interests by adolescence (e.g., Weisgram & Bigler, 2006). The presence of female role models can ameliorate gender stereotypes about some professions among older children and adolescents (e.g., González-Pérez et al., 2020), but what effect would these role models have on children's perceptions of expertise if they are not infallible?

In addition to the age-related change in children's gender stereotypes, early to middle childhood was of particular interest for this study for two additional reasons. First, children's appreciation of knowledge and expertise deepens in this same period. By 8 years of age, children have a nuanced understanding of expertise (e.g., Keil et al., 2008) and continue to maintain generally positive impressions of people who are knowledgeable (e.g., Heyman & Dweck, 1998). Second, children's ability to reason about whether someone produces a positive or negative outcome on purpose or not (e.g., mistakes) is influenced by age-related improvement in

children's theory of mind or mental state reasoning abilities (e.g., Killen et al., 2011). One particularly relevant measure that was developed to address children's reasoning about peer "accidental transgressors" (i.e., someone who makes a mistake) was used in the present study (morally relevant theory of mind task, Killen et al., 2011) to explore connections between children's developing understanding of intentionality and their evaluations of an expert that makes a mistake.

In this study, 4- to 8-year-olds heard stories in which a female expert in a stereotypically masculine domain made a mistake in her profession. Children were asked to evaluate the severity of her error and the level of deserved punishment, to judge her intentions, and to indicate whether they would prefer to learn from this expert or a male expert in the future. Children were also asked to make status-related judgments concerning these experts and to rate the perceived effort of both experts to become professionals in their field. The relation between children's morally relevant theory of mind ability (MOTOM) and these judgments was also explored to better understand whether development in children's understanding of intentionality might relate to their judgments of an expert's mistake in this context. Data collection for the comparison to a male expert who makes a mistake is planned (e.g., a male expert in a stereotypically feminine occupation makes a mistake at work). Two additional comparisons are also planned (i.e., a female expert makes a mistake in a stereotypically feminine occupation, a male expert makes a mistake in a stereotypically masculine occupation).

## **Method**

### **Participants**

Seventy-seven 4- to 8-year-olds (33 girls;  $M = 78.98$  months,  $SD = 18.46$ ) participated in this study. Data from 12 participants were unusable due to issues with Zoom audio settings that

could not be successfully resolved during the testing session ( $n = 1$ ), parent or sibling interference ( $n = 6$ ), refusal to comply with task instructions or finish the task ( $n = 3$ ), or failure to pass the comprehension checks ( $n = 2$ ). The current sample size for this study includes 65 4- to 8-year-olds 33 girls;  $M = 77.10$  months,  $SD = 18.34$ ). Twenty of these participants were contacted from a preexisting volunteer database of families who had expressed interest in participating in child development research or from preexisting relationships with childcare programs and daycares. Participants recruited from these two sources lived in the Triad and surrounding community. Due to the COVID-19 pandemic, the remaining 45 participants were recruited from a website constructed by developmental psychologists to facilitate virtual research during the COVID-19 pandemic (i.e., Children Helping Science) and word of mouth (e.g., sharing a study flyer with friends and family to pass along to their friends or neighbors). Thirty-eight of the participants recruited via one of these latter two methods lived out-of-state.

Sixty guardians reported race information, and they identified their children as 61.5% White, 3.1% Black or African American, and 15.4% Asian or Pacific Islander; 12.3% selected more than one racial identity; 3.1% identified their children as Hispanic or Latinx. Fifty-two guardians reported annual household income (not including parents who indicated “prefer not to respond”); 27.7% indicated an income “over \$120,000,” 23.1% reported an income “between \$90,000 and \$120,000,” 21.5% reported an income “between \$60,000 and \$90,000,” and the remaining families (7.6%) reported incomes below \$60,000. Parents were asked to report whether any adult in their child’s immediate household worked in an occupation related to construction/engineering or fire rescue. Forty-five families provided this information and only 6 of these households reported that children lived with a parent or guardian in a profession that was construction-related (no households reported a parent/guardian with a fire rescue position).

Testing sessions took place virtually on Zoom and lasted about 30 minutes. The experimenter screen-shared images that accompanied the stories used in this study. The research team obtained consent from parents or legal guardians during scheduling of the online session (n=59) or verbally for those parents who encountered difficulty with the electronic form or did not have access to a printer or scanner (n=6). In addition, children 7 years of age and older provided written assent via electronic signature or verbally for those children who wanted to ask the experimenter questions about the form on Zoom before agreeing to participate or in households where access for electronic forms or a printer/scanner was not possible (n=6).

## **Materials**

Images from two online stock image databases (Dreamstime and Vecteezy) were used to create the stimuli for this study. Adobe Illustrator was used to manipulate characters (e.g., create the same skin tone across characters) and scenes (e.g., remove irrelevant objects from backgrounds) and control for similarity of stimuli across tasks. Each completed scene was exported to a PowerPoint format that was screen-shared with participants during the testing session.

## **Design**

This study used a 2 (age: 4- to 5- year-olds vs. 6- to 8-year-olds) x 2 (participant gender: female vs. male) between-subjects design. All participants received two stories; in each story, a female expert made an occupational mistake in a stereotypically masculine domain (i.e., construction and fire rescue). These occupations were selected based on the combination of children's responses about these occupations during pilot data collection and the rate of female representation in each industry in the United States. According to the U.S. Bureau of Labor and Statistics, 10.9% of the construction work force is female as of 2020, with as little as 1.5%

serving visibly on construction job sites (rather than in construction office or administrative support roles; National Association of Women in Construction). Similarly, about 8% of firefighters are female nationwide (National Fire Protection Association, 2018).

## **Procedure**

Each participant engaged in a one-on-one Zoom session with one of two experimenters (both female) and the session began with the same warm-up and verbal assent process described in the dissertation. Participants heard two stories in which a male and a female expert were working together in a shared occupation and the female expert made a mistake. Each story involved a stereotypically masculine occupation (i.e., construction and fire rescue). The female expert made the mistake in both stories. The presentation order of these stories was counterbalanced across participants. Participants responded to questions both before and after the revelation that the female expert was the person who made the mistake (i.e., “before reveal” and “after reveal” below).

### ***Before Reveal***

For each story, the experimenter began with an introduction to the two experts, who were depicted in the appropriate occupational uniform (e.g., fire helmet and turnout gear), and labeled them as a man and a woman. Then, the experimenter described each person as knowledgeable about the target occupation (e.g., “This is Patrick. He is a firefighter, so he knows all about putting out fires and how to drive the fire truck. He knows about all different ways to stop a fire.”). Critically, both the male and female expert had the same occupation and the same knowledge about that occupation.

These introductions were followed by two forced-choice comprehension checks to ensure that participants accurately identified both the male and female expert as knowing “a lot” about



the profession (e.g., “Does Patrick, this firefighter the man, know a lot or a little about fighting fires?”; answer choices randomized). Fifteen participants (7 girls, 7 younger children) required repetition of the introduction descriptions to pass these comprehension checks; the remaining participants passed the comprehension checks without feedback. The order of the expert introductions was counterbalanced across participants.

After these introductions, participants heard about an occupation-relevant situation in which a mistake was made (“Today, Jessica and Patrick are working together to put out the fire at this house, but one of them chose the wrong hose to put out the fire! So it’s still not safe.”). Critically, the identity of the expert who made the mistake (i.e., the male or female expert) was not revealed at this stage of the session.

**Initial Judgment.** Participants were asked a forced-choice initial judgment question, “Who do you think chose the wrong hose?”. Participants received a score of 0 if they selected the male expert and a score of 1 if they selected the female expert. This question was followed by an open-ended prompt for participants to justify their selection.

### ***After Reveal***

Next, the experimenter revealed that the female expert made the mistake (e.g., “We found out that it was actually Jessica who chose the wrong hose to put out this fire.”). Participants responded to a series of questions for each story after this statement; the main dependent measures are described below along with the preliminary results.

**Intentionality Judgments.** Participants were asked one open-ended question to gain information about their rationale for the female expert’s mistake (e.g., “Why did Jessica choose the wrong hose from the truck?”). This question was followed by a forced-choice question to assess participants’ understanding of the expert’s intention (e.g., “Did Jessica choose the wrong

hose by accident or on purpose?”). Participants who spontaneously produced an intention statement in response to the open-ended prompt did not receive the forced-choice question. Participants received a score of “0” if they indicated that the action was intentional (i.e., “on purpose”) and a score of “1” if they indicated that the action was unintentional (i.e., “by accident”).

Next, participants were asked two forced-choice questions to assess their perceptions of the frequency of this type of mistake in the broader population of other women versus other experts in the same field (e.g., “Do you think that this happens to just this firefighter/woman or to a lot of firefighters/women?”). These two questions were presented in a counterbalanced order and each of these questions was followed by an open-ended prompt for participants to justify their responses. These qualitative responses were categorized as either a reference to intention or a reference to a gender stereotype. Coding is in progress, with 100% of responses coded by one experimenter and about 50% coded by a second experimenter.

**Deserved Punishment Judgments.** As part of a larger block of judgments, participants were asked one forced choice-question regarding the deserved punishment for the female expert (e.g., “Should Jessica get in a little bit of trouble or a lot of trouble?”). Participants received a score of “0” if they indicated “a little” and a score of “1” if they indicated “a lot” for both questions. Participants were also asked to justify their responses. These qualitative responses were categorized as a reference to intention, a reference to gender/a gender stereotype, or a reference to expertise/competency.

The next several question blocks addressed participants’ perceptions of both experts, rather than their perceptions of only the female expert who made a mistake.

**Future Preference Judgments.** Participants were asked two forced-choice questions regarding which expert they would want to learn from (e.g., “If you wanted to learn about firefighting, who would you want to learn from?”) and which expert they would want to work for (e.g., “If you worked on this team, who would you want to work for?”). Participants received a score of “0” if they selected the female expert and a score of “1” if they selected the male expert for both questions. Participants were also asked to justify these selections and their qualitative responses were categorized as a reference to gender or a reference to expertise/competency.

**Trait Attributions.** Finally, participants in this study were asked the same forced-choice trait attribution items described in Study 1 (e.g., “Is Jessica, mean, nice, or in the middle?”). Participants were asked to make a trait attribution about each expert and these two attribution items were presented in counterbalanced order across participants.

### **Preliminary Results**

Chi-square tests of independence were conducted to compare the demographic composition of database-recruited participants to those participants recruited via other methods; these two groups did not differ demographically (age  $p = .75$ , gender  $p = .54$ , household income  $p = .89$ , race and ethnicity  $ps > .37$ ). Therefore, all remaining analyses are presented collapsed across both groups.

A preliminary analysis of variance (ANOVA) indicated that story domain (i.e., construction or firefighting) did not have a systematic influence on responses, across quantitative measures. Therefore, the main analysis for each of the measures reported below was a 2(Age: 4- to 5-year-olds vs. 6- to 8-year-olds) X 2(Participant Gender: male vs. female) between-subjects analysis of variance (ANOVA) conducted on responses collapsed across story. Additional analyses are described below when they were conducted.

### ***Initial Judgment***

The ANOVA revealed no significant effects of age,  $F(1, 61) < 0.00$ ,  $p = 1.0$ ,  $\eta_p^2 = 0.00$ , gender  $F(1, 61) = 1.95$ ,  $p = .17$ ,  $\eta_p^2 = 0.03$ , nor a significant interaction between these terms  $F(1, 61) = .15$ ,  $p = .70$ ,  $\eta_p^2 = 0.003$ . *T*-tests against chance performance (score of 1) were conducted to examine whether one of the experts was selected systematically as the predicted mistake maker. Boys did not systematically endorse either expert as the mistake maker,  $M = 1.03$ ,  $SD = .79$ ,  $t(28) = .24$ ,  $p = .81$ ,  $d = .78$ ; girls demonstrated only a marginal tendency to endorse the male expert as the mistake maker,  $M = .76$ ,  $SD = .75$ ,  $t(32) = -1.85$ ,  $p = .07$ ,  $d = .75$ .

### ***Expert Intention Judgment***

The ANOVA revealed a main effect of age,  $F(1, 61) = 10.63$ ,  $p = .002$ ,  $\eta_p^2 = .16$ . Younger children ( $M = 1.39$ ,  $SD = .72$ ) were more likely than older children ( $M = 1.87$ ,  $SD = .43$ ) to indicate that the female expert acted on purpose once her mistake had been revealed. There was no significant effect of participant gender  $F(1, 61) = .72$ ,  $p = .40$ ,  $\eta_p^2 = .01$ , nor a significant interaction  $F(1, 61) = .003$ ,  $p = .96$ ,  $\eta_p^2 = 0.00$ . *T*-tests against chance performance (1) were conducted to examine whether each age group made systematic intention judgments for the female expert. Both younger and older children systematically judged that the female expert acted unintentionally: younger  $t(30) = 3.01$ ,  $p = .005$ ,  $d = .72$ ; older  $t(30) = 11.34$ ,  $p < .001$ ,  $d = .43$ .

### ***Deserved Punishment***

The ANOVA revealed a significant effect of age,  $F(1, 61) = 5.57$ ,  $p = .022$ ,  $\eta_p^2 = .09$ . Older children ( $M = .55$ ,  $SD = .68$ ) were more likely than younger children ( $M = .97$ ,  $SD = .82$ ) to indicate that the female expert deserved to get in “a little” trouble (i.e., younger children

endorsed higher rates of deserved punishment than older children). Only older children systematically endorsed “a little” trouble,  $t(30) = -3.72, p = .001, d = .68$ ; younger children were unsystematic,  $t(28) = -.23, p = .82, d = .82$ .

There was also a significant effect of participant gender  $F(1, 61) = 3.91, p = .053, \eta_p^2 = .07$ . Boys ( $M = .93, SD = .81$ ) were more likely than girls ( $M = .59, SD = .71$ ) to endorse higher rates of deserved punishment for the female expert. However, boys did not systematically endorse “a lot” or “a little” trouble,  $t(28) = -.47, p = .65, d = .81$ , whereas girls systematically endorsed “a little” trouble,  $t(31) = -3.23, p = .003, d = .71$ .

The interaction between participant age and gender was not significant,  $F(1, 61) = .04, p = .85, \eta_p^2 = .001$ .

### ***Future Preference Judgments***

The ANOVA for the future learning preference revealed no significant effects of age,  $F(1, 61) = 1.51, p = .22, \eta_p^2 = .01$ , gender,  $F(1, 61) = 2.45, p = .12, \eta_p^2 = .04$ , nor a significant interaction between these variables,  $F(1, 61) < .00, p = 1.00, \eta_p^2 = .001$ . Both younger and older children systematically endorsed the male expert for future learning, younger:  $M = .70, SD = .79, t(29) = -2.07, p = .048, d = .79$ ; older:  $M = .45, SD = .62, t(30) = -4.89, p < .001, d = .62$ .

In contrast, the ANOVA for the future work preference revealed a significant effect of gender,  $F(1, 61) = 12.27, p < .001, \eta_p^2 = .18$ , which was qualified by a significant interaction with age,  $F(1, 61) = 5.04, p = .029, \eta_p^2 = .08$ . Among 4- to 5-year-olds, girls ( $M = 1.28, SD = .83$ ) endorsed the female expert significantly more than boys, who endorsed the male expert ( $M = .25, SD = .62$ ; Bonferroni-corrected pairwise comparison  $p < .001$ ). However, these younger girls did not endorse the female expert systematically,  $t(17) = 1.43, p = .17, d = .83$ . In contrast,

younger boys systematically endorsed the male expert for future work,  $t(11) = -4.18, p = .002, d = .62$ , although data collection is ongoing. Among 6- to 8-year-olds, girls ( $M = .60, SD = .74$ ) and boys ( $M = .38, SD = .50$ ) did not significantly differ from each other (Bonferroni-corrected pairwise comparison  $p = .37$ ); both older groups systematically endorsed the male expert; girls:  $t(14) = -2.10, p = .05, d = .74$ ; boys:  $t(15) = -5.00, p < .001, d = .50$ .

### **Preliminary Summary**

These preliminary data suggest that children do not make initial assumptions about competence based on gender stereotypes, but age and participant gender influence children's reasoning about an expert's intentions and deserved punishment after children discover that a mistake has been made. Prior to the reveal of the mistake maker's identity, children did not systematically judge that the female expert was the person who made a mistake in a stereotypically masculine occupation. In fact, girls demonstrated a marginal tendency to judge that it was the male expert who had made a mistake (i.e., initial judgments). Consistent with age-related improvement in children's reasoning about intentionality (Killen et al., 2011; Mulvey et al., 2020), children in this study increasingly indicated that the female expert's mistake was unintentional and endorsed lower levels of punishment (i.e., "a lot" versus "a little") with age. Although children's reasoning about which expert to rely on in future scenarios was based primarily on their understanding of mistakes and expertise, age-related changes in children's attention to gender (e.g., ingroup preference, Aboud, 2008) may have also had a role in these judgments. Specifically, 4- to 5-year-old girls displayed a pattern of initial judgments and deserved punishment judgments consistent with an ingroup bias, and around half of 4- to 5-year-old girls continued to prefer female experts despite evidence of a mistake. Taken together, these preliminary findings suggest that with age, children disregard gender stereotypes in their initial

judgments of competence, but that these stereotypes may influence some judgments about an expert once a mistake is revealed. These findings are discussed in terms of how children's perceptions of knowledgeable people may shift across situations with different types of negative outcomes and in the context of the proposed framework for children's reasoning about knowledgeable people.

In connection with the findings from the dissertation study, these preliminary findings from the companion study indicate that negative event contexts influence children's evaluations of knowledgeable people and their perceived competence. The findings from the dissertation suggest that children view knowledge as an asset to resolve negative events, whereas these preliminary findings indicate that children may also be particularly critical of knowledgeable people who fail to demonstrate competence. Indeed, children did not make assumptions about whether the male or female expert had made the mistake in their initial judgments but used mistake information to evaluate competence. During the preschool period, children forgive a few instances of inaccuracy in some learning-related contexts and continue to trust an individual who demonstrates knowledge "most of the time" (e.g., word-learning, Pasquini et al., 2007).

Given that children's perceptions of competence tend toward the impression that men are more intelligent than women (Bian et al., 2017), it may have taken cognitive effort to consider these experts as equally knowledgeable and children were unable to maintain this effort once the mistake was revealed (Cimpian & Salomon, 2014; Richardson et al., 2012). However, a parallel condition of a male expert who makes mistakes is needed to unpack this possible interpretation. The occupational context may highlight gender stereotypes and in turn increase the salience of those stereotypes relative to other cues to knowledge during children's evaluation of competence (see Marble & Boseovski, 2020). Based on this perspective, if children are asked to evaluate the

future potential of a male expert as a teacher or leader in a stereotypically masculine occupation, they may continue to trust and endorse the male over the female expert, even when the male expert makes a mistake. This pattern would be predicted to be particularly strong among 4- to 5-year-old boys, for whom the ingroup familiarity of a male expert may be strongest (Aboud, 2008).

Based on the single condition of the present study, it is most likely that children were critical of the female expert due to the safety implications of her mistake. Indeed, some children referred to the potential harm for an unknown or ambiguous target(s) (e.g., references to injury or even death due to building safety and fire safety). In addition to young children's difficulty judging whether individuals are responsible for unintentional actions (Killen et al., 2011; Thorn et al., 2020), issues of safety are particularly salient during early childhood (e.g., Boseovski & Thurman, 2014; Nucci & Weber, 1995). The combination of safety and gender as salient cues in these negative event contexts may have created doubts about the ability for this female expert to teach and lead in future scenarios. Consistent with the possibility that the salience of these cues influenced children's judgments of this expert in combination with one another, children's evaluations of deserved punishment revealed both significant age and gender effects. Additional data collection of the remaining three conditions would inform the extent to which safety concerns versus gender stereotypes have the most influence on children's evaluations of experts. Children would be expected to disregard stereotypes and endorse whichever expert did not make a mistake, regardless of occupation, if safety and competence concerns are children's top priority.

One additional consideration for future data collection for this project is the extent to which children's reasoning about the expert's intentionality and deserved punishment align with



children's reasoning about knowledge in the dissertation. In that study, children referred often to the knowledgeable bystander's ability to "know what to do." In this companion study, 4- to 5-year-olds' higher endorsement of deserved punishment and intentionality relative to 6- to 8-year-olds might reflect expectations that the supposedly knowledgeable expert "knew better" than to make such a mistake. Young children may not only hold positive impressions of knowledgeable people (e.g., Cain et al., 1997; Heyman & Dweck, 1998), but may also conflate knowledge with an actor's intentions (see Phillips et al., 2021).

In the context of a proposed framework for children's reasoning about knowledgeable people, these preliminary findings provide additional insight alongside the dissertation that both situation cues (e.g., negative events) and characteristics of the people involved in those events (e.g., gender, wealth) influence children's perceptions of knowledge. These preliminary findings suggest that young children may rely on social category heuristics to reason about the future abilities of an expert or children's preference to affiliate with that individual, but only if those heuristics have been reinforced in the present. These findings also suggest that age-related differences in children's reasoning about intentional versus unintentional behavior influence children's perceptions of the accountability of knowledgeable people who make mistakes. Although children tend to hold positive impressions of knowledgeable people, children may be less likely to trust experts who incidentally demonstrate negative behavior. Additional research is needed to determine whether children's interpretation of negative behaviors such as mistakes are judged punitively at young ages due to children's reasoning about potential harm and welfare during early childhood.

## APPENDIX D: REFLECTION ON THE RESEARCH CHALLENGES ASSOCIATED WITH THE COVID-19 PANDEMIC

Several challenges arose for child development research in relation to the COVID-19 pandemic, which included barriers to participant recruitment and participation as well as the challenges associated with pivoting study materials to an electronic format. However, some of these challenges presented opportunities to learn new skills or reimagine how this research can be conducted moving forward. With regard to study materials and stimuli, this dissertation in its original format was already underway at the time of the March 2020 shutdown. Therefore, the first challenge was to decide whether the two studies in their original form were feasible to translate to an online format. For example, consideration of length and complexity was important given that young children were expected to struggle to maintain attention over a video chat platform for extended periods of time. In addition, some online platforms used for research prior to the pandemic were intended to be unmoderated by an experimenter, which would require parents to be present to scaffold sessions for many studies (Scott & Schulz, 2017; Rhodes et al., 2020).

Stimuli needed to be revised once the design was finalized for virtual testing, and undergraduate research assistants needed to be re-trained to administer study protocols in a virtual format. For example, experimenters needed to become familiar with the Zoom platform and agree on protocols for troubleshooting internet connectivity issues (for both experimenters and participants), audio and video troubleshooting, and participant hesitance with interacting via Zoom. In the latter case, some younger children were used to in-person warm up interactions (e.g., in a lab or daycare setting) and procedures were created to help experimenters work with

parents over Zoom to ensure that these children were comfortable before testing began. In addition, cues or animations needed to be carefully planned to mimic the advantages of in-person research, where experimenters can use face and hand gestures to help participants maintain attention and stay on task. One advantage of this process was that it required that I deepen my program skills (e.g., with Adobe Illustrator). For example, I created voice-over video training materials for undergraduate assistants to reference for testing and data entry tasks to approximate the conversations we would have naturally in the lab that would facilitate their work.

With regard to recruitment, the first challenge was to navigate appropriate procedures with the university's IRB to understand participant privacy and informed consent practices online. Several strategies were employed to recruit participants for the dissertation which included both preexisting and novel methods. One challenge with contacting families from preexisting resources (volunteer database, local daycare/preschool partnerships) was the variety of concerns and differences in procedures for sharing information during the pandemic. For example, each local daycare had its own set of procedures related to COVID-19 safety (e.g., some schools followed Guilford County School system guidelines, others followed a corporate policy, and some created their own protocols).

In-depth discussions with individual daycare directors were required to determine whether their policies would allow me to speak to parents outside, masked, and socially distanced, or distribute flyers through the classrooms. Some daycares who have worked with us consistently in the past were too overwhelmed to participate with us in any way, did not respond to calls or emails, or permanently shut down during the pandemic. Unfortunately, a handful of the day care partners also closed temporarily at unpredicted times due to clusters of cases, which also hindered recruitment efforts. Families were also dealing with a number of transitions, and

many were too overwhelmed to participate in research; several families indicated that they were “zoomed out” within the first few months of school transitions to virtual learning. Other families reported working in essential fields and feeling that they did not have time for volunteer activities. These recruitment challenges also presented new opportunities to seek out creative recruitment options. For example, several local businesses supported our efforts by allowing us to post flyers in windows or come out to specific outdoor events to speak to small groups of parents. In addition, I participated with Children Helping Science, a website put together by developmental researchers from other institutions, which posted study ads with links for families to sign up for participation. I also networked with former lab members, neighbors, family, and friends to distribute ads and study information over social media and chat groups.

As noted by other researchers (e.g., Rhodes et al., 2020; Sheskin & Keil, 2018), there may be some advantages to virtual data collection moving forward. For example, virtual access to participants can increase the geographical diversity in child development research samples (Nielsen et al., 2017). In addition, it is possible to schedule a higher number of testing sessions per day or per week because some aspects of in-person sessions are absent in the virtual format (e.g., meeting families for parking, guiding them to the lab, allowing ample time for children to settle to an unfamiliar space; Sheskin & Keil, 2018). Research participation that takes place in a familiar setting for the child may also confer additional benefits regarding a reduced number of distractions or increased willingness to participate for some children. Despite these potential advantages, the field will need to consider whether online access is universal enough to obtain the diversity of samples that has been suggested (see Lourenco & Tasimi, 2020). In addition, researchers will need to consider whether all study designs are suitable for virtual formats and/or

the extent to which some research questions can only be addressed through in-person, laboratory-based sessions.

There are also potential issues faced by researchers in the field which virtual platforms, at present, do not ameliorate. For example, the ability for researchers to provide competitive levels of participant compensation varies. Researchers from more established labs or institutions may be more likely to have the resources to attract participants whereas other researchers may have limited funds. Although efforts were made on platforms such as Children Helping Science to limit advertising on the basis on monetary compensation, parents often asked whether monetary compensation would be provided for their child's participation in the study. Virtual platforms also do not address certain logistic conflicts such as time zone differences. For example, later than typical sessions were required to accommodate participants from the west coast who expressed interest in the present study. Researchers who may want to leverage virtual platforms to increase cross-cultural work or expand the diversity of their samples will have to consider the feasibility of holding regular meetings with researchers from international institutions or conducting sessions far outside of typical working hours if those studies require moderated sessions (or the limitations of unmoderated sessions). Both of these issues raise important questions not only for the diversity of participants but also of the institutions that are involved in this research moving forward.