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Mental State Attributes in Narratives about Characters of another Gender and Race: An Intersection of Naïve Psychology and Naïve Sociology

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Mental State Attributes in Narratives about Characters of another Gender and Race:

An Intersection of Naïve Psychology and Naïve Sociology

by

Wyntre Stout

A Thesis

Presented to the Graduate and Research Committee

of Lehigh University

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in

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An Intersection of Naïve Psychology and Naïve Sociology
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ABSTRACT

The present study extends the literature on naïve psychology and naïve sociology, the everyday systems of thinking about others as psychological beings and members of social categories. A novel narrative paradigm was used to examine one way that these two systems might intersect, testing whether children varied their attributions of internal mental experience based on the social group membership of story characters. Seventy-five children ages 6 to 10 and a comparison group of 33 young adults (all identifying as White/Caucasian) generated stories about characters whose membership in the social groups of gender and race was manipulated. The number of emotion, cognition, and intention attributions as well as the quality and complexity of mentalizing for narrative protagonists were assessed. It was predicted that participants would engage in more mentalization for characters that are gender and race ingroup members and less mentalization for characters that are outgroup members. However, contrary to predictions, results revealed that the mentalizing produced by both children and young adults did not differ based on the story characters' membership in the basic social groups of gender and race. However, issues with the narrative paradigm may have obscured any subtle differences in mentalizing based on the identity of the story characters. Thus, the lack of demonstrated differences in mentalizing based on characters' social group membership should not be taken as strong evidence of equal mentalizing across social groups. Additional work is needed to further test this question and better-explore this particular intersection of naïve psychology and naïve sociology.

Mental State Attributes in Narratives about Characters of another Gender and Race:
An Intersection of Naïve Psychology and Naïve Sociology

Developing a system for interpreting and explaining the behavior of others is one of the most important and challenging tasks young children face (Hirschfeld, 2008). Children construct models that help them make sense of others' actions, which can be interpreted in a multitude of ways (Wellman, 2014). For example, Annie may walk across the room to pick up a doll because she wants to play with it, because she believes her little sister would like the doll, or because she is selfish and doesn't want the other kids to play with it. These potential explanations of Annie's behavior all reference her mental states (e.g., thoughts, beliefs, intentions, and desires), and thus fall under the primary model used to understand other's actions which involves mentalizing or attributing mental states to others (Wellman, 1990). This everyday system of thinking about others as psychological beings, interactors, and selves is called naïve psychology (Wellman, Cross, & Watson, 2001). In addition to this psychological reasoning system, however, there is another system that is relevant to the everyday understanding of others' behavior but does not require referencing mental states. This system, known as naïve sociology or the system of thinking about social categories (Hirschfeld, 2008), extends beyond the individual and references membership in social groups (Rhodes, 2012). Returning to the example of Annie, naïve sociology could allow one to infer that Annie picked up the doll instead of a nearby truck because she is a girl. Naïve psychology and naïve sociology are thought to be distinct cognitive systems that children employ in their everyday understanding of the social world (Hirschfeld, 2008). The purpose of the present study is to examine one area in which these two systems might intersect and influence each other:

that is, when making mental state inferences about others who are members of different basic social categories.

Naïve Theories of How the World Works

As children work to understand the world in early development they construct systems of foundational human knowledge (Wellman & Gelman, 1992). These systems are conceptualized as naïve theories, defined by Wellman and Gelman as nonscientists' everyday understandings of basic bodies of knowledge about important aspects of the world, including naïve physics, naïve biology, naïve psychology, and, although less widely-recognized, naïve sociology. These naïve theories allow children to explain the phenomena they observe as well as make predictions or inferences about what they are unable to observe directly, such as gravity pulling a ball to the ground, food helping animals maintain life, intention and desire driving a person's reach for a ball, and social expectations defining appropriate behavior towards others. Naïve theories are thought to be similar to scientific theories in that they are constructed and revised in order to reconcile data encountered through various experiences (see Wellman, 2014). Changes to naïve theories are constrained by initial conceptual knowledge and proceed in orderly conceptual progressions (Rhodes & Wellman, 2013). Naïve theories develop early and motivate further conceptual development as children come to understand the world (Wellman & Gelman, 1992).

Naïve Psychology. One crucially important naïve theory in early development is naïve psychology—the everyday system of thinking about others as psychological beings. Naïve psychology is based on the cognitive capacity to recognize, infer, and reason about mental states, known as theory of mind (ToM; Wellman et al., 2001).

Research suggests that children actively construct and revise their ToM understanding through a series of conceptual achievements beginning in infancy (see Wellman, 2015). For example, in the first year of life, infants demonstrate an understanding of the intentional, goal-directed nature of human action (Brandone & Wellman, 2009; Brandone, Horwitz, Aslin, & Wellman, 2014; see also Woodward, 1999). Later, in the second year, infants broaden their mental state understanding to include recognition of others' knowledge (Liszkowski, Carpenter, & Tomasello, 2008) and perceptual experience (Meltzoff & Brooks, 2008). During this time, infants also come to understand the subjective nature of mental states, recognizing that others can desire, see, and know something different than the infant himself or herself (e.g., Repacholi & Gopnik, 1997). Further, although such an interpretation is controversial, new studies using inventive methodology suggest that infants may also have some form of understanding of the representational nature of mental states and that people act on the basis of their false beliefs (for a review see Baillargeon, Scott, & He, 2010; but see Haith, 1998).

Additional important conceptual shifts in ToM reasoning are also evident during the preschool years. These shifts are primarily assessed using Wellman and Liu's (2004) ToM scale, which includes tasks designed to investigate when children explicitly demonstrate their understanding that (a) people can have different desires for the same thing (diverse desires); (b) people can have different beliefs about a common situation (diverse beliefs); (c) people who are uninformed are ignorant (knowledge access); (d) people act on their beliefs even when those beliefs do not reflect reality (false belief); and (e) people may display an emotion different from what they are actually feeling (hidden emotions). Children across multiple cultures tend to systematically proceed through this

series of understandings between roughly 2 and 6 years, with the transition between each step and the next taking three to six months (Peterson, Wellman, & Liu, 2005; Wellman & Liu, 2004). In reference to the classic false belief task in particular, children move from consistently failing this task at age three, to performing at chance, and then reliably passing it by age five (Wellman et al., 2001), although children as young as three demonstrate some implicit understanding of false belief (Rhodes & Brandone, 2014).

Consistent with the view that children actively construct and revise their ToM based on their interactions with the environment, research suggests that individual and cultural differences in the kinds of evidence children are exposed to regarding mental states are related to differences in when children pass specific ToM tasks. For example, children who are exposed to more talk about mental states in family discourse pass false belief tasks earlier than children who hear less mental state talk overall (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). Similarly, children who have siblings, and thus are likely exposed to more evidence regarding other's intentions, beliefs, and desires, also pass false belief tasks earlier (Perner, Ruffman, & Leekam, 1994). The converse of these boosts to ToM understanding is also true. Children whose social-conversational experiences are impoverished, such as deaf children born to hearing parents who are exposed to very little discourse about internal states, demonstrate sequential delays at each step in ToM understanding (Peterson & Siegal, 1995; Peterson et al., 2005). Further, despite the finding that most children across cultures follow a predictable sequence of ToM acquisition as measured by Wellman and Liu's (2004) ToM scale (see Wellman, 2015), cultural differences in the amount of talk children hear about knowing versus thinking are related to when children pass the knowledge acquisition and

diverse beliefs task (Shahaeian, Peterson, Slaughter, & Wellman, 2011; Wellman, Fang, Liu, Zhu, & Liu, 2006).

The advances in naïve psychology that occur as children construct and revise their ToM understanding play important roles in children's real-world interactions. For example, passing false belief tasks predicts teacher-assessments of social competence (Astington, 2003; Peterson, Slaughter, & Paynter, 2007; Watson, Nixon, Wilson, & Capage, 1999). False belief understanding is also associated with children's popularity with peers (Peterson & Siegal, 2002; Slaughter, Dennis, & Pritchard, 2002) and peer interactions (Dunn, Cutting, & Demetriou, 2000; Suway, Degnan, Sussman, & Fox, 2012) including the ability to engage in pretend play (Astington & Jenkins, 1995) and games like hide and seek, as well as the ability to keep secrets (Peskin & Ardino, 2003). Although the relevance of ToM ability to social functioning across the lifespan is not as well documented (but see Brandone, 2015, and Wellman, 2015, for relevant reviews), there is preliminary evidence that the ability to infer and reason about others' mental states is also related to social outcomes in young adults (e.g. Brandone, Werner, & Stout, 2014).

Overall, research on the development of naïve psychology suggests that children draw from the experiences they encounter in the environment to construct in a series of successive developmental milestones their understanding of others in terms of mental states such as intentions, knowledge, desires, and beliefs. It is clear that this naïve psychology holds important implications for understanding and navigating social interactions. However, although naïve psychology may be the primary way children

understand others (as argued by Wellman, 2015), it is not the only way children make sense of the social world.

Naïve Sociology. The theory of social groups and categories is another system children construct to help them understand and navigate our intensely social world. One of the earliest to suggest that naïve sociology should be recognized as a system for understanding the social world, Hirschfeld (1995) argued that thinking about social categories such as race is “a precocious, domain-specific competency that coheres into a sophisticated system of reasoning” (p. 210). Naïve sociology has received considerably less attention than naïve psychology in the field of early conceptual development; however, social cognitive development researchers are beginning to recognize the importance of naïve sociology, calling it a “robust component of social cognition” (Rhodes, 2014, p.1; see also Banaji & Gelman, 2014; Wellman, 2015).

Research in the area of naïve sociology suggests that the ability to make distinctions between people based on membership in basic social groups emerges early in development. There is evidence that even infants make distinctions between people on the basis of social categories (for a review see Spelke, 2013) such as gender (e.g. Katz & Kohkin, 1983; Miller, 1983), race (e.g. Kelly et al., 2005), age (e.g. Brooks & Lewis, 1976) and language spoken (e.g. Mehler et al., 1988). One early indicator of this ability is the visual preference infants show in looking time studies for members of familiar social groups (see Kelly et al., 2005; Quinn, Yahr, Kuhn, Slater & Pascalis, 2002; Sangrigoli & de Schonen, 2004). Importantly, those who are most familiar to an infant are likely to be similar to each other and to the infant in terms of race, language spoken, religion, etc.

This preference for familiarity may provide an early starting point for group distinctions as well as ingroup preferences (Banaji, Baron, Dunham, & Olson, 2010).

The categories of gender and race (for respective reviews see Shutts, 2013, and Hirschfeld, 2008) appear to be especially important among the early emerging social categories (Shutts, Roben, & Spelke, 2013). At two years of age toddlers are able to label and sort photographs of people based on gender (Weinraub, Clemens, Sockloff, Ethridge, Gracely, & Myers, 1984) and begin to accurately label their own gender (Katz & Kohkin, 1983). Children also use the social category of gender in their social evaluations of other children as potential playmates, as evident by the robust preference for same-gender friends and playmates that is observed in toddlers (Maccoby & Jacklin, 1987; Martin, 1989; Shutts et al., 2013). Later in the preschool years, children begin to demonstrate an understanding of gender constancy, recognizing that gender has a physical basis and is not simply based on outward appearances (e.g., Bem, 1989). By middle childhood children reference deep-rooted beliefs about gender to structure their views of what preferences, interests, and behavior are appropriate and actively enforce these views in social interactions with peers (Martin, 1989; Martin et al., 2013; see also Miller, Margin, Fabes, & Hanish, 2013, and Shutts, 2013, for brief reviews).

The acquisition of race concepts follows a similar course. Even toddlers demonstrate a preference for same-race playmates and tend to play more with same-race friends (although this finding may be limited to toddlers of the racial majority group; Katz & Kohkin, 1983). Building on the ability to label one's own race (Katz & Kohkin, 1983), preschoolers reference racial group membership when categorizing people and choosing friends (Ramsey & Myers, 1990), as well as when making inferences about

social relationships, as in determining who is more likely to be friends with whom (Shutts et al., 2013). Although somewhat controversial, there is some evidence that preschool-aged children also recognize race constancy and understand that race (or at least skin color) is fixed at birth (Hirschfeld, 1996; but see Kinzler & Dautel, 2011). Importantly, by as young as five years of age, children's social categorization based on race leads to biases including preferences for racial ingroup members (see Banaji, Baron, Dunham, & Olson, 2008, for a review) and prejudice towards racial outgroup members (Aboud, 1988).

The ease with which children form social categories such as gender and race stems, in part, from the fact that, from early in development, children are highly attentive to cues signaling social group membership, such as generic language (Rhodes, Leslie, Bianchi, & Chalik, under review), basic naming and labeling (Waxman, 2010; Diesendruck & haLevi, 2006), and simple visual distinctions (Dunham, Baron, & Carey, 2011). Children can use such cues to delineate meaningful social groups even when the groups are artificial and unrelated to any real social categories (e.g. based on shirt color; Dunham et al., 2011). Once social groups are formed, they can be quite powerful conceptual tools. Children reference social category membership to make inferences about the behaviors and traits of others (Diesendruck & haLevi, 2006; Rhodes & Gelman, 2008, 2009; Shutts et al., 2013), evaluate social obligations (Rhodes, 2014), and guide their own identity and social preferences (Dunham & Emory, 2015; Dunham et al., 2011). Children also reference social categories to form generalized attitudes towards other groups that are implicated in intergroup problems such as stereotyping, prejudice, and discrimination (e.g. Aboud, 1988; Banaji et al., 2010; Dunham & Degner, 2008),

although it should be noted that there is not a consensus regarding whether these intergroup problems stem from a preference for ingroup members or derogation of outgroup members (e.g. see Zosuls et al., 2011, for a discussion of children's attitudes towards same- and other-gender peers).

Overall, naïve sociology and knowledge about social category membership serves as a general, abstract guide to understanding others' behavior in a complex social world (Abrams, Rutland, Ferrell, & Pelletier, 2009; Rhodes, 2012) and clearly occupies an important place in early development. Understanding how young children learn to think about social groups not only is informative about children's conceptual development, but also can shed light on important issues related to intergroup interactions.

Intersection of Naïve Psychology and Naïve Sociology

The evidence reviewed above suggests that children possess two cognitive systems designed to interpret and explain the behavior of others in the social world: one system, naïve psychology, whose purview includes intentional relationships between actions and mental states, and another system, naïve sociology, which is based on group assignments such as race and gender (Atran, 1996). Although some (Atran, 1996; Hirschfeld, 2008) have argued that these systems are independent and operate in distinct cognitive domains (see Hirschfeld, Bartmess, White, & Frith, 2007), naïve psychology and naïve sociology are nonetheless both applied to the common end of understanding others and navigating the social world. Thus, important questions remain regarding whether these systems are in fact independent and the extent to which they may overlap. Researchers have recently begun to advocate for examining the intersection of naïve psychology and naïve sociology in understanding others' behavior. For example,

Wellman and Miller (2008) argue that the traditional focus on ToM in social understanding neglects the broader social-psychological context. Echoing this idea, Rhodes (2012) observes that work in this area tends to focus on how children reason about individual mental states, and there is a need to examine how children reference social causes extending beyond the individual, such as membership in social categories. Finally, Wellman, most recently, calls for future research to “establish the nature and development of social cognition in all its breadth and interconnections” (2015, p. 14), including examining naïve psychology’s intersection with naïve sociology. As these recommendations suggest, the intersection of these two lay theories represents a promising yet relatively unexplored area that has important implications for real-world application as well as for an understanding of conceptual development.

Although there are likely many ways in which naïve psychology and naïve sociology may be interrelated (see Diesendruck & Hassin, 2006 for one demonstration), this paper focuses on one important possible intersection: how the extent to which children engage in ToM reasoning (i.e., mentalizing) about a person might be influenced by their knowledge about that person’s social group membership. There are at least two possible models of this particular intersection of naïve psychology and naïve sociology. One possibility is that children’s understanding of the mind is human-general and applied equally to all people, regardless of group membership. On this view, children’s understanding of others as psychological agents would not be influenced by social group membership and the extent to which children engage in mentalizing would be equal for all groups of people. This seems to be the assumption in the ToM literature because group membership distinctions are typically not addressed. Indeed, studies showing that

children engage in ToM reasoning even with animals or self-moving objects (e.g. Luo & Baillargeon, 2005; Szendre, 1996) suggest that psychological reasoning is readily generalizable and thus may not be influenced by factors such as social group membership. However, a second, alternative possibility is that children's understanding of others as psychological agents is in fact influenced by social group membership. On this view, children may modulate the extent to which they engage in mental state reasoning on the basis of group membership. In particular, children may attribute a richer and more complex psychological experience to members of their own social group as compared to outgroup members. Note that here the emphasis is not on the content or valence of the psychological characteristics children ascribe to others—although these may also differ based on social group membership and the stereotypes children hold about specific social groups (e.g., Aboud, 1988). Instead, the current focus is whether social group membership impacts the extent to which children engage in mentalizing and think about others as having rich and complex internal experiences.

The traditional literature on ToM development does not examine whether group membership influences the extent to which children engage in mental reasoning about others. However, there is evidence that adults' use of naïve psychology in everyday life is influenced by a variety of factors, including social group membership. For example, in their review Epley and Waytz (2010) argue that real-world psychological reasoning is influenced by both the context and the characteristics of the target under consideration in relationship to the perceiver, such that mentalizing is higher in interdependent contexts and toward targets who are close or similar to the perceiver, while mentalizing is lower in hierarchical contexts when the perceiver is in a place of power or when the targets are

distant or different outgroup members. Moreover, data suggest that there are systematic biases in adults' attribution of complex secondary emotions (socially-constructed emotions such as embarrassment, admiration, and nostalgia) to outgroup members irrespective of emotion valence, resulting in infrahumanization (Haslam, 2006). Infrahumanization refers to the tendency to attribute more uniquely human, secondary emotions to ingroup members and fewer of these complex emotions to outgroup members while simultaneously attributing equal levels of primary, or non-uniquely human emotions (e.g., happiness, fear), across ingroup and outgroup members (most often racial boundaries, White vs. Black; Leyens et al., 2000). Since infrahumanization is the “denial of the ‘human essence’” (Haslam, 2006. p. 255) carried out without any explicit derogation of the outgroup, it is a subtle yet potentially powerful form of dehumanization.

In addition to the findings of differential emotion attribution documented in the infrahumanization literature, one study examining differential attribution of other types of mental states based on characteristics of the target was identified. Kozak, Marsh, and Wegner (2006) showed that adults' attribution of higher order cognition and intentional agency was greater for liked than for disliked targets and was reduced for targets who were victims of misfortune. These findings provide initial evidence that adults' attributions of cognition and intentional agency are also influenced by features of the target under consideration.

A handful of developmental studies examining infrahumanization in children (see Table 1 for an overview) suggest that children as young as age six (Costello & Hodson, 2014; Martin, Bennett, & Murray, 2008) as well as older children and teenagers (Brown

& Eller, 2007; Martin et al. 2008; Vezzalia, Capozza, Stathi, & Giovannini, 2012) attribute more uniquely human emotions to ingroup members than to outgroup members in several intergroup contexts, including race (Black vs. White), immigration status (native vs. immigrant), school (private vs. public), and football team loyalty.

Infrahumanization findings provide important initial documentation of the role of group membership in children's attribution of mental states. However, these findings are limited to group differences in children's reasoning about complex emotions. If naïve psychology and naïve sociology do intersect here and mental state reasoning is influenced by group membership, then corresponding effects should be observed for mentalizing in general and for other mental states, including higher order cognition and intentional agency. Yet, no studies have examined these types of mental state reasoning in intergroup contexts with children. Thus, the extent to which children's mental state attribution is influenced by group membership remains a wide-open question that the present study was designed to address.

The Present Study

As is clear by the lack of studies addressing this intersection of naïve psychology and naïve sociology, important questions remain regarding whether children engage in mental state attribution differently based on social group membership. The aim of the present study is to address this gap by examining the extent to which children's mental state attributes are dependent on the social group membership of the target under consideration.

An ideal way to examine this question is to explore how children spontaneously talk about the mental states of others who are members of different social groups. In

particular, narrative represents one such way to elicit talk about intentions, beliefs, and emotions from both children and adults, as narratives, by definition, are constructed from the actions, intentions, and mental states of characters (Bower & Rinck, 1998; Bruner, 1986). Studies of narrative development document that children begin making mental state inferences in their stories at about age five (Griffin, Hemphill, Camp, Wolf, & College, 2013; Tompkins, Guo, & Justice, 2013). Importantly, narratives are also developmentally appropriate and constitute an engaging research paradigm for use with child participants. Furthermore, this paradigm allows the elicitation of talk about the mental states of various characters while circumventing pressure to respond in socially-acceptable ways when talking about or responding to questions regarding outgroup members.

In the present study, mental state talk in narratives was used to examine how children think and talk about the intentions, thoughts, and emotions of target individuals in neutral contexts whose membership in basic social categories of gender and race (Black/White) was manipulated. This narrative paradigm allows testing of the question of whether children engage in mental state attribution differently based on the social group membership of the target under consideration. Six-year-olds were selected as the lower age limit because by age six children have achieved a level of sophistication in their understanding of others' minds that allows them to reliably pass the classic false belief task as well as include mental state inferences in their narratives. Similarly, at this age children demonstrate a relatively sophisticated understanding of social categories and their implications (Abrams et al., 2009; Rhodes, 2012). Thus, if the systems of naïve psychology and naïve sociology indeed intersect here, they may do so by the age of 6.

Children up to age 10 were tested to examine the trajectory of this potential intersection of naïve psychology and naïve sociology as these systems continue to mature across childhood. Finally, a young adult comparison group was also included.

Drawing from the infrahumanization literature documenting children's differential attributions of complex emotions based on social group membership as well as children's general sensitivity to and use of social groups as a means of understanding others, it was predicted that findings would support a model in which children's attribution of mental states is influenced by group membership. Specifically, it was predicted that children would engage in more mentalization for characters that are gender and race ingroup members and less mentalization for characters that are outgroup members. This prediction was tested using two approaches. The first was to assess the quantity of emotion, cognition, and intention attributions children ascribe to story characters. This approach extends past work on differential attribution of emotion to also address potential differences in the attribution of cognitions and intentions. The second approach was to examine the quality of mentalizing for narrative protagonists by assessing the overall sophistication, richness, and complexity of the mental experience that children ascribe to story characters. This second approach allows a complementary examination of potential differences by focusing on the quality of children's mentalization for the narrative protagonists. Because any differences in mental state attribution based on group membership are likely to be influenced by children's familiarity and contact with diverse others, these constructs were also assessed.

Method

Participants

Data from 75 children ages 6 to 10 (41 males, 34 females) who were identified by their parents as primarily White/Caucasian were included in this study. The majority of parents had at least a college degree (76%; when reports were received for more than one parent, levels of education attainment were averaged). To examine potential changes in mentalizing patterns across development, child participants were divided into three age groups that were roughly equivalent in size: young (5.9 to 7.6 years; $n = 27$), middle (7.6 to 9.3 years; $n = 24$), and old (9.3 to 11; $n = 24$). Children were recruited from a database of families who had previously expressed interest in research as well as from a charter school and after-school program in the Lehigh Valley. Children received a small prize as a token of appreciation for their participation.

The young adult comparison group was composed of 33 college students (16 males, 17 females) who identified as White/Caucasian and were native English speakers. These participants were recruited from the Lehigh Psychology participant pool and received class credit for their participation.

All who expressed an interest in participating in the study were welcomed and treated equitably; however, only data from participants who identified as White/Caucasian were included in this report. The present study focused on White/Caucasian participants for both practical and conceptual reasons. First, White children are the most easily accessible population for our lab; thus, recruiting White children was most convenient. Second, focusing on White children allowed the creation of a simplified set of stimuli depicting racial ingroup and outgroup members. Third, as

members of the majority culture, the ToM reasoning of White people towards minority cultures carries important implications from a social justice standpoint. Finally, research shows that members of minority cultures experience more complex racial preferences and identities (for example, see Katz & Kohkin, 1983), and are thus beyond the scope of this study.

Overall Design

Children and adults participated in a narrative generation task in which they were invited to tell stories about 8 different characters. Six characters were human, including two each of the following conditions: *match*, same gender and race as the participant; *gender mismatch*, same race but different gender from the participant; and *race mismatch*, same gender but different race from the participant. Two non-human characters were also included to anchor the range of mental state attributions and inform comparisons in the focal human conditions. These included a non-human animal (a bird) and an inanimate object (a rock). Participants also told two stories about themselves to orient them to the task.

Story characters were introduced by presenting an image of the target person or non-human character along with an accompanying character name (or category label, in the case of the non-human controls). Context prompts were also provided to situate participants' stories (e.g., "Tell me a story about Amy in school").

Stories were elicited in two blocks. Each block began with an introductory warm-up story (about the participant), followed by a non-human control item (bird or rock), and one trial each of the three critical conditions (match, gender mismatch, and race mismatch) in a counterbalanced order. A brief break before moving on to the second

block of trials was included for child participants, during which they were engaged in a fun activity unrelated to the study. The entire task took an average of 20 minutes.

Participants' responses were audio recorded and transcribed verbatim for analysis.

Additional details about the stimuli and procedure are provided below.

Stimuli

Story characters. Human characters were introduced by showing a photo of a person of the respective gender and race displaying a pleasant facial expression. Photos were standardized portraits of individuals in the same age group as the participants (6-10 years and young adults). Images of children were drawn from photos publicly available on the internet and were standardized so that models wore grayscale clothing and were pictured with a gray background. The child images selected for use in this study were roughly matched on subjective ratings of age, attractiveness, happiness, niceness, and unusualness as determined by pilot testing on Amazon's Mechanical Turk. Photos of young adults were drawn from the Chicago Face Database (Ma, Correll, & Wittenbrink, 2015). This database provides extensive norming data for each individual model, such as physical attributes and subjective ratings. Images of young adults selected for use were roughly matched on subjective ratings of age, attractiveness, and unusualness. Norming and pilot data were also used to ensure that the selected stimuli clearly and equally exemplified the respective social categories of gender and race. The selected stimuli included two White/Caucasian females, two Black/African American females, two White/Caucasian males, and two Black/African American males for each age group (children and young adults).

Human characters were also introduced with fictional names. These names were selected from an ABC News (2006) listing of the top 20 boy and girl names rated as the most “white” or “black.” Image-name pairings were fixed; however, the order in which these characters were presented was counterbalanced across participants. Preliminary analyses confirmed that all image-name pairings were equivalent in eliciting stories and mentalizing content.

Non-human characters were also introduced with accompanying images. The category label (i.e., “bird”, “rock”) was used in place of a character name. The testing block in which the bird or rock appeared was counterbalanced across participants.

Additional cues for child participants. For children (but not young adults), the introduction of protagonists included additional images intended to further highlight the protagonist’s social category membership as the literature suggests that both skin-color (Dunham, Stepanova, Dotsch, & Todorov, 2014) and labels (Diesendruck & haLevi, 2006; Waxman, 2010) are important in children’s understanding of social categories. To this end, smaller images of each protagonist’s purported family and friends were briefly presented when introducing child participants to the protagonists. Family members were matched to the race of the protagonist and friends were matched to the protagonist’s race and gender. The family and friend images were selected from those publicly available on the internet and were standardized by removing the background portion of the images. These images were then pilot tested using Amazon’s Mechanical Turk to identify those that were similar on subjective ratings of attractiveness, happiness, niceness, and unusualness. The stimuli were also pretested to ensure that they clearly and equally exemplified the respective social categories of gender and race.

Story prompts. Semi-structured context prompts like those used by Stein (1988) served to structure the narrative generation task in this study¹. Designed to be familiar to participants, the context prompts included school, playground (replaced with gym for young adults), party, park, shopping trip, and restaurant. Participants were asked to frame their stories within these contexts (e.g., “Tell me a story about Amy in school”). The order of these context prompts was fixed but the story characters were counterbalanced so the prompts were presented with various characters across participants.

Narrative Procedure

Children and young adults were tested individually with a researcher either in an on-campus laboratory or in a quiet space in the participant’s school.

Children. To frame the narrative task, children received the following instructions: “We’re going to play a storytelling game! I’m going to give you a couple characters and I want you to tell me a story about each of them, like make up a story about something that happens to them or something that they do. There are no right or wrong answers – just tell me whatever kind of story you want to. You get to use your imagination! Would you like to do that?” To scaffold children’s use of mental state attributes in their narratives, children were also given definitions and relevant examples of thoughts and feelings and asked to include in their stories what the characters think and feel (see Appendix A for data collection script).

Children were then introduced to the story characters one at a time on a digital screen and asked to generate a story about each. For human characters, children were presented with an image of the target character on a digital screen along with a statement about the character’s name, gender, and race. For example, “This is Amy. Amy is a girl.

She has light skin.” (see Appendix B for a complete list of prompts). These introductions were followed by pictures of and a statement identifying the character’s family and friends (e.g., “This is Amy’s family and these are Amy’s friends.”). Children were then provided with the context for their story (e.g., “Tell me a story about Amy in school”) and the well-known story opener “Once upon a time...” to prompt them to begin their story. The setup for the non-human stimuli was similar with the exception of providing family and friend information (e.g., “This is a bird. It has feathers and wings. Tell me a story about this bird in a tree”).

Once children began their stories, they were prompted to continue until they indicated they had nothing more to add. Then children were prompted about the specific mental states of interest in this study, by asking “What did Amy feel/think/try to do in this story?” The additional prompts about the characters’ feelings/thoughts/intentions served two functions: (1) a safeguard that could be analyzed for mental state attributes if children did not spontaneously include them in their generated narratives, and (2) a reminder to include mental state content in narratives. Responses to these prompts are not reported here because participants included sufficient mental state references in their narratives.

Young adults. The procedure for young adults was highly similar to that for children with a few key exceptions. Young adult participants received a similar set of instructions: “This is a storytelling task. So, I’m going to give you a few characters and I want you to tell me a story about each of them, like make up a story about something that happens to them or something that they do. There are no right or wrong answers – just tell me whatever kind of story you want to. You get to use your imagination! Please try to

spend about 2 minutes on each story. Also, feel free to take a minute to come up with a story if you need to.”

Young adults were then introduced to the story characters one at a time on a digital screen and asked to generate a story about each. Because the race and gender of the characters was presumed to be already salient to young adults, adult participants did not receive explicit information about these factors or images and statements about the character’s family and friends. Thus, young adult prompts were streamlined (e.g., “This is Amy. Tell me a story about Amy in school.”). Young adults were also prompted to continue their stories until they had nothing more to add. However, they were not given additional prompts about the character’s feelings, thoughts, and intentions in the story to avoid drawing attention to mental states that might bias the responses of these more mature participants.

Additional Measures

As a supplement to the narrative task, additional measures of interest were collected via questionnaires completed by young adult participants and the parents of child participants (see Appendix C and D). The parents of 24 of the 75 child participants did not complete the questionnaires because they were not present at time of testing.

Demographics. Participants’ demographic information was collected, including age, gender, and race. Parents of child participants also indicated their own race and highest level of education obtained.

Contact with diverse others. Since contact with diverse others may impact the constructs of interest, participants’ contact with people of different gender and other races was assessed. The minority racial composition of participants’ contacts in multiple

contexts was assessed on a four-point scale ranging from 1 “none or very few other race/ethnicity” to 4 “most other race/ethnicity,” based on measures used by Pahike, Bigler, and Suizzo (2012) and Eisenberg, Sallquist, French, Purwono, Suryanti, and Pidada (2009). The version for child participants asked parents to describe their child’s exposure to diverse others in a variety of contexts (school, classroom, neighborhood, activities, church/place of worship, friends, adult mentors/caregivers, and fill-in-the-blank “other”). The young adult version asked participants to answer similar questions about their own contact with racial minority members. Finally, the gender and race of participants’ top four closest friends was assessed.

Narrative Coding

Participants’ use of mental state attributes was coded using two distinct coding schemes: (1) a basic count of mental state attributes for narrative characters, and (2) a coding pass that captured the quality, complexity, and richness of mentalizing for protagonists.

Quantity of mental state attributes. Based on the coding protocol used by Griffin et al. (2013), mental state attributes were defined as references to the protagonist’s mental states within three domains: (1) cognition, defined as references to cognitive functions such as knowledge, thought, and memory, (2) emotion, defined as feelings and affective responses such as fear and happiness, and (3) intentionality, defined as references to goals and volition, such as plans and desires. To avoid inflation due to rote repeats of mental state attributes, only references to distinct attributes were counted within each story while identical repeats within each story were not counted. Only references to the

mental states of the protagonist were counted; mental state attributions for any other characters were disregarded.

Coders first identified each mental state reference and then categorized the reference by type (emotion, cognition, or intentionality; see Appendix E for coding manual). This quantitative coding was conducted by the principal investigator and a trained undergraduate research assistant. During coding, both researchers were blind to the protagonist type (match, gender mismatch, race mismatch). Agreement between coders was initially calculated on a subset of 18% of participants (14 children, 5 young adults). Once mental state attributes were identified as such, coders agreed 99% of the time on the categorization of the attribute type (emotion, cognition, intention). However, coders were in agreement on the identification of mental state attributes only 83% of the time. Because one coder identified a mental state attribute while the other coder did not 17% of the time, often as a result of simple oversights due to the nature of the narrative data, transcripts were initially coded by one coder and then reviewed by the other coder to verify accuracy.

Quality of mentalizing. The simple quantitative count of mental state attributes represents a relatively coarse initial pass at the data. Counting specific attributes may not be the best way to capture the extent of mentalizing for story characters. In some cases, multiple mental state attributes are provided yet they portray only a simplistic picture of internal experience. On the other hand, some sophisticated mental concepts, for example intentional deception or thoughtful reflection, can be conveyed without using very many specific references to mental states. To address the limitations of the simple count

approach, a more sophisticated coding scheme was created to capture the quality, complexity, and richness of mentalizing for narrative characters.

After careful reading of the stories participants provided, a coding scheme capturing the quality of mentalizing was developed for the current study. This coding scheme drew from the Character Representation Scheme created by Nicolopoulou and Richner (2007) as well as the Sophistication of Mentalizing Response coding used by O'Connor and Hirsch (1999). The quality of mentalizing scheme was constructed to capture the range of mentalizing for story characters, from no mentalizing—portraying characters without any internal experience, to rich and sophisticated mentalizing—portraying characters as having complex internal experiences underlying their actions and reactions.

The quality of mentalizing for the protagonist of each story was evaluated on a 5-point scale (see Appendix F for coding manual). A score of 0 was assigned when characters were inactive and were portrayed as inanimate objects or described in terms of physical features only. A score of 1 was given when characters were portrayed in terms of actions only, with no evidence of mentalizing. A score of 2 was provided for basic mentalizing, where characters were still primarily defined by actions but a few simplistic implicit or explicit internal experiences were introduced, such as references to internal experiences of emotion, cognition, intentionality, or perceptual experience. A score of 3 was given when characters were portrayed as more complex psychological agents with well-developed internal experiences, evidenced by extensive detail about internal experiences, references to multiple mental state attributes, or references to complex internal experiences such as those contrasted with the experience of others or portrayed

as generalized patterns. Finally, at the highest level, a score of 4 was given when characters were portrayed in terms of thoroughly-developed advanced internal experiences such as intrapsychic conflict, introspective reflection, thoughtful strategic planning, self-monitoring of expression of internal experiences, or internal experiences developed in complex contrast with reality or the internal experiences of others. Mentalizing quality for each character was coded by the principal investigator who was blind to the condition while coding.

Results

Descriptive Statistics

Descriptive statistics including the average number of words and mental state attributes along with the average mentalizing quality per story (excluding bird and rock control items) for participants in each age group are depicted in Table 2. Even the youngest children produced mental state attributes in their narratives, averaging roughly one distinct attribute per story. Although examination of differences in the types of mental state attributes children produce in their stories is beyond the scope of the present report, it is clear that all three mental state types—cognitions, emotions, and intentions—were utilized by children of all ages as well as by the college-age participants. Moreover, even the youngest children’s average mentalizing quality score reached the scale’s midpoint of two (scores could range from zero to four) and young adults’ average quality score was roughly three.

Data Analysis Plan

Repeated measures analysis of variance (ANOVA) was used to examine key questions related to participants’ use of mental state content in narratives. Some data

were skewed so a generalized estimating equations analysis was also conducted since it is better suited to handle non-normally distributed data. However, this analysis did not produce meaningfully different results, so only the repeated measures ANOVA analyses are reported here. The quantity of mental state attributes (number of emotion, cognition, and intention attributions) and the quality of mentalizing were analyzed in separate models.

The first set of analyses in each section examined narratives about person characters only, excluding the rock and bird controls. Where possible, mental state attribution values were averaged across the two stories within each condition (match, gender mismatch, race mismatch) to create the within-subjects independent variable of interest, condition. The second set of analyses included comparisons between the person characters and the inanimate and animal control items to establish whether participants were sensitive to the identity of the characters in their stories. For models with the quantitative outcome variable of number of mental state attributes, mental state attribute type (cognition, emotion, intention) was entered as a within-subjects variable in addition to condition. Gender and age group (for children) were entered as between-subjects variables and the average number of words per story per participant was included as a covariate to control for overall verbosity. Data from children and young adults were analyzed separately to accommodate potential developmental differences.

Finally, measures of participants' diversity exposure were added to the models as covariates to examine the potential impact of participants' contact with diverse others on the predicted trends.

Number of Mental State Attributes

The first set of analyses utilized the average number of distinct mental state attributions—cognitions, emotions, and intentions—produced in each story as the outcome variable of interest. See Table 2 for average and standard deviation of number of mental state attributions across the age groups.

Do children differentiate between match vs. mismatch characters in their mental state attributions? Contrary to the prediction of more distinct mental state references for similar characters as compared to different characters, there was no main effect of condition in the model: $F(2,134) = 1.98, p = .143$. As depicted in Figure 1, children produced roughly equivalent numbers of mental state attributes for characters in the match ($M = 0.63$), gender mismatch ($M = 0.67$), and race mismatch conditions ($M = 0.56$).

Furthermore, there were no interactions between condition and age group, mental state type, gender, or average words per story (all $ps > .197$). Therefore, it is not the case that differences in children's mental state attributes per condition appeared only for certain age groups, specific types of mental state attributes, one participant gender or the other, or at particular extremes of verbosity.

There was one significant three-way interaction between condition, age group, and gender, $F(4,134) = 3.28, p = .013$. Post hoc tests using the Bonferroni correction revealed that the only significant differences were within the oldest age group (children ages 9 through almost 11). Within this oldest age group, boys produced more mental state attributes for gender mismatch ($M = 0.81$) than race mismatch characters ($M = 0.39; p = .008$; see Figure 2), a trend not in line with predictions. The oldest girls, however, showed

a pattern consistent with predictions: mental state attributions were higher for match characters ($M = 1.20$) than gender mismatch ($M = 0.83$; $p = .016$) and race mismatch characters ($M = 0.92$), although the difference between match and race mismatch did not reach significance ($p = .102$). Note that this three-way interaction appears to be an isolated effect as it occurs only in the oldest group of children and is not reflected in the college student comparison group (see below).

Finally, results showed a main effect of age group, $F(2,67) = 8.81$, $p < .001$, and gender, $F(1,67) = 8.02$, $p = .006$, but no interaction between these two between-subjects variables ($p = .576$). The youngest children ($M = 0.29$) produced fewer mental state attributes on average than the middle ($M = 0.78$, $p = .002$) and oldest age groups ($M = 0.79$, $p = .001$), which did not differ from each other ($p = 1.00$). On average, girls ($M = 0.78$) produced more mental state attributes on average than did boys ($M = 0.76$; $p = .006$). There were no main effects of mental state type ($p = .112$).

Do young adults differentiate between match vs. mismatch characters in their mental state attributions? As with the child participants, no main effect of condition was found in the college-age comparison group: $F(2,56) = 1.46$, $p = .241$ (see Figure 3). College students produced roughly equivalent numbers of mental state attributes for characters in the match ($M = 1.31$), gender mismatch ($M = 1.15$), and race mismatch conditions ($M = 1.26$).

There were no interactions between condition and mental state type, gender, or average words per story (all $ps > .555$) for the college comparison group. Results showed a main effect of gender, $F(1,28) = 7.34$, $p = .011$, with women ($M = 1.47$) producing

more mental state attributes on average than men ($M = 1.02$). There was no main effect of mental state type ($p = .661$).

Do children differentiate between human and non-human characters in their mental state attributions? The lack of consistent differences in use of distinct mental state attributes for similar vs. different characters begs the following question: Are participants sensitive to the identity of the protagonists of the stories they tell? To address this question, the non-human comparison items—the rock and the bird—were added to the model.

Results showed a main effect of condition in the model with the controls for child participants (see Figure 4): $F(3.15, 192.29) = 3.81, p = .010$, Greenhouse-Geisser correction due to violation of the sphericity assumption as indicated by Mauchly's test of Sphericity, $\chi^2(9) = 32.37, p < .001$. Bonferroni corrected pairwise comparisons revealed that, as predicted, children produced fewer mental state attributes for the rock ($M = 0.38$) than for the match ($M = 0.63; p = .008$) and gender mismatch ($M = 0.64; p = .015$) conditions. Comparisons between the rock and race mismatch ($M = 0.56$) did not reach significance ($p = .127$). Mental state attributions were also lower for the inanimate story character—the rock—than the nonhuman animal—the bird ($M = 0.61; p = .033$).

Do young adults differentiate between human and non-human characters in their mental state attributions? A main effect of condition was also observed when controls were added to the model for young adults (see Figure 5): $F(2.82, 78.82) = 4.75, p = .005$, Greenhouse-Geisser correction due to violation of the sphericity assumption as indicated by Mauchly's test of Sphericity, $\chi^2(9) = 18.94, p = .026$. Bonferroni corrected pairwise comparisons revealed that, somewhat unexpectedly, it was the bird control ($M =$

0.67) that was lower than the match ($M = 1.31$; $p < .001$), gender mismatch ($M = 1.16$; $p = .005$), and race mismatch conditions ($M = 1.26$; $p = .001$) for college-age participants. The rock ($M = 0.82$) was different only from the match condition, and this difference was only marginal ($p = .076$).

Overall, although mental state attributions for the control conditions did not follow the predicted pattern exactly, the emergence of a main effect of condition in the models with the controls indicates that participants are at least somewhat sensitive to the identity of the characters of their stories.

Mentalizing Quality

The second set of analyses used the evaluation of mentalizing quality for story characters as the outcome of interest. This approach was developed to address the limitations of the simple quantitative count of mental states by capturing the complexity and richness of mentalizing for story characters. Mentalizing quality was evaluated for each story on a 5-point scale, ranging from no mentalizing scored as 0 to sophisticated, complex, rich, and contextualized mentalizing scored as 5. See Table 2 for average and standard deviation of mentalizing quality for each age group.

Do children differentiate between match vs. mismatch characters in their mentalizing quality? There was a marginal main effect of condition for children's mentalizing quality, $F(2,134) = 2.62$, $p = .077$ (see Figure 6). However, Bonferroni corrected pairwise comparisons revealed that the only difference between the match ($M = 2.25$), gender mismatch ($M = 2.32$), and race mismatch ($M = 2.16$) conditions that approached significance was an unexpected difference between the gender and race mismatch conditions ($p = .098$). The predicted differences between match and mismatch

characters were not observed. There were no interactions between condition and children's age group or average words per story (both $ps > .174$).

As in the quantitative analysis, results again showed main effects of age group, $F(2,67) = 7.78, p = .001$, and gender, $F(1,67) = 6.18, p = .015$, on children's mentalizing quality, with average mentalizing quality increasing with age and girls producing higher levels of mentalizing quality.

Do young adults differentiate between match vs. mismatch characters in their mentalizing quality? No main effect of condition was found in the college-age comparison group: $F(2,56) = 1.46, p = .331$ (see Figure 7). College students produced roughly equivalent mentalizing for characters in the match ($M = 2.92$), gender mismatch ($M = 2.95$), and race mismatch conditions ($M = 2.85$). There were no interactions between condition and gender ($p = .628$) or average words per story ($p = .217$). Unlike in the quantitative analyses, there was no main effect of gender on young adults' mentalizing quality ($p = .131$).

Do children differentiate between human and non-human characters in their mentalizing quality? The inanimate story character and the nonhuman animal controls were again added to the model to determine whether participants were sensitive to the identity of the protagonists of their stories in their mentalizing quality.

Results showed a main effect of condition in the model with the controls for child participants (see Figure 8): $F(2.48,153.47) = 21.08, p < .001$, Greenhouse-Geisser correction due to violation of the sphericity assumption as indicated by Mauchly's test of Sphericity, $\chi^2(9) = 78.39, p < .001$. Bonferroni corrected pairwise comparisons revealed that, as predicted, the quality of children's mentalizing was lower for the rock ($M = 1.29$)

than for the match ($M = 2.25$), gender mismatch ($M = 2.29$), and race mismatch ($M = 2.18$) conditions, as well as for the bird ($M = 2.30$; all $ps < .001$).

Do young adults differentiate between human and non-human characters in their mentalizing quality? A main effect of condition was also observed in the model with the controls for the college student sample (see Figure 9): $F(2.21, 61.73) = 11.07$, $p < .001$, Greenhouse-Geisser correction due to violation of the sphericity assumption as indicated by Mauchly's test of Sphericity, $\chi^2(9) = 47.97$, $p < .001$. As with the child participants, Bonferroni corrected pairwise comparisons revealed that college-students' mentalizing quality was lower for the rock ($M = 1.72$) than the match ($M = 2.92$), gender mismatch ($M = 2.95$), race mismatch ($M = 2.85$; all $ps < .001$), and bird ($M = 2.51$, $p = .026$). The quality of mentalizing was also lower for the bird than the gender mismatch condition ($p = .031$).

Overall, the quality of mentalizing for the control conditions followed the predicted pattern of lower mentalizing for the inanimate object and, to a lesser extent, the animal character. This trend provides evidence that the mentalizing quality of participants of all ages depended on the identity of the story characters, at least at a basic level.

Contact with Diverse Others

Finally, participants' diversity exposure was assessed to examine its potential influence on the predicted trends in mentalizing. The minority racial composition of the people that participants had regular contact with was assessed on a four-point scale ranging from 1 "none or very few other race/ethnicity" to 4 "most other race/ethnicity" and was averaged across the multiple contexts (for children: school, classroom, neighborhood, activities, church/place of worship, friends, adult mentors/caregivers, and

fill-in-the-blank “other”; for young adults: school, activities, friends, work, residence hall, church/place of worship, and fill-in-the-blank “other”) to form a marker of exposure to diverse others. The racial composition of participants’ four closest friends was also assessed.

For children, the average minority racial composition of the people with whom they had regular contact most often fell within the first category, “none or very few other race/ethnicity” (49%) or the second category, “a few but less than half other race/ethnicity” (45%). For college students, the average minority racial composition of the people they had regular contact with most often fell within the second category, “a few but less than half other race/ethnicity” (65%). The majority of children (60%) and young adults (52%) did not have a racial minority member among their top four closest friends.

Participants’ exposure to diverse others and number of racial minority members among their four closest friends were individually added as covariates to the models of the main analyses described above.

Does children’s contact with diverse others influence their differentiation between match vs. mismatch characters? There was no main effect of average diversity exposure on children’s mental state attributions ($p = .541$) or mentalizing quality ($p = .488$). Furthermore, there were no interactions between diversity exposure and condition for mental state attributions ($p = .146$) or mentalizing quality ($p = .773$), so it was not the case that children differentiated between characters differently based on their exposure to diverse others.

Similar results were found for analyses including number of diverse close friends. There was no main effect of number of diverse close friends on children's mental state attributions ($p = .602$) or mentalizing quality ($p = .501$). Furthermore, there was no interaction between number of diverse close friends and condition for mental state attributions ($p = .101$), so it was not the case that children differentiated between characters in their mental state attributions differently based on the number of their closest friends that were racially diverse.

There was a marginally significant interaction between children's number of diverse friends and condition for mentalizing quality, $F(2,86) = 2.913$, $p = .060$. However, partial correlations controlling for average words per story and gender showed no significant associations between number of diverse close friends and mentalizing quality in match ($r = .06$, $p = .704$), gender mismatch ($r = -.08$, $p = .572$), or race mismatch conditions ($r = -.14$, $p = .339$). Overall, findings do not suggest that children's exposure to diverse others impacts the extent to which they engage in mentalizing for ingroup and outgroup characters.

Does young adults' contact with diverse others influence their differentiation between match vs. mismatch characters? Results showed main effects of diversity exposure on young adults' overall mental state attributions, $F(1,27) = 8.38$, $p = .007$, and mentalizing quality, $F(1,27) = 5.28$, $p = .030$. Partial correlations controlling for average words per story and gender showed a negative relationship between diversity exposure and both average mental state attributions, $r = -.49$, $p = .007$, and average mentalizing quality across all person conditions, $r = -.40$, $p = .030$, suggesting that young adults

exposed to higher levels of diversity engage in less mentalizing about story characters overall.

There was no interaction between diversity exposure and condition for number of mental state attributions ($p = .143$), so it was not the case that young adults differentiated between characters in their mental state attributions differently based on their exposure to racially diverse others. However, there was an interaction between diversity exposure and condition for mentalizing quality, $F(2, 54) = 7.86, p = .001$. Partial correlations controlling for average words per story and gender showed a negative relationship between diversity exposure and mentalizing quality only in the gender mismatch condition, $r = -.61, p < .001$ (match $r = -.20, p = .301$; race mismatch $r = -.01, p = .924$).

Analyses including number of diverse close friends showed no main effect of close friend composition on young adults' mental state attributions ($p = .978$) or mentalizing quality ($p = .908$). Furthermore, there were no interactions between number of diverse friends and condition for mental state attributions ($p = .513$) or mentalizing quality ($p = .989$). Thus, it is not the case that young adults differentiated between characters differently based on the number of their closest friends that were racially diverse. Overall, findings provide no clear evidence that young adults' exposure to diverse others impacts the extent to which they engage in mentalizing for ingroup and outgroup characters.

Discussion

The present study used a novel narrative paradigm to explore whether children and a young adult comparison group varied their attributions of internal mental experience based on the social group membership of story characters. It was predicted

that participants would engage in more mentalizing for characters that are gender and race ingroup members and less mentalizing for characters that are outgroup members. This prediction was tested using two approaches: by assessing (1) the number of emotion, cognition, and intention attributions, and (2) the overall sophistication and complexity of mentalizing for narrative protagonists.

Results revealed that, contrary to predictions, both children and young adults produced roughly similar numbers of mental state attributes and levels of mentalizing quality for story characters regardless of the characters' membership in the basic social groups of gender and race. Furthermore, it is not the case that there were differences in mentalizing only for certain age groups, specific types of mental state attributes, one participant gender or the other, or at particular extremes of verbosity. The one isolated three-way interaction suggesting differences in number of mental state attributes is not interpreted as meaningful because (1) it relied on very small cell sizes, (2) it occurred only with the oldest children but was not replicated in the young adult sample, (3) it was consistent with the predicted pattern only for girls while boys showed a different pattern, and (4) there was no theoretical reason to expect such an interaction. Overall, the current study provides no clear evidence of differential mentalizing based on the social group membership of story characters.

Participants' contact with diverse others was also assessed to examine its potential influence on the predicted trends in mentalizing. It was hypothesized that children may differ in how they mentalize regarding gender and race ingroup members based on their experience interacting with diverse others. However, it was not the case that children differentiated the number of mental state attributes or quality of mentalizing produced for

story characters based their exposure to diversity (number of their closest friends that were racially diverse or exposure to diverse others across multiple contexts). Likewise, young adults did not differentiate the number of mental state attributes or quality of mentalizing produced for characters based on the number of their closest friends that were racially diverse.

While young adults' exposure to diverse others across multiple contexts was not implicated in the number of mental state attributes they produced for characters, there were differences in young adults' mentalizing quality based on diversity exposure. Specifically, diversity exposure was negatively related to mentalizing quality only for characters not of the same gender as participants. That is, young adults with more exposure to racial diversity showed lower quality mentalizing in stories about same race, different gender characters. It is not clear why this effect emerged; however, given its isolated nature and its lack of theoretical basis, no further speculation is provided. Overall, there was no evidence of the predicted differentiation in mentalizing between characters based on their social group membership for participants with more or less exposure to diverse others.

Not surprisingly, variability in children's mentalizing in this narrative task was best explained by age: the number of mental state attributes children produced and their mentalizing quality increased with age. This finding is consistent with naïve psychology literature documenting the development of mental state concepts across childhood (e.g. Wellman & Liu, 2004). There were also gender differences in the number of mental state attributions produced by both children and young adults as well as gender differences in the mentalizing quality produced by children (but not young adults). These differences all

avored female participants, perhaps because girls are socialized to be more sensitive to the internal experience of others (Eisenberg, Spinrad, & Sadovsky, 2006).

The lack of observed differences in mentalizing based on the story characters' social group membership in this study could be interpreted several ways. It may be the case that children and young adults engage in mentalizing equally for all people, regardless of their social group membership. This is consistent with the prevailing assumption in the literature on naïve psychology, which tends to overlook any potential interactions with naïve sociology. Indeed, children's understanding of others as psychological agents may not be influenced by social group membership.

Alternatively, this may be a meaningful intersection of naïve psychology and naïve sociology, as suggested by infrahumanization findings of differential attribution of uniquely-human secondary emotions based on group membership (e.g. Costello & Hodson, 2014), but the present narrative task may not have provided an effective paradigm for testing subtle differences in mentalizing. Speaking to this possibility, there was evidence from the non-human items that children and young adults were at least somewhat sensitive to the identity of the protagonists in the number of mental state attributes they produced, and, more clearly, in their quality of mentalizing within the narrative paradigm. However, despite this evidence, additional observations suggest that the narrative task may have masked more subtle differences in mentalizing based on characters' social group membership.

The narrative paradigm implemented here was selected as an age-appropriate means of eliciting talk from children about the mental states of various characters while circumventing pressure to respond in socially-acceptable ways when talking about or

responding to questions regarding outgroup members. However, several issues with the narrative paradigm became evident. In constructing their stories, both children and young adults seemed to draw from sources that might obscure differences in mentalizing based on the identity of the character. For example, participants often relied on general scripts or schemas to structure their stories (e.g. having cake and opening presents at a party). Also, as evidenced by periodic inadvertent switches to a first-person perspective and saying “I” instead of the character’s name, participants may have been constructing stories based on their own personal experience. Both of these strategies likely detract from and interfere with participants’ focus on the specific protagonists of their stories and thus may obscure any differences in mentalizing based on the identity of the characters. Furthermore, the observed variability in participants’ mentalizing in this task may be better explained by factors that might impact their production of narratives in this context, such as age, as demonstrated by these results, as well as creativity and extraversion, which were not assessed.

The issues that became apparent with this narrative paradigm suggest that the lack of demonstrated differences in mentalizing based on characters’ social group membership should be interpreted with caution and not taken as strong evidence of equal mentalizing across social groups. Additional work is needed to further test this question and examine this particular intersection of naïve psychology and naïve sociology.

Future Directions

The present narrative paradigm could be modified to be more useful for revealing differences in mentalizing for particular targets. One such modification would be to create cartoon caricatures that depict a basic storyline in which protagonists are

presented. Participants could then interpret the illustration and tell the story as they see it. The graphical representation and additional story stem content would likely help participants focus on the protagonist instead of relying on personal experience or basic schemas, so that variability in the extent to which mental state experiences are developed would be more closely linked to the protagonists and their social group identity. Another modification would be to supply children with the beginnings of complex narratives and ask them to complete the stories or tell what comes next. Providing complexity in the story stem would help participants create more engaging and sophisticated stories that would invite higher levels of mentalizing for protagonists and thus yield more meaningful variability in mentalizing.

An alternative to the narrative paradigm is currently underway to further test for differences in mentalizing based on the social group membership of targets. To avoid the confounds that became apparent with the present narrative paradigm, a more direct test using a card sort task and Likert scale ratings was developed based on those used successfully in infrahumanization studies with children (Costello & Hodson, 2014; Vezzalia et al., 2012). In this ongoing study, children are presented with mental state attributions on cards read aloud to them, including attributions of cognitions, emotions, and intentional agency (e.g. Knows what's going on around them; Feels a lot of different feelings; Plans things out before doing them). Using boxes marked with pictures of a same sex Black and White child, children are asked to sort each attribution card to indicate to whom the attribute applies (neither, one child but not the other, or both). Children are then asked to indicate how much each attribute is true of the selected recipients using a Likert scale ranging from "A little" to "A lot" with an accompanying

visual aid of circles increasing in size. With this more direct methodology, it is predicted that differences will be observed paralleling infrahumanization effects found using similar methods (Costello & Hodson, 2014; Vezzalia et al., 2012), such that children will attribute mental states more to targets who are similar to them and less to targets who are racial outgroup members.

In addition to the planned follow-up using an alternative paradigm, the present narrative data set is rich and can be further mined in the future. Other potentially interesting factors could be examined, such as narrative coherence, quality of emotion talk, and valence of character portrayal, just to name a few.

Limitations

In addition to the limitations that became apparent with the narrative paradigm already discussed above, several other limitations constrain the interpretation of the findings of this study. First, the sample was very homogenous, necessarily so in terms of race but also involuntarily so in terms of socioeconomic status; thus, the generalizability of these results is limited. Furthermore, several features of the task protocol may have influenced results in ways that should be noted. Although even the youngest children included mental state attributes in their stories, they did so infrequently. In anticipation of this, children were explicitly asked to include what the characters thought and felt in their stories and then at the end of each story they were asked what each character thought, felt, and tried to do in the story. These additional prompts were sometimes anticipated by children who would then produce mental state attributes that seemed forced instead of naturally-flowing. Thus, these results cannot be interpreted as documenting spontaneous mentalizing in narratives.

Conclusion

The present study extends the literature on naïve psychology and naïve sociology by using a novel narrative paradigm to examine one way that these two systems might intersect, testing whether children and a young adult comparison group varied in their attributions of internal mental experience based on the social group membership of story characters. Although it was predicted that participants would engage in more mentalizing for characters that were gender and race ingroup members and less mentalizing for characters that are outgroup members, results revealed that the mentalizing produced by both children and young adults did not differ based on the story characters' social category membership. This lack of differences in mentalizing held with both the number of emotion, cognition, and intention attributions as well as with the quality and complexity of mentalizing for narrative protagonists, but issues with the narrative paradigm that became apparent suggest that any differences may have been obscured. Additional work is necessary to better-explore this question and further examine how naïve psychology and naïve sociology might interact both in this particular context and in others, as the crossroads of these two systems represents a fertile ground for future research. Studying the relation between lay theories of people as psychological agents and members of social categories remains an important endeavor to further our knowledge of how children understand other people.

Footnotes

¹ Several strategies for eliciting narratives were initially piloted with 10 child participants to determine the most effective method. The semi-structured context prompt set was piloted alongside entirely open-ended prompts, in which participants were introduced to the protagonist and simply asked to tell a story about the character (e.g., “Tell me a story about Amy.”), as well as more structured story beginnings modeled after those created by Wang and Leichtman (2000; e.g., “One day, Amy goes to the market with her mom. There are so many toys in the store! Amy can’t take her eyes off them. Then she gets lost and can’t find her Mom. Tell me what happens next.”). The open-ended and semi-structured context prompts appeared to be roughly similar in the narrative quality and number of mental state attributes that they elicited, while the structured story beginnings appeared to be slightly less effective. Accordingly, and because creating equivalent story beginnings proved to be somewhat complex, the structured story beginnings were eliminated. The semi-structured context prompts were ultimately selected over the entirely open-ended prompts because the context information served as a starting point for stories and seemed to aid children in beginning their narratives effectively.

Tables

Table 1. Overview of literature examining children’s attribution of uniquely-human emotions based on group membership (infracommunication).

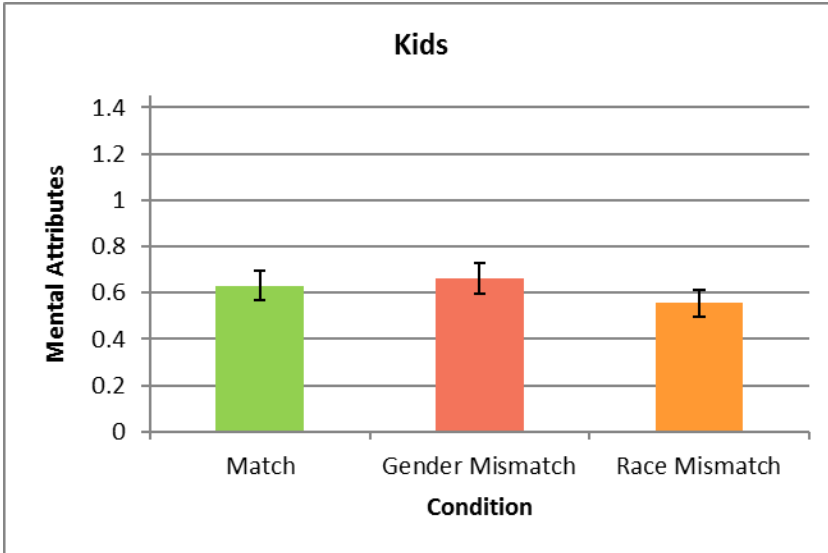
Study	Age	Groups	Method	Findings
Costello & Hodson (2014)	6-10	Black vs. White children	Sort uniquely human/not emotions and traits in black/white/neither child's box (photo stimuli)	White children attributed fewer uniquely human traits and emotions to Black vs. White children, no difference in non-uniquely human
Vezzali, Capozza, Stathi, & Giovannini (2012)	9	Italian vs. immigrant children	Indicate on 5-point Likert scale (<i>Definitely - Definitely Not</i>) how much child is likely to feel 2 positive and 2 negative uniquely human/not emotions	Children assigned more non-uniquely than uniquely human emotions to outgroup members
Martin, Bennett, & Murray (2008)	6-7 & 10-11	Fans of own vs. rival football team	Project the intensity of uniquely human/not emotions using 7-point circle Likert scale	Children predicted ingroup would experience secondary emotions more intensely than primary; no such distinction for outgroup
Brown & Eller (2007)	11-16	Private vs. public school	Indicate which of 16 emotions (8 uniquely human, 8 not) each character in 4 vignettes might feel	More secondary emotions attributed to ingroup than outgroup; difference for the primary emotions was negligible

Table 2. Means and standard deviations by age group for average number of words and mental state attributes produced per story and average mentalizing quality.

Age	<i>n</i>	Words		Number of Mental State Attributes								Mentalizing Quality	
		<i>M</i>	<i>SD</i>	Overall		Cognitions		Emotions		Intentions		<i>M</i>	<i>SD</i>
				<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
5.9-7.6	27	76	50	0.9	0.7	0.2	0.3	0.4	0.3	0.3	0.3	1.9	0.5
7.6-9.3	24	122	76	2.1	1.6	0.5	0.5	0.8	0.8	0.8	0.6	2.4	0.7
9.3-11	24	172	136	2.3	1.9	0.7	0.8	0.7	0.7	0.8	0.8	2.4	0.7
Young adults	33	201	120	3.7	1.8	1.2	0.7	1.2	0.7	1.3	0.8	2.9	0.6

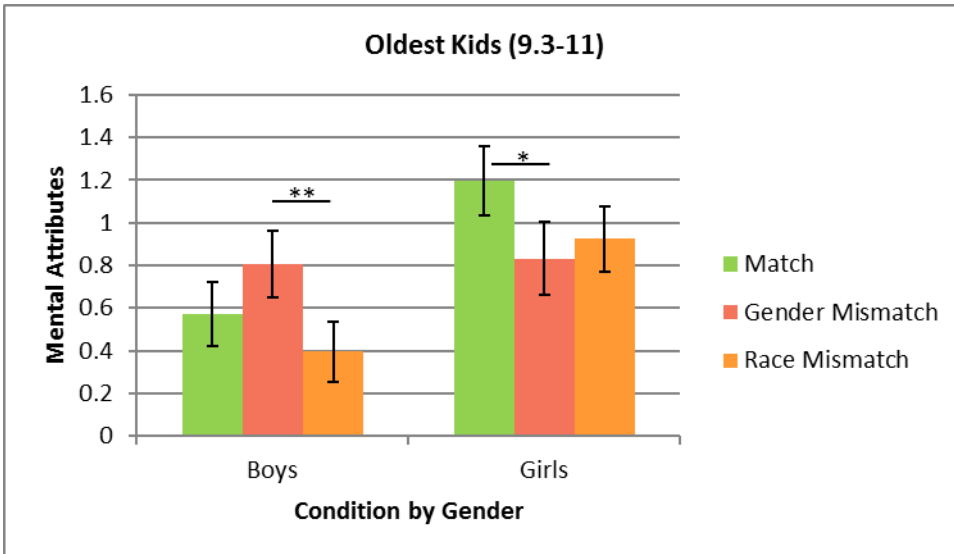
Figures

Figure 1. Mean quantity of mental state attributes by condition for children.



Error bars denote standard error

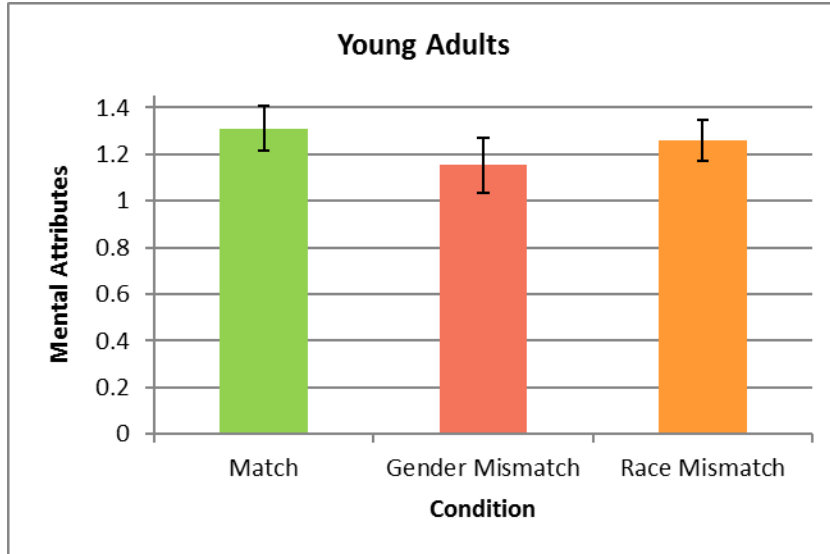
Figure 2. Mean quantity of mental state attributes by condition and gender for the oldest children.



Error bars denote standard error

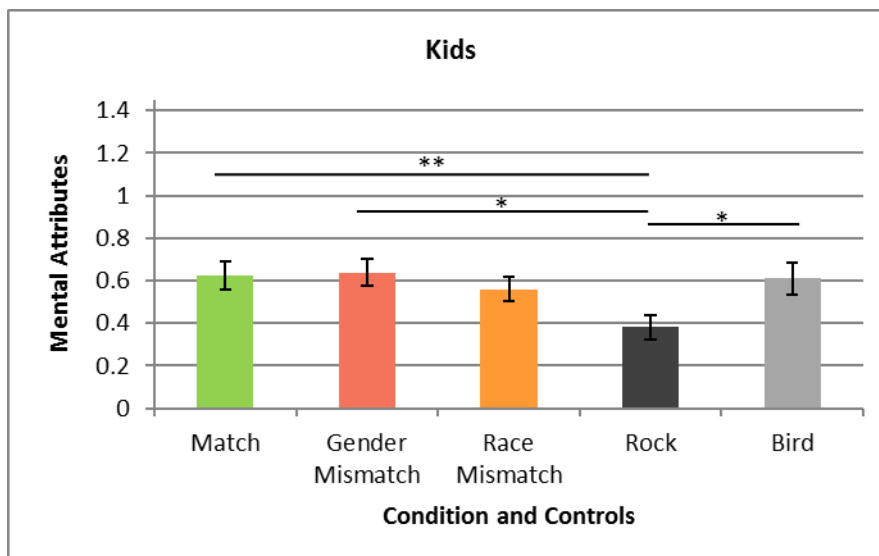
* Denotes $p < .05$

Figure 3. Mean quantity of mental state attributes by condition for young adults.



Error bars denote standard error

Figure 4. Mean quantity of mental state attributes by condition with controls for children.

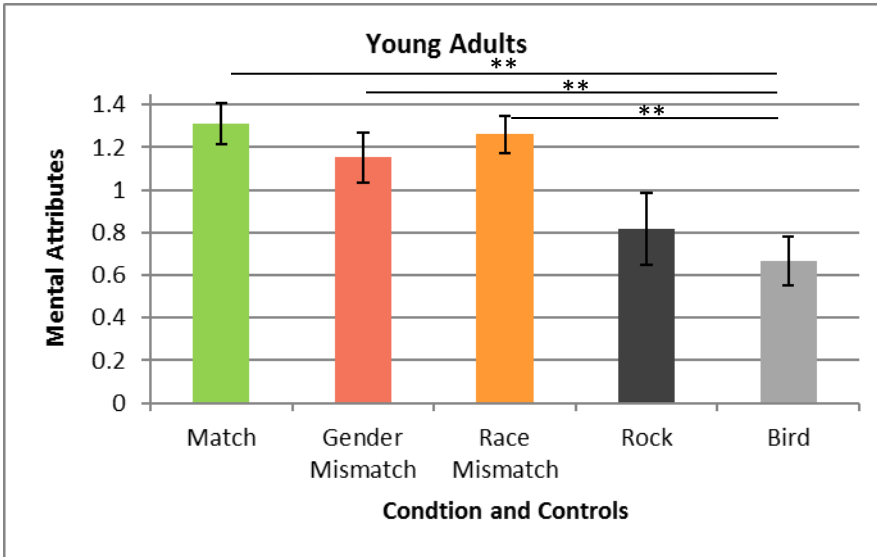


Error bars denote standard error

* Denotes $p < .05$

** Denotes $p < .01$

Figure 5. Mean quantity of mental state attributes by condition with controls for young adults.

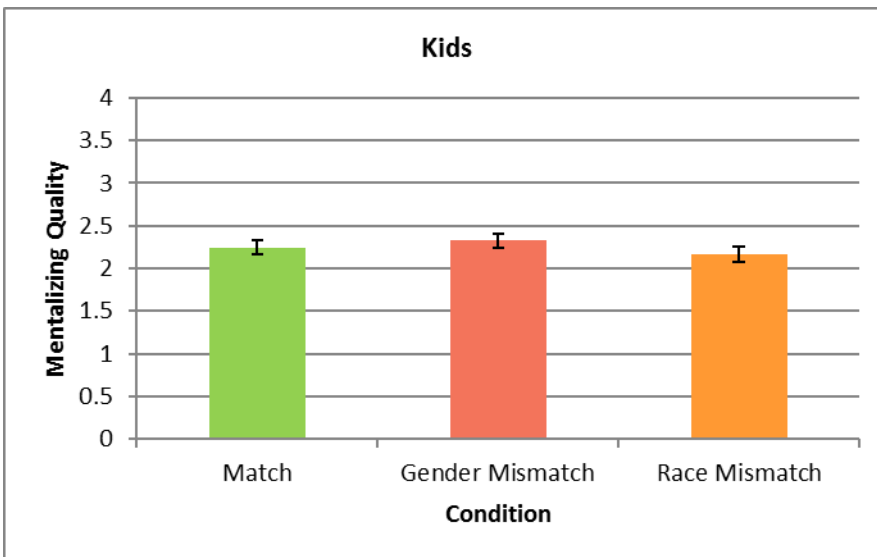


Error bars denote standard error

* Denotes $p < .05$

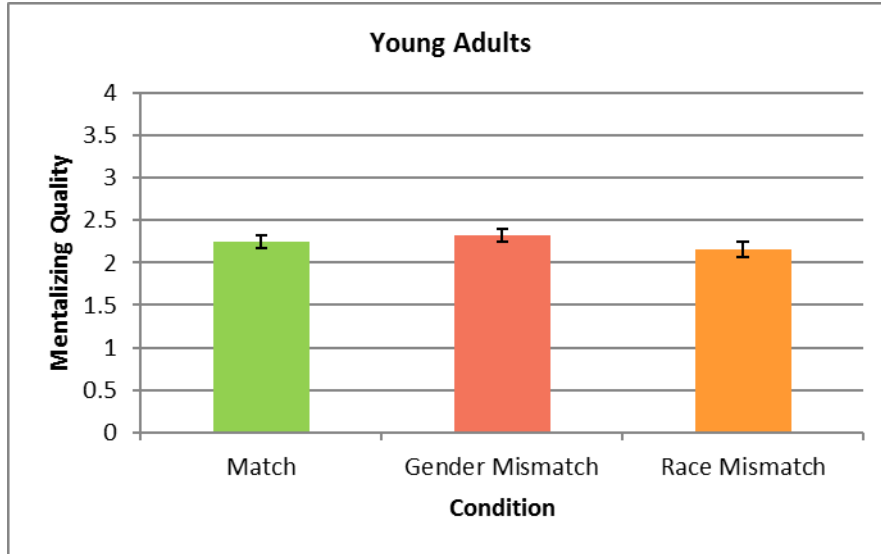
** Denotes $p < .01$

Figure 6. Children's average mentalizing quality by condition.



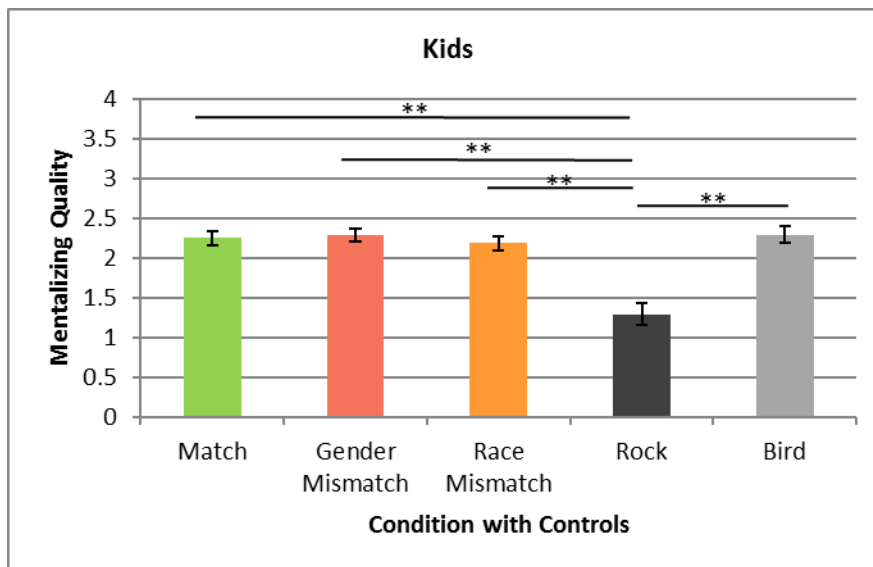
Error bars denote standard error

Figure 7. Young adults' average mentalizing quality by condition.



Error bars denote standard error

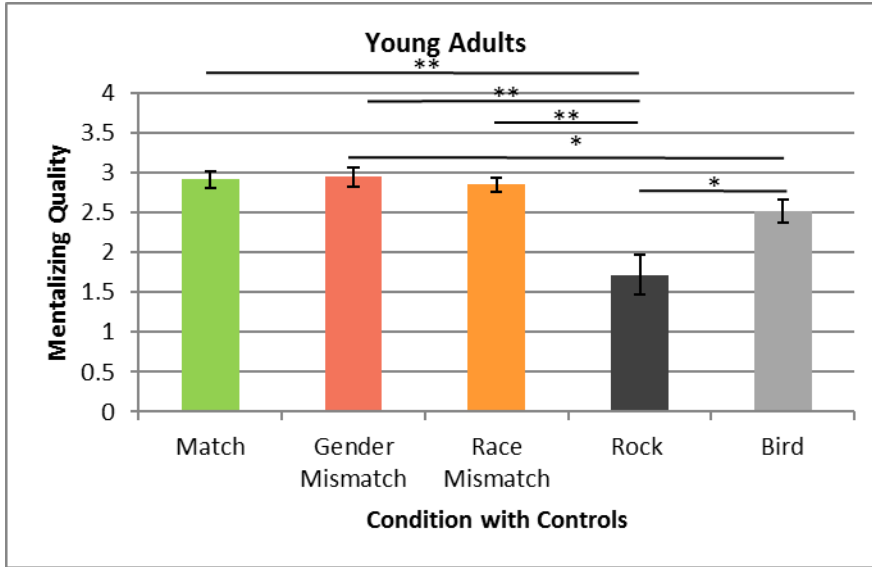
Figure 8. Children's average mentalizing quality by condition with controls.



Error bars denote standard error

** Denotes $p < .01$

Figure 9. Young adults' average mentalizing quality by condition with controls.



Error bars denote standard error

* Denotes $p < .05$

** Denotes $p < .01$

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Appendix A

Data Collection Procedure

Warm-Up

Chat about what they have done today/so far this summer etc.

Instructions:

We're going to play a storytelling game!

I'm going to give you a couple characters and I want you to tell me a story about each of them, like make up a story about something that happens to them or something that they do.

In your stories I want you to talk about what the characters think and feel.

Thoughts are things you think in your head about something, like *I think it's sunny outside* or *I think this is a small room* or *I like that rug*.

→ point to head

Feelings are things you feel on the inside, like *sad, happy, scared, or mad*.

→ point to chest

There are no right or wrong answers – just tell me whatever kind of story you want to – you get to use your imagination!

Would you like to do that?

Prompts: Give only vague feedback – oh, ah, wow, uh huh, mmm, ok

Then what happens?

Can you tell me some more?

Anything else?

Story Questions:

1. What did ___ try to do in this story?
2. What did ___ think in this story? → point to head
3. What did ___ feel in this story? → point to chest

Appendix B

Narrative Generation Prompts

Character Introductions

This is _____. _____ is a girl. She has light skin. This is _____'s family. These are _____'s friends.

This is _____. _____ is a girl. She has dark skin. This is _____'s family. These are _____'s friends

This is _____. _____ is a boy. He has light skin. This is _____'s family. These are _____'s friends

This is _____. _____ is a boy. He has dark skin. This is _____'s family. These are _____'s friends

Semi-structured context prompts for children:

1. Tell me a story about _____ in school.
2. Tell me a story about _____ at the pool.*
3. Tell me a story about _____ at a party.
4. Tell me a story about _____ on the playground.
5. Tell me a story about _____ on a shopping trip.
6. Tell me a story about _____ at a restaurant.

Semi-structured context prompts for young adults:

1. Write a story about _____ in school.
2. Write a story about _____ at the gym.*
3. Write a story about _____ at a party.
4. Write a story about _____ at the park.*
5. Write a story about _____ on a shopping trip.
6. Write a story about _____ at a restaurant.

*Different prompt for young adults vs. children.

Nonhuman Controls/Anchors for Comparisons

Non-human: Rock

This is a rock. Tell me/write a story about this rock on top of a hill.

Non-human: Bird

This is a bird. Tell me/write a story about this bird in a tree.

Warm-up/transition stories about self

Self Narrative 1

Tell me/write a story about you at home.

Self Narrative 2

Tell me/write a story about you in the doctor's office (dentist's office for young adults).

Appendix C

CONFIDENTIAL DEMOGRAPHIC QUESTIONNAIRE

Gender: Male Female **Age:** _____ **Ethnicity and Race** (check all that apply):
 White/Caucasian Hispanic/Latino
 Asian Native American
 Black/African American N/A or Unknown
 Hawaiian/Pacific Islander Other
 (_____)

The following questions inquire about the racial and ethnic diversity of the individuals with which you have frequent contact. Please respond as accurately as possible but feel free to skip any questions you don't feel comfortable answering.

Please list the first name of up to 4 of your closest friends. Estimate how often you spend time with each friend (**1 = never, 4 = all the time**). Lastly, indicate the gender and race of each of your friends.

First Name	Time (circle)	Gender (circle)	Ethnicity and Race (check all that apply)
1. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other
2. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other
3. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other
4. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other

Please circle the number that best represents the diversity of individuals you have frequent contact with in the settings listed below using the following key:

- 1 = **none** or **very few** other race/ethnicity
- 2 = **a few** but **less than half** other race/ethnicity
- 3 = about **half** other race/ethnicity
- 4 = **most** other race/ethnicity

Lastly, for each setting, estimate the percentage of individuals you have frequent contact with that belong to each Ethnicity/Race. Leave blank if N/A.

Setting	Diversity	Estimated Percentages
School	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%
Activities (clubs, teams)	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%
Friends	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%
Work	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%
Residence Hall	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%
Church/place of worship	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%
Other: _____ (list)	1 2 3 4	White: ___% Asian: ___% Black: ___% Hispanic: ___% Other: ___%

Thank you for your responses!

Appendix D

CONFIDENTIAL DEMOGRAPHIC QUESTIONNAIRE

Child's DOB: ___/___/____ Child's Gender: Male Female

Child's siblings (please circle gender):

1. _____	Male Female
2. _____	Male Female
3. _____	Male Female
4. _____	Male Female
5. _____	Male Female
6. _____	Male Female

Child's Ethnicity and Race (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> White/Caucasian | <input type="checkbox"/> Hispanic/Latino |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Native American |
| <input type="checkbox"/> Black/African American | <input type="checkbox"/> N/A or Unknown |
| <input type="checkbox"/> Hawaiian/Pacific Islander | <input type="checkbox"/> Other (_____) |

Please indicate information about the contributing members of your household.

You

Gender: Male Female

Ethnicity and Race (check all that apply):

- White/Caucasian
- Asian
- Black/African American
- Hawaiian/Pacific Islander
- Hispanic/Latino
- Native American
- N/A or Unknown
- Other (_____)

Highest level of education obtained:

- Less than high school
- High school/GED equivalent
- Some college
- College degree
- Post college degree

Spouse/Partner (leave blank if N/A)

Gender: Male Female

Ethnicity and Race (check all that apply):

- White/Caucasian
- Asian
- Black/African American
- Hawaiian/Pacific Islander
- Hispanic/Latino
- Native American
- N/A or Unknown
- Other (_____)

Highest level of education obtained:

- Less than high school
- High school/GED equivalent
- Some college
- College degree
- Post college degree

How did you first hear about the Cognitive Development Lab?

- Friend
- By mail
- Brochure from doctor's office
- Facebook
- Internet
- Poster in local business
- Other: _____

Would you like to receive a copy of the Cognitive Development Lab newsletter summarizing the results of this and other studies going on in our lab?

Yes No

The following questions inquire about the racial and ethnic diversity of the individuals your child has frequent contact with outside of your immediate family. Please respond as accurately as possible but feel free to skip any questions you don't feel comfortable answering.

Please list the first name of up to 4 of your child's closest friends. Estimate how often your child spends time with each friend (**1 = never; 4 = all the time**). Lastly, indicate the gender and race of each of the friends.

First Name	Time (circle)	Gender (circle)	Ethnicity and Race (check all that apply)
1. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other
2. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other
3. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other
4. _____	1 2 3 4	Male Female	<input type="checkbox"/> White <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Other

Please circle the number that best represents the diversity of individuals your child has frequent contact with in the settings listed below using the following key:

- 1 = **none** or **very few** other race/ethnicity
- 2 = **a few** but **less than half** other race/ethnicity
- 3 = about **half** other race/ethnicity
- 4 = **most** other race/ethnicity

Lastly, for each setting, estimate the percentage of individuals your child has frequent contact with that belong to each Ethnicity/Race. Leave blank if N/A.

Setting	Diversity	Estimated Percentages
School	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Classroom	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Neighborhood	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Activities (clubs, teams)	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Church/place of worship	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Friends	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Adult mentors/caregivers	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%
Other: _____ (list)	1 2 3 4	White: __% Asian: __% Black: __% Hispanic: __% Other: __%

Thank you for your responses!

Appendix E

Narrative Mental State Frequency Coding: Cognition, Emotion, & Intentionality

Cognition – knowledge, thought

Know
Think/thought
Idea
Understand/clarity/make sense
Learn/associate
Decide
Reason/figure out
Recognize/realize
Analyze
Guess/suppose
Bet/anticipate/expect
Remember
Conscious/alert/distracted
Curious/inquisitive
Wonder/ponder
Interest/disinterest/bored
Dream
Impressed/amazed
Surprised
Notice/observe
Explore
Discover
Found out (but not just found)
Smart/intelligent
Pretend
Trick
Sure/unsure
Obsessed

Intentionality – volition, goals, plans, desires, preferences

Try to (if indicating direction of effort or desired outcome, NOT just sampling/trial)
Plan/forethought
On purpose
Mean/Meant to
Decide
Choose/pick/select
Wants/desires/wishes
Hopes* (if orienting to specific outcome)
Needs (if psychological needs)
Prefer/love*/like/favorite/rather/keen/into (i.e. she's into that music, she loves it)
Indifference/don't care* (if not affect-driven)
Going to/let's (if planning action)

Emotion – feelings, affective responses

Felt/feels (if referring to an emotional experience not otherwise specified)
Mood – good/bad
Happy/glad (but not happily ever after)
Calm/content
Scared/afraid/frightened/fear/startled
Anxious/nervous/worried
Mad/angry
Sad/depressed
Cry (if linked to an emotional experience, not just in response to physical pain)
Upset
Stress
Disappointed
Lonely
Concerned/cares* (if cares for __)
Hurt (if referring to an emotional experience)
Affection/attachment/love* (if referring to a person)
Sympathy/compassion/"feeling bad for"
Guilt/remorse/shame/embarrassment
Hope* (if affect-laden)
Pride/conceit
Excitement/thrill
Joy/enjoy
Startle/shock
Admiration
Disgust/hate/rancor
Cranky/crabby/grumpy/irritable/bad mood/cross
Nostalgia
Entertaining/amusing/funny
Fun/funny
Alright/ok (as in to be all right)
Traits directly linked to an emotion (such as shy) but not behavioral traits more removed from emotion (so not aggressive or outgoing/introverted)

Note:

- Mental state attributes only count if given in reference to the protagonist (i.e. not the narrator or any other characters).

Coding instructions

- Type CTRLJ to run the prep MACRO
 - The MACRO excel file must be open in order for the MACRO to run
 - The MACRO file is called “PERSONAL” in the Narrative > Transcriptions folder
- Select the spreadsheet with the coding copy, “MenState.XX”
- Rename the spreadsheet, changing the XX to your initials
- Code for mental state attributions for the protagonist (“she didn’t know”), but NOT for the narrator (“I don’t know”; unless it’s a story about the narrator and they are talking from their frame of reference in the story) and NOT for any other characters that might be introduced in the story (“her friends didn’t know”)
- Collective mental states: code if the protagonist is included in the group of people experiencing a mental state
- Repeats: if a mental state word is immediately repeated verbatim in a way that suggests it’s a stutter or mindless repeat, count only the first instance. Otherwise, count both words
- Read through each block of text 5 times:
 1. Initially familiarize yourself with the content
 2. Identify **cognitions**, changing their font color to **blue**
 3. Identify **emotions**, changing their font color to **purple**
 4. Identity **intentions**, changing their font color to **green**
 5. Finally, count the number of each kind of mental state attribute and enter the totals in their respective columns.
- Sometimes Excel doesn’t display the full content of cells with particularly long segments, so always check to make sure that you can see the full content
 - You can adjust the column width to be as wide as needed so that you can see all the content
- If you notice anything weird that you have questions about, change the font of the word in question to **red** and highlight the participant number in the “Narrative Coding Sheet” file
- Once coding is complete, mark it in the “Narrative Master Sheet” file

Appendix F

Mentalizing Quality Coding Scheme

Goal: capture the quality/sophistication/complexity/richness of mentalizing for target story characters. Ranging from no mentalizing (level 0, character does not act, or level 1, character depicted simply as an actor), to sophisticated, complex, rich, and contextualized mentalizing (level 4, character depicted as a person).

0. Inactive. Character is portrayed as an inanimate object (acted upon but does not act) OR in the case of animate characters, is only described (does not act or participate in actions).

It (the rock, the character) was big. Somebody steps on it. The rock wasn't hard and then it got squished. A kid saw the rock. And then he saw the rocks and then he picked them up and played with them.

1. Actors. Actors are portrayed simply in terms of actions: the narrative is a sequence of actions with no indication of the character's internal experiences

And she did some math, she did some reading, and then it was recess. And then they went outside and they played on the playground and they played a game. Her and her friends played a game. And then they went back inside then it was time to go home. And she went on the bus then she got off and went home.

2. Psychological Agents: Basic. Basic psychological agents are still primarily defined by actions but a few basic internal experiences or responses are introduced, evidenced by one or more of the following:

- Basic references to 1 or 2 intentions (implicit or explicit, such as *try, want, need, decide*): actions framed as goal-directed with basic underlying motivations
"He was playing tag and he dropped off the ladder to get away from the tagger"
- References to perceptual/physical experience
see, hear, hunger, thirst, pain (must clearly refer to character experiencing pain, not just that she hurt herself)
- Basic speech produced by character
"And then she finished her picture and said, 'I'm done!'"
- 1 or 2 unique explicit/implicit references to internal experiences such as thoughts and emotions (but these are only cursory and not well-developed)

3. Psychological Agents: Full. Full psychological agents are portrayed as having distinct psychological experiences that serve as the basis for actions or are thoroughly-developed responses to circumstances, evidenced by one or more of the following:

- More advanced description of intentionality, evidenced by:
 - Multiple steps to carry out goals, or
 - Explicit references to intentionality (*try, want, need, decide*) linked with other internal experiences (*thoughts, feelings*)
- References to multiple (3+) unique explicit/implicit internal experiences (*thoughts, feelings, intentions*)
- Just a few thoroughly-developed internal attributes, accompanied by one or more of the following:
 - Extensive detail (such as behavioral implications etc.)
 - Change across time (past to present, origin and resolution)
 - Verbal expression by the character (only counts for cognitions and emotions)
- Internal experiences clearly marked as the causes of other internal experiences
She felt X because she knew Y; “She doesn’t like going to parties because she’s focused on school”
- Basic contrast with the internal experiences of others or reality
“She wanted a root beer but her dad didn’t want her to have one”
- Depiction of generalized internal experience pattern
traits, tendencies, disposition

4. Persons. Persons are portrayed as having sophisticated, complex, rich, and contextualized internal experiences, evidenced by one or more of the following:

- Internal experiences indicating sensitivity to social evaluation
Embarrassment, pride, shame, shy, “she was afraid they might think she was silly”
- Intrapsychic conflict/mixed emotions
“and then she notices her friend is getting involved in all the college-y stuff and she doesn’t really know whether or not to step in because it’s her friend’s birthday and she wanted her to have a good time.”
- Rich/detailed contrast with the internal experience of others or reality
“He tries to convince the robins that this is his branch and his tree but they’re not convinced and he decides to fly away and let them, and be the bigger bird and not push the conflict any further.”
- Pronounced empathic responding to the distress of others (not just “felt bad for ___”)
“And I started crying because my sister was crying about her shot and I just felt so bad for her I didn’t want her to hurt”
- Self-monitoring of expression of internal experiences
hiding feelings, deception, pretense
- Insight from introspective reflection/evaluation
“whenever she tries something on she’s very critical, she’s like hmm no I don’t really like this, and her friends are like no it looks good! But she doesn’t believe them...and when nothing works she’s like maybe I’m too critical and need to trust my friends.”
(#104 has more good examples)
- Thoughtful intentional planning: advanced strategic thinking-ahead (foresight) and/or orienting towards complex goals
“and he tried to think of a way to just not get in trouble but have fun”

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RESEARCH INTERESTS

My research interests center around the development of children's thinking about other people. I am particularly interested in naïve psychology and naïve sociology, everyday systems of thinking about people as psychological beings and members of social categories, and how these two ways of understanding others interact across development.

EDUCATION

PhD in Psychology, Lehigh University, anticipated completion in May 2019

MS in Psychology, Lehigh University, anticipated completion in May 2017
Master's thesis: *Mental State Inferences in Narratives about Characters of another Gender and Race: An Intersection of Naïve Psychology and Naïve Sociology*

MS in Clinical Mental Health Counseling, Southern Adventist University, May 2014
Master's thesis: *Extravert/Introvert Personality Types and Empathy in Emerging Adults: An Exploratory Description of Differences and Similarities in Dispositional Empathy, Perspective-Taking Ability, Empathic Concern, and Prosocial Helping Behavior*

BA in Psychology with a minor in Education, Southern Adventist University, May 2011

BS in Outdoor Leadership with an emphasis in Adventure-Based Counseling, Southern Adventist University, May 2011

PUBLICATIONS

Laible, D., Van Norden, C., Karahuta, E. & **Stout, W.** (in press, expected publication July 2017). Children's social-emotional development. In K. Nedal (Ed.), *The SAGE Encyclopedia of Psychology and Gender*. New York, NY: Sage.

Laible, D., Karahuta, E., Van Norden, C., & **Stout, W.** (in press). Close relationships. In M. Bornstein (Ed.), *The SAGE Encyclopedia of Lifespan Human Development*. New York, NY: Sage.

Stout, W. (2015). What dimensions of empathy predict prosocial helping behavior in emerging adulthood? The relationships between volunteering to help and perspective-taking, experience of empathic concern, and self-report empathic inclinations. *Journal of Interdisciplinary Graduate Research* (Vol. 1, Article 1). Southern Adventist University.

Robinson, W. (2009). Accept a Helping hoof? Openness to equine-assisted mental health as an emerging alternative therapy: A descriptive study among college students. *Journal of Interdisciplinary Undergraduate Research* (Vol. 2, Article 3) and (2009, April) Paper and poster presentation at Southern Adventist University annual Campus Research Symposium.

PRESENTATIONS

Stout, W., & Brandone, A. B. (2017, April). Children's use of mental states in narratives: Attributions of intention, emotion, and cognition in narrative generation. Poster presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.

Brandone, A. B., **Stout, W.,** & Moty, K. (2017, April). Relations between the Capacity for Coordinated Joint Engagement and Infants' Emerging Understanding of Intentional Actions. Poster presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.

Brandone, A. B., Moty, K., & **Stout, W.** (2017, April). Relations Between Self-locomotion Experience and Infants' Developing Understanding of Intentional Actions. Paper presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.

Stout, W., Moty, K., & Brandone, A. B. (2016, May). *Links between infant's emerging intention understanding and parent's adoption of an intentional stance*. Poster presented at the biennial meeting of the International Congress of Infant Studies, New Orleans, LA.

Moty, K., **Stout, W.,** & Brandone, A. B. (2016, May). *The development of infant intention understanding: Contributions of joint attention and motor experience*. Poster presented at the biennial meeting of the International Congress of Infant Studies, New Orleans, LA.

- Brandone, A. C., & **Stout, W.** (2015, October). *The Role of ToM Skill and Disposition in Mature Social Cognition*. Paper presented at the biennial meeting of the Cognitive Development Society, Columbus, OH.
- Brandone, A. C., Werner, J., & **Stout, W.** (2015, March). *Individual differences in theory of mind reasoning and relations to social competence in college students*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- WilliamsMorris, R., Trim, R., Kulik, S., **Stout, W.**, Alvarez, R., Li, K. (2014, March). *Starting right? Time to bed, resilience, and sleep quality*. Paper presented at the annual meeting of the Southeastern Psychological Association, Nashville, TN.
- WilliamsMorris, R., Trim, R., **Stout, W.**, Kulik, S., Otis, S., Pauldurai, J. (2013, November). *Sleep quality, resilience, and cortisol reactivity to acute stress*. Poster presented at the annual meeting of the Society for Neuroscience, San Diego, CA.
- WilliamsMorris, R., Kulik, S., Yopez, E., Otis, S., Milmine, M., Alvarez, R., & **Stout, W.** (2013, March). *The facts of the matter: College students' knowledge of neuroscience*. Paper presented at the annual meeting of the Southeastern Psychological Association, Atlanta, GA.
- Robinson, W.**, Bradt, K., & Wesleyan, A. (2010, April). *Getting schooled in psychology: Psychology and Adventist higher education*. Paper and poster presented at Southern Adventist University annual Campus Research Symposium.

AWARDS

- Tennessee Licensed Professional Counseling Association's Outstanding Student Recognition, 2013
- Professional Award in Outdoor Leadership, Southern Adventist University, 2011
- Distinguished Dean's List, Southern Adventist University, 2007-2011
- Who's Who Among Students in American Universities and Colleges, Southern Adventist University, 2010
- Coombs Motivation Award, Southern Adventist University, 2010
- Best Individual Poster at Campus Research Symposium, Southern Adventist University, 2009: Poster of research in Openness to Equine Assisted Mental Health Therapies
- Psychology Faculty Scholarship, Southern Adventist University, 2009

- The dos Santos Scholarship for Psychology Students, Southern Adventist University, 2008

ORGANIZATIONS

- International Congress of Infant Studies
- Society for Research in Child Development
- PSI CHI – International Honor Society in Psychology

TRAINING & CERTIFICATIONS

- Coding, Sharing, and Reusing Video Data with Databrary workshop, 2015
- Teacher Development Program for Graduate Students Level 1, Lehigh University, 2014
- Social and Behavioral Responsible Conduct of Research training, CITI, 2014
- Gottman Method Marital Therapy Level 1 Training: Bridging the Couple Chasm, 2013
- Equine Assisted Growth and Learning Association Model Practice Part 1 Training, 2013
- Death and Grief Companionship Philosophy workshop, Dr. Alan Wolfelt, 2011

SERVICE ACTIVITIES

- Reviewer of Eastern Psychological Association poster abstracts in Cognitive area for 2017 Annual Meeting
- Secretary for the Graduate Student Senate Executive Board at Lehigh University, 2016-2017
- Lehigh University Psychology Brown Bag Coordinator, 2016- 2017 school year
- Psychology Program Alternate for Dean's Graduate Student Advisory Council at Lehigh University, 2016-2017
- Reviewer of Eastern Psychological Association poster abstracts in Cognitive area for 2016 Annual Meeting
- Contributor to a Child Development Research Group proposal for the Graduate Research and Development Experience, an outreach at Lehigh University, 2016
- Lehigh University Psychology Brown Bag Coordinator, 2015- 2016 school year
- Volunteer for Project Keep Warm of the Lehigh valley, 2014
- Counseling program student representative for booth at American Association of Christian Counselors World Conference, 2013
- Representative at campus-wide Drugs and Alcohol Awareness week booth, 2013
- Volunteer at therapeutic horseback riding program for children with disabilities at Heartland Ranch, 2008-2014

- Facilitator of adventure programming for all ages, including outdoor schools, challenge courses (high ropes and low ropes initiatives), camping, caving, and rock climbing through Southern Outdoor Adventure Program, 2009-2014
- President and co-founder of Granite Girls, a girls-only outdoor club, 2009-2010
- Mission trips to Guyana, South America, and Ghana, Africa, 2006 & 2009
- Benefit races, including the Susan G. Komen Race for the Cure and Kirsten Wolcott Memorial 5k

PAID RESEARCH, TEACHING, & OTHER ACADEMIC EXPERIENCE

Research Assistant – Lehigh University

August, 2015-current

Cognitive Development Lab, projects primarily related to development of social cognition with participants ranging from infants to young adults. Assist in research study planning, preparation, data collection, data analysis, and supervision of undergrad research assistants.

Graduate Assistant – Southern Adventist University

August 2013-May 2014; Supervisor: Dr. Rob Coombs

School of Education and Psychology, Counseling. Teacher Assistant for PSYC 490 Psychology Seminar, editor of department newsletter *Unraveled*, assistant editor of the *Journal of Interdisciplinary Undergraduate Research*, student advisement assistant.

Graduate Assistant – Southern Adventist University

August 2011- May 2013; Supervisor: Dr. Doug Tilstra

School of Education and Psychology, Outdoor Leadership. Teacher Assistant for OLAC 136 Survey of Outdoor Adventures and OLAC 142 Basic Rock Climbing, Coordinator of academic events, Outdoor Leadership Program Admissions Officer and process administrator.

Assistant to Unit Assessment System Manager – Southern Adventist University

August 2010-July 2011, June-August 2013; Supervisor: Elaine Hayden

School of Education and Psychology. Assistant for preparation related to NCATE re-accreditation visit, SACS Unit Planning and Assessment Report, and CACREP accreditation application.

Office Assistant – Southern Adventist University

October 2008- July 2011; Supervisor: Asti Conibear

School of Education and Psychology Office. Assistant to department faculty and staff, exam proctor, creator of advisement documents and prospective student packets, student advisement assistant.

Grader – Southern Adventist University

August 2008-May 2010; Supervisors: Dr. Rob Coombs, Mikhaile Spence, Cristy Pratt

School of Education and Psychology, Developmental Psychology classes. Grader for exams and essays in multiple classes with 50+ students each.

CLINICAL EXPERIENCE

Clinical Mental Health Counseling Clinical Internship – 600 hours of supervised clinical work, including 240 direct hours, Fall 2013-Spring 2014

- ♦ At Behavior Research Institute, a non-profit community agency targeting the prevention of child abuse, and at Associated Psychological Services, a private practice
- ♦ Adult psychoeducational groups for parenting skills
- ♦ Child and adolescent psychoeducational groups for life skills, anger management, and affect management
- ♦ Individual counseling with children, adolescents, and adults

Clinical Mental Health Counseling Clinical Practicum – 60 direct hours under supervision with additional 150 indirect hours, Fall 2012

- ♦ At university-based clinic open to students and community members
- ♦ Individual counseling with adults and college students

Undergraduate Internship – 500 hours of experience, Winter 2011

- ♦ At Mane Support, a non-profit equine-assisted grief counseling center
- ♦ Individual and group grief counseling