Social Cognitive Development:
Learning from Others

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Abstract
Children's reliance on other people as sources of information has become an important topic of study within childhood development. Researchers have shown that children younger than age 5 can draw on a range of cues to determine when skepticism of sources is warranted, and that source reasoning is related to the development of theory of mind. This chapter provides an overview of children's source reasoning and discusses some limitations in their ability to learn from others, including difficulties in reasoning about deception. Research on more dynamic aspects of social learning that involves information seeking and the active construction of belief systems in collaboration with others is also discussed. As a whole, research in this area is beginning to reveal how children's developing social and cognitive skills serve to guide their acquisition of knowledge.

Key Words: childhood development, deception, skepticism, reasoning, information seeking, theory of mind

Introduction
The human capacity to learn from others facilitates development at both the individual and the cultural levels (Tomasello, 2008). This ability helps children to become socialized, permits culture to be transmitted across generations, and underlies progress in science and technology. However, learning from others also carries risks. Not all people are reliable sources of information, and people sometimes mislead others, either intentionally or unintentionally. The way children reason about other people as sources of information, including how they navigate the associated challenges and opportunities, has become an important topic in social cognitive development. This chapter provides an overview of research on children's source reasoning and its broader context within developmental psychology.

By the time infants reach their first birthday, they are able to make use of social information to guide their interpretations of entities and events. In one classic study using a modified visual cliff paradigm, Sorce, Emde, Campos, and Klinnert (1985) placed 12-month-olds on a glass table that had an illusory drop-off. Infants tended to cross the illusory drop-off to their mother if she expressed joy or interest, but not if she expressed fear or anger. In another study, Mumme and Fernald (2003) found that 12-month-olds were more likely to avoid a novel object such as a spiral letter holder if they had previously seen an experimenter express a negative emotional response to it, compared with a neutral or positive emotional response.

Although some of the foundations of learning from others are in place by 12 months of age, very young children lack the language skills to benefit from much of the verbal communication that surrounds them. As children's language skills develop, their capacity to draw on others as sources of information increases dramatically. However, the effective use of this information requires social cognitive skills as well as linguistic skills.
This chapter focuses on children's reliance on others as sources of information once they have developed the language skills to benefit from verbal interactions. This is an active topic in social cognitive development and has recently been the focus of a large number of studies. It intersects with other areas of social cognitive development such as the development of theory of mind, trait reasoning, and achievement motivation. We will touch on these and other intersecting areas, but we do not seek to provide a comprehensive overview of these intersecting areas. There are also other significant findings on children's social cognitive development that are beyond the scope of this chapter, such as work on mental state understanding among infants (Luo & Baillargeon, 2010) and children's implicit attitudes (Cvencek, Greenwald, & Melzoff, 2011; Dunham, & Degner, 2010).

Most of the studies we will be discussing have been conducted with children between the ages of 3 and 5, the ages at which children begin to demonstrate foundational skills in evaluating others as potential sources of information. However, we will also cover a substantial amount of research involving children between 6 and 12 years because there are major developments during these ages as well, including changes in children's ability to reason about the possibility that others may not be motivated to communicate their true beliefs accurately.

There has been no single theoretical framework that has served to guide the current research on children's reasoning about others as sources of information. However, certain theoretical issues cut across much of this work. One such issue concerns whether children's source reasoning is fundamentally about their conceptions of mental life, or is based on more associative processes. Other questions revolve around the centrality of inhibitory control in children's ability to reject information provided by others. Also of theoretical interest is the extent to which children's source reasoning skills are domain specific, and whether they are influenced by various forms of social and cultural inputs. These themes will be discussed in relation to studies that address them.

This chapter is divided into two major sections. The first section covers research on factors that influence children's source reasoning. We begin by examining the cues that 3- to 5-year-olds can use to identify reliable sources, and we then address research on how the use of these cues is linked to the ability to make inferences about the mental life of others. Next, we discuss limitations in children's ability to put their source reasoning skills into practice that tend to persist even after age 5 years, an age at which many children have developed the foundational skills that source reasoning requires. Finally, we discuss recent efforts to extend models of children's source reasoning from the standard contexts, which involve factual information, to contexts that involve value judgments such as personal preferences.

In the second major section, we review research on dynamic aspects of social learning in which children actively process information to construct systems of beliefs in collaboration with others (Gelman, 2009). We begin by describing the sociocultural approach, which emphasizes cultural aspects of children's learning from others, such as how children use cultural artifacts to construct beliefs. We then review research on the role of asking questions. Next, we describe how children's intuitive theories can shape the way they make use of information they obtain from others. Finally, we address how children evaluate claims about unobservable processes and events. Following the two major sections, we discuss promising areas for future research.

Identifying Reliable Sources
A Source's Previous Statements

Recent findings suggest that by 3 to 4 years of age, children treat information about the accuracy of a source's previous statements as a cue to the source's reliability. The standard paradigm begins with a training phase in which two informants apply a verbal label to a pair of familiar objects such as a ball and a cup, with one informant labeling the objects correctly and the other labeling them incorrectly (Birch, Vauthier, & Bloom, 2008; Corriveau & Harris, 2009; Harris, 2007; Jaswal & Neely, 2006; Koenig & Harris, 2005). Next, there is a test phase in which the two informants identify a series of novel objects using different novel labels such as "mido" and "loma." Koenig and Harris (2005) found that 4-year-olds were more likely to accept a novel label when it came from the informant with a history of accuracy, and that they expected the same informant to provide more accurate information in the future. Birch et al. (2008) replicated these findings and extended them to the functions of objects.

In each of these studies, the informants were either consistently reliable or consistently unreliable during the training phase. The finding that young children can systematically differentiate between informants under these conditions shows that they are able to make use of information about a source's
they are prone to discount or ignore such information if it pertains to familiar and ordinarily trustworthy informants” (Corriveau & Harris, p. 436).

In a longitudinal study, Corriveau et al. (2009) investigated the link between an infant’s attachment status and his or her preference for a familiar source as a 4- or 5-year-old. In the first phase of the study, the attachment status of a group of 15-month-old infants was measured using the strange situation procedure (a standard measure of young children’s responses to caregiver separation and reunion; Ainsworth et al., 1978). Each child was classified as secure, insecure-avoidant, or insecure-resistant (a fourth category, insecure-disorganized, will not be discussed here). Children were classified as secure if they attempted to reestablish a connection with their mother after a brief separation, as insecure-avoidant if they showed relatively little interest in interacting with their mother, and as insecure-resistant if they showed a preoccupation with the separation but were not comforted by the reunion.

When the children reached age 4, and again at age 5, they completed a set of tasks in which they were presented with conflicting information from their mother and from a stranger. For example, as 5-year-olds, the children were presented with pictures of novel animal hybrids such as a blend between a bird and a fish (see Jaswal, 2004). On one part of the task, participants reasoned about hybrids in which the contribution of each animal was equal and the two sources offered conflicting labels (e.g., bird versus fish). On another part of the task, each child was shown hybrids in which the contribution of one of the animals was more perceptually salient (e.g., the fish), and the mother used the label of the animal that was less salient (e.g., bird). Overall, children tended to agree with the label provided by their mother unless it contradicted the perceptual evidence, but the effect varied with the child’s attachment status. Securely attached children were the most likely to accept the perceptual evidence, children with insecure-avoidant attachment showed no systematic preference for the claims of their mother, and children with insecure-resistant attachment tended to agree with their mother regardless of the perceptual evidence. Corriveau et al. (2009) interpreted these results as reflecting a tendency for securely attached children to shift strategies based on the available perceptual evidence, children with insecure-avoidant attachment to focus on their own perceptual observations, and children with insecure-resistant attachment to be hypervigilant to the signals of their mothers.

The Child’s Relationship with the Source

There is evidence that young children are also sensitive to the nature of their relationship with potential sources. Corriveau and Harris (2009) found that children ages 3, 4, and 5 considered a familiar teacher to be a better source of information than an unfamiliar teacher. Among the 3-year-olds, selective trust was only minimally affected by the prior accuracy of the teachers, and it was seen even when the familiar teacher was portrayed as being consistently inaccurate and the unfamiliar teacher was portrayed as being consistently accurate. In contrast, 4- and 5-year-olds’ trust of familiar teachers was strengthened by a history of accurate labeling and weakened by a history of inaccurate labeling. Developmental differences indicate that, “like older preschoolers, younger preschoolers can register and remember inaccuracy but unlike older preschoolers
in the function of attachment in early childhood and adulthood (Fraley & Shaver, 1998; Sharpsteen & Kirkpatrick, 1997; Shaver & Mikulincer, 2007), it will be important to determine whether attachment styles among adults also have implications for evaluating sources of information. For example, does the distrust seen among insecurely attached adults generalize beyond topics that pose a clear threat to the relationship (Simpson, 1990)?

**Other Cues**

There are other cues that preschool-aged children use to assess a potential source’s reliability. One is to rely on people who provide relevant information in response to requests for help (Eskritt, Whalen, & Lee, 2008). Another is to mistrust sources who have a history of dissenting from others rather than agreeing (Corriveau, Fusaro, & Harris, 2009).

Young children generally consider adults to be more reliable sources of information than same-age peers. Jaswal and Neely (2006) found that when no specific information was presented about the reliability of an adult source and a child source, 3- and 4-year-olds tended to prefer the adult. However, when the adult source was shown making inaccurate statements and the child source was shown making accurate statements, participants tended to prefer the child. This pattern of results is consistent with the notion that young children use life experience as a proxy for reliability when information about a source’s previous statements is not available. Other research suggests that children will make an exception to the general heuristic of relying on adults in contexts in which same-age peers are likely to have special expertise, such as with reference to questions about how to operate certain types of toys (VanderBorght & Jaswal, 2009). Research on developmental differences in cultural transmission among child peers supports the possibility that the sophisticated imitative capacities that characterize human children support age-related improvements in the ability to acquire skills by observing others (Flynn & Whiten, 2008).

**Source Reasoning and the Representation of Mental Life**

**THEORY OF MIND**

The ability to reason about sources is an important aspect of learning to represent the mental life of others. These representations, commonly referred to as *theory of mind*, involve reasoning about people in relation to inner states such as beliefs and desires in a way that serves as a framework for interpreting and predicting human behavior (Aastington, 2001; Wellman, Cross, & Watson, 2001). The skills that underlie theory of mind develop rapidly between the ages of 3 and 5, and have been described as a “cornerstone of social intelligence and satisfying social interaction” (Peterson, Wellman, & Liu, 2005, p. 502). Among adults, ideas about a source’s reliability are closely tied to notions of mental life. For example, adults often reject sources who are suspected of lacking relevant knowledge, or of having deceptive intent.

The paradigms that have been used to examine source reasoning in relation to potential sources’ history of reliability do not permit a definitive assessment of the role played by conceptions of mental life. Although it is possible that children make mental state inferences when they decline to accept information from sources who have previously been unreliable, it is also possible to make the same pattern of responses without giving any consideration to the mental life of the informant. One such strategy is to simply identify certain sources as unreliable, just as one might avoid using a computer that exhibits a high rate of failure without having any understanding of the underlying problem (Heyman, 2008; see also Birch et al., 2008; Nurmsso & Robinson, 2009).

To explore the relation between source reasoning and theory of mind, new research has begun to include measures assessing both capacities. There is some evidence that children who show greater sophistication on theory of mind tasks also show more sophisticated reasoning about the evaluation of sources (DiYanni & Kelemen, 2008; Vanderbilt, Liu, & Heyman, 2011; see also Pasquini et al., 2007, who found no such link). Vanderbilt et al. (2011) gave 3- to 5-year-olds a theory of mind scale developed by Wellman and Liu (2004) to assess the developmental progression of mental state understanding. The scale includes measures of children’s understanding of diverse desires, diverse beliefs, knowledge and ignorance, false beliefs, and false emotions. After controlling for age, children’s performance on the theory of mind scale was positively correlated with their performance on a selective trust task, which suggests that children’s understanding of mental life may facilitate their ability to critically evaluate what they learn from others.

**MENTAL STATE INFERENCES**

Another strategy that has been used to examine the link between notions of a source’s reliability and beliefs about mental life is to examine whether
children make use of information about mental states and processes when they evaluate sources. Some studies using this strategy have found that children younger than age 5 are sensitive to cues that can serve as indicators of a source’s knowledge. For example, they expect creators of objects to be particularly good sources of information about the objects (Jaswal, 2006; Sabbagh & Baldwin, 2001).

A second cue to a potential source’s mental state is the degree of confidence he or she expresses. Sabbagh and Baldwin (2001) found that 3- and 4-year-olds were more likely to learn a new word from a speaker who verbally expressed certainty about it rather than uncertainty. Findings from Birch, Akmal, and Faramon (2009) suggest that even 2-year-olds can use confidence as a cue when assessing a source’s reliability. Participants preferred to learn about an object from a source who appeared certain, rather than uncertain, when interacting with it. The degree of certainty was indicated using nonverbal cues such as gestures and facial expressions, which suggests that young children are sensitive to nonverbal as well as verbal cues in this context. Tenney, Small, Kondrad, Jaswal, and Spellman (2011) demonstrated that 5- and 6-year-olds, like adults, were more likely to trust sources who expressed confidence in their claims than those who expressed uncertainty. However, unlike adults, the children tended to maintain high levels of trust in confident sources even when evidence was presented suggesting that the source’s confidence had previously been overstated.

A third potential cue to a source’s mental state is the extent to which he or she has access to relevant information. In a study by Robinson, Champion, and Mitchell (1999, Study 1), children ages 3 to 6 were asked to guess which of two objects was hidden inside an opaque container. Next, an informant contradicted the participant’s guess. Finally, participants were asked to guess which object was in the container once again, and could either repeat their original response or switch to the response indicated by the informant. In one condition, the informant was shown looking inside the container before responding, and in a second condition, the informant did not look inside the container. Participants in the former condition were more likely to switch their responses, which suggests young children understand that having access to relevant information has implications for a source’s credibility.

Nurmsoo and Robinson (2009) also found that young children consider task-relevant knowledge to have implications for a source’s reliability. They pointed out that adults often excuse inaccurate statements that result from a lack of access to relevant information, such as when someone attempts to diagnose a problem before learning important facts about the situation. Nurmsoo and Robinson (2009) found that young children also consider the circumstances of the situation in which an informant provides inaccurate information. Participants aged 3 to 5 were more likely to follow the advice of an informant who had previously been inaccurate about the identity of a toy if the incorrect statement was due to a lack of access to information about the toy. In that study, participants were asked to identify the properties of objects that were hidden in a tunnel (i.e., whether an object was hard or soft, or its color), and learned that from one side of the tunnel an observer can feel whether the object is hard but not see its color, and from another side of the tunnel an observer can see the object’s color but cannot feel whether it is hard. Participants then observed informants providing inaccurate information about the properties in question, either after having access to the relevant property only (e.g., by looking inside the tunnel when asked to identify the objects’ color) or after having access to the irrelevant property only (e.g., by reaching inside the tunnel when asked to identify the objects’ color). Next, test trials were presented in which the informant was shown as having access to the relevant type of information. Children were more likely to believe informants whose prior inaccuracy could be explained by a lack of access to the relevant information. These results provide further evidence that young children have the capacity to interpret states of knowledge as holding important implications for the evaluation of sources.

INFORMANT EXPERTISE

Young children are aware that different people often possess different clusters of knowledge. Lutz and Keil (2002) found that 3-year-olds tended to associate different professions with different types of knowledge, for example, by linking doctors with knowledge of how to fix a broken arm. Four-year-olds demonstrated a more sophisticated understanding, by indicating that a doctor would know more about biology than would an auto mechanic, and that an auto mechanic would know more about the functioning of mechanical devices than would a doctor. Lutz and Keil (2002) interpreted their results as indicating that by age 4, children understand that there are individual differences in expertise that correspond to differences in knowledge about abstract categories, such as living
Even very young children can appreciate the possibility of deception. By age 3, children begin to understand the distinction between appearance and reality (Sapp, Lee, & Muir, 2000; Woolley & Wellman, 1990) and realize that a speaker's beliefs and verbal statements do not always correspond (Lee & Cameron, 2000). Children as young as age 3 also engage in lie telling and other deceptive practices (Chandler, Fritz, & Hala, 1989; Lewis, Stanger, & Sullivan, 1989; Polak & Harris, 1999; Talwar & Lee, 2002; Talwar, Murphy, & Lee, 2007). For example, Talwar and her colleagues found that many children ages 3 and older were willing to lie in order to be polite, such as when discussing an undesirable gift. By age 3, children also begin to appreciate that an individual’s deceptive behaviors can influence other people’s beliefs and behavior. For example, Hala, Chandler, and Fritz (1991) presented young children with an opportunity to help a puppet to deceive an experimenter in a hide-and-seek game. The goal was to prevent the experimenter from finding a treasure in one of four closed boxes. After seeing the puppet’s footprints marking a clear path to the box that contained the treasure, most of the 3-year-olds wiped away the tracks and made false tracks that led to one or more of the empty containers.

Gee and Heyman (2007) found that 4- and 5-year-olds have some awareness that people’s motivation to accurately convey what they know can vary across circumstances. When participants were asked to evaluate a child’s claim of feeling ill, they rated it as less plausible when they were told that the child did not want to attend camp that day. Participants were also asked whether a child would be likely to reveal an interest in playing with dolls, and they rated it as more likely when the child was identified as a girl, rather than a boy.

Jaswal (2004) found that young children were able to make use of relatively subtle information about a source’s motives. Children ages 3 and 4 were shown images of imaginary hybrid animals that most closely resembled one of a pair of existing animals (as was done by Corriveau et al., 2009; see above). Participants were more likely to accept that a hybrid shared category membership with the less similar existing animal when the source began by saying, “You’re not going to believe this, but this [the hybrid] is actually a...” Jaswal suggested that the manipulation was effective because children inferred that the less obvious category label was being provided intentionally, rather than by mistake.
they fail to recognize that a judge’s positive feelings about a particular contestant can lead to skewed judgments in the contestant’s favor, even though they have no difficulty recognizing that a judge’s negative feelings about a particular contestant can lead to skewed judgments against the contestant.

RECOGNIZING DECEPTION BUT FAILING TO ACT ON IT

Results of a study by Vanderbilt, Liu, and Heyman (2011) suggest that young children sometimes recognize that deception is present, but fail to make use of it when evaluating the trustworthiness of a source. Children ages 3 to 5 completed a task in which they accepted or rejected the advice of informants concerning the location of a hidden sticker. On some trials, advice about the sticker’s location came from a helper who was shown happily providing correct advice about the location of a sticker to two people, and on other trials the advice came from a trickster who was shown happily providing incorrect advice about the location of a sticker to two people.

Participants were asked to verbally identify the source as either a helper or a trickster, and to guess the location of the sticker. The 3-year-olds considered both helpers and tricksters to be trustworthy, according to both their verbal statements and their guesses about the location of the sticker. The 5-year-olds showed the reverse pattern by consistently differentiating between helpers and tricksters in their verbal statements and in their guesses about the location of the sticker. The most interesting pattern was seen among the 4-year-olds. They identified the helpers as more likely than the tricksters to have a helpful intent, and more likely to provide correct information to others about the location of the sticker. However, their guesses about the location of the sticker showed no differentiation in the extent to which they followed the advice of helpers versus tricksters.

The finding that 4-year-olds were able to verbally express a distinction between sources that they failed to act on is surprising given that many studies have found the opposite pattern, in which children’s behavior indicates a level of sophistication that is not obvious from their verbal responses (Woolley, 2006). For example, children begin hiding their emotions as early as age 3 (Cole, 1986), but it is not until about age 6 that they are able to provide clear answers to questions about the difference between expressing and experiencing emotions (Gnepp & Hess, 1986; Gross & Harris, 1988).
Why would 4-year-olds accept advice from individuals they have observed trying to deceive others? One possibility is that children have a general tendency to follow the advice of others, and that 4-year-olds sometimes have trouble exerting the necessary inhibitory control to overcome this tendency. This type of inhibitory control is slow to develop and does not reach its peak until adulthood (Moses & Baldwin, 2005). Moses and Baldwin (2005) argued that deficits in inhibitory control are also likely to make children vulnerable to adverse effects from advertising even after they have a clear understanding of the intentions that underlie such advertising. For example, audiovisual effects might capture children’s attention in a way that makes it difficult for them to focus on the persuasive intent of the advertisement.

The role that inhibitory control processes play in children’s ability to reject misleading advice is currently a subject of debate in the literature. Researchers who argue for the centrality of inhibitory control processes have asserted that for conventional cues such as a pointed finger or a verbal instruction, acceptance is a highly practiced response, and consequently such cues require more inhibitory control to reject than do less conventional cues such as an arrow. As is consistent with this prediction, researchers have found that young children often have a harder time rejecting advice when it is presented in more conventional forms (Couillard & Woodward, 1999; Jaswal, Croft, Sefiani, & Cole, 2010; Palmquist & Jaswal, 2012). For example, Couillard and Woodward (1999) found that preschool children more successfully rejected advice from deceptive informants about the location of a hidden object when the advice took the form of a ball placed near the location being referenced than when the advice took the form of pointing.

An alternative interpretation of these findings is that unconventional forms of advice tend to be more ambiguous, which encourages children to treat deceptive cues as accurate indicators of which box not to pick, thus transforming the task into one that no longer involves rejecting deceptive advice (Mascaro, 2011; Mascaro & Sperber, 2009). To assess this possibility, Heyman, Brinton, and Vanderbitt (in press) created a task in which it was made clear to children that a source was attempting to deceive them. Results indicated that the conventionality of the form of communication did not matter, and children’s performance on the task was not associated with independent measures of inhibitory control. These findings suggest that the conventionality of the cue may simply serve to establish whether the task involves the rejection of advice, and once this question has been answered, the child’s inhibitory control skills play a relatively minor role. Such an interpretation is consistent with the possibility that young children have difficulty forming an integrated understanding of overtly antisocial informants who nevertheless “seem to engage in cooperative sharing of information by communicating” (Mascaro & Sperber, 2009).

**ROLE OF SOCIAL EXPERIENCE**

That children show such a wide range of limitations in their reasoning about motives to deceive remains a puzzle, given that they appear to possess the knowledge to do so. Heyman, Fu, and Lee (2007) suggested one possible explanation: once children become aware of the possibility of deception, social experience is required before they can fully understand the consequences of deceptive motives, and identify the contexts in which such motives are likely to be present (see also Banerjee & Yuill, 1999).

As a first step toward examining this possibility, Heyman, Fu, and Lee (2007) examined the development of skepticism in China and in the United States, using nationality as a proxy for differences in social experience. Prevailing social norms about how people should communicate about themselves differ substantially across the two countries. For example, in China there is a greater emphasis on the importance of managing information about the self, especially if it concerns the expression of thoughts and feelings that could leave one vulnerable to criticism from others, or disrupt group harmony (see Gao, Ting-Toomey, & Gudykunst, 1996). Children ages 6 to 7 and 10 to 11 in each country were asked to reason about the disclosure of information concerning the self (see Heyman & Legare, 2005). Both the younger and older children from China showed more sophisticated reasoning about social desirability motives than did their counterparts in the United States, which suggests that differences in social experience might play an important role in shaping children’s beliefs about the contexts in which people may not be motivated to communicate what they believe to be true.

**Sources of Information about What is Desirable**

The research described thus far concerns how children reason about sources when the goal is to obtain accurate factual information. However,
children also show selectivity about sources of subjective evaluations, such as when assessing the desirability of particular objects or activities. There is evidence that young children’s reasoning in this context is sensitive to shared preferences. In a study by Fawcett and Markson (2010), 2-year-olds were more likely to follow the toy recommendations of an adult whose toy preferences matched their own.

Young children often give greater weight to information from sources with whom they have characteristics in common. In a study with 12-month-olds, Shutts, Kinzler, McKee, and Spelke (2009) showed movies that portrayed two actors eating different foods. One actor was shown speaking the child’s native language, and the other was shown speaking an unfamiliar language. In a subsequent paired-preference task, children preferred the foods that had been eaten by the actor who spoke their native language.

Finally, there are reasons to expect young children to prefer same-sex peers as sources of information about preferences. Shell and Eisenberg (1990) found that 4- and 5-year-olds are more likely to join an activity when same-sex peers are involved. Young children are more likely to imitate the behaviors of same-sex peers (Perry & Bussey, 1979) and to avoid the behaviors of opposite-sex peers (Bussey & Perry, 1982; Ruble, Balaban, & Cooper, 1981). These findings suggest that when deciding which objects and activities are desirable, young children selectively make use of information from individuals who they see as similar to themselves.

Dynamic Aspects of Social Learning Processes

The research described in the previous sections of this chapter focuses on children’s reasoning about people as sources of information. Although these studies provide important information about factors that can influence source reasoning, they do not address many of the dynamic aspects of social learning processes, in which children seek out and actively construct information in collaboration with others (Callanan, 2006). This section describes what is known about these processes and how they shape children’s general worldview.

Learning by Participating: Sociocultural Research

One research tradition that addresses the dynamic aspects of social learning is the sociocultural approach (Cole, 2003; Rogoff, 2003; Vygotsky, 1978), which examines how knowledge is transmitted across generations collaboratively, and includes the role that material artifacts, symbolic artifacts, and conventional social practices play in this process.

Rogoff and colleagues (Rogoff et al., 2005; Rogoff, Turkanis, & Bartlett, 2001) have used apprenticeship as a model for social learning. They describe cognitive development as a process of guided participation on the part of mentors and appropriation on the part of the child (Rogoff, 1990). In guided participation, children engage with peers and adults in collaborative activities, and through this process, acquire the skills and knowledge of their cultural community.

The degree to which children receive direct instruction from others varies across cultural contexts. Learning through observation and listening in anticipation of participation is especially valued in communities in which children have access to learning by informal community involvement. In many communities, children frequently observe and listen with intent, concentration, and initiative, and their participation is expected when they are ready to help in shared endeavors (Correa-Chávez, Rogoff, & Mejía Arauz, 2005). This tradition, referred to as intent participation (Rogoff, 2003), is prominent in many indigenous American communities (Rogoff et al., 2003) and has also been observed in voluntary organizations, interactive museums, and collaborative schools in middle-class U.S. communities (Rogoff, Turkanis, & Bartlett, 2001). Intent participation contributes to many types of learning, including first-language acquisition (Akhtar, Jipson, & Callanan, 2001). By monitoring and emulating the language people use, very young children learn to address others with culturally appropriate personal pronouns and respect terms (Ochs, 1988; Oshima-Takane & Derat, 1996).

Several studies have revealed cross-cultural differences in the extent to which children engage in observation of others. Bloch (1989) found that young rural Senegalese children spent more than twice as much time observing others than did middle-class European American children. Guilmet (1979) found that Navajo students quietly observed teachers more than twice as often as did Caucasian students in the same classroom. In many cultures, the value of observation is actively promoted by adults. For example, when Rotuman (Polynesian) children ask for instruction, they are “likely to be told to watch a skillful adult in action” (Howard, 1970, p. 116). In many communities, observation skills are emphasized and honed as children attend
to ongoing events for the purpose of learning the practices of their community. When children are integrated into a wide range of settings, they are able to observe the ongoing activities of their community as legitimate peripheral or third-party participants (Lave & Wenger, 1991).

**Learning by Seeking Information:**
**Children’s Questions**

Another research tradition that emphasizes the dynamic nature of social learning processes has focused on the ways in which children actively seek out information from others. Much of this work has focused on the questions children ask when they are faced with problems that are too difficult for them to solve on their own. Research on children’s questions indicates that children formulate questions to obtain specific information, such as to identify an unfamiliar object (Keimler Nelson & O’Neil, 2005), to distinguish between two objects that are hidden in a box (Chouinard, 2007), or to learn details about a conceptual category such as an unfamiliar animal or a novel artifact (Greif, Keimler Nelson, Keil, & Gutierrez, 2006).

To use questions efficiently in the service of problem solving, children need at least a minimal level of proficiency in several component skills (Mills, Legare, Bills, & Mejias, 2010). Once children recognize that there is a problem that they cannot solve on their own, they must determine who will be able to answer their questions in an informative and accurate way. As discussed earlier in this chapter, children acquire considerable skill in making such judgments before they reach their fifth birthday, and a recent study on children’s problem solving suggests that 3-year-olds engage in selective help seeking in a way that takes the prior behavior of potential sources into account (Cluver, Carver, & Heyman, in press).

After an appropriate source has been identified, children must be able to generate effective questions (Chouinard, 2007) and make sense of the responses they obtain. Research by Mills et al. (2010) has shown that there are dramatic developmental differences in the efficiency and efficacy of children’s questions. In a novel problem-solving task, they found that even though 3-year-olds can ask questions to solve problems, their questions are largely ineffective and directed toward inappropriate sources. Four-year-olds directed questions toward appropriate sources but asked an approximately equal number of effective and ineffective questions. Only 5-year-olds asked appropriate sources while simultaneously formulating effective questions. Other research has shown that by age 4, children who seek explanations are able to evaluate the adequacy of the responses they obtain, and if they find the answers inadequate, they often repeat their questions (Callanan & Oakes, 1992; Keimler Nelson, Egan, & Holt, 2004) or devise their own explanations (Frazier, Gelman, & Wellman, 2009).

**Mechanisms of Learning from Others:**
**The Case of Essentialist Reasoning**

One important aspect of the dynamic social learning process is that children can learn from others in the absence of explicit instruction, and when explicit instruction is taking place, there may be no direct mapping between the topic of the instruction and what is actually learned. Intuitive theories about the physical, psychological, and biological world constrain children’s developing belief systems and constrain how children reason about and acquire new information. Accordingly, researchers have sought to better understand the types of influences that are important for children’s emerging beliefs. One context in which these influences have been explored concerns children’s developing beliefs about psychological essentialism in relation to the social world (Gelman, 2003).

Essentialism is the notion that each member of a particular category has an underlying nature or essence with causal properties that make it what it is. As applied to people, psychological essentialism implies that individuals hold essences that serve as causal explanations for the way they think, feel, and act. For example, an individual who thinks about artistic skill in an essentialist manner might reason that some people are born with an innate potential to develop a high level of artistic skill with minimal effort, and that an individual’s level of artistic skill at one point in time is a strong indicator of his or her long-term artistic potential. Psychological essentialism is applied to a range of social categories and psychological characteristics. For example, individuals often reason essentialistically about gender (Taylor, 1996), race (Hirschfeld, 1995), and personality characteristics and abilities (Heyman & Gelman, 2000).

There is evidence that the tendency toward psychological essentialism is sensitive to the ways in which members of one’s community talk about people. Gelman, Heyman, and Legare (2007) examined this issue experimentally by presenting children ages 8 and 9 with vignettes in which characters were described with a novel noun phrase.
predicted that the characteristics that had been described using a noun label would be significantly more stable over time and across contexts than those that had been described using a verbal predicate.

One practical implication of these findings is that when children hear people described using a noun label they may come to see the relevant characteristic as a more fundamental and stable part of their own identity. Heyman (2008) presented 8- to 12-year-olds with scenarios about students who were described as being the best in their class in a particular subject. In one version of a scenario about math, a teacher said that whoever does the best on a math test would be called a “math whiz,” and then applied that label to the top performer. In the other version the teacher simply identified the top performer without using a label. The participants who heard the label version were more likely to infer that the character was born with special ability, and that he or she would continue to be successful even without subsequent practice. This finding suggests that the use of ability-related labels encourages children to view ability as a gift that some individuals are born with, rather than as a set of skills that can be developed over time. This essentialist way of thinking about ability raises questions about which individuals have special abilities and which do not, and shifts attention away from processes that promote skill development (see Mueller & Dweck, 1998).

There is evidence that cross-linguistic differences in the way people describe personal characteristics have implications for psychological essentialism. Heyman and Diesendruck (2002) investigated the distinction between the Spanish verbs ser and estar. Each word translates to the English verb to be, with ser used to refer to permanent properties and estar used to refer to temporary properties (see Sera, Bales, & del Castillo Pintado, 1997). Bilingual speakers of English and Spanish ages 6 through 10 heard descriptions of characters, with one group hearing the description in Spanish using the ser form, a second hearing it in Spanish using the estar form, and a third group hearing it in English using to be. For example, participants heard about a female character who “es amistosa” or “esta amistosa” in the two Spanish conditions, or “is friendly” in the English condition. The children in each group made inferences about whether the character would be likely to engage in trait-consistent ways at other times and in other contexts. Children treated ser and to be as more likely to convey the stability of psychological characteristics than estar. This finding suggests that the ser/estar distinction serves as a cue for
Spanish-speaking children when they are learning whether certain characteristics of people tend to be superficial and transient versus fundamental and stable. This result also raises the question of why the *to be* form in English corresponds more closely to the more stable *ser* form than the more transient *estar* form. One possibility is that children tend to interpret the verb form *to be* as referring to relatively enduring qualities of a person unless there is a specific reason to apply a more transient interpretation (e.g., if someone describes Sarah as acting friendly at the party rather than simply describing Sarah as friendly).

Another linguistic form that is available to young children across a wide range of linguistic and cultural contexts and can serve to promote or endorse essentialist reasoning is the generic form, which involves making general statements that refer to a kind as a whole (Gelman, 2009). For example, the generic statement "girls wear dresses" refers to girls in general rather than to any particular set of girls. Generics characterize a category as an abstract universal that is not tied to any particular context, and children typically begin to appreciate the semantic implications of generics long before the onset of formal schooling (Gelman, 2009).

There is also evidence that the feedback children receive can influence the extent to which they endorse essentialist beliefs, both for themselves and more generally. The responses of parents and teachers to children’s negative outcomes are likely to influence the extent to which such outcomes are viewed as temporary setbacks versus reflecting more fundamental difficulties that are likely to limit the effectiveness of future efforts. One such source of feedback is the emotional response of others. For example, when a child experiences academic difficulty, a teacher’s response of sympathy is more likely to be interpreted as a reflection of the belief that the child’s difficulty reflects more fundamental problems than is a response of anger (Graham, 1984). Similarly, quickly jumping in to help a child at the first sign that he or she is having difficulty may communicate that the child lacks the capacity to overcome the difficulties on his or her own (Pomerantz & Eaton, 2000).

Responses to positive outcomes can also inform the extent to which children view ability in an essentialist manner. Mueller and Dweck (1998) found that fifth graders who were praised for their intelligence in response to a positive outcome (e.g., "you must be really smart at these") were significantly more likely to endorse the view that people cannot do much to change how smart they are than were fifth graders who were praised for their effort (e.g., "you must have worked hard"). Such global praise may implicitly communicate that ability is a fundamental quality that can be readily assessed by immediate outcomes, rather than a quality that can be developed over time. Dweck (1999) has argued that these results “give us insight into the kinds of situations that, if experienced repeatedly, might mold students’ theories in a more permanent way.”

**Acquiring Systems of Beliefs about What Is Real**

Another line of research that has explored the dynamic nature of children’s social learning has focused on children’s reasoning about testimony concerning entities that are not directly observable, such as germs and angels (Harris & Koenig, 2006). This research examines how children make use of different sources of information to develop systems of beliefs, and how they evaluate claims that cannot be verified by first-hand observation.

**ACQUISITION OF SUPERNATURAL AND NATURAL BELIEFS**

One focus of research on how children acquire broader systems of belief has examined the development of supernatural and natural beliefs (Evans, Legare, & Rosengren, 2010; Harris & Koenig, 2006; Legare, Evans, Rosengren, & Harris, 2012). Supernatural and natural beliefs have been of considerable interest to researchers because much of the content in these domains (e.g., spirits and molecules) are transmitted primarily through testimony (Harris & Koenig, 2006; Harris, Pasquini, Duke, Asscher, & Pons, 2006). Moreover, children often encounter contrasting supernatural and natural descriptions of the same event. Natural is defined as observable (at least in principle) and empirically verifiable phenomena of the physical or material world. Supernatural is defined as phenomena that violate, operate outside of, or are distinct from the realm of the natural world or known natural law. Even when a particular cause is unknown, natural or physical mechanisms are assumed to exist in the case of natural explanations, and supernatural mechanisms are assumed to exist in the case of supernatural explanations. Rather than making strong definitional claims about the distinction between natural and supernatural phenomena, research on this topic focuses on the kinds of causes and practices that are generally regarded as belonging to natural (e.g., science, medicine, biology) versus supernatural (e.g.,
Religion, divination, witchcraft) kinds from an interview, psychological perspective (Legare, Evans, Rosengren, & Harris, 2012).

Researchers have begun to examine whether children's exposure to natural beliefs might replace their supernatural beliefs, or whether the belief systems tend to coexist in some way. Substantial research conducted in a range of cultural contexts indicates that the belief systems do coexist (Astuti & Harris, 2008; Evans, 2001; Evans, Legare, & Rosengren, 2010; Harris & Giménez, 2005; Rosengren et al., 2009; Legare & Gelman, 2008).

In one such study, Harris and Giménez (2005) interviewed 7- to 11-year-olds from a predominantly Catholic culture in Madrid, Spain regarding their beliefs about death. They asked participants whether bodily processes such as seeing, thinking, and hearing would continue after death. Of interest was whether they would predict that these processes would continue, as would be consistent with the spiritual view they had been taught, or whether they would predict that these processes would cease, as would be consistent with the scientific view they had been taught. Harris and Giménez (2005) found that contextual cues played an important role in determining which responses children provided, with participants more likely to predict that bodily functions would continue after death when asked the question from within a narrative context in which a priest informs the family of the death, compared with a narrative in which a doctor informs the family of the death. Astuti and Harris (2008) found similar effects of contextual cues in reasoning about death among Vezo participants in Madagascar.

Legare and Gelman (2008) also found evidence for the coexistence of natural and supernatural explanations in their research on AIDS. This research was conducted among 5-, 7-, 11-, and 15-year-olds, as well as adults in two Sesotho-speaking, South African communities. In these communities, a prevalent view is that AIDS is caused by witchcraft. Of interest was whether exposure to a biological conception of AIDS would replace the witchcraft-based conception. Legare and Gelman (2008) found that although biological explanations for illness were endorsed at high levels, witchcraft was also often endorsed, and that endorsement of witchcraft beliefs increased with age. Importantly, participants showed a similar kind of sensitivity to the narrative context in which the question was asked, as was seen by Harris and Giménez (2005). Specifically, although participants generally gave biological explanations as a default, when attention was drawn to the socially risky behaviors that are believed to put one at risk for witchcraft attacks (e.g., lack of generosity or jealousy), participants gave primarily witchcraft explanations for AIDS. Findings also pointed to some specific ways participants may integrate the apparently contradictory witchcraft and biological explanations. For example, some explanations involved causal chains of events (e.g., “A witch can put an HIV infected woman in your path and seduce you”). Results from these lines of research suggest that children are capable of applying different belief systems in different contexts, and that they often attempt to integrate different modes of reasoning in novel ways in order to maintain coherent beliefs.

**FACTORS AFFECTING CHILDREN’S BELIEFS ABOUT SUPERNATURAL ENTITIES AND FORCES**

A related line of research has examined factors contributing to children’s willingness to accept claims about the supernatural entities and forces. This research indicates that children are sensitive to information about the context in which the claims are being made. One important aspect of the context is the extent to which beliefs are actively encouraged by socializing agents and by the broader culture (Rosengren & Hickling, 1994). This active encouragement is undoubtedly central in the widespread acceptance of Santa Claus and the Tooth Fairy among children in the United States. Once children reach about 5 or 6 years of age, the level of active encouragement of these beliefs tends to decline, which likely plays a role in children’s increasing rejection that these entities are real (Rosengren & Hickling, 1994). The specific contexts in which supernatural entities are introduced are also likely to play a role in whether they are accepted (Corriveau, Kim, Schwalen, & Harris, 2009; Woolley & Van Reet, 2006). Woolley and Van Reet (2006) found that 4- to 6-year-olds were less likely to infer that a novel entity was real when it was introduced in a narrative that included fantastical beings than when introduced within the context of mundane or scientific narratives. For example, they were less likely to accept that “surnits” were real when they learned that “Dragons hide surnits in their caves” than if they learned that “grandmothers hide surnits in their garden” or that “doctors use surnits to make medicine.”

Children’s motivation to believe may also influence whether they will accept claims about supernatural entities. In one line of research addressing this issue, Woolley, Boerger, and Markman (2004)
introduced young children to a novel fantastical entity called "the Candy Witch," who was described as visiting people's homes to exchange candy for a new toy. They asked each participant whether he or she preferred toys or candy. The researchers reasoned that those who reported that they liked toys better than candy, who presumably had a stronger motivation to believe in the Candy Witch than those who preferred candy to toys, might be more willing to accept the Candy Witch as real. As is consistent with this possibility, they found that 4- to 5-year-olds with a toy preference were more likely to accept the Candy Witch as real. These results suggest that by age 4, children may engage in some type of cost benefit analysis when determining what to believe.

Other research has focused on how children make use of evidence when evaluating claims (Keil, 2006; Kuhn, 1999). Young children often accept forms of evidence that older children and adults would not find compelling. For example, 4- to 5-year-olds interpreted the overnight replacement of their Halloween candy with a new toy as evidence of the Candy Witch's existence (Woolley, Boerger, & Markman, 2004). The extent to which children make use of the evidence available to them is likely to depend on their prior beliefs. In addressing this issue, Tullos and Woolley (2009) asked 4- to 8-year-old children about the reality status of novel animals. Children with an initial hypothesis about the reality status of the animal tended to disregard the evidence, while children who had no initial hypothesis were able to make use of the evidence to critically evaluate whether or not the novel animal was real. This finding is consistent with other evidence that young children have difficulty making use of evidence that conflicts with their prior beliefs (Koerber, Sodian, Thoermer, & Nett, 2005).

Conclusion

The ability to obtain information from others facilitates many forms of learning, and it underlies the transmission of cultural knowledge across generations (Tomasello, 1999). Developmental research is providing important insights into this process. A number of studies show that by the time children reach 4 years of age, they understand that some people are more knowledgeable than others, and this understanding is closely linked to broader conceptions of mental life. By this age, children can use a range of cues to identify which people are appropriate sources of information, and they have some appreciation that people are not always motivated to accurately convey what they know. However, even older children often have substantial difficulty with recognizing deception, and when they do recognize a deceptive motive, they often fail to act accordingly.

This research has also informed our understanding of the dynamic nature of knowledge transmission. This dynamic learning occurs through observation and actively seeking out information from others. When constructing systems of belief, children make use of a wide range of subtle cues available in the communication of others, and they employ a diverse range of reasoning strategies to evaluate and integrate claims they hear.

Future Directions

An important goal for future work will be to examine how children's social experiences influence the way they make sense of information that other people provide. As noted previously, there is evidence that children from China understand motives relating to social desirability at a younger age than do children from the United States (Heyman, Wu, & Lee, 2007). This raises the question of the scope of these cross-cultural differences and how the developmental trajectory of this form of reasoning varies across cultures more generally. It will also be important to identify which aspects of the social environment have the greatest influence on the development of children's source reasoning. For example, when children are routinely lied to by their parents (Heyman, Luu, & Lee, 2009), do they become skeptical of what their parents say, or skeptical in other social contexts? Additionally, does exposing children to individuals who are incompetent or who have antisocial motives help them to become aware of the possibility that others might provide inaccurate information?

There are also important unanswered questions about what cues children use to determine the reliability of individuals. This includes what types of cues they use. For example, to what extent do children make use of explicit information they are given about trusting particular individuals or particular types of people? To what extent do they take motive information into account when assessing reliability? Adults are likely to make differing evaluations of individuals who provide incorrect information in the context of a joke or an attempt to protect someone's feelings versus individuals who provide the same information for antisocial reasons, but little is known about the development of this type of reasoning.
There are also unanswered questions about how children use to assess the reliability of specific claims. Harris and Koenig (2006) pointed out that people do not typically express avowals of belief in an entity if its existence is beyond doubt. For example, it would be odd for a parent to tell a child, “I believe in oxygen.” Consequently, it may be that these avowals paradoxically lead to higher levels of doubt about the existence of such entities. Children may also view extended discussion about the existence of an entity as an indicator that the entity is not conventionally accepted (Callanan, 2006).

There is evidence that children, like adults, are less skeptical of claims that they want to believe are true (Stipek, Roberts, & Sanborn, 1984; Woolley, Boerger, & Markman, 2004), but little is known about the details of this phenomenon. It will be important to assess the extent to which children consciously choose to engage in skeptical thinking based on their desires, and how children’s desires influence basic cognitive processes such as selective encoding and retrieval when they are learning from others. From an applied perspective, investigating how children develop the capacity to reason about deception and self-interest has implications for understanding the impact of advertising campaigns.

Finally, more research is needed on how children seek out information from others. How do children decide that it is time to seek help, rather than attempting to solve problems on their own? How do the responses that children receive influence their future efforts to seek help? By addressing these questions, we will be better able to understand the psychological underpinnings of children’s efforts to seek information, and how to promote interactions that optimize learning.

Author Note
This chapter was supported by NICHD Grant HD38529. We thank Brian Compton, Nicole Jones, Candice Mills, Paulina Singhapok, and Jacqui Woolley for their helpful comments. Address requests for further information to Gail D. Heyman, Department of Psychology, University of California, San Diego, 9500 Gilman Dr., La Jolla CA 92093-0109; e-mail: gheyman@ucsd.edu.

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