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Developing expectations regarding the boundaries of expertise

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ABSTRACT

Three experiments examined elementary school-aged children's and adults' expectations regarding what specialists (i.e., those with narrow domains of expertise) and generalists (i.e., those with broad domains of expertise) are likely to know. Experiment 1 demonstrated developmental differences in the ability to differentiate between generalists and specialists, with younger children believing generalists have more specific trivia knowledge than older children and adults believed. Experiment 2 demonstrated that children and adults expected generalists to have more underlying principles knowledge than specific trivia knowledge about unfamiliar animals. However, they believed that generalists would have more of both types of knowledge than themselves. Finally, Experiment 3 demonstrated that children and adults recognized that underlying principles knowledge can be generalized between topics closely related to the specialists' domains of expertise. However, they did not recognize when this knowledge was generalizable to topics slightly less related, expecting generalists to know only as much as they would. Importantly, this work contributes to the literature by showing how much of and what kinds of knowledge different types of experts are expected to have. In sum, this work provides insight into some of the ways children's notions of expertise change over development. The current research demonstrates that between the ages of 5 and 10, children are developing the ability to recognize how experts' knowledge is likely to be limited. That said, even older children at times struggle to determine the breadth of an experts' knowledge.

1. Introduction

It is important for individuals to take a critical stance towards sources of new information by evaluating cues indicating whether he or she is likely to be accurate (Mills, 2013). One such cue is whether a source has relevant *expert* knowledge (e.g., Aguiar, Stoess, & Taylor, 2012; Koenig & Jaswal, 2011; Landrum, Mills, & Johnston, 2013; Lutz & Keil, 2002). People turn to experts for advice because they believe experts to be knowledgeable (e.g., Bohner, Ruder, & Erb, 2002; Chaiken, 1987). In fact, when people lack enough background knowledge (or motivation) to evaluate the content of a claim, they often use the source's expertise as a heuristic to determine how much to believe the claim (e.g., peripheral route processing, Haugtvedt & Petty, 1992; Petty, Cacioppo, & Goldman, 1981).

Given that children often have less background knowledge than adults, the ability to use expertise as a proxy for claim accuracy becomes particularly important. After all, since children recognize that adults generally possess more knowledge than themselves, they may be prone to trust all information from all adults (e.g., Mossler, Marvin, & Greenberg, 1976; Wimmer & Hogrefe, 1988). Yet as all adults are not experts in all topics, it is crucial that children

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recognize when someone has relevant expert knowledge and when she does not. The goal of the current set of experiments is to examine children's expectations regarding the boundaries of expertise—what they expect different experts to know and to what extent they expect experts' knowledge to be limited—and how these expectations change across development. Successful recognition of expertise, and subsequent inference about knowledge, can assist children in finding and trusting the most accurate information.

The preliminary skills necessary for evaluating expertise begin to appear during infancy and develop over the preschool years. By 14–16 months, infants recognize when someone produces statements that are incongruent with the world (e.g., Koenig & Echols, 2003). By age 4, children begin to reason about others' mental states: recognizing, for example, when someone lacks access to knowledge (e.g., Pillow, 1989; Robinson, Champion, & Mitchell, 1999) or believes something that is inaccurate (e.g., Wellman & Liu, 2004). By age 5, children become more adept at evaluating potential sources of information, at least when choosing between obviously accurate and inaccurate informants (e.g., Koenig & Harris, 2005). For instance, this age group has demonstrated an ability to track an informant's accuracy and use that information to (1) make inferences about an informant's relative knowledgeability and helpfulness (e.g., Shafto, Eaves, Navarro, & Perfors, 2012), (2) determine whether to endorse new information provided by an informant (e.g., Birch, Vauthier, & Bloom, 2008; DiYanni & Keleman, 2008; Koenig & Harris, 2005; Scofield & Behrend, 2008), and (3) determine whether to seek information from the informant (e.g., Mills, Legare, Bills, & Mejias, 2010; Mills, Legare, Grant, & Landrum, 2011).

Yet, people are not often presented with a choice between a clearly accurate and a clearly inaccurate (or ignorant) informant; thus it is also important for children to differentiate between two knowledgeable sources who simply vary on *what* they are knowledgeable about, as is the case with experts. Evaluating experts requires understanding that someone's knowledge can be limited to what is *relevant* to that person's area of expertise. This understanding begins during the preschool years and develops through the elementary school years.

Preschoolers, in some circumstances, can attribute knowledge to the most relevant expert available (e.g., Lutz & Keil, 2002). For example, when asked to compare a bicycle expert and an eagle expert, 3-, 4-, and 5-year-olds attributed bird-related knowledge to eagle experts over bicycle experts and vehicle-related knowledge to bicycle experts over eagle experts (Lutz & Keil, 2002). Moreover, 4- and 5-year-olds attributed knowledge from a broader category to the most relevant expert (e.g., saying that bicycle experts are more likely than eagle experts to know about mechanical things, such as elevators; Lutz & Keil, 2002). Beyond attributing knowledge, when these two experts provided conflicting claims about a series of novel objects, 4- and 5-year-old children preferred to trust the claims provided by the more relevant expert (i.e., trusted the eagle expert's claims about bird-related objects and the bicycle expert's claims about vehicle-related objects; Landrum et al., 2013, Experiment 1).[1] Thus, as preschoolers are somewhat able to use relevancy to organize knowledge domains, they are demonstrating the beginning of another skill important for evaluating experts: understanding how knowledge clusters together.

Although research has demonstrated that preschoolers start to think about how knowledge clusters together, the bulk of this ability develops between ages 6 and 10 (the elementary school years). Particularly noteworthy, between the ages of 8 and 10, children shift from preferring to think of expertise as grouping by topic (clustering around information relevant to a single topic of interest; e.g., eagles, bicycles) to recognizing that expertise can group by discipline (clustering by knowledge of deep, often causal, underlying principles relevant to a discipline such as biology or physics; Danovitch & Keil, 2004; Keil, Stein, Webb, Billings, & Rozenblit, 2008).

Although previous literature describes a developmental trajectory in understanding expertise, due to the paradigms used by the majority of these studies, it is unclear from the current literature what children understand about the boundaries of someone's expertise—how an expert's knowledge might be incomplete or limited, and how these expectations might change across development.

In the vast majority of studies investigating both preschool-aged and elementary-aged children's understanding of expertise, two different experts (or two knowledge items) have been pitted against one another in a forced-choice paradigm (e.g., Danovitch & Keil, 2004; Keil et al., 2008; Landrum et al., 2013; Lutz & Keil, 2002; Sobel & Corriveau, 2010). In this kind of paradigm, children either have to determine which of two experts has the best answer to one question or which of two items one expert is more likely to know about. However, recognizing that one expert knows more than another expert about a given topic, for example, tells us nothing about expectations regarding how much each expert knows on his or her own. These paradigms tell us about expectations regarding *relative* knowledge levels, not absolute ones. For instance, a child could believe that an eagle expert knows a lot about birds while a bicycle expert knows just *marginally less*, or that an eagle expert knows a lot about birds while a bicycle expert knows *nothing*. Both would lead to the same result within the aforementioned paradigm. In fact, researchers using a different paradigm in which preschoolers were asked whether one expert has one bit of knowledge found that 4- and 5-year-olds attributed knowledge to an expert that was unrelated to that expert's area of expertise (attributing mechanical expertise to a child described as an animal expert; Taylor, Esbensen, & Bennett, 1994). Thus, children may have more difficulty recognizing the limitations to an informant's expertise when they are asked to evaluate whether that individual has the appropriate knowledge to answer a question than when they are asked to choose the better of two options.

[1] Although, this ability is somewhat tenuous (e.g., Boseovski & Thurman, 2013; Landrum et al., 2013, Experiments 2 & 3).