

## WHAT CAN CHILDREN TELL US ABOUT HINDSIGHT BIAS: A FUNDAMENTAL CONSTRAINT ON PERSPECTIVE-TAKING?

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We propose that hindsight bias in adults and some limitations in children's "theory of mind" (ToM), or mental-state reasoning, share a core cognitive constraint: a tendency to be biased by one's current knowledge when attempting to recall, or reason about, a more naive cognitive state—regardless of whether that more naive state is one's own earlier naive state or someone else's. That is, hindsight bias is a fundamental problem in cognitive perspective-taking. We review the developmental literature on hindsight bias as well as other limitations that resemble hindsight bias. We believe that some of children's limitations in ToM may stem, from the same core component as hindsight bias, and thus, will shed light on the underlying mechanisms. We discuss several processes that may contribute to this biased perspective-taking. We believe a developmental approach is necessary for a comprehensive understanding of the nature of hindsight bias in social cognition.

Show virtually any three-year-old a closed candy box, and ask him or her what is inside. He or she will wisely answer, "candy." Yet, if you open it up to reveal that there are actually pencils inside, then close it up and ask the child what he or she thought was inside *before* it was opened, that child will say "pencils" (see Wellman, Cross, & Watson, 2001 for a review). If you teach

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preschool children novel facts and later ask them if they have known these facts for a long time or just learned them today they will insist that they have known them all along and that a peer will also know (Taylor, Esbensen, & Bennett, 1994). Such errors are often regarded as evidence that children lack a mature *theory of mind* (ToM)—the ability to understand and reason about their own and others' mental states (such as understanding that the mind can misrepresent reality). Older children and adults rarely make these types of errors outright, and are, thus, believed to possess a more mature ToM. However, the types of errors that young children make on a variety of perspective-taking tasks resemble hindsight bias.

We propose that limitations in children's ToM, and hindsight bias in adults, share a core component: a tendency to be biased by one's current knowledge when attempting to recall, or reason about, a more naive cognitive state—either one's own earlier naive state or someone else's. Exploration of this core commonality is not only an important area for memory research, but also critical for research on sociocognitive perspective-taking. We discuss several factors that contribute to biased perspective taking that may elucidate the common mechanisms underlying hindsight bias and some of children's limitations in ToM. We believe a developmental approach can provide a more unified understanding of the nature of hindsight bias. There may be some important differences in children's and adults' limitations, but tapping into the fundamental similarities and differences will prove fruitful in understanding the nature of our perspective-taking limitations and the implications for social cognition across development.

Once we know something about the world, it is difficult to ignore that knowledge. A wealth of research in cognitive and social psychology has demonstrated the pervasive nature of hindsight bias using two experimental designs. In the *memory* design, participants provide what they believe to be the answer (or their best prediction) to a question. Later they learn the correct answer, and are asked to recall their original response. Generally, their recollection of their original answer is biased in the direction of their new-found knowledge. For example, Fischhoff and Beyth (1975) asked participants on the eve of former President Nixon's visits to China and the USSR to estimate the probability of various possible outcomes of the visits. After Nixon's visits, the same participants were asked to recall their original predictions. Participants' recollections were biased in the direction of their knowledge of what had actually transpired.

In the *hypothetical* design, participants learn the outcome of an event or the answer to a question and then are asked to estimate either how they would have answered if they had not known the information, or how another, naive person, would answer. For example, Fischhoff (1975) provided adult participants with descriptions of events and told them that these descriptions were also presented to other students. Compared to participants who were ignorant of the outcome of these events, participants who were told the outcome judged that others would think that particular outcome was more

probable. In both the hypothetical and memory designs, people's responses are biased in the direction of their current knowledge, as long as the question is sufficiently difficult to provoke a state of uncertainty about their earlier, or someone else's, knowledge. If the question is too easy (e.g., "What is  $2 + 2$ ?") or too difficult (e.g., "What was Einstein's telephone number?"), no hindsight bias occurs (Pohl, 2004).

This bias has received different names in different disciplines: "creeping determinism" (e.g., Fischhoff, 1975), the "knew-it-all-along effect" (e.g., Wood, 1978), "realist bias" (e.g., Taylor & Mitchell, 1997), "adult egocentrism" (e.g., Kelley & Jacoby, 1996); and "epistemic egocentrism" (e.g., Rozman, Cassidy, & Baron, 2003). Economists Camerer, Lowenstein, and Weber (1989) coined the term "*the curse of knowledge*" to explain why sales agents, who were better informed about their products than other agents, are at a *disadvantage* when selling their products. They found that participants who had privileged information about a company's earnings failed to fully ignore that privileged knowledge when estimating what uninformed participants would predict about the company's earnings. Participants were biased in their predictions—"cursed" by the knowledge they possessed—and inaccurately judged what the uninformed participants knew. The term, "curse of knowledge," effectively captures the commonality across both memory and hypothetical hindsight designs, namely, the tendency to be biased by one's own current knowledge when attempting to take a more naive perspective.

Hindsight bias is both robust and widespread. It occurs across a range of time intervals between exposure to the privileged information and the hindsight judgment, persists after participants have been explicitly warned to avoid it (Pohl & Hell, 1996), and even occurs when participants are educated about the bias and provided with cash incentives for being more accurate (Camerer et al., 1989). It also occurs across many domains and paradigms (Blank, Fischer, & Erdfelder, 2003; Bryant & Brockway, 1997; Keysar, Ginzel, & Bazerman, 1995; Mark & Mellor, 1991; Tykocinski, Pick, & Kedmi, 2002). It occurs across cultures (Heine & Lehman, 1996; Pohl, Bender, & Lachmann, 2002) and has been documented in many applied settings (see Guilbault, Bryant, Brockway, & Posavac, 2004, and Hawkins & Hastie, 1990 for reviews).

## THE RELATION BETWEEN HINDSIGHT BIAS AND TOM

In comparison to the adult literature, the developmental literature has largely ignored the hindsight bias phenomenon. Or has it? This phenomenon bears a striking resemblance to the types of errors that young children make in mental state, or ToM, reasoning. Much research in developmental psychology has focused on children's ability to reason about mental states because it is critical for predicting and interpreting people's behavior. Although children show some sophisticated ToM abilities fairly early in devel-

opment (see Astington, 1993; Bloom, 2000 for reviews), they also show some remarkable deficits in mental state reasoning.

#### HINDSIGHT IN RECALLING ONE'S OWN EARLIER PERSPECTIVE

When taught new information, young children are unable to recall which information they have known longer: information they learned moments before (e.g., the word *chartreuse*) or information they have known for a long time (e.g., the word *green*) (Taylor et al., 1994). This limitation is often said to reflect deficits in children's "source monitoring," or "source memory"—the processes involved in recalling or reasoning about how and when one acquired information (see Roberts & Blades, 2000).

In addition, young children demonstrate considerable difficulties reasoning about false beliefs—beliefs that are inconsistent with reality. Many studies have explored the development of false belief reasoning and ToM in children using different measures. One commonly used measure is the "Unexpected Contents" task first developed by Perner, Leekam, and Wimmer (1987). An example was provided in the opening paragraph: Children are presented with a closed container (e.g., a candy box) and asked to guess the contents. They are then shown that it actually contains something else (e.g., pencils) and are asked to recall what they said before the box was opened. Three-year-olds typically say, "pencils," whereas older children correctly answer, "candy."

In another task, the "appearance-reality task," children see an object that looks like a rock and are asked, "What is this?" They say, "a rock." Then they learn (e.g., by feeling it and being told) that the object is actually a sponge. Next, they are asked, "When you look at this with your eyes right now, what does it look like?" Three-year-olds say, "a sponge," whereas older children correctly say, "a rock" (Flavell, Green, & Flavell, 1986).

In each of these tasks, children's newfound knowledge interferes with their ability to recall their own earlier ignorance. In important ways, these tasks are comparable to those used in the memory design in adult hindsight bias research. Much like Fischhoff and Beyth's (1975) participants who were swayed by their new knowledge of the actual events of Nixon's trips when recalling their original predictions, three-year-olds tend to report their new knowledge of the contents of the box, the true identity of the sponge-rock, and claim they "knew all along" information they have just learned.

#### HINDSIGHT IN REASONING ABOUT SOMEONE ELSE'S PERSPECTIVE

Young children are also poor judges of what information other people know. For instance, preschool children tend to behave as if seeing a small

uninformative part of an object is sufficient for someone else to also know the object's identity (Taylor, 1988; see also Chandler & Helm, 1984, and Mossler, Marvin, & Greenberg, 1976), regardless of whether that other person is a peer, an adult, or even a six-month-old baby (Taylor, Cartright, & Bowden, 1991).

In a different version of the unexpected contents task, children are shown what is in the box and then asked to predict what someone else, who was absent when the real contents were revealed, will think is inside. Again, children younger than four typically fail, saying that a naive other will also know that there are pencils in the box. In another measure of false belief understanding, the "displacement task" (e.g., Wimmer & Perner, 1983; Baron-Cohen, Leslie, & Frith, 1985), participants are told a story about Sally who puts her candy in a basket and then leaves. In her absence, another character moves the candy to a box. Children are then asked where Sally will first look for her candy when she returns. The right answer, the basket, requires understanding that because she was absent when her candy was moved, Sally will falsely believe that it is where she left it. Before age four, children typically answer in accordance with their *own* knowledge rather than ascribing a false belief to Sally.

These tasks are comparable to those used in the hypothetical design in adult hindsight research. In Fischhoff's (1975) design described previously, adults who were told the event outcome overestimated the likelihood that others would share their knowledge. In a similar manner, though notably to a greater degree, three-year-olds respond as if naive others share their privileged knowledge.

Generally speaking, four- and five-year-olds tend to do much better at these ToM tasks than younger children. A meta-analysis of 178 studies demonstrated that this pattern of performance is robust across a wealth of different procedures and cultures (Wellman et al., 2001). The younger children do not answer randomly; instead, they tend to answer in accord with their own knowledge. We are not claiming that hindsight bias is the sole reason for children's difficulties in these areas (see Bloom & German, 2000; Wellman et al., 2001; and commentaries, for discussions of other contributing factors). We do believe, however, that the exploration of the core component that hindsight bias and ToM limitations share is necessary for a comprehensive understanding of both hindsight bias and ToM.

## CHANGES IN HINDSIGHT BIAS ACROSS DEVELOPMENT

With age, children reason better about the sources of their knowledge (e.g., Gopnik & Graf, 1988; Roberts & Blades, 2000), about what others are likely to know based on limited information (e.g., Taylor, 1988; Taylor et al., 1991), and about their own and others' false beliefs (e.g., Wellman et al., 2001). Because adults easily pass the tasks given to children, but show hindsight bias, this indicates that these limitations are different. How much of this differ-

ence, however, is a matter of degree, rather than kind? Do children experience a more exaggerated hindsight bias than adults?

To address this question, Birch and Bloom (2003) compared children's ability to attribute ignorance to others while manipulating whether the children themselves had access to privileged information. Three- to five-year-old children were presented with two sets of toys that contained "a special little thing inside." Children were told that a puppet, Percy, was familiar with one toy (i.e., he said, "I've played with that one before") and unfamiliar with the other (i.e., he said, "I've never ever seen that one before"). In half of the trials, children were shown the specific contents of both the familiar and unfamiliar toys; for the other trials the children remained ignorant of the toys' contents. Children were asked to judge whether Percy would know what was inside the toys. As predicted from a hindsight bias account, children overestimated Percy's knowledge of the unfamiliar toys' contents when they were knowledgeable of the contents compared to when they did not know the contents. Importantly, the opposite was not true: When the children were ignorant about what was inside they were not more likely to *under*-attribute knowledge to Percy, suggesting that the results cannot be accounted for by simple memory demands, or a more general egocentric bias in which children cannot reason about any perspective different from their own (see Birch, 2005; Birch & Bloom, 2004). Thus, in a design resembling the hypothetical hindsight designs used with adults, children showed hindsight bias by ascribing their own knowledge to a naive other. Moreover, the magnitude of this bias declined between age three and age five, mirroring the age difference in children's performance on many ToM tasks.

With a similar objective, Bernstein, Atance, Loftus, and Meltzoff (2004) modified a procedure developed by Harley and colleagues (Harley, Carlsen, & Loftus, 2004). In this task, three- to five-year-old children and adults identified degraded images of common objects that gradually clarified on a computer (see Figure 1). In the baseline condition, observers did not know in advance what the object would become. In the hindsight condition, observers knew in advance the clarifying object's identity, and estimated when a naive peer would identify the image. This privileged knowledge led children and adults to overestimate their peers' ability to identify the objects. The magnitude of this hindsight bias declined from childhood to adulthood in one experiment, but remained relatively stable with age in a second experiment. Moreover, the magnitude of the bias remained stable from ages three to five in both experiments. In a pair of follow-up experiments, Bernstein and colleagues found mixed evidence for a developmental decline in hindsight bias between the ages of three and five (Bernstein, Atance, Meltzoff, & Loftus, 2007). Hence, the data on whether there are developmental changes in the magnitude of hindsight bias across the preschool period are limited and somewhat mixed.

Regardless of whether or not hindsight bias consistently declines across the preschool period, there seems to be growing evidence that at least from

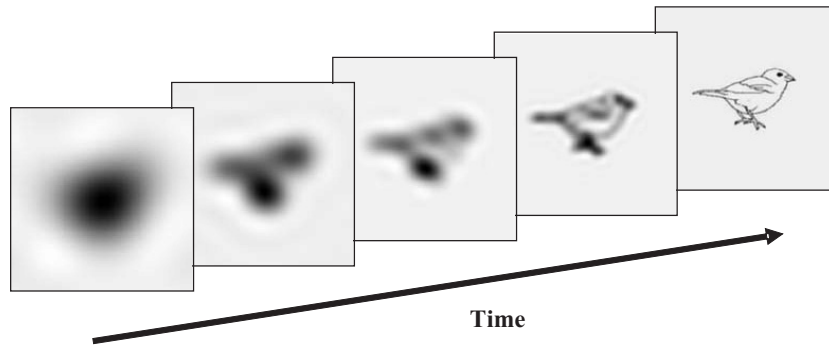


FIGURE 1. Example of stimulus clarification procedure used by Bernstein et al. (2004). Observers viewed up to 30 degradations of a common object as the object clarified on a computer. In a baseline condition, observers identified the object as soon as they knew its identity. In a hindsight condition, observers learned the object's identity before estimating when a naïve, same-age peer would identify it.

childhood to adulthood, more generally, the bias diminishes. For instance, Pohl and Haracic (2005) asked fourth, sixth, and eighth graders, as well as adults, to estimate the answers to difficult numerical knowledge questions. They were also provided with a value and told it was someone else's estimate, either a teacher's or a peer's, and were told not to let the other person's estimate influence their own. All age groups showed hindsight bias: Those given high values as the other person's estimate produced higher estimates than those given low values as the other person's estimates. Importantly, the children showed this bias to a greater extent than the adults.

Epley, Morewedge, and Keysar (2004) also found that privileged knowledge appears to have a greater biasing effect in children than adults. In their design, 4- to 12-year-old children and adults were asked to move objects around a  $5 \times 5$  grid of boxes as instructed by a director seated on the opposite side of the grid. Participants were shown that some of the boxes were closed on the director's side so that he could not see (and did not know) what was inside. The director then asked participants to follow his instructions. To the participant, the instructions appeared to be ambiguous, such as "move the bunny" when "bunny" could refer to a chocolate Easter bunny or a toy bunny. However, this ambiguity could be resolved by taking the director's point of view: He only knew about one bunny and the participants could clearly see that the other one was hidden from his view. The researchers were interested in how often the participants failed to appreciate the director's more ignorant perspective—that is, how often they made an "egocen-

tric" reach based on their privileged knowledge, moving an object about which the director could not have known. Older children made fewer egocentric reaching errors than younger children and adults made fewer errors still (although they still erred frequently).

Mitchell and Taylor (1999) revealed a similar age effect. Here, children aged four to seven peered into a dark chamber to view an illuminated disk oriented at a slant. The children then chose from a series of shapes the one that looked most like what they saw. When they knew that the object was really a circle (even though it appeared more elliptical due to its slant) they exaggerated its circularity compared to when they did not know. The biasing effects of this knowledge were greatest in the youngest children. Furthermore, the magnitude of this bias was significantly correlated with children's performance on ToM tasks (i.e. displacement, unexpected contents, and appearance-reality) even after controlling for age.

More recently, Bernstein et al. (2007) explored the correlation between three- to five-year-old children's performance on a battery of ToM tasks and a battery of hindsight bias tasks. In two experiments they found modest correlations (*partial r* = .35) between hindsight bias and false belief performance after controlling for the effects of age, inhibitory control, working memory, and language.

Providing further support for the link between children's ToM and adults' hindsight bias, Birch and Bloom (2007) demonstrated that when sensitive measures are used even adults can experience difficulty reasoning about false beliefs. In different versions of a displacement task, adults were asked to report the probability that a story character, who was absent when her object was moved, would first look in each box for her object when she returned. Participants who knew the outcome of the displacement event, and could conceive of a plausible reason for why the story character might act in accord with their knowledge (rather than her own), were less likely to predict that the story character would act on a false belief compared to participants who did not know the specific outcome. These findings are consistent with previous research showing the mediating effects of plausibility on hindsight bias (Hardt & Pohl, 2003; Pohl, 1998; Wasserman, Lempert, & Hastie, 1990). The fact that outcome knowledge can compromise even adults' ability to reason about false beliefs suggests that important similarities between children's and adults' reasoning may be obscured by structural differences in the tasks used to measure false belief and hindsight bias (see Bernstein et al., 2007). Although many of these experimental designs are not typical hindsight bias designs, they all share the core element of reasoning about a more naive perspective. We believe that understanding the mechanisms involved in this constraint on perspective-taking will shed light on the nature of the aforementioned difficulties.



### MECHANISMS CONTRIBUTING TO HINDSIGHT BIAS AND SIMILAR PROBLEMS IN PERSPECTIVE-TAKING

What causes a person to have difficulty recalling or reasoning about a more naive cognitive state? If the magnitude of hindsight bias declines with age, then either the mechanisms that cause this bias exert less influence with age, or there are no changes in the core mechanisms, but other mediating factors serve to amplify the bias earlier in development (or help us to overcome it later in development). What might these developmental changes in underlying and mediating factors be? We discuss several possible factors, including anchoring and adjustment, inhibitory control, and fluency misattribution. As described here, anchoring refers to the tendency to use outcome feedback, or one's current knowledge, as an "anchor" when trying to recall one's earlier knowledge state or when estimating what another, naive person knows, and "adjustment" refers to the processes involved in shifting from this anchor. Inhibitory control refers to the ability to ignore, or overcome, a default response such as what comes to mind first. Fluency misattribution refers to the difficulty of discounting, or correctly interpreting, the ease with which one processes the new information when trying to recall one's original knowledge or when estimating what another, naive person knows.

One proposed explanation for why it is hard to recall or reason about a more naive cognitive state is that to appreciate a different cognitive state, we use our current state as a starting point, or anchor, and then adjust (Epley & Gilovich, 2001; Pohl, Eisenhauer, & Hardt, 2003; Smith, 1999). As is typical in other instances of anchoring and adjustment (e.g., Tversky & Kahneman, 1974), this adjustment tends to be insufficient. We would add that for reasoning about other cognitive states, the adjustment process also appears asymmetrical: People tend to overestimate what another person knows when they are more knowledgeable than the other person, but do not underestimate what another person knows to the same degree when they are more ignorant than the other person (Birch & Bloom, 2003). Why would adjusting from one's current perspective (the anchor) to a more knowledgeable cognitive state be easier, or lead to more accurate assessments, than adjusting to a more ignorant cognitive state?

A mechanism that might account for one's difficulty ignoring knowledge, in particular, is inhibitory control. Inhibitory control is the ability to override a pre-potent, or default response, or to stop a more natural tendency (e.g., Leslie & Polizzi, 1998). Inhibiting knowledge, and all the aspects associated with that information, is different from ignoring one's ignorance (Birch & Bloom, 2004). Inhibitory control improves with age (e.g., Carlson, Moses, & Breton, 2002; Diamond & Taylor, 1996). These age-related changes in inhibitory mechanisms may explain why children are more susceptible to hindsight bias than adults. Indeed, in Epley et al.'s (2004) task, described previously, there were no age differences in children's and adults' tendency

to first *look* at the “egocentric” object (e.g., the bunny that they could see but the director could not). What differed with age was the participants’ ability to overcome this automatic response. That is, adults and children were equally likely to first look at the object about which only they knew, but older children and adults were better able to inhibit, or adjust from, their own perspective to appreciate the director’s more naive perspective.

Furthermore, if inhibitory control contributes to hindsight bias, then one would also expect to see age-related differences at the other end of the developmental spectrum—in older adults—because inhibitory control diminishes late in development. Indeed, Bayen, Erdfelder, Bearden, and Lozito (2006) found that older adults (mean age 72) showed a greater hindsight bias than younger adults (mean age 19) because of inhibitory factors rather than other factors associated with aging. Also, German and Hehman (2006) found that older adults (mean age 78) experienced difficulties with false belief reasoning similar to those of younger children, and provided evidence that these difficulties stemmed from age-related decline in executive functions such as inhibitory control and processing speed.

Another mechanism that may underlie hindsight bias and contribute to the difficulty in reasoning about a more naive perspective is fluency misattribution. Prior exposure to stimuli (words, pictures, sounds) improves the speed, effort, and accuracy with which those stimuli are later processed (Jacoby, Kelley, & Dywan, 1989). This processing advantage has been termed “fluency”—which many psychologists operationalize as speed of processing. People often experience fluency as familiarity, and this can affect many judgments, including how clear a stimulus appears, whether the stimulus was shown previously, and how much the participant liked the stimulus (see Bernstein, Whittlesea, & Loftus, 2002; Clore, 1992; Winkielman, Schwarz, Reber, & Fazendeiro, 2003).

Harley and colleagues (Bernstein & Harley, 2007; Harley et al., 2004; see also Sanna, Schwarz, & Small, 2002) proposed a processing fluency account of hindsight bias in adults. According to this account, the outcome to a problem, or any plausible information that is provided in the form of outcome feedback, is processed fluently. This fluent knowledge, in turn, is difficult to ignore when trying to estimate what a naive self or other knows. Participants must discount this fluency if they are to correctly appreciate a more naive cognitive state. However, participants misattribute their processing fluency—it is familiar and easy for them now and they assume it always was, and will be for others, as well.

Fluency misattribution resembles inhibitory control except that inhibitory control typically involves discounting the content of the information, whereas fluency misattribution involves discounting the speed with which the information is processed. Furthermore, fluency misattribution relies on memory retrieval (cf. MacLeod, Dodd, Sheard, Wilson, & Bibi, 2004; see also Appleton-Knapp, 2002) because processing experiences are recorded by memory (see Bernstein, 2005; Kolers, 1973). As Jacoby (1978) has shown, it is

easier to repeat what we have just done than it is to solve a problem anew. In so doing, we must rely on memory. Applied to a typical hindsight bias memory design, fluency misattribution proposes that people rely on automatic, habitual responding whenever possible. Thus, when asked what they originally thought the outcome to President Nixon's trip to China would be, participants simply rely on the actual, salient outcome rather than doing the hard work of recalling their original judgment. People process the actual outcome to a problem fluently, and mistake this fluency for evidence that they must have known the outcome all along. To date, there is ample work involving fluency misattribution in adults, although little is known about its development in children (see Guttentag & Dunn, 2003).

We do not intend anchoring and adjustment, inhibition, and fluency misattribution to be an exhaustive list of all possible mechanisms that may contribute to hindsight bias, nor do we intend them to be mutually exclusive. Rather, we argue that anchoring and adjustment (in which we anchor on our own current state) is a useful model for understanding hindsight bias and emphasize that many factors may influence the "adjustment" process including inhibitory control, fluency misattribution, source monitoring (e.g., Birch, 2005), perceived plausibility (e.g., Hardt & Pohl, 2003; Pohl, 1998), and notions of surprise (e.g., Pezzo, 2003), among others (see Epley, Keysar, Boven, & Gilovich, 2004).

## IMPLICATIONS AND CONCLUSIONS

Much research on hindsight bias has emphasized the important implications resulting from people's inaccurate memory of their earlier predictions. The emotional consequences of these errors may prove a particularly interesting area for future research. For instance, a victim of a mugging, in hindsight, might think, "I should have known this would happen" and may experience increased self-blame and shame.

Equally important, however, are the implications this bias has for reasoning about *other* people's cognitive states. In academia, for example, educators are typically more informed than those whom they hope to educate. If they fail to fully appreciate their audience's more naive perspective they will deliver their message at a less than optimal level (e.g., Hinds, 1999). This is an example of a *direct* effect of hindsight bias on cognitive perspective taking: when our ability to appreciate what someone else *knows* is biased by our own knowledge.

*Indirect* effects of hindsight arise when these biased assumptions about what others know lead to erroneous expectations about how someone will, or should, *behave* or *feel*. In addition, biased assumptions about what others should know may influence assessments of others' (not just states). For instance, hindsight may indirectly influence people's judgments of how intelligent someone is. If people overestimate the likelihood that others will share their knowledge and then learn that a specific individual does, in fact,

not know what they assumed he should, they may deduce that he is not up to par intellectually. That is, rather than recognize that one's estimates of what others know are inaccurate, one may make trait attributions about others (such as "he is not very bright").

These indirect effects can have important implications for social and moral judgments, including jury decisions (see Roese, Fessel, Summerville, Kruger, & Dilich, 2006). For example, if you know that your coworker missed a deadline because of a family emergency, and your boss berates her for missing the deadline, you may judge him more harshly for his actions than someone who did not know about her family emergency, because you assume that your boss "should have known." Indeed, Keysar, Linn, and Barr (2003) found that one can explicitly discount that the other person knows what you know, but still be unable to rescind the implicit effects of that knowledge. Given that children appear more susceptible to hindsight bias than adults, one would likewise expect children to experience these consequences, both direct and indirect, to a greater degree than adults. Future research should explore the impact that hindsight bias has on these aspects of social cognition across development.

In sum, we have shown how the types of errors that young children make on certain ToM tasks resemble those made by older children and adults on hindsight bias tasks. We argue that limitations in children's ToM, and hindsight bias in adults, share a core cognitive constraint: a difficulty appreciating a more naive perspective as the result of being biased by one's own current knowledge. We do not believe that ToM errors and hindsight bias are one and the same, but both types of error involve failure to ignore privileged knowledge. We believe that future research targeted at elucidating the mechanisms underlying this commonality will provide invaluable insight for both hindsight bias and ToM research. More broadly, our agenda is to raise further awareness of the similarities across disciplines in hopes of fostering a more unified understanding of the nature and development of hindsight bias in social cognition.

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