



Original Articles

A ‘curse of knowledge’ in the absence of knowledge? People misattribute fluency when judging how common knowledge is among their peers



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ABSTRACT

Knowledge can be a curse: Once we have acquired a particular item of knowledge it tends to bias, or contaminate, our ability to reason about a less informed perspective (referred to as the ‘curse of knowledge’ or ‘hindsight bias’). The mechanisms underlying the curse of knowledge bias are a matter of great import and debate. We highlight two mechanisms that have been proposed to underlie this bias—inhibition and fluency misattribution. Explanations that involve inhibition argue that people have difficulty fully inhibiting or suppressing the *content* of their knowledge when trying to reason about a less informed perspective. Explanations that involve fluency misattribution focus on the feelings of fluency with which the information comes to mind and the tendency to misattribute the subjective feelings of fluency associated with familiar items to the objective ease or foreseeability of that information. Three experiments with a total of 359 undergraduate students provide the first evidence that fluency misattribution processes are *sufficient* to induce the curse of knowledge bias. These results add to the literature on the many manifestations of the curse of knowledge bias and the many types of source misattributions, by revealing their role in people’s judgements of how common, or widespread, one’s knowledge is. The implications of these results for cognitive science and social cognition are discussed.

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1. Introduction

As scientists and educators it is easy to embrace the old adage ‘knowledge is power’. After all, the merits of increases in knowledge are plentiful and obvious. Perhaps less obvious is the fact that knowledge can also be a curse, especially when it comes to perspective-taking: Once we have acquired a particular item of knowledge that knowledge tends to bias, or contaminate, our ability to reason about a more naïve perspective. For instance, people who know the meaning of an idiom (Keysar & Bly, 1995), whether or not a statement is sarcastic (Keysar, 1994) or the outcome of an election or other event (e.g., Fischhoff, 1975) are biased in the direction of *what they currently know* when assessing the judgments of someone less informed (for reviews see Blank, Musch, & Pohl, 2007; Ghrear, Birch, & Bernstein, 2016; Hawkins & Hastie, 1990).

As another example, economists Camerer, Lowenstein, and Weber (1989) were interested in whether sales agents who were

better informed about their products than other agents might be at a disadvantage when selling their products as a result of their privileged information. In one study, participants were provided with a company’s earnings over a 10-year-period. ‘Informed participants’ were provided with information about the company’s earnings for the following year. ‘Uninformed participants’ were not given that additional information. The informed participants were asked to predict what uninformed participants would estimate as the companies’ earnings for the additional year, and in doing so failed to fully ignore their privileged information. That is, they were biased in their predictions—‘cursed’, so to speak, by the privileged knowledge they possessed.

This ‘curse of knowledge’ bias has received a variety of different names, depending in part on the discipline or context in which it has been examined, including ‘hindsight bias’ (e.g., Bernstein, Atance, Loftus, & Meltzoff, 2004; Fischhoff, 1975), the ‘knew-it-all-along’ effect (e.g., Fischhoff, 1977; Sutherland & Cimpian, 2015; Wood, 1978), ‘the curse of expertise’ (e.g., Hinds, 1999), ‘adult egocentrism’ (e.g., Kelley & Jacoby, 1996; Keysar, Lin, & Barr, 2003), ‘epistemic egocentrism’ (e.g., Royzman, Cassidy, & Baron, 2003) and ‘reality bias’ (e.g., Mitchell & Taylor, 1999). We believe each is a manifestation of, and can best be described as, the ‘curse of knowledge bias’ defined as *a tendency to be biased by one’s current knowledge state*

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when attempting to reason about a more naïve perspective. This biasing effect occurs regardless of whether the more naïve perspective is one's own earlier perspective (in hindsight) or someone else's (see Birch & Bernstein, 2007; Birch & Bloom, 2003).²

At first glance, the curse of knowledge might appear to have a negative connotation as it constrains our ability to make accurate inferences about the perspectives of other individuals; however, some researchers have suggested that the curse of knowledge is the by-product of an otherwise adaptive learning system (Hoffrage, Hertwig, & Gigerenzer, 2000; Henriksen & Kaplan, 2003). These researchers argue that our brains are geared toward *acquiring* knowledge (not ignoring it!) and readily integrate new information, or update old information. Although this routine updating may worsen perspective taking, it serves an adaptive function by keeping track of new events and focusing our cognitive resources towards the most up-to-date information.

Importantly, the curse of knowledge bias is a robust and widespread phenomenon that has been documented cross-culturally (Heine & Lehman, 1996; Pohl, Bender, & Lachmann, 2002). This bias occurs even after people have been explicitly warned to avoid it (Pohl & Hell, 1996), and persists even when people are educated about the phenomenon and provided with cash incentives to try to prevent it (Camerer et al., 1989). Given the regularity with which we must gauge what others know, the bias frequently crops up in many day-to-day conversations, as well as in written forms of communication (see Pinker, 2014). The curse-of-knowledge bias has been examined through a host of different experimental techniques and across a wide range of academic disciplines and real-world contexts, such as in medicine, law, education, business, politics, inter alia (e.g., Hinds, 1999; Keysar, 1994; Keysar & Bly, 1995; see Guilbault, Bryant, Brockway, & Posavac, 2004, and Hawkins & Hastie, 1990 for reviews).

Cognitive scientists and memory researchers typically investigate the curse of knowledge bias (often referred to as the hindsight bias in this discipline) using either a memory design or a hypothetical design (see Pohl, 2004). In a memory design, researchers ask participants to answer questions. Later, the participants learn the correct answers to the questions, and are asked to recall their original answers. Participants' recollection of their original answers tends to be biased toward the newly learned correct answers (e.g., Fischhoff & Beyth, 1975). In a hypothetical design, participants learn the answer to a question, and then estimate how another individual will respond, or how they *would have* answered the question if they had not been told the answer. For example, Fischhoff (1975) provided participants with descriptions of a historical event involving the war between the British and the Gurka. Some participants did not learn the war's outcome, whereas others did. Subsequently, participants had to consider several possible outcomes, including the actual outcome. For each possible outcome, participants estimated how likely it would be for a naïve peer to predict that outcome. Compared to participants who did not know the true outcome, knowledgeable participants overestimated the likelihood that a naïve peer could predict the outcome.

There is a wealth of psychological literature on the curse of knowledge in adults and its effects on different aspects of memory and social cognition (see e.g., Lilienfeld, Amirati, & Landfield, 2009; Roese & Vohs, 2012). Despite the extensive research on this bias in adults, comparatively few studies have examined this bias in children. Nonetheless, researchers have shown that young children are more susceptible to this bias than older children and adults (Birch & Bloom, 2003; Bernstein, Erdfelder, Meltzoff, Peria, & Loftus, 2011; Bernstein, Atance, Meltzoff, & Loftus, 2007) and have argued that the exaggerated form of this bias may account, at least in part, for young children's deficits in their ability to reason about false beliefs in the classic false belief or 'theory of mind' tasks (see Bernstein et al., 2004; Bernstein et al., 2007; Birch, 2005; Birch & Bernstein, 2007; Birch & Bloom, 2003; Birch & Bloom, 2004; Birch & Bloom, 2007; Ghrear et al., 2016; Mitchell & Taylor, 1999; for a recent review see Birch et al., 2017). This bias also appears to contribute to children's difficulties with source monitoring and source memory recall (see e.g., Gopnik & Graf, 1988; Sutherland & Cimpian, 2015; Taylor, Esbensen, & Bennett, 1994).

1.1. Potential mechanisms underlying the curse of knowledge bias

Despite an abundance of evidence showing the widespread impact of this bias in a variety of contexts, there is comparatively little known about the specific mechanisms that contribute to the curse of knowledge bias. Several researchers have proposed factors that may influence the bias, such as individual differences in working memory and intelligence (e.g., Coolin, Erdfelder, Bernstein, Thornton, & Thornton, 2015; Musch & Wagner, 2007), source monitoring abilities (e.g., Birch, 2005; Birch & Bernstein, 2007) and the extent to which the outcome information 'makes sense' or is surprising (e.g., Konečný & Bačová, 2012; Pezzo, 2010; Pohl et al., 2002), just to name a few (see also Fischhoff, 1977; Harley, Carlsen, & Loftus, 2004; Nestler, Blank, & Egloff, 2010; Pohl, Eisenhauer, & Hardt, 2003; Sanna & Schwarz, 2004 and the 'General Discussion' section). Still, the exact nature of the mechanisms underlying the curse of knowledge bias is a matter of immense interest and discussion (e.g., Groß & Bayen, 2015a; Groß & Bayen, 2015b). Identification of the mechanisms underlying this bias will advance our understanding of how people reason about others' knowledge and shed light on how to craft more effective de-biasing techniques to reduce the curse of knowledge bias and improve our memory and perspective taking abilities.

One proposed mechanism underlying the curse of knowledge bias is Inhibitory Control (IC). Explanations that involve inhibition argue that people have difficulty fully discounting or inhibiting their own knowledge (see Bayen, Pohl, Erdfelder, & Auer, 2007; Groß & Bayen, 2015b; Pohl et al., 2003; Lagattuta, Sayfan, & Blattman, 2010; Lagattuta, Sayfan, & Harvey, 2014). For example, when people are asked trivia questions such as "Where is the Trevi Fountain?" and are asked to estimate the percentage of peers who know the answer to this question, those who know the answer (i.e., Rome, Italy) overestimate the percentage of their peers who will know the answer compared to participants who do not know the answer. That is, individuals who know where the Trevi Fountain is are not able to completely ignore this information when trying to gauge a more naïve perspective. A strength of the inhibition explanation is its potential to explain the U-shaped pattern of age-related changes in which the magnitude of the curse of knowledge bias is greater in younger children and older adults than it is in older children and young adults (Bayen et al., 2006; Bernstein et al., 2011; Groß & Bayen, 2015b). This U-shaped developmental trajectory is consistent with the fact that inhibitory processes are tied with frontal lobe development, and the frontal lobes are the last part of the brain to develop and the first part to show signs of deterioration in older adults (Dempter & Corkhill, 1999). Both

² We favor the term 'curse of knowledge' over the term 'hindsight bias' because the bias is not limited to recollections made in hindsight but applies more generally to any attempt to reason about a less informed perspective than one's current perspective. We also favor the term 'curse of knowledge' over terms that use the word 'egocentrism' because the bias appears to be asymmetrical in nature (i.e., there does not appear to be an equivalent 'curse of ignorance') suggesting it is not purely due to a difficulty taking any perspective other than one's own (see e.g., Birch & Bloom, 2003; Nickerson, Baddeley, & Freeman, 1987). Finally, we favor the term 'curse of knowledge' over 'reality bias' because the former captures the fact that it is one's knowledge or beliefs about reality (and not necessarily reality per se) that leads to the bias—that is, one can be biased by what one *thinks* they know about reality (such as whether a statement was intended to be sarcastic or not) even if what one thinks is incorrect.

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