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Hypocognition: Making Sense of the Landscape Beyond One's Conceptual Reach

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Hypocognition: Making Sense of the Landscape Beyond One's Conceptual Reach

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People think, feel, and behave within the confines of what they can conceive. Outside that conceptual landscape, people exhibit *hypocognition* (i.e., lacking cognitive or linguistic representations of concepts to describe ideas or explicate experiences). We review research on the implications of hypocognition for cognition and behavior. Drawing on the expertise and cross-cultural literatures, we describe how hypocognition impoverishes one's mental world, leaving cognitive deficits in recognition, explanation, and memory while fueling social chauvinism and conflict in political and cultural spheres. Despite its pervasive consequences, people cannot be expected to identify when they are in a hypocognitive state, mistaking what they conceive for the totality of all that there is. To the extent that their channel of knowledge becomes too narrow, people risk submitting to hypocognition's counterpart, *hypercognition* (i.e., the mistaken overapplication of other available conceptual notions to issues outside their actual relevance).

Keywords: concept, cross-cultural, hypocognition, hypercognition, meaning

In 1806, Boston entrepreneur Frederic Tudor sailed to tropical Martinique with a grand scheme of selling ice to the locals, but his plans soon went awry (Weightman, 2003). The Martinique islanders found his product to be nothing other than a curiosity. Having never experienced a cold drink, the islanders could not fathom why ice held any value. They left Tudor's cargo to melt away unappreciated and unsold.

In this article, we suggest that the outcomes of human events often turn not on the ideas that people possess but rather on notions for which they have no conception, such as the Martinique islanders' lack of notion for ice. We argue that, much like the Martinique islanders in this story, people fail to have knowledge of all the concepts it is possible to know. There are innumerable ideas and notions that lie beyond their personal and cultural horizons of expertise. Further, it is the ignorance of these concepts that directs their interpretation of circumstances and the decisions they reach.

For example, roughly two thirds of Americans execute poor financial decisions, in part, because they have little comprehension of compound interest and how it can help or hurt their future finances, thus taking on too much debt and saving too little (Lin et al., 2016). Similarly, a full third of people suffering from Type II diabetes remain unaware of having the disease and take no health precautions because they have no overarching concept helping to piece together their disparate symptoms into a unified pattern

(Cowie et al., 2006). Further, people interested in sustainable living buy food more in line with their environmental preferences only after the conceptual distinction between sun- and oil-based foods is made clear to them (Lakoff, 2010).

We argue that people's finite conceptual horizons are a pervasive and powerful constraint on how they make sense of the world. These horizons represent the hard boundaries of where people's possible interpretation of their circumstances can go and define the finite channels into which their understanding is funneled. To be sure, what each individual person knows is considerable, but it pales against the entire landscape of concepts that are possible to know. The typical 20-year-old English speaker knows the equivalent of 42,000 dictionary entries, with the number rising to 48,000 by age 60 (Brysbaert, Stevens, Mandera, & Keuleers, 2016). Webster's *Third New International Dictionary*, however, contains roughly 470,000 entries; the second edition of the *Oxford English Dictionary* contains over 600,000. Add to that concepts from other languages that fail to translate to English: A recent emotion lexicography listed 216 untranslatable words related just to the concept of "well-being" from non-English languages (Lomas, 2016). Thus, what each individual knows is merely a narrow slice of concepts, ideas, and analyses that humanity has developed to comprehend the world that they inhabit.

Hypocognition

In particular, we examine the impact of these conceptual gaps by focusing on the notion of *hypocognition*, a concept with a robust intellectual life in linguistics and anthropology. *Hypocognition* refers to lacking a cognitive or linguistic representation of a concept. The condition parallels the experience of the denizens of Abbott (1884) *Flatland.* Being two-dimensional creatures living in

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a two-dimensional world, Flatlanders could not comprehend such three-dimensional ideas as *up* or *sphere*.

Hypocognition has much to say about psychological life. If people base their interpretations of their circumstances upon readily available cognitive frameworks (Park, 2010), the frameworks one does not have limit the scope of which understandings are possible. Hence, making sense of how people make sense of the world entails knowing the possible interpretations not available to them.

In this review, we explore how hypocognition affects meaning construction and steers thought and action as people navigate their social worlds. We detail the social and cognitive consequences of being hypocognitive, describe the phenomenology of people afflicted with hypocognition, and discuss patterns of "knowing" that hypocognition might produce.

History and Relevance to Psychology

The notion of hypocognition was introduced to modern behavioral science by the anthropologist Robert Levy (1973) in his classic field study of the Society Islands in Tahiti. Levy noticed when Tahitians suffered painful loss they expressed no long-term grief. Indeed, they articulated no conception of the emotion, instead describing their sorrow and anguish vaguely as "sickness" or "feeling strange."

With regard to psychological functioning, we take being hypocognitive as the absence of being schematic for a concept (Neisser, 1976). As traditionally defined, *schemata* are knowledge structures that represent, organize, and make sense of the features of people, places, objects, and events encountered by the social perceiver. Schemata contain not only the features needed to identify an instance of an object, but also all its associations to other ideas, events, and actions to which the concept may be relevant (Minsky, 1975; Rumelhart, 1981; Schank & Abelson, 1977; Taylor & Fiske, 1984). That is, the schema contains elaborations detailing how a concept connects to other concepts a person may possess. For example, a schema for psychological stress may contain not only the symptoms needed to recognize stress, but also ideas about what causes or explains stress, what stress may cause in turn, and common responses for managing or reducing it. To be hypocognitive about psychological stress would be to have none or only a sparse collection of these associations.[1]

Examples of Hypocognition

To be sure, people may still experience some fragmentary or vague aspects of the concepts of which they are hypocognitive, such as Levy's (1973) Tahitians who felt some diffuse somatic signs of sickness or strangeness when experiencing grief. Even the two-dimensional beings in Flatland can experience spheres as expanding and contracting circles as the spheres pass through their two-dimensional world. Either group, however, will not attain the full experience of the concept or connect it to other concepts. Rather, they come away with a crude understanding and an impoverished experience of the concept.

In the behavioral science literature, one sees evidence for impoverished experience among the hypocognitive. What they see in an instance of a concept—if they see it at all—is different from what people more familiar with the concept see or experience. Examples come from two different areas of psychology.

The psychology of expertise.

Identifying instances. What a novice sees is often quite different from what an expert experiences (Chi, 2006; Nokes, Schunn, & Chi, 2010). Novices lack meaningful schemata to aid recognizing instances of a category and thus miss things. For example, novice physicians are not as good at identifying abnormalities in lung X-rays as their more knowledgeable counterparts. They recognize three fewer findings per film, miss more subtle cues of pathology, and notice fewer relationships among those cues (Lesgold et al., 1988). Similarly, Alberdi et al. (2001) found although novice physicians were equally as good at seeing key events on a record of physiological function as experts, they saw fewer secondary events and were less successful at distinguishing clinically relevant readings from simple artifacts.

In addition, when interpreting a situation, novices lack the penumbra of background associations that experts connect to their experiences. Novices see only that which is explicitly there, that is, the exogenous properties of a stimulus. In physics, for example, novices fail to recognize the deep structure inherent in physics problems—the representation most relevant to problem-solving (Chi, Feltovich, & Glaser, 1981; Voss & Post, 1988). Given a selection of problems and asked to group them, novices—hypocognitive to underlying concepts—sort them based on more superficial features, such as whether the problem involves pulleys or inclined planes. Experts will sort the problems according to underlying principles of physics that the problems suggest, such as conservation of energy (Silver, 1979). That is, they bring crucial endogenous associations to the task, associations generated internally upon seeing the stimulus. This discrepancy is also seen in medicine (Groen & Patel, 1988), engineering (Moss, Kotovsky, & Cagan, 2006), and mathematics (Silver, 1979).

Further, when trying to identify and distinguish letters from the Arabic alphabet, novices fail to have access to nonvisual, endogenous associations that experts bring to bear in recognition and interpretation, such as the brushstrokes needed to create the letters as well as their meaning and sound. Novices see only the exogenous, physical characteristics of the letters. Thus, when making judgments about whether pairs of letters are identical, novices are slower and less accurate than their more expert peers, and 50% of the difference in speed and 10% of that in accuracy are explained by nonvisual associations available to experts but not to novices (Wiley, Wilson, & Rapp, 2016).

Memory. Missing those schematic associations also prompts novices to have worse memory than experts. Chess novices recall nonrandom positions of chess pieces at a rate only one fourth of that of experts (Chase & Simon, 1973). Novice baseball fans recall fewer balls and strikes after listening to a baseball game than do

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[1] Note that our treatment of hypocognition focuses on knowledge of concepts, not knowledge in general. For example, our treatment does not cover factual knowledge, such as knowing that General Custer died in the Battle of Little Big Horn or $6 \times 7 = 42$. Concepts can be items people experience, such as color, shape, emotion, or shoeburyness (Adams & Lloyd, 1984; i.e., the warmth experienced when one sits in a chair that has recently been vacated; now made aware of it, we suspect readers will potentially experience this sensation more often) or more abstract intellectual notions, such as hyperbolic discounting or *stare decisis*.

experts, because they lack the schemata to aid their memory (Chiesi, Spilich, & Voss, 1979). Likewise, novices to air flight recall air traffic control messages less accurately than do expert pilots (Morrow et al., 2001).

Cross-cultural psychology. Examples of hypocognition abound in cross-cultural psychology as well. Different cultures often bring disparate notions to their interpretation of the same situation. What they experience, therefore, can be quite different.

Color. The ability to distinguish between shades of blue depends on the underlying linguistic representation of colors that one's language affords. Whereas English has one generic concept for the color blue, distinct linguistic representations of light versus dark blue exist in Russian (*goluboy* vs. *siniy*; Winawer et al., 2007), Greek (*ghalazio* vs. *ble*; Thierry, Athanasopoulos, Wiggett, Dering, & Kuipers, 2009), Turkish (*mavi* vs. *lacivert*; Özgen & Davies, 1998), Korean (*yeondu* vs. *chorok*; Roberson, Pak, & Hanley, 2008), and Japanese (*ao* vs. *mizuiro*; Athanasopoulos, Damjanovic, Krajciova, & Sasaki, 2011). Deprived of these finer-grained color concepts, native English speakers are not only slower, but less accurate, at discerning different shades of blue than speakers of languages with more granular linguistic distinctions (Winawer et al., 2007).

Nonetheless, English speakers can perceive differences among broader color categories (e.g., blue vs. green) not apparent to other cultural groups. English has 11 basic color terms. Others, such as the Berinmo hunter-gathers in Papua New Guinea or the Himba nomads in southern Africa, have only five. The objective vision of the Berinmo and the Himba is just as good as that among English speakers; however, they show poorer perceptual judgment and more memory confusion for colors that English-speakers place into distinct categories (Davidoff, Davies, & Roberson, 1999; Roberson, Davies, & Davidoff, 2000).

Numbers. Cultures also vary widely in the degree to which they are hypocognitive of numerical representations. On one end of the spectrum, the Pirahã tribe of Amazonia have only a "one-two-many" counting system. Unable to entertain numerical concepts beyond two, the Pirahã fail to enumerate exact numbers of three items or more (Gordon, 2004). They can recognize which bundles of objects are more numerous, but fail to recall which bundle is larger once removed from sight (Frank, Everett, Fedorenko, & Gibson, 2008).

Emotion. People experience emotions as situated conceptualizations within the bounds of their knowledge (Barrett, 2006). Just as the Tahitians suffer from hypocognition of sorrow (Levy, 1973), Illngots of the Philippines (Rosaldo, 1980), and the Pintupi of aboriginal Australians (Morice, 1978) cannot elucidate feelings of guilt; the Kaluli of Papua New Guinea (Schieffelin, 2005) and the Xhosa of South Africa (Cheetham & Cheetham, 1976) fail to articulate feelings of depression; the Eskimos of North America (Leff, 1973) and the Machiguenga of Peru (Johnson, Johnson, & Baksh, 1986) lack the lexicon for anxiety.

English speakers are of no exception. They may have an approximate sense of *liget* (Illongot) as anger but not fully capture the subtleties and elaborations it entails, such as exuberance in aggressive acts and in the perspiration of hard work. They may come to understand *lajja* (Odia) as feelings of shame, but miss the totality of its meaning as manifested through self-control, moral responsibility, and social hierarchy (Parish, 1991). They may un-

derstand grief, but have little understanding for *mo'emo'e*, or feelings of loneliness tinged with a "sense of the uncanny" commonly felt among Tahitians (Levy, 1973). Hypocognitive of the emotions as felt by cultural insiders, people cannot fully appreciate the richness of emotional terrains foreign to their own (Wierzbicka, 1999).

One distinct example is the concept of *amae*, the ability to "depend and presume upon another's love or bask in another's indulgence." Amae has no linguistic equivalent in non-Japanese cultures (Doi, 1992, p. 8). As best translated, it refers to a pleasant emotion elicited when someone makes an inappropriate request of another individual. Both the person making and the one receiving the request feel the emotion, but the latter is more likely to experience a greater sense of amae because they recognize the inappropriate nature of the demand being asked. Although amae can be experienced to some extent (e.g., asking a cousin to help with a paper, knowing he has his own exam to study for; Niiya, Ellsworth, & Yamaguchi, 2006) or partially captured by close equivalents ("mardy"; Lewis & Ozaki, 2009), non-Japanese natives are nonetheless hypocognitive of its many facets and nuances in meaning.

Qualitative research highlights its complex nature. Consider the following account by a Japanese woman about her male acquaintance's wife: One day, the wife begged for her help in translating a letter into English. Despite the woman's reluctance, the wife further insisted that the woman make a trip to her house and bring the letter in person. "Well, it turned out that the letter she wrote was a love letter for someone whom she's having an affair with," said the Japanese woman with little surprise. "It was definitely amae because somehow, even though she knew that I knew her husband, she expected that I wouldn't tell him about her affair" (Behrens, 2004, p. 21).

To foreign ears, such intricacies in relationship entanglement and expected dependency may sound befuddling, strange, or pathological: Why would the wife not simply ask someone else to conduct the translation? Yet, to Japanese listeners fluent with amae, the wife's action speaks volume: By presuming the woman's loyalty and confidence, the dallying wife indulges in their mutual secrecy, fosters a closer bonding, and reinforces social harmony (Bower, 2004).[2]

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[2] Some readers may associate our proposals with the classic Sapir-Whorf hypothesis (Kennison, 2013), which states that language and language structure places heavy constraints on what people think. Although there are similarities between our project and the Sapir-Whorf one, in that we share a focus on constraints on human thought, our concerns are distinct from the Sapir-Whorf project. The Sapir-Whorf hypothesis focused squarely on the relation between language and cognition, contending the former constrains the latter. We, however, make no claims about the relation between language and cognition. Instead, we are interested in how deficits in either cognitive or linguistic representations affect human thought and action. Deficits in cognitive representations can take place independent of language. For example, even in the same language community, experts and novices might hold different cognitive representations of concepts that may lead to divergent interpretations and behaviors. In addition, whereas Sapir-Whorf focused on concepts that people have, we focus on where thought goes even when people fail to have a representation of the concept.

How Hypocognition Is Experienced

Given the pervasiveness and consequences of hypocognition, one would expect that lay readers and social scientists alike would already be familiar with it. But we think catching one's self in a hypocognitive state is difficult. Hypocognition is largely invisible to those who suffer from it, much like the Dunning-Kruger effect (Dunning, 2011; Kruger & Dunning, 1999) in which unknowledgeable individuals lack the very expertise they need to identify their deficits in knowledge. An individual cannot sense a failure to recognize a concept lacking that concept in the first place. As such, people in hypocognitive states are not capable of recognizing their hypocognition.

The Totality Illusion

People often fail to see their errors of omission in comprehension and classification (Caputo & Dunning, 2005) because they lack the knowledge base necessary to recognize things outside their ken. After all, research shows that a majority of people with red-green color blindness are often unaware of their color vision deficiency well into adulthood (Tagarelli, Piro, & Tagarelli, 1999). They see something but are unaware of what else they miss.[3]

As such, people under hypocognition often incorrectly assume they are experiencing the world in full. This phenomenon can be termed *WYSIATI* ("what you see is all there is"; Kahneman, 2011), or as we would call the *totality illusion*. Consider the following short passage:

> The man stood before the mirror and combed his hair. He checked his face carefully for any places he might have missed shaving and then put on the conservative tie he had decided to wear. At breakfast, he studied the newspaper carefully and, over coffee, discussed the possibility of buying a new washing machine with his wife.
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> Then he made several phone calls. As he was leaving the house, he thought about the fact that his children would probably want to go to that private camp again this summer. When the car didn't start, he got out, slammed the door, and walked down to the bus stop in a very angry mood. Now he would be late. (Bransford & Johnson, 1973, p. 415)

Upon first glance, the passage seems to convey in full the events of a man's morning. However, what if the man in the passage is unemployed? Reread the passage with this newly implanted concept. Does the passage seem richer in tone and deeper in meaning? Were there connotations missed without knowledge of that underlying concept that actually inform the passage?

In sum, people experience something even if hypocognitive of the concept in play. A lack of emotional concept may manifest itself through experiences of somatic symptoms (Chan, 1990; Ryder et al., 2008), such as those feelings of sickness among the grief-stricken Tahitians (Levy, 1973). Americans in amae-evoking situations do experience positive emotions, although such feelings may comprise a sense of control rather than mere relationship intimacy felt by Japanese respondents (Niiya et al., 2006).

Workaround Knowledge

Ironically, people are not paralyzed by their hypocognition. Although they may lack understanding about a particular concept, they have a rich tapestry of existing notions, theories, metaphors, and heuristics to work around gaps in direct knowlege. Indeed, this complex tapestry of a flexible knowledge base is designed to help people deal with novel and unfamiliar situations, allowing them to make judgments often to their benefit but not without risk. They know, for example, whether to throw a basketball or a bowling ball to help a friend having trouble in the water. With such knowledge, people can use existing schemes to make novel inferences to apply to new situations (Marsh, Cantor, & Brashier, 2016; Risen, Gilovich, & Dunning, 2007).

This rich knowledge base, however, can subject people to claim knowledge they cannot possible have, a phenomenon known as *overclaiming* (Paulhus, Harms, Bruce, & Lysy, 2003). When quizzed about physics, people claim knowledge of nonexistent items as the plates of parallax, in biology of metatoxins, and in philosophy of the logistic heresy (Paulhus et al., 2003). Of financial instruments, they claim familiarity with prerated stocks; of towns, they claim knowledge of Cashmere, Oregon (Atir, Rosenzweig, & Dunning, 2015). In reality, none of these items exists.

People claim knowledge of these places, in part, because their rich fabric of world workaround knowledge allows them to bring to mind associations that suggest some familiarity. People may not have exactly heard of Barjolet cheese, but Barjolet sounds French and France makes cheese they like (Graeff, 2003). In a similar vein, in political surveys, they may not have heard of the American Trade Act, but they may think that "shipments from Japan are killing our products," and so oppose an imaginary piece of legislation (Schuman & Presser, 1980).

This is also why people may fail to recognize when they dwell in hypocognition, particularly when dealing with another culture's concept. They may hear of Japanese amae, for example, and believe they understand the concept once they have been given a definition of it in their own language. What they fail to appreciate is that the given definition may miss important nuances or even the central idea of the concept. They are like students using thesaurus-inspired words without fully comprehending what those words mean. For example, a student might try to show erudition by writing "I was meticulous when I fell off the cliff" in place of "very careful" (Willingham, 2017). What is revealed is not erudition but a little personal hypocognition.

Or, take this observation of the American use of the common Sanskrit salutation of *namaste*, after it was banned in a Georgia school for its presumed religious overtones:

> After the [yoga] class, I started paying attention to what Americans mean by *namaste*. I got the feeling that they didn't think of it just as a greeting, but it had a spiritual connotation—a Hindu mantra, a divine chant, a yoga salutation. Using namaste in India never made me feel spiritual in any way (Singh, 2015).

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[3] This lack of recognition among the hypocognitive has also given rise to a proposed phenomenon called the *frequency illusion*, in which people may not recognize instances of a concept before learning about it, but become overly aware of it once they have (Zwicky, 2005). In fact, one of the authors encountered someone on Twitter claiming, "Ever since I found out what the Dunning-Kruger effect is, I see it everywhere," although there are no formal tests of the phenomenon outstanding.

Social Consequences

Hypocognition can carry many implications for people's dealings with each other.

Cultural Chauvinism

Viewing a foreign culture from the lens of one's own runs the risk of falling into a hypocognitive trap of chauvinism. People note the concepts from their own culture that are missing in another culture, but fail to recognize the other culture's concepts that fill in any presumed gaps. Such naivety, in turn, leads people to think of their own culture as more sophisticated and advanced and other cultures as crude and simplistic (Oyserman, 2017).

For example, Porter (2008) in an English Google search of "the Chinese lack" yielded at least 2,354 mentions of modern life that Westerners claimed China failed to have: intellectual property rights, legal transparency, declinable verbs, respect for individual freedom, and so on. As Porter quipped, "The Chinese would seem to be lacking in so many essential qualities . . . that it seems something of a wonder they can sustain a functional society at all" (p. 174).

One wonders, however, what the result would be from the reverse: a Chinese search of deficits in American culture. The absence of knowledge about another culture's conceptual landscape may mistakenly place the self and the self's culture as the normative standard against which to compare all others, leading to chauvinism at the most visible levels of achievement. Of the Nobel laureates for Literature since 1901, 83% come from Western cultures, with mostly European authors (Fisher, 2013). The Swedish Academy's secretary Peter Englund has acknowledged that a Eurocentric outlook on literature might be responsible (CBC News, 2009).

Indeed, when one initiates a cultural analysis using one's own culture as the only one starting point, the analysis may lead to an incomplete understanding of another culture's fullness. In 1980, Hofstede published his landmark study of cultural values among IBM employees in over 50 countries, identifying power distance, masculinity/femininity, individualism/collectivism, and uncertainty avoidance as cultural dimensions that differentiated national cultures. Hofstede's work was a model of a comprehensive study, but could he have missed something? After all, the work originated among Western researchers using Western ideas and Western research instruments. What if, instead, the research started elsewhere?

Soon after the publication of Hofstede (1980), Michael Harris Bond took an additional research step, starting a second round assessing cultural dimensions but beginning his search in the East. He asked Chinese colleagues to generate a list of basic values, surveyed students in 23 countries, and unearthed a novel dimension that contrasts persistence and thrift with tradition and personal stability (Minkov & Hofstede, 2011). This additional dimension has proved meaningful: it predicted math performance across countries as well as rates of economic growth (Hofstede & Bond, 1988; Minkov & Hofstede, 2012).

Today, the dimension is referred to as *long-versus short-term orientation* (Minkov & Hofstede, 2012). Those endorsing long-term values focus on the future, delaying short-term rewards, valuing persistence, and adjusting one's reasoning to the circumstances. Those endorsing short-term values focus on the present, preferring immediate gratification, valuing tradition, and thinking in absolute terms. There are critics of the dimension labeling (Ashkanasy, Gupta, Mayfield, & Trevor-Roberts, 2004). Nevertheless, whatever the name it is given, it was discovered by starting from another culture rather than solely from within one's own.

Hypocognitive chauvinism across cultures can give rise to pointed instances of misunderstanding and discord. In early 2016, a Thai beauty company had to pull a skin product ad that touted "just being white, you will win" after a storm of international criticism accusing the company of overt racism (Chan, 2016). Sociologists and political scientists have indeed documented anti-Black sentiments among East and Southeast Asia (Sautman, 2009).

However, care should be taken to not assume certain cultures are more racist than others. Rather, the conception of racism in the East may be hypocognized and not as historically entrenched and central as in the West (Jaffe, 2012). Thus, people in a culture can commit the offense while unaware that it is possible. Their acts need not be blatant racism, but rather ignorance and provincialism (Fan, 2016).

Political Conflict

Hypocognition can ignite political or ideological conflict, with partisans of opposite sides seeing only the concepts associated with their own side. Political partisans remain hypocognitive of principles that support the moral judgments of their ideological opponents. According to moral foundations theory (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007; Haidt, 2012), political liberals construct moral arguments primarily on two principles, harm/care and fairness/reciprocity, failing to recognize additional principles (ingroup loyalty, respect for authority/respect, purity) that drive conservative opposition. This lack of understanding can leave liberals misunderstanding conservative opposition to social policy related to purity concerns, such as opposition of same sex marriage and abortion rights (Inbar, Pizarro, & Bloom, 2009; Inbar, Pizarro, Iyer, & Haidt, 2012). When engaged in political discourse, each side stays largely inside the bounds of the principles supporting their own views, leaving the other side unimpressed (Feinberg & Willer, 2015).

Partisan conflict can be removed by setting aside the parochial stance of hypocognition toward the other side's concerns. Conservatives can become more concerned about preserving the environment when presented with arguments in a purity frame (Feinberg & Willer, 2013). Liberals can be moved to support military spending if exposed to arguments emphasizing economic opportunities for soldiers; they can also be shifted toward establishing English as an official language if fairness concerns are emphasized (Feinberg & Willer, 2015).

Interpersonal Communication

Hypocognition also directs the course of human conversation, and with it collective memory. People more easily communicate— and receive—those ideas for which they have rich representations. Therefore, as people discuss any issue or event, it is likely to be shaped toward schemata they have and away from material that fails to fit a language community's linguistic frames. Hypocognition, thus, constrains where interpersonal conversation can go.

Bartlett's (1932) classic experiments on memory further showed how hypocognition can combine with elements of preexisting

knowledge within a language community to produce a satisfying but distorted rendering of experience. In his experiments, British participants read a short story based on a Canadian aboriginal legend about a war along a river between ghosts. They then told the story to another set of participants, who in turn were asked to retell the story to another panel of participants. Soon enough, the supernatural elements of the legend, of which participants were hypocognitive, dropped out of the participants' telling. Ghosts disappeared; spiritual wounds became physical; boats became canoes; pea-nuts became acorns. Hypocognitive details, both central and peripheral, shifted toward concepts participants already possessed.

Cognitive Consequences

Hypocognition carries implications for the individual as well. As noted in the examples above involving expertise and culture, hypocognition has many cognitive consequences, involving (a) failures to recognize instances of a concept (Chi et al., 1981; Lesgold et al., 1988; Voss & Post, 1988); (b) crude, fragmentary, or diffuse conscious experiences of it (Cheetham & Cheetham, 1976; Gordon, 2004: Levy, 1973; Morice, 1978); (c) failure to differentiate instances of a concept from those of other concepts (Davidoff et al., 1999; Roberson et al., 2000; Winawer et al., 2007); and (d) diminished memory (Chiesi et al., 1979; Frank et al., 2008; Morrow et al., 2001).

Gettier Cases in Explanation

Hypocognition carries another important consequence. People cannot use concepts they do not have to explain trends or phenomena they encounter (Levy, 1973). In these cases, workaround knowledge can conspire to produce specious explanations of events. These specious explanations can be erroneous, yet lead to predictions and actions that are sensible.

After all, medicine has been practiced by human species since its beginning, even though foundational modern concepts such as germ theory are a 19th century invention. In the absence of germ theory, a practicing physician in Vienna (ca. 1840) held a confident idea about how diseases were caused and transmitted: diseases such as cholera and the plague were transmitted by *miasmas,* poisonous vapors identifiable by their bad smell. Likewise, obesity was caused by breathing in beef odors. As such, diseases were spread not from person to person, but from contact with contaminated locations. It follows that hygeine, and in particular the elimination of foul odors, was essential for disease control (Halliday, 2001). The theory was wrong, but it led to actions and beliefs of hygiene that were largely correct.

How often do people predict the right result via a wrong rationale, reaching the right conclusions with little actual understanding of the dynamics underlying social situations? Accurate beliefs based on false reasoning—what philosophers call *Gettier cases* (Gettier, 1963)—are more common in everyday life than one might think. One study interviewed 36 students about their answers to biological quiz questions. Among those unaware of the actual target concepts the questions probed for, a full 37% still managed to get to the right answer without blind guessing (Noble et al., 2012). They got to the right answer, but by a route of reasoning that was completely distinct from the one their testmakers had in mind.

Hypercognition

Herein lies potentially the most important implication of hypocognition. If there are certain concepts that people cannot use in their explanations because they fail to have them in their cognitive arsenal, there are other likely concepts that people slide over to use. Those other concepts become the "go to" notions for people to use to make sense of their world. These concepts would be cognitively salient and filled with elaboration to other ideas. In certain cases, people may lean on them too much. They take these concepts and overextend their use as explanatory variables, ultimately giving these known concepts too much credit for producing events they witness in real world. In sum, hypocognition leads to the potential overuse of other concepts that are familiar and complex.

When this happens, we can say that people engage in hypercognition. A hypercognitive concept is salient and woven extensively, perhaps too much, into people's explanatory schemes of objects and events (Levy, 1973). It is used to explain that which, in reality, it does not.

For example, Westerners might be hypercognitive about self-esteem. Not only is it a culturally central concept, but much is attributed to it. People claim that high self-esteem is the key for better performance, success, happiness, and health, whereas low self-esteem is responsible for violence, cheating, delinquency, prejudice, and other social ills. Actual data, however, suggest that the relationship between self-esteem and such outcomes is more meager and complex. Although high self-esteem may be consistently related to reports of happiness, its link to the other supposed consequences is difficult to establish empirically (Baumeister, Campbell, Krueger, & Vohs, 2003). Its use as an explanatory variable is overextended.

One can wonder how many concepts out there prove to be hypercognitive. Here is one candidate: rational self-interest. People overemphasize its role in determining attitudes and choice (Miller, 1999; Sears, Lau, Tyler, & Allen, 1980). As perhaps best evidence of this overemphasis, researchers have gone so far to show how easily people attribute altruistic behavior to selfish motives than to do the reverse—ultimately rendering the idea of self-interest impossible to falsify (Critcher & Dunning, 2011).

As such, self-interest might constitute an explanatory principle that people overextend. Consider the fact that lay people are largely unfamiliar with the endowment effect. The phenomenon arises when people value an object more the instant they possess it, thereby demanding more money when selling it than they would spend on it to buy it, due to purely cognitive mechanisms of attention (Morewedge & Giblin, 2015). Nonetheless, people are not naïve about the role of ownership in the value of goods. People do indicate that an object's owner will demand a price higher than the typical buyer will be willing to pay. However, they incorrectly cite human greed (i.e., self-interest) as the reason instead of the endownment effect (Van Boven, Dunning, & Loewenstein, 2000). This lay explanation leads to the right prediction, yet fails to capture the correct psychology underlying the behavior of owners.

This leads to an interesting query: Psychological research has long obssessed about human error and bias (e.g., Ross, 1977). Hypocognition leaves us with the question for future pursuit: Of correct conclusions laypeople make about human nature and the

social world, how many are based on faulty reasoning? How many intuitive social theories constitute Gettier cases?

Déformation professionelle. Experts and professionals may experience their own peculiar form of hypercognition. When interpreting a situation, they may overuse the constricted set of concepts salient in their own profession while neglecting a broader array of equally valid concepts, a phenomenon known as *déformation professionnelle* (Warnotte, 1937). Consider a factory where the workers are no longer as productive as they used to be. Where an economist may see a problem with an incentive structure and a psychologist instead a problem in self-identification with work, a sociologist might see a breakdown in social norms.

Medical research, too, provides demonstrations of *déformation professionnelle.* Doctors readily interpret a patient's illness in terms of their own specialty. Cardiologists are more likely to diagnose a case as heart disease than their peers specializing in infectious disease. Infectious disease specialists are more likely diagnose a case as an infection than will their compatriots in hematology or gastroenterology. Nonspecialists were the best diagnosticians of all. As such, it appears that doctors diagnose what they know. What they do not know because of specialization may lead to otherwise preventable errors at the time of diagnosis (Hashem, Chi, & Friedman, 2003).

In a similar vein, psychiatric clinicians overdiagnose depression, relative to a standard assessment instrument, whereas primary care physicians underdiagnose (Schulberg et al., 1985). Patients are not free from hypercognition themselves. Those hypercognitive of "winter blues" suffer from seasonal affective disorder (SAD) at an outsized rate (Rosenthal et al., 1984), despite mixed evidence of whether SAD exists (Traffanstedt, Mehta, & LoBello, 2016).

Implicit Knowledge in the Shadow of Hypocognition

Hypocognition complicates what it means to have knowledge. Psychological research suggests that it is possible to both know yet not know something. People may reveal expert knowledge about principles through their behavior, yet have no conscious representation of that knowledge, much like typists so overlearn their skill that they lose conscious access to their schema of a QWERTY keyboard (Go ahead, tell us which keys surround the "U" key; Snyder, Ashitaka, Shimada, Ulrich, & Logan, 2014). Sociologists term these implicit schemes *habitus* (Bourdieu, 1984): principles and practices developed by cultural groups that become so endemic that they are triggered automatically and executed without conscious scrutiny.

As such, people may not only be hypocognitive of the concepts lying outside their culture; they may be so well-versed in the principles at the heart of their own culture that they lose conscious awareness of them (Ichheiser, 1949). They become hypocognitive of the facets of their own culture. That is, they follow behavior, but fail to know understand why. Fijian women avoid certain types of fish during pregnancy or breastfeeding—successfully avoiding toxins to their offspring—but give no reason or fanciful ones for their avoidance (Henrich & Henrich, 2010). In Western cultures, people display moral dumbfounding, holding clear moral preferences but no clear understanding of the moral principles underlying those preferences when pressed to explain or justify their behavior (Haidt, 2001).

Another example is the linguistic concept of *positive face* (Brown & Levinson, 1987). In speech acts, people strive to maintain the public façade of others as they interact with them (Bavelas, Black, Chovil, & Mullett, 1990; DePaulo & Bell, 1996). At first blush, readers may believe they are fully aware of how positive face influences everyday social interaction, but psychological research suggests otherwise (Dunning, Fetchenhauer, & Schlösser, 2016). People think they are more likely to violate positive face if offended by another person than they actually do (Kawakami, Dunn, Karmali, & Dovidio, 2009; Swim & Hyers, 1999; Woodzicka & LaFrance, 2001). People accept apologies from another person—even ones that appear insincere to third parties (Risen & Gilovich, 2007). People accede to the requests of other people more readily than request-seekers expect because of the discomfort of refusal (Flynn & Lake, 2008). People trust strangers with their money out of the aversion to insinuating the other person is distrustful (Dunning, Anderson, Schlösser, Ehlebracht, & Fetchenhauer, 2014), even though they seem unaware of this aversion themselves (Zak, 2008).

Open Questions

The notion of hypocognition leads to several open questions.

Can Hypocognition Be Motivated?

So far, we have discussed hypocognition as a purely cognitive phenomenon, but could it be the product of motivated, purposeful intentions? In his treatment of the Tahitians, Levy (1973) described the hypocognition of grief and sorrow as such. He claimed that the community deliberately kept knowledge of such emotions hypocognitive to suppress their expression. Hypocognition was a form of social control. As such, individuals or entire communities may expressly dispel unwanted concepts by never elaborating on them. Or, instead, by just suppressing any thought of these concepts, they may render them hypocognitive as an inadvertent side effect—impoverished and difficult to access.

Extension to Meaning-Making

Herein, we have focused on the impact hypocognition bears on how people make sense of their day-to-day experience. But psychological scholars of meaning often focus on how people "make meaning" of bigger or more enduring events, examining how people find purpose and significance in their lives, form personal identities and life-goals, and build narratives of their place in the world to render it comprehensible and fulfilling. People, for example, can find such meaning in religion or spirituality, or are prompted to seek it after life events of significant stress (Baumeister & Newman, 1994; Park, 2010).

We can imagine that the larger meanings people construct in their lives can be just as channeled by hypocognition as is their interpretation of everyday experiences, abstract ideas, and linguistic terms, although this remains a prospect that remains unexplored by empirical research and theoretical thought.

Does Action Require Meaning?

But our discussion of hypocognition leads to a rather pointed question: To act, do people necessarily need meaning? As our

Fijian example about pregnant women and toxic fish suggests, significant actions at times may require no explicit meaning or rationale for people to guide people to execute them (Henrich & Henrich, 2010). Our discussion of Gettier cases suggests, too, that actions may follow from spurious or mistaken understandings of circumstances that just happen to lead to adaptive behavior.

After all, across human history, people have lived their lives just fine without the aid of concepts we enjoy in our modern life. Many songwriters and composers have written beautiful music without any conception of the *mu* chord. Parents were able to raise their children without a modern conception of adolescence, which did not arise until the 19th century (Mintz, 2004).

That said, human experience may be further enriched with more concepts in hand. The construction of adolescence as a distinct phase led to a transformative understanding of human development in biology (e.g., onset of puberty and rapid physical growth), cognition (e.g., extensive brain maturation), and psychology (e.g., shaping of identity and self-concept; Elliott & Feldman, 1990; Hall, 1904). The same can be said about *emerging adulthood*, a relatively new concept introduced two decades ago by psychologist Jeffrey Arnett (2000) marking the otherwise nebulous period between the end of adolescence and the beginning of adulthood (ages 18–25).

Concluding Remarks

For most of human history, zero was really nothing, in that the number did not exist (Seife, 2000). People just left a space, or a special symbol indicating a gap, when dealing with numerical calculation or communication; and humans got on just fine in their personal, religious, and commercial affairs without it.

However, the emergence of zero in 300 BCE created a boon— which continues to this day. The concept allowed mathematicians to infuse the material idea of nothing with more abstract arithmetical properties, thus paving the way for the 9th century Arab world to devise modern algebra and Fibonacci to write his famous equations. It let bookkeepers to set aside their abacuses and to balance the books with written notations. Today, the numeral sits at the foundation of the binary number system, making possible computer programming and the laptop this paragraph was written on. Once a numerical concept that did not exist, zero is now hard to imagine living without.

We argue that hypocognition is a likewise important notion for people to grasp and for psychologists to study. Life could go on without it, but as the linguist George Lakoff once stated, the belief that we have all the concepts we need is a mere illusion (Rosenberg, 2014). Adding hypocognition to our arsenal of analysis would go a long way toward helping us understand how people make sense of the world. In specifying what people cannot conceive of, hypocognition highlights what people can and do conceive. The notion may not prove to be as valuable as zero has shown itself to be, but we bet its benefit is more than nothing.

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