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Gullible or Streetwise:

How Does the Self Bias Information Processing?

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What does it take for us to treat one mug more positively than the next? Not much, it seems — we simply have to assume that it belongs to us. What is more, this special treatment appears to extend to everyday objects (such as pens, ties, and keychains) that we did not wish for, and neither need, nor find valuable. Considering something to be a personal belonging has been found to exert a powerful effect on cognition, affecting various aspects of how we engage with the object in question and, more broadly, the world around us. For example, in comparison to identical items owned by or associated with someone else, we are more attentive to our own items, remember their characteristics better and price them higher when trying to sell them (e.g., Beggan, 1992; Morewedge & Giblin, 2015; Symons & Johnson, 1997; Truong & Todd, 2017).

Strikingly, it requires almost no persuasion for us to relate an object (or even an abstract shape) to ourselves, and consequently to exhibit egocentric-like predispositions in our behavior towards it. That is, the wide-ranging effects that ownership has on our thinking and behavior are indicative of a host of self-serving tendencies that influence cognitive processing purely based on associations with the self. In other words, a proportion of our choices, judgments, and appraisals in everyday social situations are guided by mostly unnoticeable egocentric biases. Of interest in whether these biases represent the operation of a gullible mind or a streetwise social perceiver? We suspect the latter.

Even though egocentrism is most pronounced in early childhood (Perner, 1991; Wimmer & Perner, 1983), adults continue to think and behave in a self-centered manner. It has been suggested that in comparison to children, adults have stronger and more efficient corrective processes that counteract the effects of egocentrism (e.g., thankfully adults rarely

end game nights because they lost a hand of poker). In other words, adults and children are equally self-centered, but adults are better at correcting their initial (though perfectly reasonable) egocentric reactions (Epley & Gilovich, 2004; Epley, Keysar, Van Boven, & Gilovich, 2004). Nevertheless, the effects of our egocentric inclinations can be observed frequently adult behavior. In this chapter, we initially review how egocentrism impacts interpersonal communication, social interactions and social perception. Interestingly, as the effects of self-centrism are already present much earlier in the processing stream, the influence of self-relevance on cognitive outcomes, such as memory and decision-making will also be discussed. Finally, we will present results from our laboratory suggesting that ownership yields a potent bias in decision-making across cultures, further indicating the apparently egocentric character of the human mind.

Interpersonal Communication

One instance in which we commonly give away our self-centered perspective is when we try to communicate with others. Put simply, we tend to assume others know what we know, and this assumption guides our interactions (Nickerson, 1999). Effective communication requires a certain level of shared knowledge (such as a common language), but it is further greatly facilitated by being able to rely on widely understood schemas, cultural references, and common experiences. In most social situations, our egocentric biases can aid communication, as the majority of people we interact with indeed share most of the information we have, and we take that for granted (Tversky & Kahneman, 1974). For example, when we suggest determining who has to take out the trash by playing rock-paper-scissors, we typically assume that the person we are talking to knows that we are not expecting them to go find a rock, a sheet of paper, and a pair of scissors, and more often than not, we are right in assuming so. That being the case, relying on our own knowledge to guide

our assumptions about how much information we need to present (or confirm) usually simplifies our everyday interactions — it makes us interpersonally streetwise.

Notwithstanding potential benefits, we are somewhat gullible when it comes to estimating just how much shared knowledge we can refer to (Epley & Gilovich, 2006; Epley et al., 2004; Keysar, Lin, & Barr, 2003; Tversky & Kahneman, 1974). For example, in a communication game, Keysar et al. (2003) demonstrated that participants were guided by their egocentric view, acting in ignorance of the fact that their partner does not have the same information that they themselves do. Further complicating matters, even when we become aware of an extant knowledge discrepancy, we tend to make only minor corrections to our original account, thereby demonstrating our credulity with regard to generalizing knowledge and overestimating our communal understanding. To sum up, relying on our own knowledge as a reference point for what others might know commonly aids interpersonal communication, serving as the basis for an educated guess that allows us to omit superfluous information. However, on occasion, this simplification can come at the cost of accuracy (e.g., Epley et al., 2004; Gilovich, Medvec & Savitsky, 2000, Gilovich, Savitsky & Medvec, 1998; Keysar et al., 2003), opening the door to potential misunderstandings and confusion.

Social Perception

Beyond verbal communication, the inflated importance we assign to all that affects our self gives rise to many misperceptions in our interactions with others. For example, we tend to overestimate the extent to which others notice our appearance and our behavior, believing that everyone around us pays a great deal of attention to us (Gilovich & Savitsky, 1999). This conviction that has been dubbed the ‘spotlight effect’ (Gilovich et al., 2000). Consider, for a moment, what it would mean if the spotlight effect indeed accurately described our everyday lives. It would imply that we are either the only person in our

surroundings deemed worthy of heightened attention by those around us, or that the individuals we believe are noticing us so much are also paying close attention to most others around us (which would be incredibly overwhelming). Clearly, neither interpretation withstands rational examination at a societal scale, yet the spotlight effect is well documented. Students wearing an embarrassing t-shirt have, for instance, been found to misjudge how many people notice them, and individuals taking part in a group project overestimated how much attention their colleagues were paying to them (Gilovich et al., 2000).

Similarly, we often overestimate how easily others detect our feelings and emotions (the so-called 'illusion of transparency', Gilovich & Savitsky, 1999; Gilovich et al., 1998). For example, Gilovich et al. (1998) found participants to believe that they could not successfully cover up their distaste for an awful drink, and that others could easily detect their lies. Both the spotlight effect and the illusion of transparency have been attributed to insufficient internal adjustment of our judgments — that is, we do not take our internal biases into account enough when making decisions (Gilovich et al., 1998, 2000; Gilovich & Savitsky, 1999). In other words, the powerful influence of our egocentric predispositions comes from our inability to escape our own particular perspective (Gilovich et al., 1998, 2000; Gilovich & Savitsky, 1999). Interestingly, similar biases have even been found to manifest via associations with the self as demonstrated by the effects of egocentrism on our interactions with objects.

Ownership

Object ownership has been regarded as a psychological extension of the self (Beggan, 1992; James, 1890), such that individuals consider their personal belongings (e.g., car, house, and phone) to be part of their self-concept. This has often served to explain why our appraisal

of our own objects — compared to (otherwise equal) objects not owned by us – is distorted by a range of self-serving biases (Belk, 1988, 1991, 2014). For example, we become more attached to, and value our personal belongings more than identical items that are owned by somebody else. This is commonly referred to as the endowment effect (Kahneman, Knetsch, & Thaler, 1990; Knetsch & Sinden, 1984; Morewedge & Giblin, 2015). It suggests that the value of self-owned objects is inflated by the owner, compared to appraisals of identical items owned by anyone else (Maddux et al., 2010). For example, we genuinely believe that our plain blue mug is worth more money than a stranger's, our least favorite colleague's, our best friend's, and even our mother's.

In everyday life, the endowment effect can give rise to complications when owners looking to sell their items ask for higher prices than potential buyers find justified (Beggan, 1992; Kahneman et al., 1990; Maddux et al., 2010; Morewedge & Giblin, 2015). This effect further appears to increase with time for consideration: the more time we have to decide how much we would be willing to buy or sell an item for, the larger the gap between the buyers' and sellers' prices (Ashby, Dickert, & Glöckner, 2012). Similarly, experiments have shown that participants buying or selling items for themselves overvalue these more than when they are making such decisions for another person (e.g., Morewedge, Shu, Gilbert, & Wilson, 2009). Notably, even owning a second item that is identical to the item-to-be-sold does not prevent the endowment effect (Morewedge et al., 2009), thereby demonstrating that, rather than being grounded in considerations of practical value, the overvaluation of our own belongings stems from biases in our everyday thinking. This bias, however, may reflect the streetwise character of social perceivers. Feeling good about one's belongings can make one feel good about oneself (Beggan, 1992).

Even outside of economic exchanges, we can notice the effect of our self-centered tendencies in our daily lives. They can, for instance, become apparent when trying to clean

out our closets: we are motivated to achieve our goal, yet it can be difficult to give up our personal belongings, even when we have not used them in years (Belk, 1988). Similarly, we can feel sad when an item breaks or is stolen, even when we consider its monetary value to be negligible (Belk, 1988). In experimental settings, the self-related biases associated with the endowment effect can be evoked simply by presenting participants with the owned object on a computer screen (e.g., Ashby et al., 2012) — we credulously adopt what we are shown only virtually, a real-life encounter is not required (Turk et al., 2011). The emergence of the endowment effect has also successfully been demonstrated by giving participants a small gift at the beginning of an experiment (e.g., a pen or a mug, Kahneman et al., 1990), and even by randomly assigning an object to the participant (the so-called 'mere ownership effect', Beggan, 1992; Belk, 1988, 1991). From this line of research, it becomes apparent that people can be effortlessly persuaded to take ownership of an object, and immediately begin to display biases in their judgments.

Memory

Beyond their immediate effects on judgments, egocentric biases have further been found to leave a lingering impression on our thinking. Their effects on memory perhaps constitute the most well-documented domain of self-related cognitive biases (Conway, 2005; Conway & Pleydell-Pearce, 2000; Heatherton et al., 2006; Symons & Johnson, 1997). They are characterized by better recognition and recall performance for stimuli associated with the self, compared to associations with others and no association at all, and are commonly referred to as 'self-reference effects' (e.g., Conway, 2005; Macrae, Moran, Heatherton, Banfield, & Kelley, 2004; Symons & Johnson, 1997). Typically, this is demonstrated by asking participants to either process information by relating it to themselves (e.g., "Does 'honest' describe me?"), or to process it in relation to another person (e.g., "Does 'honest'

describe Donald Trump?"). In an early demonstration of the self-reference effect, Rogers, Kuiper, and Kirker (1977) asked participants to judge trait adjectives structurally, phonemically, semantically, or self-referentially. The incidental encoding phase was followed by a surprise recall test. Comparing memory performance across the different word processing conditions, Rogers and colleagues found a significant memory advantage for self-referentially processed words, suggesting that relating information to ourselves constitutes an advantage during encoding that facilitates recall, and this holds true even when we did not expect to have to recall the information.

Beyond mere word recollections, more recent research has further found enhanced episodic memory for perceptual (e.g., images of objects) and other source information pertaining to self-referentially encoded items, indicating that the self-reference effect extends to non-critical, incidentally encoded information (e.g., Conway & Dewhurst, 1995; Cunningham, Turk, Macdonald, & Macrae, 2008; Leshikar, Dulas, & Duarte, 2016; Turk, Cunningham, & Macrae, 2008; Van den Bos, Cunningham, Conway, & Turk, 2010). While this effect appears to not yet be reliably developed in children before the age of five (Sui & Zhu, 2005), some studies have found a source-memory advantage for information associated with the self in even younger children (e.g., Cunningham, Brebner, Quinn, & Turk, 2014; Ross, Anderson, & Campbell, 2011). The increased richness of episodic memory for self-relevant information has been attributed to increased integration, suggesting that self-representations bind together different types of information (Sui & Humphreys, 2015a). Again, enhanced memory for self-related material would indicate the operation of a streetwise mind.

A considerable number of studies exploring the influence the self exerts on memory takes advantage of the ownership effects previously described, comparing memory performance for self-owned to other-owned objects (e.g., Cunningham, Brady-Van den Bos,

& Turk, 2011; Cunningham et al., 2008; Cunningham, Vergunst, Macrae, & Turk, 2013; Englert & Wentura, 2016; Van den Bos et al., 2010; Sparks, Cunningham, & Kritikos, 2016). By not directly asking participants to relate information (such as traits) to themselves, ownership experiments can arguably shed more light on how egocentric biases may affect our memory in everyday contexts. Cunningham and colleagues (2008), for example, asked participants to sort items into baskets that belonged to themselves or somebody else in an ownership paradigm. Memory performance was greater for self-owned objects, compared to other-owned, suggesting that even for merely experimentally assigned objects, our memory appears to favor our own over somebody else's (e.g., Cunningham et al., 2008; Van den Bos et al., 2010). The observed memory advantages might be attributable to deeper processing of self-related information. Proponents of this view hold that the self serves as a potent schema, providing a rich set of knowledge structures associated with ourselves (compared to others), which is readily available during information processing and encoding, thereby aiding our memory (e.g., Rogers et al., 1977). Not only does this view fit nicely with findings of better episodic memory for self-referentially encoded information (e.g., Van den Bos et al., 2010), but also with neuroimaging research which provides evidence for a distinct processing pathway for self-related information (e.g., trait adjectives, Heatherton et al., 2006). This suggests that self-referential processing offers a unique advantage over associations with other people (e.g., Bower & Gilligan, 1979), and that this advantage might occur very early in the processing stream (Dunning & Balcetis, 2013), thus setting the stage for subsequent biases in memory and even decision-making.

Decision-Making

Recent evidence shows that we are faster and more accurate when making decisions that are relevant to ourselves, compared to non-self-relevant decisions (Humphreys & Sui,

2015; Sui, He & Humphreys, 2012; Sui & Humphreys, 2015a). This finding, called the 'self-prioritization effect,' has been investigated with a perceptual matching paradigm, in which participants learn pairings of shapes (e.g., triangle, circle, square) and labels (e.g., self, friend, stranger), and are subsequently asked to indicate whether the presented shape-label pairings match or mismatch the previously learned associations (Sui et al., 2012; Humphreys & Sui, 2015, 2016; Sui & Humphreys, 2015a). These experiments show that shapes associated with the self are processed more efficiently (i.e., faster response times and higher accuracy) than shapes associated with other labels (e.g., friend, stranger, Sui et al., 2012), indicating that our impressionable minds readily accept such abstract associations. It has been suggested by proponents of the self-related integrative processing framework that self-relevance provides a form of associative 'glue' for perception, memory, and decision-making which, depending on the task context, can either facilitate or disrupt performance (Sui & Humphreys, 2015a). In other words, the self acts as a central mechanism in information processing. Notwithstanding the accumulated evidence in favor of self-prioritization, exactly *how* the self exerts its influence on decision-making is largely unknown.

Many decisions are driven by uncontrollable factors favoring one response over another. Consider, for example, trying to pick a sandwich to buy for lunch. It would take no time to choose your regular option compared to a new one. Similarly, you might be quicker to pick a sandwich that is displayed at the counter (i.e., a more visually noticeable option), rather than choosing from the cafeteria's menu. In other words, we might have a predisposed preference for more familiar, frequent options, or we might be persuaded by the relative saliency and ease of one option compared to another. Similarly, on a daily basis we are unnoticeably swayed in expressing rapid judgments which are in fact underpinned by underlying biases in decision-making (White & Poldrack, 2014).

Bias is an essential component of decision-making and can provide useful information about cognition and its underlying processes (White & Poldrack, 2014). Specifically, there are two different ways in which biased responding can occur. These refer to how the processed stimulus is evaluated or how the response is generated, respectively. Whereas variation in stimulus processing affects the evidence that is extracted from the item under consideration (i.e., stimulus bias), adjustments in response preparation influence how much evidence is required before a specific judgment is made (i.e., response bias). Having a priori knowledge allows us to make adjustments for the response we are going to make, such that, returning to the previous example, less evidence and time is required to order the more regular sandwich option. Contrastingly, in absence of prior information we might rely on the most salient information (e.g., sandwiches behind the counter), such that our decision would be based on an evaluation of appearance. Each of these biases reflects a distinct underlying cognitive component and differentiating them has important theoretical implications for understanding decisional processing (White & Poldrack, 2014).

One way to differentiate stimulus and response biases in experimental settings is through application of the drift diffusion model of decision-making (Ratcliff, 1978). In the context of binary decision-making, this model describes decisions unfolding over time and assumes that information is continuously gathered until sufficient evidence has been acquired to initiate a response. In other words, we accumulate evidence over time until we reach one of the response thresholds. For example, we could continuously gather information about a pen presented to us until we either reach the threshold for the decision that the pen belongs to us, or until we have sufficient evidence to decide that it belongs to somebody else. Pertinent to the current enquiry, decision processes can be biased in two different ways. Self could bias the speed and quality of information acquisition from the stimulus, such that we would, for example, be faster at processing the incoming sensory information from our own personal

belonging, compared to somebody else's. This would be interpreted as a measure of processing efficiency during decision-making (White & Poldrack, 2014). Alternatively, or additionally, response options related to the self could benefit from an a priori bias when making relevant decisions, such that self-biases could lead us to start the evidence accumulation process closer to the self-related (e.g., object is mine) than other-related response option (White & Poldrack, 2014). Put simply, it would take less information for us to identify and respond to our own pen (compared to somebody else's pen), in the same way that we do not need much convincing to pick our usual sandwich option.

Drift diffusion modelling can be informative of how exactly the self influences our thinking and behavior, as it has the capacity to separate stimulus and response-related biases during decision-making (Voss, Rothermund, & Brandtstädter, 2008). In other words, this type of analysis offers an identification of the processes underpinning speeded self-related responses (e.g., self-prioritization effect), thereby providing valuable new insight into the existing literature on how self-relevance impacts thinking and doing. Specifically, if the mind is streetwise, what form does this streetwise processing take?

Self-Ownership Effect

To date, most demonstrations of the self-prioritization effect have relied on geometric shapes to serve as a proxy for the self (e.g., Sui et al., 2012; Sui, Liu, Mevorach & Humphreys, 2013). Although this approach is experimentally useful, it is notably removed from everyday social-cognitive functioning. This then raises the question of whether self-prioritization extends to more naturalistic processing conditions, such as objects associated with the self through ownership. On a daily basis, people interact with objects (e.g., mobile phones, clothes, pens) that belong to them or somebody else. Thus, interaction with a complex environment may benefit from enhanced item classification and recognition based

on personal significance (e.g., owned by self vs. other). In other words, decision-making might be facilitated for personally owned objects, compared to identical items belonging to someone else (Ashby et al., 2012; Cunningham et al., 2008).

Evidence from our laboratory has illuminated the effects of self-ownership during decision-making (Golubickis, Falben, Cunningham, & Macrae, 2018a). Specifically, in a modified ownership task (Cunningham et al., 2008), participants were presented with items (pencils or pens) that were randomly assigned to — that is, owned by — either the self or a non-intimate other (a stranger). Their task was simply to classify the objects as either their own or owned by a stranger as quickly and accurately as possible. The experiment provided evidence that, in comparison to items owned by a stranger, objects belonging to the self were judged more rapidly. Submitting the data to a drift diffusion model analysis (HDDM package, see Wiecki, Sofer, & Frank, 2013) further revealed that task performance was underpinned by a pre-potent response bias, such that participants required less evidence to respond to owned-by-self (vs. owned-by-stranger) objects. In other words, during the ownership task, participants made adjustments in response preparation, hence facilitating decision-making for self-relevant material.

In the previous experiment, decisions were made with respect to the self and a complete stranger, but what about judging objects that are owned by someone familiar, such as one's best friend? At least in the memory domain, there have been a number of demonstrations that the target of comparison to the self can influence the magnitude of the resultant effects. Specifically, when the self is compared to an intimate other (e.g., parent, best friend) rather than a non-intimate other (e.g., stranger), the benefits of self-referencing are sometimes reduced (Symons & Johnson, 1997). We explored this in a follow-up experiment, in which participants again performed an ownership task; however, this time, objects either belonged to the self or to the participant's best friend. Replicating the results

from our previous study, the analysis revealed that the objects owned by the self were judged more rapidly than items owned by a friend. Similarly, drift diffusion analysis yielded evidence that these speeded self-ownership judgments originated from a predisposed response bias, such that less information was necessary to identify the object as self-owned.

These results not only demonstrate that self-ownership facilitates decision-making, regardless of whether the target of comparison is a stranger or one's best friend, but also reveal that task performance is underpinned by a pre-potent response bias for one's own (i.e., self-relevant) objects. The latter finding is particularly interesting as response preparation biases are often induced by some sort of pre-existing knowledge. For example, in binary decision-making tasks, this has been done by informing participants before each trial which response outcome is more probable (Mulder, Wagenmakers, Ratcliff, Boekel, & Forstmann, 2012), and by manipulating the frequency of the appropriate responses (i.e., unequal stimulus proportions; Ashby, 1983). Both of these manipulations have been found to result in a shift of the decision-process starting point (i.e., less evidence required) towards the more likely judgment. In the current experiments, no such information was provided, yet it appears that merely acquiring arbitrary ownership for the objects was sufficient for participants to make adjustments to their response preparation.

Reward might be another possible explanation for the displayed preference for self-relevant responses. It has been shown that response bias can be prompted by manipulating the pay-off of one judgment over another, such that participants are biased towards the rewarding (vs. unrewarding) outcome (Ashby, 1983; Bogacz, Brown, Moehlis, Holmes, & Cohen, 2006; Diederich & Busemeyer, 2006; Simen et al., 2009; van Ravenzwaaij, Mulder, Tuerlinckx, & Wagenmakers, 2012; White, Ratcliff, Vasey, & McKoon, 2010). It has been shown that self-relevance can activate brain regions associated with reward (Northoff & Hayes, 2011). For example, Krigolson, Hassall, Balcom and Turk (2013) provided a gambling task in which

participants could win or lose prizes for either themselves or someone else. The results revealed that self-relevant stimuli (i.e., items owned by self) as well as responses (i.e., trials on which a 'self' response is made) were deemed more rewarding. Interestingly, this effect occurred regardless of whether participants won or lost. In other words, self-relevant responses were inherently rewarding, while responses unrelated to self were not. Additionally, the brain areas associated with the self-prioritization effect have also been linked to processing reward-related information, as proposed by an integrative model of self, namely the Self-Attention Network (Humphreys & Sui, 2016). Overall, self-relevant material is treated as more satisfying and rewarding than other kinds of information (Krigolson et al., 2013; Nayakankuppam & Mishra, 2005; Northoff & Hayes, 2011; Sui et al., 2012; Truong, Roberts, & Todd, 2017). Similarly, the response bias found in our experiments might be indicative of a pre-existing preference for the most rewarding option (i.e., objects are mine), suggesting that we lean towards the self-related option because of its potential payoff.

A recent study aimed to further examine the relative influence of self and reward, respectively, on responses in a perceptual-matching task (Sui & Humphreys, 2015b) by assigning rewards (high vs. low) to friend and stranger-associated shapes, but not to self-associated shapes. The study found both self and high reward to independently influence response patterns. That is, despite receiving no reward, responses to self-related materials were advantaged relative to low-reward stimuli and did not differ from responses to high-reward items. It was proposed that self and reward-based biases in decision-making emerge through different pathways. Notably, however, reward did not influence all participants equally. Specifically, participants who had indicated close personal distance to strangers showed weaker effects of self-bias and were more strongly affected by rewards, whereas the opposite pattern emerged for socially distant individuals (i.e., large self-advantage, non-significant reward-effect). This finding suggests that individual differences may play an

important role in determining how, and to what extent, egocentric biases impact our perception, thinking, and decision-making. It stands to reason that cultural differences might also exert a moderating influence on the products of self-referential processing (Markus & Kitayama, 2010) — but is this indeed the case?

Culture

It has been well documented that cultural factors exert a significant influence on the products of self-referential processing, including the ownership effect (Markus & Kitayama, 2010; Sparks et al., 2016). Western cultures are believed to promote independent self-construal (i.e., emphasis on the differences between self and others), whereas in Asian cultures, self-construal is deemed to be more interdependent. Here, self is thought to be interconnected with other people, especially family members, to a greater extent than in Western cultures (Markus & Kitayama, 1991). In memory, this results in an eliminated or even reversed self-referencing effect among East Asians, such that relating stimuli to one's mother leads to better memory performance than self-relevant encoding (Zhu & Zhang, 2002; Zhu, Zhang, Fan, & Han, 2007). Similarly, this cultural variability has been shown to affect object ownership. In an ownership paradigm measuring memory performance, Sparks et al. (2016) randomly assigned objects (i.e., common shopping items) to the self, best friend, mother, or stranger. The Western sample displayed a typical self-reference benefit (Cunningham et al., 2008; Van den Bos et al., 2010), such that items associated with the self were the most memorable, compared to other targets. In contrast, Asian participants showed no, or reversed, memorial advantages for self-relevant material, such that their mothers' items were equally or more likely to be remembered than their own. To sum up, at least in the context of memory, cultural socialization yields a potent influence on self-referential processing.

Decision-making, on the other hand, does not show such cultural variation of the self-prioritization effect (Humphreys & Sui, 2016; Sui & Humphreys, 2015a). Specifically, during a perceptual matching task, participants showed an advantage for self-relevant stimuli independently of their cultural backgrounds (Sui, Sun, Peng & Humphreys, 2014). In other words, the self facilitated decision-making for both the Western and the Asian samples, even when the self was compared to the participant's mother. This once again raises the question of whether the cross-culturally observed effects of egocentrism also emerge when a more ecologically valid ownership task is employed. Specifically, would cultural differences in self-construal trigger different response-time effects between Western (i.e., self < mother) and Asian (i.e., mother < self) participants (Sparks et al., 2016), or would a standard self-prioritization effect emerge regardless of culture (Sui et al., 2012, 2014)?

To explore this, we conducted two experiments in which Asians were compared to Westerners in an ownership paradigm (Golubickis et al., 2018b). We acquired samples from Kuala Lumpur and Hong Kong (East Asia), both of which were contrasted with a separate set of participants living in Aberdeen (United Kingdom). The task was identical to our previous experiments; however, it had an important modification: Participants judged the ownership of the presented objects (i.e., pens and pencils) that supposedly belonged either to themselves or their mother. Across two experiments and cultures, a stable pattern of results emerged. Ownership facilitated decision-making, such that self-owned objects were judged faster than identical items owned by mother for both the Western and Asian participants. As before, we submitted the data to drift diffusion modelling to explore the origins of this effect. Mirroring our previous experiments, the analysis revealed that decision-making was underpinned by a predisposed response bias, such that participants favored (i.e., required less evidence for) responses to self-owned items, compared to mother-owned, prior to the commencement of decisional processing. Importantly, this bias occurred for both the Asian and Western

samples. This is in line with previous demonstrations that self-relevance facilitates decision-making among both cultural backgrounds alike (Sui et al., 2012, 2014).

To sum up, the equivalence of stimulus-prioritization effects across cultures suggests that object identification is subject to egocentrism and resistant to cultural influence (Sui et al., 2012, 2014). The question of why cultural socialization impacts memorial benefits of self-relevant material therefore remains to be answered. Sparks et al. (2016) proposed that the explanation may lie in differential processing requirements posed by different tasks employed in investigations of the effects of egocentric biases. The memorial advantages associated with self-referencing are believed to originate from elaborative (i.e., post-perceptual) processing operations that enhance stimulus encoding and representation (Conway & Dewhurst, 1995; Johnson, Hashtroudi & Lindsay, 1993; Keenan & Baillet, 1980; Klein & Loftus, 1988; Rogers et al., 1977; Symons & Johnson, 1997; Turk et al., 2013). Culture is stipulated to influence the degree to which self and other overlap in memory, resulting in differences in the representation of person knowledge (see Ng & Lai, 2009; Wuyun et al., 2014), which can account for divergent effects between Western and Asian participants (Sparks et al., 2016).

In contrast, decision-making tasks, such as the ones used in our experiments, require only low-level identification of self-owned (vs. other-owned) stimuli. At the basic level of analysis at which self and other are being differentiated, egocentric responses are likely the default product of perceptual processing (Northoff, 2016), leading our minds to prefer self-relevant stimuli. Operating in such a way, the streetwise mind is preferentially furnished with self-relevant (vs. other-relevant) material on which subsequent processing operations can be undertaken (Sui & Humphreys, 2017).

Conclusion

The present chapter examines evidence from various fields of research within psychology investigating how egocentrism affects cognition and behavior. Throughout, the effects of self-relevance on stimulus processing, judgments, and memories (among others) were found to occur in adults and children, to be easily experimentally induced, and to follow immediately after introduction, suggesting that our egocentric tendencies may influence our everyday lives in important and diverse ways. Given even minimal evidence to believe something is ours, we will happily accept this proposition and act on it, such that additional processing resources are assigned towards our newly acquired personal belongings — we remember them better and make decisions regarding them faster than for items we do not consider to be ours. The self, therefore, appears to be acting as a central mechanism throughout our interactions with the world (Sui & Humphreys, 2015a), guiding at least our initial reactions in an egocentric manner.

Despite the demonstrated scope and strength of egocentric biases, the question of why our minds so readily accept them has not yet been definitively answered. It has been suggested that the self plays a critical role in our ability to communicate with, and relate to, our environment by serving as a stable reference point, thereby constituting an evolutionary advantage (see Oakley & Halligan, 2017). Extending this line of thinking, enhanced cognition (including decision-making and memory) for all that is relevant to us may contribute to successful integration in our complex social world by continuously updating our self-narrative and enabling important (i.e., self-relevant) decisions to be made very rapidly. In this view then, the self emerges as a highly efficient strategy for engaging with the world around us, allowing us to prioritize what directly affects the basis of our social existence.

On a societal scale, an evolutionary advantage may further emerge from our egocentric tendencies if they lead us to behave in a socially beneficial manner. The

impression of being noticed substantially more than is actually the case (i.e., the spotlight effect) could, for example, make us behave more in ways which we consider to be socially desirable, as has been suggested to occur when we believe we are being watched (although individual differences might moderate this phenomenon, e.g., Pfattheicher & Keller, 2015). Similarly, it stands to reason that assuming others cannot be fooled by our attempts to hide our feelings and emotions (i.e., the illusion of transparency) keeps us honest, which may also benefit society on the large scale. Taken together, this indicates that our self-favoring strategies may make us streetwise.

While the cognitive processes that potentially underpin such a self-centered strategy have in the past largely been the subject of speculation, new analytical methods can provide tools which allow a peek into the cognitive 'black box'. The results from recent research by Golubickis and colleagues (2018a), which took advantage of these analytic advances, lend support to the notion that, at least during the early stages of decision-making, people are inherently egocentric. Specifically, as evidenced in an a priori response bias toward self-relevant material, people require less evidence when responding to their own than other people's things. A cross-cultural investigation further revealed that such a self-bias is not only found in individualistic cultures, but is also exhibited by members of cultures in which the self is more strongly construed in relation to others. Put simply, the self matters most.

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