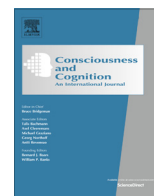




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## The optimist within? Selective sampling and self-deception

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### ABSTRACT

The nature and existence of self-deception is controversial. On a classic conception, self-deceived individuals carry two conflicting representations of reality. Proponents of an alternative, deflationary account dispute this, arguing that putative cases of self-deception simply reflect distorted information processing. To investigate these alternatives, we adapted a paradigm from the “crowd-within” literature. Participants provided two different estimates for each of a series of incentivized questions. Half of the questions were neutral in content, while half referred to undesirable future events. Whereas the first and second estimates for neutral questions did not differ systematically, second estimates for undesirable questions were more optimistic than first estimates. This result suggests that participants were sampling selectively from an internal probability distribution when providing estimates for undesirable events, implying they had access to a less rosy representation of their future prospects than their individual estimates conveyed. In short, self-deception is real.

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### 1. Introduction

Self-deception, the motivated acquisition and retention of a belief in the face of countervailing evidence (Deweese-Boyd, 2012), is a long-debated phenomenon. A classic conception (“real” self-deception; Mijovic-Prelec & Prelec, 2010) construes self-deception as analogous to interpersonal deception: some part of the self actively misleads another part (Gur & Sackeim, 1979; Trivers, 2000). The implication is that self-deceived individuals carry two conflicting representations of reality. Proponents of an alternative, “deflationary” account dispute this, arguing that the interpersonal analogy is misguided and that putative cases of “self-deception” simply reflect distortions in the processing of relevant information (Mele, 1997).

To illustrate, consider the “optimism bias,” the alleged tendency of healthy individuals to underestimate their likelihood of future misfortune (Sharot, 2011; Weinstein, 1980, 1989; cf. Shah, Harris, Bird, Catmur, & Hahn, in press). On the classic conception of self-deception, a heavy smoker who believes her future health prospects are good may also harbour a more accurate – and less rosy – belief about this. In contrast, proponents of the deflationary view might argue that whereas this person may be processing evidence about the health implications of smoking in a biased fashion (Sharot, 2011), there is no need to suppose that she carries two conflicting representations of reality.

A potential means of teasing these alternatives apart involves adapting a paradigm from the “crowd-within” literature. Participants in prominent optimism bias experiments estimate their likelihood of undesirable future outcomes (e.g., having a limb amputated) and receive directional feedback pertaining to each of these estimates (i.e., feedback suggesting each estimate was too high or too low) before supplying second estimates (Sharot, 2011; Sharot, Korn, & Dolan, 2011). In contrast,

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participants in crowd-within experiments supply second estimates for *neutral* questions (e.g., “What percentage of the world’s airports are in the United States of America?”), *without* intervening directional feedback.

The crowd-within effect refers to the fact that the average of the two estimates in these studies has a smaller error than the errors of the individual estimates on average (Herzog & Hertwig, 2009, 2014a; Vul & Pashler, 2008). This effect partly arises through bracketing of the true value, in which one estimate underestimates and the other overestimates the true value (Herzog & Hertwig, 2009). As Larrick and Soll (2006) point out, when there is at least one instance of bracketing, the error of the average estimate is less than the average estimate error. An example can help clarify this. Assume a person is asked to provide two guesses for an item with a true value of 70. If the person guesses 60 and 66 (i.e., does *not* bracket the true value), the error of the average estimate (63) is 7 and the average estimate error (i.e., the average of 10 and 4) is also 7. However, if the person guesses 60 and 84 (i.e., *does* bracket the true value), the error of the average estimate (72) is 2, while the average estimate error (the average of 10 and 14) is 12.

To investigate potential self-deceptive optimism, we adapted this crowd-within paradigm in the present study by having participants supply repeated estimates, without intervening directional feedback, for neutral *and* undesirable questions. We incorporated financial incentives for accuracy.

The different estimates provided in crowd-within studies are thought to be sampled randomly from an internal distribution of potential estimates (Vul & Pashler, 2008). Accordingly, one possibility is that when asked to supply multiple estimates of their probability of experiencing undesirable outcomes, people sample randomly from an internal probability distribution. If so, the second estimate is just as likely to be more optimistic than the first as it is to be less optimistic than the first, irrespective of the underlying distribution’s shape (indeed, this is the basis for the distribution-free Wilcoxon signed-rank test; Howell, 2010).

In line with the “real” self-deception approach, however, a second possibility imputes more intentionality to the optimist, who samples *selectively* from the optimistic end of an internal distribution.<sup>1</sup> In this case, the two estimates might vary systematically. On the one hand, participants might sample less selectively second time around, providing a less optimistic estimate and perhaps producing an *enhanced* crowd-within effect through reduction in systematic error. On the other hand, they might sample even *more* optimistically second time around, perhaps as a kind of defensive maneuver (e.g., Harris & Napper, 2005; Weinstein, 1980). Gal and Rucker (2010) found that individuals induced to experience doubt about their beliefs became stronger advocates of those beliefs than did individuals induced to feel confident of their beliefs, especially when the beliefs were viewed as particularly important. In their experiments, confidence in beliefs was not shaken by presenting evidence that contradicted those beliefs, but via more subtle means (e.g., asking participants to write about their beliefs using their non-dominant hand). We used dialectical instructions in the present study. This entailed telling participants to assume their first estimate was incorrect and asking them to think about reasons why they could have been wrong. This prompt for an alternate estimate to the one already provided might shake confidence in the initial estimate, leading to attempts to bolster one’s position by selecting even more optimistic estimates.

Our primary aim was thus to investigate whether participants provide second estimates for undesirable questions that are more optimistic than their first estimates for such questions, instead of less optimistic or equivalent, and thus to seek evidence for optimistic “self-deception”. In addition, we hypothesized that we would replicate the crowd-within effect for neutral questions and potentially extend this to estimates of undesirable future outcomes.

## 2. Methods

### 2.1. Participants

Participants were 104 students from Royal Holloway, University of London (RHUL; 41 male, 63 female; mean (SD) age = 20.38 (1.90) years). As several of our research questions were novel, no established effect sizes were available for power analyses. Instead, following an equivalent laboratory study of the crowd-within effect (Herzog & Hertwig, 2009;  $n = 101$ ) we decided to test at least 100 participants. We collected data in five group sessions, each of which 25 participants could sign up to. This way, we were likely to collect at least  $n = 100$ , even if several registered participants failed to attend each session. Participants received a show-up fee of £3 and a decision-based bonus of between £0 and £2 (mean (SD) = £1.83 (£0.38)). The Psychology Department Ethics Committee of RHUL approved this study.

### 2.2. Materials

The study included two question types: neutral (eight questions, e.g., “What percentage of the world’s roads are in India?”) and undesirable (eight questions, e.g., “What is the chance that you will die before 90?”). The full list of 16 questions is reported in Table S1 in the Supplemental Online Material. The neutral questions were the eight used in the original crowd-within study (Vul & Pashler, 2008). The undesirable questions were selected from eighty items used by Sharot et al. (2011; see Supplemental Online Material for information about how we selected these items). The required responses to all questions were percentages.

<sup>1</sup> The “real” self-deception account predicts selective sampling from an internal distribution, but is agnostic as to whether that distribution is itself biased (e.g., an outcome of biased information encoding; Sharot, 2011; Sharot et al., 2011).

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