



The bright side of the COVID-19 pandemic: Public coughing weakens the overconfidence bias in non-health domains

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ABSTRACT

The COVID-19 pandemic is a serious threat that produces harm to people around the globe. Prior work has almost exclusively focused on deconstructive consequences of the novel coronavirus, the present research reveals a bright side of the coronavirus outbreak: reduce the overconfidence bias in non-health domains. In Experiment 1, students passed by a trained confederate who was coughing loudly or not and completed a peer-comparison problem measuring their overconfidence bias. The results showed that participants, who were exposed to a salient health threat, displayed a lower level of overconfidence than did participants in the control condition. Experiment 2 recapitulated the effects of public coughing on overconfidence by using a non-student sample and an alternative measure of overconfidence. Across two field experiments, we replicated prior findings regarding sex differences for the overconfidence bias. Taken together, our research suggests that whereas the COVID-19 pandemic has undoubtedly ravaged nations and economies, the unprecedented crisis offers an opportunity for individuals to counteract their overconfidence in judgment and decision-making.

1. Introduction

The world is now confronted with an unprecedented global health threat. The ongoing COVID-19 pandemic had a substantial impact on individuals' well-being and on the world's economy. For instance, Patrick et al. (2020) found that parents in the United States reported both deterioration in psychiatric health for themselves and in behavioral health for their children as the coronavirus disease was continuing its spread across the country. Additionally, Fernandes (2020) provided evidence that a global recession seems almost inevitable and the economic costs of a recession might be extremely high in some countries and industries (e.g., tourism) due to the coronavirus outbreak. While much previous research has focused on the dark side of the COVID-19 pandemic, including a devastating human toll and a new set of challenges to almost every aspect of life, the present work investigates whether the coronavirus crisis also possesses a bright side. Across two field experiments, we show that exposure to public coughing in times of the COVID-19 pandemic can weaken individuals' overconfidence bias in two unrelated domains, namely, self-evaluation in job hunting (Experiment 1) and in general knowledge tests (Experiment 2).

One well-established phenomenon in behavioral decision making

and judgment is the overconfidence bias (Alicke et al., 1995; Lichtenstein et al., 1982). Overconfidence refers to an egoistic belief in which people's subjective confidence in judgments and knowledge is reliably higher than their objectively reasonable performance and abilities (Rućević et al., 2020; Yates, 2010). The vast majority of individuals, regardless of their ages, genders, races, and cultural backgrounds, demonstrate different degrees of overconfidence in many areas of professional and non-professional life, including public health (Harris et al., 2008; Niu, 2010). For instance, Monzani et al. (2020) found that individuals displaying a high degree of overoptimism, one type of overconfidence, tended to underestimate the risk of the COVID-19 pandemic and thus showed less compliance with preventive measures.

Although this heuristic of overconfidence is one of the most consistent and robust biases reported in the literature, much evidence suggests that a wide range of methods including argument recruitment customs (Yates et al., 1997), thinking styles (Li et al., 2011), and language experiences (Li & Shen, 2020) can significantly reduce people's overconfidence bias. For example, Li and Shen (2020) found that both monomodal (e.g., Chinese-English learners) and bimodal bilinguals (Chinese-Chinese Sign Language learners) exhibited overconfidence to a lesser degree than monolinguals, which suggests a negative relationship

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hired before the participant represents greater overconfidence, and a larger number with less overconfidence. Table 1 summarizes the descriptive statistics for all variables. A 2 (Condition: coughing and control) by 2 (Gender: Male and Female) ANOVA revealed that a main effect of the coughing manipulation was significant, $F(1, 180) = 14.18$, $p < .001$, $\eta_p^2 = 0.07$. Concretely, in comparison to participants in the control condition ($M = 0.12$, $SD = 0.15$), participants who had just walked by a coughing confederate ($M = 0.03$, $SD = 0.17$) estimated that more people would get a job before them. The main effect of gender was also significant, $F(1, 180) = 8.68$, $p = .004$, $\eta_p^2 = 0.05$. This pattern of results suggests that male participants ($M = 0.11$, $SD = 0.17$) in both coughing and control conditions showed greater overconfidence than their female counterparts ($M = 0.04$, $SD = 0.16$), respectively. However, there was no interaction between Condition and Gender, $F < 1$.

These findings offer an initial demonstration that individuals indeed evidenced a lower level of overconfidence if they were exposed a salient health threat related to COVID-19. To further substantiate these findings, we conducted a second field experiment in which we used a non-student sample and a different measure of overconfidence bias, namely, the general knowledge test.

3. Experiment 2

3.1. Method

3.1.1. Participants

The sample size was based on the number of subjects who were willing to participated in the experiment. A total of 168 non-student (88 females, mean age = 40.3, $SD = 14.1$) voluntarily participated in the experiment. They received payment as compensation for time and burdens associated with research participation.

3.1.2. Materials and procedure

Participants were approached individually in shopping centers. Coughing was manipulated after they agreed to participate in the brief survey allegedly conducted for a class project about general knowledge tests. In the experimental condition, with the booklets that contained the general knowledge test in his right hand, the trained confederate coughed three times into his upper sleeve before handing the questionnaire over to respondents in the coughing condition ($n = 84$, 42 females); in the control condition ($n = 84$, 46 females), the same confederate did not cough.

In this pen-and-pencil testing, participants read and respond questions in writing. After providing their demographic information (e.g., age, gender, and native language), participants were asked to complete a general knowledge test measuring their overconfidence bias, which was adapted from Lichtenstein et al. (1982). It consisted of twenty general knowledge questions such as ‘Which of historical event happened first (e.g., Wu Cheng’en wrote *Journey to the West* vs. Cao Xueqin wrote *Dream of the Red Chamber*)?’’. First, participants were asked to choose between the two alternatives which they thought correct. They then estimated a probability that their choices are indeed correct. For instance, if a respondent answered half of the questions correctly (the proportion correct, PC), whereas the average probability judgment (AJ) of that person was 65%. Thus, the respondent demonstrated overconfidence in the correctness of the choices than his or her actual performance. The overconfidence bias can be calculated as: $AJ (65\%) - PC (50\%) = Bias (15\%)$. This general knowledge test has been used extensively to explore the strength of overconfidence bias across many cultures (e.g., Lichtenstein et al., 1982; Yates et al., 1997).

3.2. Results and discussion

Participants were asked about the true purpose of the short survey. Participants’ debriefing reports revealed no conscious awareness of the relationship between coughing and overconfidence. Table 2 summarizes

Table 2

Descriptive statistics for all variables: Effects of exposure to a public coughing on overconfidence bias in the general knowledge test and sex differences in Experiment 2.

	Men	Women
Coughing condition	0.10(0.08)	0.02(0.12)
Control condition	0.14(0.10)	0.08(0.13)

the descriptive statistics for all variables. A 2 (Condition: coughing and control) by 2 (Gender: Male and Female) ANOVA revealed that a main effect of the coughing manipulation was significant, $F(1, 166) = 9.37$, $p = .003$, $\eta_p^2 = 0.05$. Concretely, in comparison to participants in the control condition ($M = 0.11$, $SD = 0.12$), participants who had just walked by a coughing confederate ($M = 0.06$, $SD = 0.10$) estimated that more people would get a job before them. The main effect of gender was also significant, $F(1, 166) = 17.34$, $p < .001$, $\eta_p^2 = 0.10$. This pattern of results suggests that male participants ($M = 0.12$, $SD = 0.09$) in both coughing and control conditions showed greater overconfidence than their female counterparts ($M = 0.05$, $SD = 0.13$), respectively. However, there was no interaction between Condition and Gender, $F < 1$.

These findings provided further evidence that the activation of a salient health threat related to the COVID-19 pandemic prior to a task gauging people’s overconfidence bias can significantly boost their overconfidence in a domain that has no apparent relationship with the coronavirus disease. In addition, we also replicated sex differences for the overconfidence bias in a non-student sample.

4. Discussion

Since the beginning of the COVID-19 pandemic, a growing body of empirical research has revealed the negative impact of novel coronavirus on people’s physical and mental health. In contrast, the current inquiry identified an important bright side: reduce the overconfidence bias. Our aim in the present research was to investigate the effect of everyday behaviors like coughing in times of COVID-19 on individuals’ overconfidence bias in non-health domains. In Experiment 1, we found that student participants passed a confederate who cough loudly displayed a lower level of overconfidence in the peer-comparison problem regarding self-evaluation in getting a job than did participants in the control condition. In Experiment 2, we replicated and extended these findings in two important ways. First, we used a more representative population to minimize the influence of sample characteristics. Second, we administered an alternative measure of overconfidence bias to exclude the possibility that the findings of Experiment 1 merely arise from idiosyncrasies in the specific measures employed. Moreover, across two experiments, we replicated prior findings that men scored higher than women in overconfidence.

Previous research indicated that exposure to a salient and enormous health threat can exert predictable influence on people’s perceptions of risk and fearfulness about virus and many other unrelated things (Lee et al., 2020). In other words, these signals (e.g., public sneezing and coughing) can transform and overgeneralize risk perception and health concerns into unrelated domains such as federal spending (Lee et al., 2010). Based on risk compensation theory, individuals will become more careful and shun overconfidence in response to a higher likelihood of acquiring the infection (Wilde, 1982). Thus, risk overgeneralization triggered by disease salience may in turn counteract overconfidence unrelated to the COVID-19 pandemic.

Importantly, we recognize that the high salience of disease might not be the only possible mechanism explaining the effect of health threat on overconfidence. The COVID-19 is a new disease with multiple faces. The unfamiliarity of the threat may also heighten peoples’ risk perception and overconfidence bias (Alter & Oppenheimer, 2006). For instance, Song and Schwarz (2009) showed that the perceived health hazards of ostensible food additives were rated as higher when they had a relatively