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Philosophy in the flesh: How philosophical view of embodiment motivates public compliance with health recommendations during the COVID-19 crisis

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ABSTRACT
Philosophical view of embodiment, one of the most influential hypotheses in cognitive science, postulates that sensorimotor experiences and bodily states influence people’s behavior, cognition, and emotion. Despite embodiment theory addressing the basic experiences of cognitive life, there is a paucity of information available regarding the health consequences of holding such a philosophic belief. In the current investigation, we examined a new idea that embodiment theory leads people to believe in the central role of physical body in shaping cognitive processes and mental activities, which can in turn alter individuals’ motivation to comply with preventive measures to the COVID-19. In Study 1, participants who were primed with theories of embodied cognition (vs. Cartesian dualism) self-reported more compliance with safety-promoting measures surrounding the new coronavirus disease. Extending beyond self-report measures, Study 2 focused on an actual virus-mitigation behavior. The results showed that participants primed with philosophic conceptions of embodiment (vs. dualism) were more likely to choose face masks (vs. pencils) as a gift. These findings suggest that the philosophical view of embodiment not only offers scientifically valuable insight into the mechanics of cognitive processing, but increases people’s willingness to follow non-pharmaceutical containment measures in the fight against the COVID-19 pandemic.

1. Introduction

The new coronavirus disease 2019 (COVID-19) pandemic has dramatic negative impacts on our lives and our societies such as adverse health outcomes, economic recession, and political unrest and instability (Greer, King, da Fonseca, & Peralta-Santos, 2020; Leung et al., 2020; Li & Cao, 2021; Susskind & Vines, 2020). Despite vaccine campaigns rolling out across the world, many low- and middle-income countries are experiencing unequal access to vaccines and varying levels of efficiencies in receiving the shots (Mallapaty & Ledford, 2020; Subbaraman, 2020). Before vaccinating a higher percentage of the total population and achieving herd immunity, adherences to the non-pharmaceutical preventive measures such as social distancing, hand washing, and wearing masks are still needed to mitigate transmission of the new coronavirus disease (Iboi, Ngonghala, & Gumel, 2020).

An emerging line of research in the literature has found that subtle nudges, namely changes to the design of the environment (Patel, 2018), can be used to increase people’s compliance with containment measures and lockdown guidelines (Sheetal, Feng, & Savani, 2020). For example, in one study conducted by Pfattheicher, Nockur, Böhm, Sassenrath, and Petersen (2020), participants were asked to watch a 1-minute video regarding vulnerable populations during COVID-19 response before self-reporting their physical distancing practice. The results showed that compared to participants in the control condition without receiving any information and video, participants in the empathy-induced condition showed a greater propensity to abiding by social distancing rules. This pattern of results suggests that strong affective information might be an effective way to motivate people to engage in recommended measures.

In the present research, we investigated, for the first time in the literature, the effect of affect-neutral philosophic beliefs on safety-promoting measures surrounding the COVID-19 pandemic. We propose that the philosophical view of embodiment will significantly increase the motivation to comply with preventive measures surrounding the pandemic. To date, one of the most influential hypotheses in cognitive science is the theory of embodied cognition (Lakoff, 2012; Lakoff & Johnson, 2003; Wilson, 2002). The core idea of the philosophical view of embodiment is that higher mental activities are deeply grounded in the entire body of the organism (Lakoff & Johnson, 1999).
Thus, proponents of the embodied cognition emphasize the important role of sensorimotor experience and bodily state in constraining, regulating, and shaping cognitive processes (Foglia & Wilson, 2013). On this embodied account, there is no fracture between an organism’s body, cognition, and natural and social environments.

In the past few decades, a substantial number of studies have provided support for the idea that bodily experience influences the nature of cognitive activity such as physical warmth promoting interpersonal warmth (Zhong & Lilienquist, 2006), physical slant rendering a less severe moral judgment (Li & Cao, 2019), and physical cleanliness enhancing moral purity (Williams & Bargh, 2008). Despite the philosophical view of embodiment yielding scientifically valuable insight into the effect of sensory and motor functions on behavior, cognition, and perception, there is a paucity of information available regarding its health consequences. Research is only starting to document the psychological ramifications of philosophical beliefs (Britiol, Gasco, Petty, & Horcando, 2013). For instance, reasoning that holding dualistic beliefs leads individuals to perceive their body as a mere vessel for the mind in the interaction with the physical world, Forstmann, Burgner, and Mussweiler (2012) hypothesized that participants who were primed with dualism (vs. physicalism) would be less likely to engage in health behaviors. Consistent with their theoretical perspective, the results indicated that participants reading a text on mind-body dualism reported less health-promoting engagement (e.g., eating habits, health care, and personal hygiene) than did participants reading a text on physicalism. Such findings suggest that philosophic beliefs about the relationship between body and mind may have potential implications for everyday judgment and behavior such as health interventions.

In contrast to Cartesian dualism in which one’s mind decouples from one’s body, the philosophic view of embodiment emphasizes the role of phenomenological experience of bodies in shaping how human beings build and organize knowledge construction (Gibbs, 2005). Theories of embodied cognition posit that sensorimotor experiences and bodily state play significant causal or physically constitutive roles in mental activities and cognitive processing (Glenberg, 2010). Holding such a belief may lead people to think that any harm to the body can finally damage various aspects of mind. Influenced by the philosophy of embodied cognition, individuals may feel the need to protect their bodies from the virus by following social distancing and other preventive measures in order to protect their minds. By contrast, the dualistic view postulates that the mind and body are distinct and separable substances, and the souls live on even if the body is destroyed (Heinaman, 1990; Rozemond & Rozemond, 2009). Thus, adopting this philosophical perspective of dualism, individuals may think that any damage to one’s body might be negligible and thus are less likely to engage in safety behaviors.

Since the proponents of the embodied approach argue that the agent’s body fundamentally affects the way people think about the world and themselves (Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005), and thus generally places a greater value on body over mind, any potential damage to one’s body will finally have a serious effect on the essence of one’s mind. If people feel that their highly valued mind are vulnerable to physical harm, it can be expected that this embodied view would significantly influence how people treat their bodies in personal COVID-19 mitigation behavior. In the current investigation, we hypothesized that the more people agree with the critical role of body in their minds, the more they comply with preventive measure to the COVID-19 which can protect their bodies from the new coronavirus disease. To test the hypothesis, we conducted two studies using different populations (university students and community sample) and mixed methods (self-report and behavioral measure).

2. Study 1

2.1. Method

2.1.1. Participants

The sample size varied according to the availability of participants. Participants were recruited on flyers, social media, and word of mouth. A cohort of 152 Chinese undergraduate and graduate student (83 females; mean age = 23.5, SD = 4.1) from Wuhan city took part in this study for a monetary reward. Upon arrival at the laboratory, participants were randomly assigned to either an embodied view condition or a dualism condition. Of note, there were no differences in gender and age between the two groups, ps > .55. To minimize the chance of false positives due to researcher degrees of freedom, we never performed the statistical tests before terminating data collection.

2.1.2. Materials and procedure

Our procedure composed of two steps presented to the participants as two ostensibly unrelated tasks. In the first step, participants were asked to read a text under the aegis of an experiment about textbook materials evaluations. Modelling after Forstmann et al. (2012), participants in the embodied view condition were asked to read a text on embodiment, whereas participants in the dualism condition read a text on mind-body dualism. The text in the embodied view condition described, “Many features of cognition including higher mental processes and cognitive performance depend on the interaction of human body and the surrounding environment.”, and concluded, “To sum up, the embodied view of cognition proposes that physical body plays a fundamental role in influencing various aspects of mind”. The text in the dualism condition described, “immaterial mental states are different from, though dependent on, physical brain states.” and concluded, “To sum up, the dualism of Descartes proposes that there is a real distinction between body and mind”. The two texts of vignettes were structurally equivalent and of the similar length (about 420 words, see the Supplementary material for the whole manipulations). They outlined similar statements and reasoning examples, only differing in framing with regard to particular philosophic beliefs.

Next, participants responded to a one-item pictorial measure of the association between body and mind which served as a manipulation check (Forstmann et al., 2012; Schubert & Otten, 2002). The measure composed of seven diagrams of two increasingly overlapping circles of equal size. The two circles were vertically centered on a horizontal line and separated from each other by some distance. From top to bottom, the circles in each picture came closer, touched one another at exactly one point on the third diagram and overlapped almost totally on the seventh diagram. Participants were informed that the left circle corresponded to the concept of “body” and the right circle corresponded to the concept of “mind” (the associations between “left/right” and “body/mind” were fully counterbalanced across subjects). Participants were asked to indicate which of the diagram best represented their idea about the relationship between body and mind on a 7-point Likert scale (1 = closer circles, 7 = farther circles). Therefore, lower numbers indicated a stronger view of embodied cognition, while higher numbers indicated a stronger dualist view.

In the second step, participants completed a 6-item questionnaire describing engagement behaviors to COVID-19 containment measures on campus, which was adapted from Li (2021). The six items covered multidimensions of precaution measures, including “wearing masks in classes” and “not leaving campus unless it is essential”. Participants indicated their compliance with these prevention instructions on a 5-point Likert scale ranging from 1 = not at all to 5 = always (a = 0.80). Finally, participants were debriefed about the true purpose of the study and were thanked for their participation.
2.2. Results and discussion

Debriefing responses indicated that no participants correctly guessed the true purpose of the study and thus no data were excluded from the analysis. Participants in the embodied view condition reported a closer connection between body and mind (M = 2.39, SD = 1.34) than did participants in the dualism condition (M = 3.01, SD = 0.98), t(150) = 3.26, p = .001, Cohen’s d = 0.53, 95% confidence interval (CI) = [−0.9693, −0.2437]. This pattern of results suggests that the priming manipulation was indeed successful in inducing the corresponding philosophical beliefs.

As predicted, participants in the embodied view cognition reported more compliance with preventive measures to the COVID-19 pandemic (M = 3.90, SD = 0.75) than did participants in the dualism condition (M = 3.51, SD = 0.82), t(150) = 3.06, p = .002, Cohen’s d = 0.50, 95% confidence interval (CI) = [0.1381, 0.6419]. Thus, these findings provided preliminary evidence for the effect of embodied cognition theory on people’s adherence to prevention instructions. To substantiate these findings, we conducted a study to test whether philosophic beliefs influence real-time, preventive measure for COVID-19 outbreak by employing a more diverse sample, namely, non-student adults.

3. Study 2

3.1. Participants

The sample size varied according to the availability of participants. Participants were recruited on flyers, social media, and word of mouth. A cohort of 172 Chinese non-student adults (94 females; mean age = 31.8, SD = 6.1) from Wuhan city took part in this study in exchange for gift vouchers. To ensure that participants can fully understand the research materials, all participants had bachelor degrees. Upon arrival at the laboratory, participants were randomly assigned to either an embodied view condition or a dualism condition as in Study 1. Of note, there were no differences in gender and age between the two groups, ps > .70. To minimize the chance of false positives due to researcher degrees of freedom, we never performed the statistical tests before terminating data collection.

3.2. Materials and procedure

Upon completing the priming task and responding to the manipulation check as Study 1, participants were informed that they had an opportunity to choose a free gift and were given a choice between face masks or pencils. Finally, participants were debriefed about the true purpose of the study and were thanked for their participation.

3.3. Results and discussion

Debriefing responses indicated that no participants correctly guessed the true purpose of the study and thus no data were excluded from the analysis. Participants in the embodied view condition reported a closer connection between body and mind (M = 2.58, SD = 1.09) than did participants in the dualism condition (M = 3.19, SD = 1.17), t(170) = 3.54, p < .001, Cohen’s d = 0.54, 95% confidence interval (CI) = [−0.9504, −0.2696]. This pattern of results suggests that the priming manipulation was indeed successful in inducing the corresponding philosophical beliefs.

As expected, the likelihood of choosing face masks differed significantly between the two groups of participants, as revealed by a binary logistic regression, Wald χ²(1, N = 172) = 7.17, p = .007, odds ratio = 2.59, 95% confidence interval (CI) = [1.291, 5.206]. The majority of participants (81.4%) in the embodied view condition took face masks at the end of the study, Z = 5.82, p < .001. However, only 62.8% participants chose face masks in the dualism condition, Z = 2.37, p = .017. These findings replicated and extended the results of Study 1 by showing that the philosophic view of embodiment promoted actual preventive behavior since face masks represent an effective mitigation strategy against the coronavirus disease.

4. General discussion

Despite previous research showing the effect of dualistic beliefs on health behaviors such as meal choice (Forstmann et al., 2012), surprising little is known about whether different philosophical beliefs can also influence preventive measures in the ongoing COVID-19 pandemic. In the study reported here, we provided consistent and significant evidence that holding the philosophical view of embodiment can motivate public compliance with health recommendations during the COVID-19 crisis. In Study 1, participants in the embodied view condition reported higher compliance with COVID-19 safety measures than did participants in the dualism condition. Study 2 replicated this finding by using a meaningful behavioral outcome, which minimized the influence of common method variance. When being offered a choice of prizes, participants in the embodied view condition were more likely to choose face masks, one of the most effective strategies to slow the spread of the coronavirus, than participants in the dualism condition. Overall, the fact that we found support for our hypothesis across diverse populations (student and community samples) and complementary measures of compliance with health guidelines (self-report and actual behavior) highlights the robustness of the observed effect.

The current study contributes to the existing literature in three important aspects. First, though a rapid growing body of research on the factors that are associated with people’s adherence to COVID restrictions such as personality, emotion, and cultural differences (Miguel, Machado, Pianowski, & de Francisco Carvalho, 2021; Zajenkowski, Jonason, Leniarska, & Kozakiewicz, 2020), the importance of philosophical beliefs is largely unknown. For instance, in a cross-cultural study involving 58 countries, Huynh (2020) found that people’s tolerance for uncertainty of environment (“uncertainty avoidance”) is a chief factor in predicting the proportion of individuals who engage in safe social distancing indoors. The present research represents the first attempt, to the best of our knowledge, to demonstrate that the philosophic view of embodiment has an immediate consequence on people’s willingness to abide by preventive measures to the pandemic.

Second, the results of our studies enrich a burgeoning body of work on the cognitive foundation of mind-body dualism. Previous research has shown that people are “natural-born dualists” who divide the world into physical and mental properties (Bloom, 2007). For instance, Gergely, Nádasdy, Csibra, and Biro (1995) found that even 12-month-old babies can already identify goal-directed spatial behavior of a rational agent and evaluate the rationality of these actions. Such findings suggest that beliefs in mind-body dualism might be grounded on people’s basic cognitive architecture. There is also some evidence that although the notion of dualism is an instinctive pattern but is subject to learning experiences (Bloom, 2007). For example, Brinol et al. (2013) showed that even if thoughts cannot be treated as material objects in Western dualist beliefs, objectifying thoughts by throwing them into the trash or keeping them in a safe place in imagination can influence people’s subsequent attitudes and evaluations. Consistent with these findings, we found that even a short exposure to texts of vignettes can at least temporarily change the magnitude of philosophical beliefs, which suggests the flexibility in shifting between different philosophies.

Finally, the present findings have some important practical implications. In addition to providing a new, simple strategy to promote compliance with COVID-19 safety measures, we provided a case for impact-focused cognitive science (Meier, Schnall, Schwarz, & Bargh, 2012). We do not question the theoretical value of embodiment in explaining conceptualizations of knowledge and cognitive variation. Yet, it appears that cognitive scientists have not much impact on global initiatives aimed at mitigating the spread of COVID-19. In light of our findings that the philosophical view of embodied cognition has a
considerable impact on compliance with public health safety measures, cognitive scientists can increase their contributions to prevent and control the pandemic by educating people the importance of body in various aspects and effects of mental phenomena. In doing so, theories of embodiment not only have value in accounting for cognitive antecedents of human behaviors, but increase their practical relevance to impactful behaviors and their determinants. Thus, the attention to high-impact behavior can make findings from the fields of cognitive science more relevant to other scientists and policymakers.

The present research has both strength and limitations. Among the strength is the exploration of a new idea using ecologically valid behavioral measures and examining diversified participants. Prior work showed that many individuals may engage in COVID-19 concealment behaviors, which suggests discrepancies between the results of self-reported measures in the laboratory and actual behavior in the natural environment (O’Connor & Evans, 2020). Despite debriefing responses indicating that no participants guessed the purpose of our study, some critical may argue that the social desirability bias influences their self-reported compliance with preventive measures. Yet, this is less likely in our Study 2 since we investigated actual behavior. This design can improve the related external validity and generalizability of our findings.

Still, this research has some limitations. First, though our samples were culturally and politically different from WEIRD (Western, educated, industrialized, rich, and democratic) population in most psychological research (Henrich, Heine, & Norenzayan, 2010). Our findings may not generalize outside of China since the virus situation varies across the world. Second, we only used one priming procedure to manipulate people’s philosophical beliefs. Future research using different operationalization of philosophical view such as unscrambling the words in sentences related to embodiment and dualism would be valuable (Forstmann et al., 2012: Study 2). Finally, we established a causal effect of philosophic views on compliance with preventive measures. However, it is still an open question whether this link is bidirectional. Some evidence has shown that participants primed with pictures related to health-constraining concepts reported stronger dualistic beliefs than did participants primed with pictures related to health sustaining concepts (Forstmann et al., 2012: Study 3). The results showed that health behaviors can amplify people’s metaphysical beliefs. This offers the intriguing possibility regarding the bidirectional nature of embodiment and compliance with social distancing and mask wearing regulations during the pandemic. Such a reversed link warrants future investigation.

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Heng Li: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Data curation, Validation.

Appendix A. Supplementary data
Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2021.111059.

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