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# Dirty Hands and Dirty Mouths: Embodiment of the Moral-Purity Metaphor Is Specific to the Motor Modality Involved in Moral Transgression

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Water and soap remove more than physical dirt—they attenuate guilt from one’s moral transgressions (Zhong & Liljenquist, 2006) and soften one’s judgment of others’ misdeeds (Schnall, Benton, & Harvey, 2008). Conversely, immoral acts increase the appeal of physical cleansing (Zhong & Liljenquist, 2006). Such findings indicate that abstract thought about morality is grounded in concrete experiences of physical cleanliness (Lakoff & Johnson, 1999). Natural language use associates this *moral-purity* metaphor with specific body parts (e.g., “dirty hands,” “dirty mouth”), suggesting that the motor modality involved in a transgression may figure prominently in the embodiment of moral purity. If so, people should prefer purification of the “dirty” body part over purification of other body parts.

We tested this conjecture, which is compatible with the canon of embodiment (Barsalou, 2008; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005), by inducing participants to perform the same immoral act (conveying a malevolent lie) or moral act (conveying a benevolent message) with their mouths (by using voice mail) or their hands (by using e-mail). Their subsequent desire for mouthwash and for hand sanitizer served as the dependent variables. If the embodiment of moral purity is independent of motor modality, as previous research implicitly assumed, both cleaning products should be more attractive to people after they convey a malevolent message than after they convey a benevolent message; if the embodiment is sensitive to motor modality, however, mouthwash should be particularly desirable after lying in a voice mail, and hand sanitizer should be particularly desirable after lying in an e-mail. Note, however, that people not only avoid physical contact with morally tainted people and objects, but also seek physical contact with virtuous ones (Rozin & Nemeroff, 1990). Hence, they may not only attempt to remove the metaphorical residue of immoral acts, but also avoid removing the residue of virtuous acts. In this case, people would find mouthwash particularly unappealing after conveying a virtuous message in a voice mail and hand sanitizer particularly unappealing after conveying a virtuous message in an e-mail.

## Method

Eighty-seven undergraduates (34 male, 53 female) participated in our experiment for course credit and were randomly assigned to conditions in a 2 (modality: mouth vs. hands)  $\times$  2 (ethicality: unethical vs. ethical) between-subjects design. Told that they were taking part in a personality study, participants enacted a scenario modeled after one used by Zhong and Liljenquist (2006). Each person imagined being a law-firm associate competing for promotion with a colleague, Chris, and finding an important document that Chris had lost. Returning the document would help Chris’s career and hurt the participant’s own career. The participant was instructed to leave Chris a voice mail (mouth) or type Chris an e-mail (hands) telling him “who you are” and explaining that “you *could not find* his document” (unethical) or that “you *found* his document” (ethical). The participant actually delivered the message, allegedly to provide verbal material for personality analysis.

Next, participants rated the desirability of several products (1 = *completely undesirable*, 7 = *completely desirable*) as part of an ostensible marketing survey and reported how much they were willing to pay (WTP) for each one (“\$ \_\_\_”). The products included mouthwash and hand sanitizer. The participants were then given a funnel debriefing. None of them indicated any suspicion about the experiment’s true purpose.

## Results

Desirability and log-transformed WTP data were standardized and submitted to a 2 (ethicality: ethical, unethical)  $\times$  2 (modality: hands, mouth)  $\times$  2 (product: hand sanitizer, mouthwash)  $\times$  2 (measure: desirability, WTP) mixed analysis of variance

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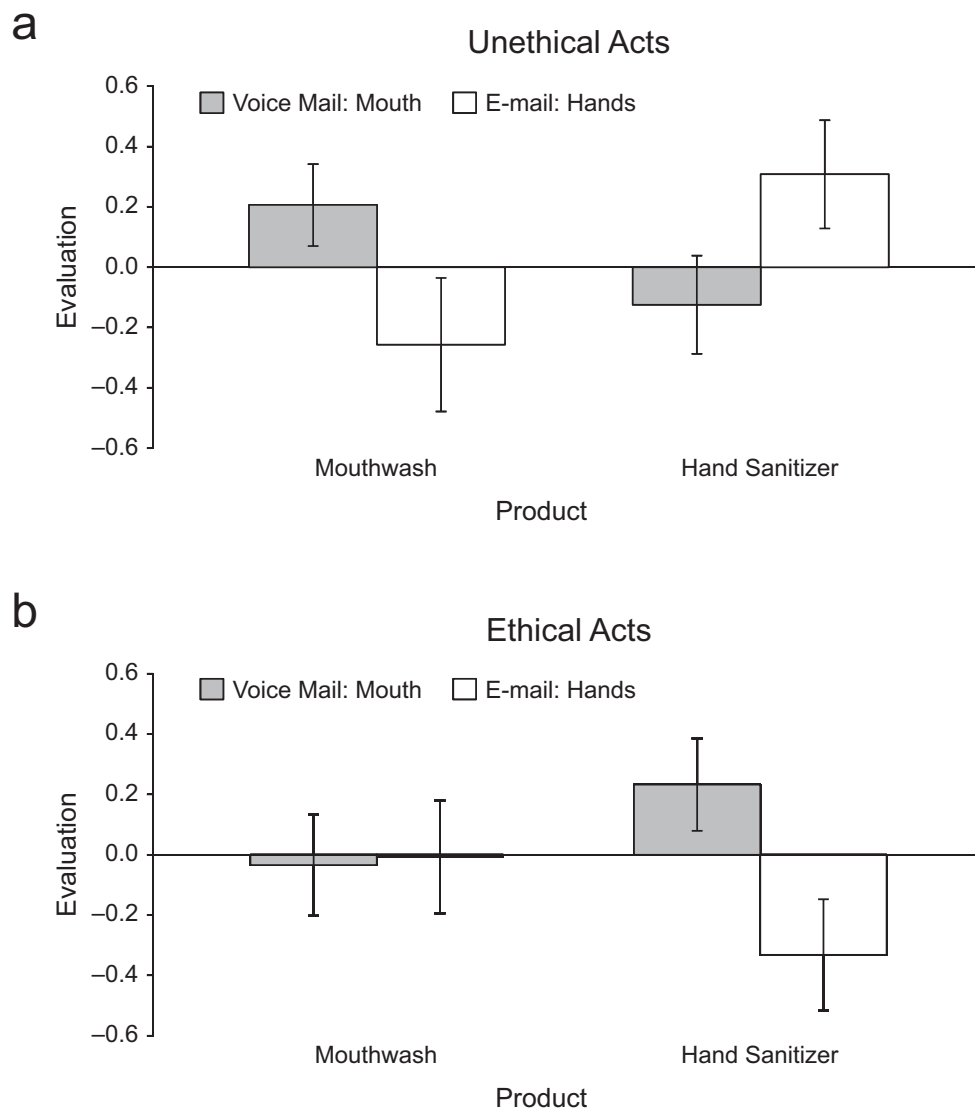
(ANOVA), with the last two factors being within subjects. An Ethicality  $\times$  Modality  $\times$  Product interaction,  $F(1, 81) = 10.29$ ,  $p = .002$ , indicated a significant role of motor modality, which was not moderated by measure ( $F < 1$  for the four-way interaction). The two measures were averaged, with higher scores indicating higher desirability and WTP.

As shown in Figure 1a, participants evaluated mouthwash more positively after lying in a voice mail ( $M = 0.21$ ,  $SD = 0.72$ ) than after lying in an e-mail ( $M = -0.26$ ,  $SD = 0.94$ ),  $F(1, 81) = 2.93$ ,  $p = .03$  (one-tailed),  $d = 0.55$  (simple main effect), but evaluated hand sanitizer more positively after lying in an e-mail ( $M = 0.31$ ,  $SD = 0.76$ ) than after lying in a voice mail ( $M = -0.12$ ,  $SD = 0.86$ ),  $F(1, 81) = 3.25$ ,  $p = .04$  (one-tailed),  $d = 0.53$  (simple main effect). The Modality  $\times$  Product simple interaction was significant under unethical conditions,  $F(1, 81) = 7.45$ ,  $p = .008$ .

In contrast, participants evaluated hand sanitizer less positively after telling the truth in an e-mail ( $M = -0.33$ ,  $SD = 0.82$ ) than after telling the truth in a voice mail ( $M = 0.23$ ,  $SD = 0.70$ ),  $F(1, 81) = 5.02$ ,  $p = .03$ ,  $d = 0.74$  (simple main effect). However, modality did not affect their evaluation of mouthwash,  $F < 1$  (Fig. 1b). The Modality  $\times$  Product simple interaction was marginally significant under ethical conditions,  $F(1, 81) = 3.29$ ,  $p = .07$ .

## Discussion

These findings indicate that the embodiment of moral purity is specific to the motor modality involved in a moral transgression, making purification of the “dirty” body part more desirable than purification of other body parts. Consistent with this observation, reanalysis of earlier findings shows that copying



**Fig. 1.** Participants' mean evaluation of mouthwash and hand sanitizer as a function of the motor modality (mouth or hands) of (a) unethical acts and (b) ethical acts. Error bars represent standard errors of the mean.

(rather than enacting) a story about immoral others increases the desire to clean the external world (as reflected in evaluations of detergent and disinfectant,  $d_s = 1.15$  and  $0.75$ ) more than the desire to clean one's own body (as reflected in evaluations of soap,  $d = 0.37$ ; Zhong & Liljenquist, 2006, Study 2). Moreover, hand washing influences judgments of others' transgressions more when the transgressions involve solely the hands ( $d_s = 0.61$ – $0.81$ ) rather than additional body parts ( $d_s = 0.28$ – $0.45$ ; Schnall et al., 2008). In addition, our findings indicate that the embodiment of moral purity extends to virtuous acts: Having typed a virtuous e-mail made hand sanitizer unappealing, a result suggesting that people may avoid rinsing away residues of virtue (Bloom, 2009; Rozin & Nemeroff, 1990); however, parallel effects were not observed for mouthwash. In natural parlance, metaphorical references to "clean hands" seem more common and natural than metaphorical references to a "clean mouth," raising the possibility that accessibility of an applicable metaphor is a crucial ingredient for the observed effects (Chandler & Schwarz, 2009).

Going beyond moral purity, numerous studies have demonstrated the pervasive effects of embodied metaphors in the social domain (for reviews, see Landau, Meier, & Keefer, in press; Williams, Huang, & Bargh, 2009). The present findings suggest that such effects should be more pronounced when the motor modality of the metaphor-priming task matches the motor modality of the downstream judgment and behavior.

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The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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