

**Wiping the Slate Clean:  
Psychological Consequences of Physical Cleansing**

Spike W. S. Lee Norbert Schwarz

University of Michigan

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We thank the Center for Advanced Study in the Behavioral Sciences and the R. C. Lee Charitable Foundation for support. Address correspondence to Spike W. S. Lee ([spikelee@umich.edu](mailto:spikelee@umich.edu)) or Norbert Schwarz ([norbert.schwarz@umich.edu](mailto:norbert.schwarz@umich.edu)), Department of Psychology, University of Michigan, 530 Church Street, 3/F East Hall, Ann Arbor, MI 48109-1043.

**ABSTRACT.** *Cleaning one's hands removes more than physical contaminants; it also removes residues of the past, from the guilt of past transgressions to doubts about past decisions. We review recent evidence for these and other clean slate effects from the perspectives of neural re-use, grounded cognition, and conceptual metaphor, discuss their implications, and suggest promising future directions.*

As you use water and soap to remove dirt and contaminants, may you also be removing psychological residues of your past? A growing body of research suggests so. For example, after people cleanse themselves, they feel less guilty about their past moral transgressions, less conflicted about recent decisions, and are less influenced by recent streaks of good or bad luck. We review select findings and theoretical accounts and discuss their implications.

### **PHYSICAL AND MORAL CLEANLINESS**

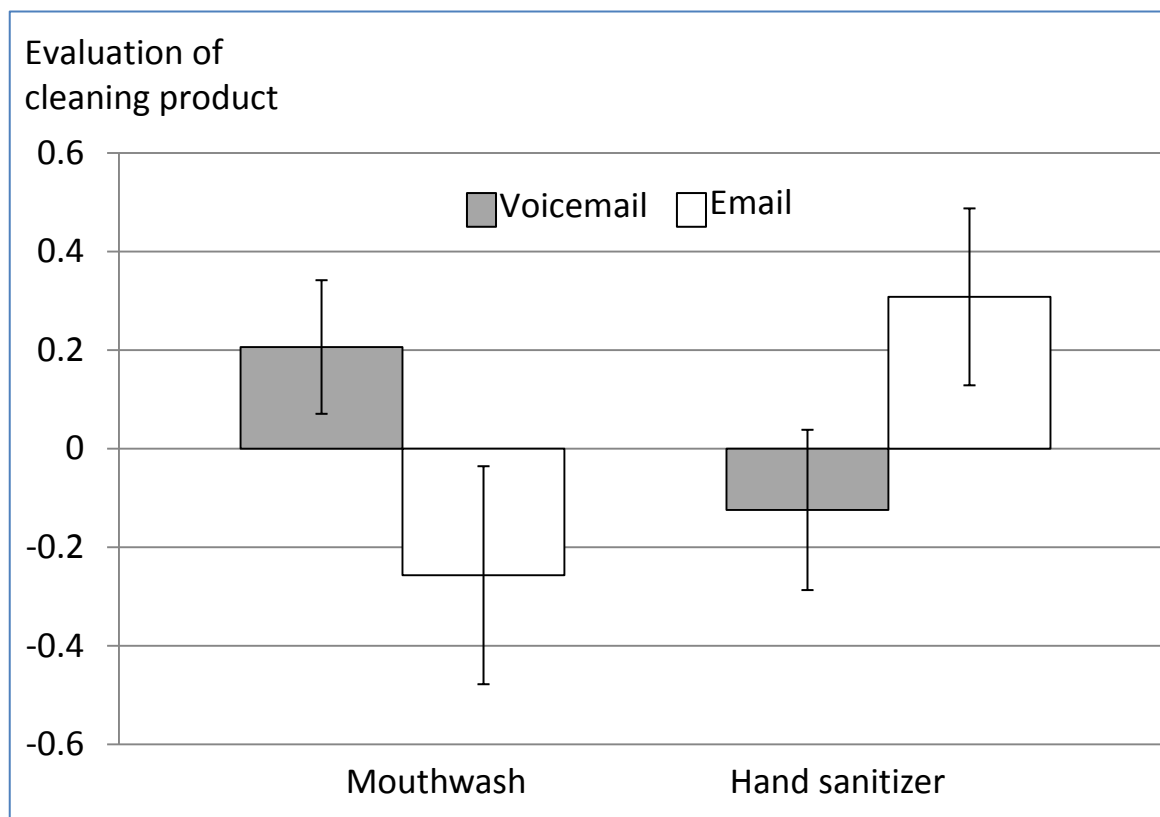
People respond to moral transgressions with disgust, an emotion otherwise associated with exposure to physical contaminants, from open wounds to spoiled food (e.g., Curtis, Aunger, & Rabie, 2004). The parallels in response include similar facial expressions (oral-nasal rejection), overlapping neural network activities and subjective feelings (Borg, Lieberman, & Kiehl, 2008; Chapman, Kim, Susskind, & Anderson, 2009; Lee & Ellsworth, in press; Rozin, Haidt, & McCauley, 2008). The physical-moral association is also evident in language use, from the Psalm's (24:4) notion of "clean hands and a pure heart" to everyday references to "dirty hands" or a "dirty mouth". These parallels are compatible with two related perspectives. On the one hand, responses to moral transgressions may be scaffolded on physical disgust, an earlier adaptation that keeps us away from physical contaminants and prompts their removal in case of contact. This is consistent with re-use models of embodied cognition (Anderson, 2010), which emphasize that evolution builds new functions on existing mechanisms. On the other hand, human reasoning about abstract domains, including morality, is assumed to be grounded in concrete domains with which we have direct sensory experience (Barsalou, 2008). From this perspective,

conceptual metaphors guide inferences by linking abstract and concrete domains (Lakoff & Johnson, 1980; Landau, Meier, & Keefe, 2010), here by grounding moral reasoning in the experience of physical purity and contamination. These perspectives are not mutually exclusive. For example, the parallels between physical and moral disgust may have given rise to the conceptual metaphor that links physical and moral purity. Once developed, the metaphor may influence reasoning independent of the concurrent experience of disgust.

### **Moral Transgressions Are Dirty and Elicit the Desire to Cleanse**

Both perspectives suggest that we think about morality in terms of cleanliness. If so, thinking about one domain should make information about the other domain more accessible. Empirically, this is the case. Zhong and Liljenquist (2006, Study 1) asked participants to recall either a moral or immoral past behavior. As expected, participants who recalled an immoral act were subsequently more likely to complete word fragments (e.g., *W\_\_H*, *S\_\_P*) with cleansing-related words (*WASH*, *SOAP*). Conversely, Schnall, Haidt, Clore, and Jordan (2008) found that exposure to physical dirtiness influenced perceivers' moral evaluations. Some participants judged the severity of others' moral transgressions while sitting in a clean room, whereas others were exposed to an unkempt room (Study 2), a stinky smell ("fart spray"; Study 1), or a video featuring a dirty toilet (Study 4). As expected, the latter participants expressed stronger moral condemnation than the former. These studies highlight the bidirectional relationship between physical and moral cleanliness. This relationship has motivational and behavioral consequences. If recalling one's own moral transgressions leaves one with a "dirty" feeling, it should also elicit the desire to cleanse. Indeed, Zhong and Liljenquist (2006, Study 3) found that participants who had to recall an immoral behavior were more likely to choose an antiseptic wipe over a pencil as a free gift (Study 3), indicative of a desire to cleanse. The nature of physical disgust further suggests that this desire should be specific to the contaminated body part: If you step into feces, rinsing your mouth does not help. The same specificity is apparent in the moral domain, where everyday

parlance refers to a “dirty mouth” and “dirty hands.” To test this implication, Lee and Schwarz (2010a) had participants complete a role-playing task in which they conveyed a malevolent lie by voicemail (using their mouth) or email (using their hands). Then participants evaluated several consumer products, including mouthwash and hand-sanitizer. As expected, participants who had to lie with their mouth preferred mouthwash over hand-sanitizer, whereas those who had to type the same lie with their hands preferred hand-sanitizer over mouthwash. Participants were also willing to pay more for the product that cleansed their “dirty” body part (Figure 1).



*Figure 1.* Evaluation of mouthwash and hand sanitizer after conveying a malevolent lie by voicemail or by email (Lee & Schwarz, 2010a). Evaluation of each cleaning product is the average of standardized desirability rating and standardized amount of money a participant is willing to pay for it. Error bars represent standard errors of the mean.

Converging evidence comes from reanalyses of other studies (Lee & Schwarz, 2010a). For example, Zhong and Liljenquist (2006, Study 2) had participants copy a story about another person's moral or immoral behavior before they rated the desirability of consumer products. While copying an immoral story increased participants' desires for cleaning products in general, the effect was primarily driven by products that cleanse the external world (e.g., detergent, disinfectant), as would be expected when the moral contamination came from *someone else's* rather than one's own transgressions.

These findings highlight the parallels between physical and moral contamination. Just as people want to clean the body part that touched a physical contaminant, people want to clean the body part involved in a moral transgression. This specificity of cleansing is functional in the physical domain, where removing the disgusting substances from the contaminated body part reduces the risk of disease (Curtis et al., 2004). Its spill-over to the moral domain, as observed in the above studies, presumably reflects that the regulation of moral behavior is built upon earlier mechanisms that evolved to handle physical contamination.

### **Consequences of Cleansing**

Does the desire to cleanse achieve its presumed psychological goal? Several studies suggest so. Most importantly, washing one's hands can attenuate the psychological consequences of one's past transgressions. Zhong and Liljenquist (2006, Study 4) had participants recall an immoral behavior of their own. Following the recall task, some participants were given an antiseptic wipe to use, as part of the hygiene protocol for using public computers; other participants did not receive a wipe. Without wiping their hands, participants felt guilty about their past transgressions and made amends by volunteering for another project, replicating the common observation that guilt motivates prosocial behavior. In contrast, those who wiped their hands felt less guilty and were less inclined to do good by volunteering, suggesting that physical cleansing was sufficient to restore their moral cleanliness and to alleviate the need to make amends. In related work, Schnall, Benton, and Harvey (2008, Study 2) found that

participants who had just watched a disgusting movie judged others' transgressions more harshly, unless they washed their hands before making the judgments. In both studies, cleansing presumably attenuated disgust and hence resulted in less condemnation (Schnall, Benton, et al., 2008), less guilt, and less compensatory helping behavior (Zhong & Liljenquist, 2006).

Suppose, however, that a person feels very "clean" herself when she witnesses another's immoral act. Would her physical cleanliness translate into a sense of moral superiority that renders others' immoral acts particularly aversive and despicable? Experiments by Zhong, Strejcek, and Sivanathan (2010) suggest so. Their participants did or did not clean their hands with an antiseptic wipe (Study 1), or imagined themselves either as clean and fresh or as dirty and stinky (Studies 2 and 3), before they judged the wrongness of moral issues. As expected, "clean" participants made harsher moral judgments on a wide range of issues, from abortion to drug use and masturbation. They also rated their own moral character more favorably in comparison with their fellow students.

These findings indicate that the psychological impact of cleanliness/dirtiness is context-sensitive. When we experience disgust-related feelings and thoughts as a response to the behavior under evaluation, removing dirty residues makes the behavior less bad and we evaluate it less harshly (e.g., Schnall, Benton, et al., 2008; Zhong & Liljenquist, 2006). But when we bring the experience to bear on our own moral standing, feeling clean licenses more self-righteous condemnation of others' dirty behaviors (Zhong et al., 2010). These diverging effects are consistent with the malleable nature of inferences from other phenomenal experiences (Schwarz, in press).

### **BEYOND MORALITY: CLEAN SLATE EFFECTS**

Are guilt and moral concerns the only things we can wash away? Songs and lyrics suggest otherwise. From "I'm gonna wash that man right outta my hair" to "wash away my troubles, wash away my pain", people's hopes about what can be "washed away" seem to extend beyond the contamination concerns associated with disgust and beyond the conceptual metaphor of moral cleanliness. Note that

at the heart of this conceptual metaphor is the notion of purity (Lakoff & Johnson, 1980), and things are purest when they start afresh, with a “clean slate” that is not contaminated by past residues. Thus, the meaning of clean may have extended to other domains through conceptual generalization, from the removal of past *moral* concerns to the removal of past concerns *in general*. This raises the possibility that physical cleansing can attenuate the impact of past behaviors and experiences in domains that are unrelated to morality.

### **Washing Away Postdecisional Dissonance**

In a first test of this possibility, Lee and Schwarz (2010b) observed that washing one’s hands can eliminate the classic post-decisional dissonance effect. Using a standard free choice paradigm (Brehm, 1956), participants rated the attractiveness of several CDs and then chose one of two moderately attractive ones as a gift to take home. Next, they participated in an alleged product test; some participants merely examined a bottle of hand-soap, whereas others tested the soap by washing their hands. When asked to provide a final evaluation of the CDs, participants who had merely examined the soap showed the standard post-decisional dissonance effect: their preference for the chosen CD over the rejected CD was stronger after they made their choice than before. However, this classic effect was not observed for participants who had washed their hands after making a choice (Figure 2). A second study, in which participants chose between two fruit jams and tested an antiseptic wipe, replicated this pattern: participants who had merely examined the wipe expected the chosen fruit jam to taste much better than the rejected one, but participants who had wiped their hands did not. In both studies, simply cleaning one’s hands eliminated the need to justify one’s choice by increasing the perceived attractiveness of the chosen over the rejected alternative.

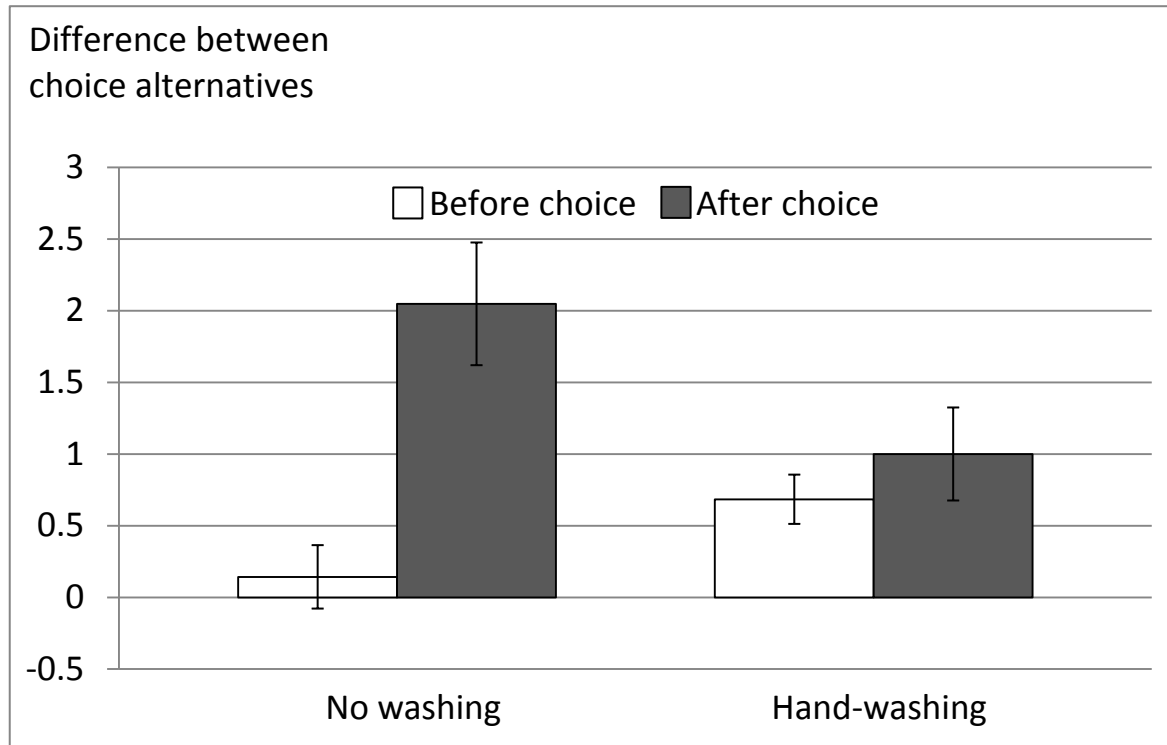


Figure 2. Post-decisional dissonance after washing or not washing hands (Lee & Schwarz, 2010b, Study 1). Each bar represents the rank difference between the chosen and rejected alternatives, with higher values indicating higher preferences for the chosen alternative. Error bars represent standard errors of the mean.

### Washing Away One's Luck

Many anecdotes suggest that athletes with a winning streak avoid washing their “lucky” socks, whereas those with a losing streak change outfits, take a shower, and so forth (Bleak & Frederick, 1998). Experimental evidence shows that luck is indeed something that lingers and can be washed away (Xu, Zwick, & Schwarz, 2011). Following a winning or losing streak in an experimental gamble, participants completed a soap test. Among participants who merely examined the soap, those who had been on a winning streak bet more money in a subsequent round of gambling than those who had been on a losing streak. This influence of good and bad luck was eliminated for participants who tested the soap by



washing their hands (Study 2). Replicating this pattern, participants who were asked to recall a lucky financial decision took more risk in a subsequent hypothetical management decision than participants who were asked to recall an unlucky financial decision (Study 1). In both studies, the influence of one's good or bad luck in the past was effectively removed by cleaning one's hands.

### **Implications**

These findings show that the psychological impact of cleansing goes beyond the conceptual metaphor of moral cleanliness (Lakoff & Johnson, 1980). The metaphoric notion of washing away one's sins seems to have generalized to a broader conceptualization of wiping the slate clean (Lee & Schwarz, 2010b). This allows people to remove unwanted residues of the past, from threats to a moral self-view (Zhong & Liljenquist, 2006) to doubts about recent decisions (Lee & Schwarz, 2010b) and worries about bad luck (Xu et al., 2011). Note, however, that these "clean slate" effects are not limited to residues that people want to remove. Positive residues that people would rather keep, such as good luck, are also removed in the act of cleansing (Xu et al., 2011), which may be why people avoid cleaning behaviors after lucky streaks (Bleaks & Frederik, 1998) and find cleaning products unappealing after virtuous acts (Lee & Schwarz, 2010a). Hence, the psychological effects of physical cleansing are not limited to conditions where they benefit one's motivated reasoning.

In sum, physical cleansing removes not only physical contaminants, but also moral taints and mental residues. The psychological impact of physical cleansing may result from the neural re-use (Anderson, 2010) of evolutionarily older disgust responses to health-threatening contaminants in the regulation, avoidance, and rejection of acts and actors that threaten the moral order. Others assume that it results from the grounding of abstract moral reasoning in concrete experience with physical cleanliness, as reflected in numerous metaphoric expressions (Lakoff & Johnson, 1980; Landau, Meier, & Keefe, 2010). These accounts are not mutually exclusive and the conceptual metaphor of moral purity may itself reflect the consequences of neural reuse. Nevertheless, these perspectives highlight different

mediating processes. On the one hand, physical cleansing may attenuate disgust and thus reduce the impact of negative affect on the dependent variables; on the other hand, physical cleansing may make salient the concrete experience of removing contaminants and activate abstract thought about removing residues of past acts. Future research may fruitfully address these different pathways.

Once conceptual metaphors are established, their assumptions may generalize beyond their original domain. Thus, the notion of washing away one's sins, entailed in the moral purity metaphor, seems to have generalized to a broader conceptualization of "wiping the slate clean", allowing people to metaphorically remove a potentially broad range of psychological residues. Understanding the dynamics of such generalizations, and their limits, is a promising avenue for future research.

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