

The Smell of Virtue: Clean Scents Promote Reciprocity and Charity

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*“The smell and taste of things remain poised a long time...and bear unfaltering, in the tiny and almost impalpable drop of their essence, the vast structure of recollection.”* (Proust, 1928, p. 65)

As Proust’s words so eloquently express, a familiar smell can transport us to an exact time and place in our past. Indeed, psychologists have found that scents can dutifully retrieve images and feelings from the deepest recesses of the mind (Chu & Downes, 2000; Doop, Mohr, Folley, Brewer, & Park, 2006). Not only do smells activate memories, they can also influence judgment (Schnall, Haidt, Clore, & Jordan, 2008) and even regulate behavior. For example, Holland, Hendriks, and Aarts (2005) found that exposure to citrus cleaning scents enhanced the mental accessibility of cleaning-related constructs and led participants to maintain a cleaner environment while eating.

Based on the symbolic association between physical and moral purity, we introduce a provocative possibility: clean smells might not only regulate physical cleanliness, but may also motivate virtuous behavior. Indeed, moral transgressions can engender literal feelings of dirtiness (Zhong & Liljenquist, 2006). Just as many symbolic associations are reciprocally related (Lakoff, 1987), such as coldness and loneliness (Zhong & Leonardelli, 2008) or darkness and depravity (Frank & Gilovich, 1988), morality and cleanliness may also be reciprocally linked. In the current research, we investigate whether clean scents can transcend the domain of physical cleanliness and promote virtuous behavior.

### Experiment 1: Promoting Reciprocity

Experiment 1 tested the impact of clean scents on reciprocating trust. We chose this behavior because Aristotle advocated justice in exchange as a primary “moral virtue” (Aristotle,

c330BC/1999) and because studies have indentified traits like fairness and generosity as central to moral identity (Aquino & Reed, 2002).

Twenty-eight participants (12 female) were individually assigned to either a *clean-scented* room or a *baseline* room. The only difference between the two rooms was a spray of citrus-scented Windex in the clean-scented room.

In both conditions, participants engaged in a one-shot anonymous trust game (Berg, Dickaut, & McCabe, 1995) involving two parties: a sender and receiver. In a typical trust game, the sender is given money that he can choose to keep or "invest" with an anonymous receiver. Any money sent is tripled, and the receiver then decides how to split the tripled money. For example, if the sender passes all of the money and the receiver reciprocates this trust by returning half of the tripled amount, both would be better off. However, sending money can be risky if the receiver chooses to exploit the sender and keep all the invested money (Camerer, 2003).

All the participants in the current experiment were told they had been randomly assigned to play the role of the *receiver* and that their ostensible counterpart had decided to send them the full amount (\$4) which was now tripled to \$12. They had to decide how much money to keep or return to the sender. Participants could exploit their counterpart by keeping all the money or they could honor the trust by returning some portion to the other party.

As predicted, participants in the clean-scented rooms returned significantly more money than those in the baseline condition,  $t(26) = 2.64$ ,  $p = .01$ ,  $d = 1.03$  (see Table 1). The clean-scented room led participants to resist exploitation and reciprocate the trusting behavior of the sender.

## Experiment 2: Promoting Charity

Experiment 2 was designed to replicate the conceptual pattern of Experiment 1 by exploring whether clean scents would motivate another aspect of moral virtue: charity (Aristotle, c330BC/1999; Machan, 1998). Ninety-nine undergraduate students (50 female) were individually assigned to either a *clean-scented* room (sprayed with Windex) or a *baseline no-scent* room and asked to work on a packet of unrelated tasks. Included in the packet was a flier requesting volunteers for a charity, Habitat for Humanity. Participants indicated their interest level in volunteering for future Habitat efforts (1-7 scale), specified the activities they would like to assist with, and selected whether they wanted to donate funds to the cause (yes/no). To rule out mood as a driver of the effects of clean scents, participants completed a shortened version of the PANAS (Watson, Clark & Tellegen, 1988).

As predicted, participants in the clean-scented environment expressed greater interest in volunteering than control participants,  $t(97) = 2.33, p = .02, d = .47$ . Additionally, a greater proportion of participants in the clean-scented rooms indicated a willingness to donate money,  $\chi^2(1, N = 99) = 4.78, p = .03$  (see Table 1). Room scent had no impact on positive nor negative affect ( $p$ 's  $> .20$ ), and when controlling for affect, room scent continued to have a significant effect on volunteerism and donation rate ( $p$ 's  $< .05$ ). Because our charity measures captured intentions, future research should measure behavior directly.

## Discussion

Two experiments demonstrated that clean scents not only motivate clean behavior, but also promote virtuous behavior by increasing the tendency to reciprocate trust and to offer charitable help. Capitalizing on the fact that abstract concepts are often symbolically derived from the concrete environment (Emerson, 1836), our results suggest that olfactory cues can

trigger virtuous behaviors that are related to cleanliness at only a symbolic level. The link from cleanliness to virtuous behavior appears to be a nonconscious one: in neither experiment did participants recognize an influence of scent on their behavior, and in Experiment 2, perceived cleanliness did not differ by condition nor correlate with the effects.

These findings carry important implications for environmental regulation of behavior. Evidence abounds of how people lose their moral footing, how saints become sinners. However, there is much less understanding of what can lead sinners toward the path of virtue. By demonstrating that the association between morality and cleanliness is bidirectional, the current research identifies an unobtrusive way – a clean scent – to curb exploitation and promote altruism.

Beyond olfactory cues, there is the possibility that visual cleanliness can also influence morality (Liljenquist, Zhong, & Galinsky, 2008), which is consistent with the “broken windows” theory of crime that argues damage and disrepair in the environment promote lawless behavior. The current findings suggest there is some truth to the claim that cleanliness is next to godliness; clean scents summon virtue, helping reciprocity prevail over greed, and charity over apathy.

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Table 1. Reciprocation of trusting behavior in Experiment 1. Volunteerism and donation rate in Experiment 2. Standard deviations are in parentheses.

	<b>Experiment 1</b>	<b>Experiment 2</b>	
	Money Returned	Volunteering Interest	Willingness to Donate
<b>Clean Scent</b>	\$5.33 (2.01)	4.21 (1.86)	22%
<b>Baseline (No Scent)</b>	\$2.81 (2.81)	3.29 (2.04)	6%