

Detaching the Ties of Ownership:

The Effects of Hand Washing on the Exchange of Endowed Products

Arnd Florack, Janet Kleber, Romy Busch, and David Stöhr

University of Vienna, Austria

JOURNAL OF CONSUMER PSYCHOLOGY (in press)

Author Note

Arnd Florack, Department of Psychology, University of Vienna, Austria; Janet Kleber, Department of Psychology, University of Vienna, Austria; Romy Busch, Department of Psychology, University of Vienna, Austria; David Stöhr, Department of Psychology, University of Vienna, Austria.

Correspondence concerning this article should be addressed to Arnd Florack, Department of Psychology, University of Vienna, Universitaetsstrasse 7, 1010 Vienna, Austria. E-Mail: arnd.florack@univie.ac.at

Abstract

Recent studies have demonstrated that the ownership of a product leads to a biased perception of its aspects. Based on research on embodied cognition, we argue that the physical action of hand washing can reset the cognitive system to a more neutral state by reducing the asymmetrical perception of owned and not owned products. In three studies, we examined the effects of hand washing on the endowment effect by asking owners of a product to exchange it for a similar one. As expected, in Experiment 1, we showed that hand washing doubled the percentage of participants who exchanged an owned product for an alternative product. In Experiment 2, we replicated this finding and showed that only the action of hand washing and not a prime of physical cleaning elicited this effect. In Experiment 3, we again replicated the hand washing effect on exchange rates and examined the effect of hand washing on product evaluations. The results of all experiments suggest that hand washing reduces decision preferences that are biased by ownership.

Keywords: ownership, endowment effect, embodiment, hand washing

Imagine you buy a new car and you are touching the steering wheel for the first time. It is often at this moment that you feel that this is your car. Indeed, research in consumer psychology has shown that physical actions like touching (Peck & Shu, 2009) affect perceived ownership and lead to a more positive evaluation of products. However, an open question is whether physical actions can also detach such ties of ownership. The present paper examines this question by applying a product-exchange paradigm used in research on the endowment effect.

Endowment Effect

Research on the endowment effect demonstrated that evaluations of an object depend, in part, on its ownership (Kahneman, Knetsch, & Thaler, 1990, 1991; Knetsch & Sinden, 1984; Thaler, 1980). Usually owners evaluate their objects more positively, focus on what they would lose by giving their objects away, and refrain from trading them in market transactions. This difference between owners (i.e., sellers) and non-owners (i.e., buyers) appears to be a robust finding (for an overview see Horowitz & McConnell, 2002; Sayman & Öncüler, 2005).

One explanation of the endowment effect is loss aversion (Thaler, 1980). Giving an object away creates a loss while receiving the same product creates a gain, but the loss is weighted more than the objectively commensurate gain (Kahneman et al., 1990). In addition, recent findings highlighted that ownership leads to an asymmetric focus on the positive aspects of the owned and the negative aspects of the alternative objects (Carmon & Ariely, 2000; Johnson, Häubl, & Keinan, 2007; Kleber, Dickert, & Betsch, 2013; Weber et al., 2007). However, recent research also suggests that embodied aspects of ownership affect the evaluation of objects. Touching an object, for instance, enhances feelings of ownership and increases positive evaluations of the object (Peck & Shu, 2009). Similarly, the execution of movements associated with acquisition leads to more positive evaluations of objects (e.g.,

Cacioppo, Priester, & Berntson, 1993; Förster, 2004). Based on this research, we suppose that physical actions can contribute to effects of ownership. However, research that has directly examined physical actions that are able to decrease the effects of ownership is rare. In the present studies, we therefore examined hand washing as a physical action that we hypothesized to reduce the loss aversion associated with ownership.

Hand Washing as Embodied Cognition

For several hundreds or even thousands of years, individuals have regularly applied hand washing to clean their hands from dirt and contamination. It refers to physical cleansing, but it is also an element of religious rituals to wash away one's sins in a metaphorical way and also has effects on experiences and evaluations. For instance, it was found that physical cleansing reduces the importance of morality and that hand washing can even weaken the motivation to compensate for unethical behavior (Schnall, Benton, & Harvey, 2008; Zhong & Liljenquist, 2006; Zhong, Strejcek, & Sivanathan, 2010).

The effects of hand washing, however, go beyond morality issues (De Los Reyes, Aldao, Kundey, Lee, & Molina, 2012; Kaspar, 2013; Lee & Schwarz, 2011). Recent research has found, for instance, that hand washing can influence the effects of decisions on subsequent justifications and evaluations (Lee & Schwarz, 2010), the effects of failure on optimism and performance (Kaspar, 2013), and the effects of good and bad luck on risk behavior (Xu, Zwick, & Schwarz, 2012). For instance, whereas individuals usually chose riskier options after they experienced good luck than after they experienced bad luck, Xu and colleagues (2012) found that the impact of previous luck is reduced when individuals cleaned their hands before choosing between a risky and a less risky option. Hence, there is a lot of evidence for the assumption that, in general, hand washing as an act of physical cleaning wipes the slate clean by removing the metaphorical residue of the past (Lee & Schwarz, 2010, 2011).

Predictions and Overview of Studies

Since hand washing has been found to reduce the influence of prior behavior and states (Lee & Schwarz, 2011), we examined in three studies whether hand washing decreases the influence on temporal ownership on choice and makes it easier to exchange an owned product. In all studies, participants received or chose a product at the beginning of the experiment as compensation for their participation (e.g., a drink). Later the experimenter offered participants the opportunity to exchange the product for a similar one. We assessed the likelihood of exchanging the product when participants had washed their hands or not as a measure of the endowment effect. In Experiment 1, the basic effect of hand washing on ownership was observed. In Experiment 2, we tested whether the prime of cleaning would have the same effect as the physical action of hand washing. In Experiment 3, the effects of hand washing on possible mechanisms underlying the endowment effect were examined.

In our experiments, we distinguished between participants who received a product or chose a product to test whether hand washing effects are moderated by choosing vs. receiving. Choosing a product is an action producing a higher commitment to the choice alternative than just receiving a product (LoSciuto, & Perloff, 1967). Individuals who chose a product are likely to be motivated to appear as a consistent and smart decision maker (Festinger, 1957). To revert a choice would threaten this motivation. We therefore expected that, for participants who chose their product, hand washing is less likely to induce a wish of participants to switch their product than, for participants, who received their product. At first glance, this assumption might appear to be at odds with research demonstrating that even post-decisional dissonance could be reduced through hand washing (De Los Reyes et al., 2012; Lee & Schwarz, 2010). However, this previous research studied the effects of choice on evaluation, but not the actual reversal of choice.

Experiment 1

Method

Participants and design. One hundred thirty-seven students from vocational schools in Siegen, Germany ($M_{\text{age}} = 19.2$ years, $SD_{\text{age}} = 3.0$ years; 48.9% female) took part in this experiment. As compensation for their time, they received a soft drink (value: 1.36 Euro). In a between-subjects design, we varied whether participants received or chose a soft drink at the beginning of the experiment (receiver vs. chooser condition) and whether participants washed their hands afterwards or had their height measured by the experimenter instead (hand washing vs. control condition). In addition, in the receiving condition we varied the soft drink given to the participants (Brand A vs. Brand B).

Material. To examine the exchange behavior, two objects with equivalent price and similar popularity were needed. We ensured this equivalence with a pretest of two different pairs of soft drinks with varying flavors (i.e., Pair 1: black currant vs. lemon; Pair 2: black currant vs. apple). These pairs were rated in a shopping street by 167 passers-by who spontaneously decided which of the soft drinks they would prefer to drink (without testing it). The results of this pretest showed that there was no difference in preference among the soft drinks from the first pair, $\chi^2(1, N = 167) < 1, p = .588$ (probability of choosing: black currant flavor 48%, lemon flavor 52%); whereas for the second pair, the apple flavor (63%) was favored over the black currant flavor (37%), $\chi^2(1, N = 167) = 12.13, p < .001$. Therefore, we used the first pair of soft drinks: black currant flavor (Brand A) versus lemon flavor (Brand B).

Procedure. Each participant was tested individually in a room with a wash basin in a vocational school. When participants entered the room, the experimenter either gave them a soft drink (receiver condition) or asked them to choose between two soft drinks (chooser condition). Then, participants had to leave the soft drink on a table and follow the experimenter to the wash basin. In the hand washing condition, the experimenter asked participants to wash their hands in order to continue with the study. All participants complied with the request and washed their hands for approximately 40 seconds. In the control

condition, the experimenter measured the participant's height beside the wash basin. The measurement took about the same amount of time as the hand washing. After the experimental treatment consisting of hand washing or the height measurement, the experimenter offered participants a soft drink they could exchange for the soft drink that they received or chose before. If participants received or chose soft drink Brand A at the beginning, the experimenter offered soft drink Brand B, and vice versa. In an unnoticed moment, the experimenter made a note of whether participants gave up their soft drink to obtain the other one (i.e., exchanged the soft drink) or if they preferred to keep the one they had obtained earlier. Finally, participants filled out a questionnaire about demographic data, were thanked, and debriefed.

Results and Discussion

To test the hypothesis that participants in the receiving condition would be more likely to exchange the received soft drink after washing their hands than after the experimenter measured their height, we conducted a logistic regression analysis for the receivers with the experimental treatment (1 = hand washing, 0 = control condition) and the brand of soft drink received as independent variables and the exchange (0 = no exchange, 1 = exchange) as the dependent variable, $\chi^2(2, N = 105) = 10.98, p = .004$, Nagelkerke $R^2 = .135$. As predicted, there was a significant main effect of the experimental treatment (Table 1), Wald $z = 9.53, p = .002$, odds ratio = 0.264. In the hand washing condition, 52.8% of the participants exchanged the soft drink. In the height measuring condition, only 23.1% exchanged it. Hence, this study provides the first empirical evidence that the effect of ownership can be reduced through hand washing.

The main effect of the brand participants received from the experimenter did not reach statistical importance, Wald $z = 0.91, p = .340$, odds ratio = 0.667. Also, the effect of hand washing was independent of the brand participants received from the experimenter at the beginning of the study. The inclusion of the interaction between the experimental treatment

and the brand received did not improve the model, $\Delta\chi^2(1, N = 105) = 0.87, p = .352$. We also examined the exchange behavior of participants in the choosing condition. In this condition, no participant exchanged the product in either experimental treatment.

Experiment 2

Experiment 2 was conducted with two objectives. First, we wanted to replicate the results of Experiment 1 by using a different product type (i.e., chocolate bar). Second, a control group that was asked to evaluate a liquid soap was included to show whether it would be sufficient to prime the concept of cleaning to reduce the effect of ownership or whether hand washing was necessary. In line with previous research on the effect of physical cleaning (Lee & Schwarz, 2010), we expected that the physical action of hand washing would be needed to influence exchange behavior.

Method

Participants and design. One hundred fifty-six students from vocational schools in Siegen, Germany ($M_{\text{age}} = 19.3$ years, $SD_{\text{age}} = 3.7$ years; 53.2% female) participated in this experiment and received a bar of chocolate (value: 0.50 Euro) as compensation. We applied the same design as in Experiment 1, but changed the product type and the task in the control condition. Participants received or chose a chocolate bar at the beginning of the experiment (receiver vs. chooser condition) and afterwards either washed their hands or evaluated a liquid soap (hand washing vs. control condition). In addition, the chocolate bar that participants received was varied in the receiving condition.

Material. To select two equally likable products, we conducted a pretest with two different pairs of chocolate bars (i.e., Pair 1: yogurt strawberry bar of Brand A vs. nut chocolate bar of Brand B; Pair 2: nut chocolate of Brand C vs. nut chocolate of Brand D). One hundred fifty-eight individuals in a public place were asked which of the two chocolate bars they would prefer from each pair. Participants' preferences for chocolate bars from Pair 1 were not significantly different, $\chi^2(1, N = 158) < 1, p = .426$ (probability of choosing: yogurt

strawberry bar 47%, nut chocolate bar 53%), whereas for the second pair, the nut chocolate of Brand C (62%) was favored over the other nut chocolate of Brand D (38%), $\chi^2(1, N = 158) = 9.14, p < .001$. Hence, we used Pair 1 with the yogurt strawberry bar (Brand A) and the nut chocolate bar (Brand B).

Procedure. We conducted the experiment in the same rooms as Experiment 1. The procedure was identical to Experiment 1, but we made two changes: Chocolate bars were used as products instead of soft drinks, and the control group differed. In the control condition, the experimenter asked participants to evaluate a liquid soap on the wash basin without testing it.

Results and Discussion

To test the hypothesis, we computed a logistic regression with the experimental treatment and the chocolate bar received predicting the exchange rate, $\chi^2(2, N = 126) = 6.69, p = .035$, Nagelkerke $R^2 = .070$. In line with the results of Experiment 1, there was a significant effect of the experimental treatment, Wald $z = 6.41, p = .011$, odds ratio = 0.381. In the hand washing condition, 50.0% of the participants exchanged the chocolate bar. In the soap evaluation condition, only 27.6% exchanged the chocolate bar. Again, this effect was independent of the chocolate bar participants received from the experimenter, Wald $z = 0.01, p = .918$, odds ratio = 1.039. Also, the inclusion of interaction between the experimental treatment and the chocolate bar did not improve the model, $\Delta\chi^2(1, N = 126) = 0.79, p = .375$. In the choosing condition, no participant exchanged the product.

Experiment 2 demonstrated that the effect of ownership was not affected by the activation of cleanliness concepts. It seems that only the action of hand washing leads to a higher exchange rate of the object.

Experiment 3

As demonstrated in both of the previous studies, hand washing can reduce the endowment effect. In Experiment 3, we studied whether hand washing affects how

individuals evaluated the aspects of the offered products. Based on previous research on the endowment effect (Carmon & Ariely, 2000; Johnson et al., 2007), we expected that ownership would lead to a higher sensitivity to the positive aspects of the endowed object and negative aspects of the alternative product.

Method

Participants and design. Fifty students from the University of Vienna ($M_{\text{age}} = 23.5$ years, $SD_{\text{age}} = 5.1$ years; 60% female) were randomly assigned to the hand washing or the measurement condition. Two participants did not complete the entire questionnaire. They therefore were not included in the statistical analyses. Importantly, the inclusion or exclusion of the participants did not affect the observed effects. As an incentive for their participation, all participants received a soft drink (value: 1.36 Euro) and additionally we offered the chance to win a 20 Euro token for the university bookstore. In contrast to the previous studies, we did not vary the kind of product the participants received at the beginning of the experiment and we only studied the receiver condition.

Material. We conducted a pretest with students on the campus of the University of Vienna to examine two equally valued products for the Austrian population. We presented participants of the pretest different pairs of chocolate bars and soft drinks (i.e., Pair 1: soft drink with black currant flavor vs. cherry flavor ($n = 64$); Pair 2: soft drink with cherry flavor vs. lemon flavor ($n = 64$); Pair 3: waffles chocolate bar vs. nut chocolate bar ($n = 79$)). Only preferences for the soft drinks with cherry and lemon flavor were not significantly different, $\chi^2(1, N = 79) = 0.64, p = .423$ (probability of choosing lemon flavor 54% and probability of choosing cherry flavor 46%). Therefore, we used Pair 2 for Experiment 3.

Procedure. The instructions and procedure were identical to Experiment 1 with an additional questionnaire about the products at the end. In particular, participants evaluated the two different products by anticipating them as good choice (i.e., “The taste of the drink will be fantastic”, “I find the drink very good”), bad choice (i.e., “The drink is likely to be a bad

choice”, “The taste of the drink will be bad”), or acceptable choice (i.e., “The taste of this drink will be okay”, “The drink is likely to be okay”) on a 9-point scale ranging from 1 (*disagree*) to 9 (*agree*). The items of the three categories were averaged into three scales. The items on the bad choice constitute the negative aspects of the products, whereas the items of the good choice and the acceptable choice include the positive aspects. High values indicate positive ratings for all aspects of the products (endowed drink: good choice Cronbach’s $\alpha = .86$, acceptable choice Cronbach’s $\alpha = .65$, bad choice Cronbach’s $\alpha = .60$; alternative drink: good choice Cronbach’s $\alpha = .90$, acceptable choice Cronbach’s $\alpha = .95$, bad choice Cronbach’s $\alpha = .75$). Also, participants indicated their mood on two 9-point scales with the end points 1 (*sad/moody*) and 9 (*happy/cheerful*). The two mood items were averaged into a single scale (Cronbach’s $\alpha = .73$).

Results and Discussion

Preliminary analysis. An ANOVA indicated that the experimental treatment had no effect on mood, $F(1, 46) < 1$.

Exchange of the product. We tested the hypothesis of higher exchange rates after hand washing with a logistic regression analysis, $\chi^2(1, N = 48) = 4.893, p = .027$, Nagelkerke $R^2 = .136$. In line with the results of the previous experiments, there was a significant effect of the treatment, Wald $z = 4.45, p = .035$, odds ratio = 0.236. In the hand washing condition, 45.8% of the participants exchanged the soft drink. In the control condition, only 16.7% exchanged the soft drink.

Evaluation of the products. We examined whether the experimental treatment had an effect on the evaluation of the positive and negative aspects of the endowed and alternative product. We computed a MANOVA with the treatment as the independent factor and the type of the rated aspects (good choice, acceptable choice, and bad choice) as well as the product (endowed vs. alternative) as repeated measurement factors. The main effect of the experimental treatment was significant, $F(1, 46) = 4.79, p = .034, \eta^2_p = .094$. In the hand

washing condition, both products were evaluated more positively ($M = 6.27$, $SD = 1.27$) than in the control condition ($M = 5.52$, $SD = 1.18$). Except for a less relevant main effect of the type of the rated aspects, $F(2, 92) = 24.27$, $p < .001$, $\eta^2_p = .345$, no other effect reached significance, $F_s < 1.84$, $p_s > .182$.

Experiment 3 again shows that hand washing increases the likelihood of the exchange of a received product. Unexpectedly, we found that hand washing led to more positive evaluations of the aspects of both products, and not only for the alternative product. Although we did not expect more positive evaluations of both products, the results are compatible to the idea that hand washing reduces the focus on losses and to findings that individuals who are in general more sensitive for the presence and absence of positive information are more open for changes, and show reduced endowment effects compared to individuals who are more sensitive for the presence and absence of negative information (Lieberman, Idson, Camacho, & Higgins, 1999). Hence, a possible explanation for the present results is that hand washing similar to a promotion focus allows individuals to consider what they might gain from an exchange.

General Discussion

In three studies, we examined the effects of hand washing on the endowment effect by testing whether owners of a product are willing to exchange it for a similar one. We put forward that the physical action of hand washing resets the cognitive system to a more neutral state and reduces the postulated asymmetrical perception of owned and not owned products. The results of our experiments support our hypothesis. In Experiment 1, we showed that hand washing doubled the percentage of participants who exchanged an owned product for an alternative product. In Experiment 2, we replicated this finding and showed that only the action of hand washing and not a prime of physical cleaning elicited this effect. In Experiment 3, we provided a further replication for the effect and found a more positive evaluation of products after hand washing.

The finding that the endowment effect can be eliminated by hand washing extends previous research on embodiment. The extensive consequences of physical actions and especially hand washing were recently shown in various domains (Meier, Schnall, Schwarz, & Bargh, 2012). The present studies underline the range of the effects of physical cleaning reported by previous research by showing that even the robust endowment effect can be diminished by the action of hand washing.

We suppose that hand washing is a physical routine or a ritual that is strongly associated with closing a previous action and starting something new. The results of the present experiments support this notion. Furthermore, the results of Experiment 2 show that the observed effect of hand washing on the exchange of products does not result from the simple activation of the cleaning concept, but indeed needs the physical action of hand washing (Lee & Schwarz, 2010). This again shows the importance of the physical action of hand washing, which is likely to be associated more strongly with openness for change than the concept of cleaning alone.

Interestingly, we found that participants who chose a product did not exchange it, also not after hand washing. We expected this reluctance to change the chosen product, because changing would be a threat to the motivation to be consistent. It is reasonable to assume, however, that hand washing is more likely to lead to exchange in individuals who chose a product when a reason for the exchange can be more easily constructed than in the paradigms applied for the present studies (cf. Cohen & Goldberg, 1970).

Although more direct process evidence would be welcome, the results suggest that hand washing might lead to a state in which the choice between the endowed and the alternative products is perceived as a situation, in which individuals could gain or not gain something (cf. Florack, Keller, & Palcu, 2013), whereas usually the choice between the endowed product and the alternative product represents a state for the individual, in which she or he can lose or not lose something (Carmon & Ariely, 2000). In this way, hand washing

might set the perception of the choice situation back to a choice between two products without a prior history of possession and without the associated loss aversion.

Future research might study whether hand washing indeed primes the described focus while also taking an alternative measurement for the strength of the endowment effect into account like the price difference between willingness to pay (for non-owners) and the willingness to accept (for owners). In our experiments, we used the traditional approach by asking for the willingness to exchange a product (e.g., Brenner, Rottenstreich, Sood, & Bilgin, 2007; Carmon & Ariely, 2000), however, if the alternative product increases in strategic importance after hand washing the measured value of this product should increase, as well. The comparability of these measurement methods of the endowment effect was recently demonstrated (Shu & Peck, 2011).

Conclusion

Hand washing is a daily routine that individuals conduct after they have finished a task to start a new one. In the present paper, we argued that such a routine can reset the mind to be open to something new and to detach the ties to the old. The present studies are in line with this reasoning and provide evidence that even such a robust finding like the endowment effect can be diminished with the simple action of hand washing.

References

- Brenner, L., Rottenstreich, Y., Sood, S., & Bilgin, B. (2007). On the psychology of loss aversion: Possession, valence, and reversals of the endowment effect. *Journal of Consumer Research, 34*, 369-376.
- Cacioppo, J. T., Priester, J. R., & Berntson, G. G. (1993). Rudimentary determinants of attitudes. II: Arm flexion and extension have differential effects on attitudes. *Journal of Personality and Social Psychology, 65*, 5-17.
- Carmon, Z., & Ariely, D. (2000). Focusing on the forgone: How value can appear so different to buyers and sellers. *Journal of Consumer Research, 27*, 360-370.
- Cohen, J. B., & Goldberg, M. E. (1970). The dissonance model in post-decision product evaluation. *Journal of Marketing Research, 7*, 315-321.
- De Los Reyes, A., Aldao, A., Kundey, S., Lee, B. G., & Molina, S. (2012). Compromised decision making and the effects of manipulating physical states on human judgments. *Journal of Clinical Psychology, 68*, 1-7.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Florack, A., Keller, J., & Palcu, J. (2013). Regulatory focus in economic contexts. *Journal of Economic Psychology, 38*, 127-137.
- Förster, J. (2004). How body feedback influences consumers' evaluation of products. *Journal of Consumer Psychology, 14*, 416-426.
- Horowitz, J. K., & McConnell, K. E. (2002). A review of WTA/WTP studies. *Journal of Environmental Economics and Management, 44*, 426-447.
- Johnson, E. J., Häubl, G., & Keinan, A. (2007). Aspects of endowment: A query theory of value construction. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 33*, 461-474.

- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy*, 98, 1325-1348.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status-quo bias. *Journal of Economic Perspectives*, 5, 193-206.
- Kaspar, K. (2013). Washing One's Hands After Failure Enhances Optimism but Hampers Future Performance. *Social Psychological and Personality Science*, 4, 69-73.
- Kleber, J., Dickert, S., & Betsch, T. (2013). The influence of differential focus on the endowment effect in risky objects. *Swiss Journal of Psychology*, 72, 159-164.
- Knetsch, J., & Sinden, J. (1984). Willingness to pay and compensation demanded: Experimental evidence of an unexpected disparity in measures of value. *Quarterly Journal of Economics*, 99, 507-521.
- Lee, S. W. S., & Schwarz, N. (2010). Washing away postdecisional dissonance. *Science*, 328, 709.
- Lee, S. W. S., & Schwarz, N. (2011). Wiping the slate clean: Psychological consequences of physical cleansing. *Current Directions in Psychological Science*, 20, 307-311.
- Liberman, N., Idson, L. C., Camacho, C. J., & Higgins, E. T. (1999). Promotion and prevention choices between stability and change. *Journal of Personality and Social Psychology*, 77, 1135-1145.
- Losciuto, L. A., & Perloff, R. (1967). Influence of product preference on dissonance reduction. *Journal of Marketing Research*, 4, 286-290.
- Meier, B. P., Schnall, S., Schwarz, N., & Bargh, J. A. (2012). Embodiment in social psychology. *Topics in Cognitive Science*, 4, 705-716.
- Peck, J., & Shu, S. B. (2009). The effect of mere touch on perceived ownership. *Journal of Consumer Research*, 36, 434-447.

- Sayman, S., & Öncüler, A. (2005). Effects of study design characteristics on the WTA–WTP disparity: A meta analytical framework. *Journal of Economic Psychology*, *26*, 289-312.
- Schnall, S., Benton, J., & Harvey, S. (2008). With a clean conscience: Cleanliness reduces the severity of moral judgments. *Psychological Science*, *19*, 1219-1222.
- Shu, S. B., & Peck, J. (2011). Psychological ownership and affective reaction: Emotional attachment process variables and the endowment effect. *Journal of Consumer Psychology*, *21*, 439-452.
- Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*, *1*, 39-60.
- Weber, E. U., Johnson, E. J., Milch, K. F., Chang, H., Brodscholl, J. C., & Goldstein, D. G. (2007). Asymmetric discounting in intertemporal choice: A query-theory account. *Psychological Science*, *18*, 516-523.
- Xu, A. J., Zwick, R., & Schwarz, N. (2012). Washing away your (good or bad) luck: Physical cleansing affects risk-taking behavior. *Journal of Experimental Psychology: General*, *141*, 26-30.
- Zhong, C. B., & Liljenquist, K. (2006). Washing away your sins: Threatened morality and physical cleansing. *Science*, *313*, 1451-1452.
- Zhong, C. B., Strejcek, B., & Sivanathan, N. (2010). A clean self can render harsh moral judgment. *Journal of Experimental Social Psychology*, *46*, 859-862.

Table 1. Exchange rate of the product in the three studies by conditions.

| | Study 1 | Study 2 | Study 3 |
|-------------------|---------|---------|---------|
| Receiver | | | |
| Hand washing | 52.8% | 50.0% | 45.8% |
| Control condition | 23.1% | 27.6% | 16.7% |
| Chooser | | | |
| Hand washing | 0% | 0% | - |
| Control condition | 0% | 0% | - |