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**Utrecht University**  
**Psychology Master, Social Psychology**

**THESIS**

The Underlying Process of Physical Cleansing in a Moral Threat Situation:

Moral Buffer or Clean Slate?

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**Abstract**

In two experiments, we aimed to discover whether the beneficial effect of physical cleansing in a moral confrontation can be best explained by a moral buffer, which provides a boost to the moral self-image (Zhong & Liljenquist, 2006), or by a clean slate, which washes away past behavior (Lee & Schwartz, 2011). In Experiment 1, participants first tasted a sausage and were then confronted with a bogus participant who refused to taste the sausage on moral grounds. Results showed that participants who cleansed their hands before the confrontation with the moral refuser felt more dislike for the refuser than participants who cleansed their hands after the confrontation or not at all. In Experiment 2, participants had to give an anti-gay rights speech, and were then confronted with a moral refuser, after they received a moral boost or blow and cleansed their hands (or not). Although no significant effects were found in Experiment 2, overall findings suggest that the beneficial effect of physical cleansing are due to a moral buffer, rather than a clean slate. This implies that the negative effects of a moral confrontation could be prevented when one physically cleanse his/herself beforehand, because it enhances the moral self image.

*Keywords:* physical cleansing; moral buffer; clean slate; moral threat; moral refuser

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### **Introduction**

People physically cleanse themselves on a daily basis. They often do this routinely without paying attention or being aware of the effect this might have, other than becoming physically clean. Research shows that physical cleansing can also lead to a sense of moral purity (Gollwitzer & Melzer, 2012; Zhong & Liljenquist, 2006). Physical cleansing can even protect one's moral self-image, when one is being threatened after a confrontation with a moral refuser (Cramwinckel, van Dijk, Scheepers & van den Bos, 2013). A moral refuser is someone who refuses to go along with a certain behavior, based on moral objections (Cramwinckel et al., 2013). Although there is accumulating research about its positive effects (e.g. Cramwinckel et al., 2013; Lee & Schwarz, 2011; Xu, Zwick & Schwarz, 2012; Zhong & Liljenquist, 2006; Zhong, Strojcek & Sivanathan, 2010), much less is known about the underlying process. Current research focused on the underlying process of physical cleansing in the moral domain. In previous research, there are two possible mechanisms described that can explain the effect of physical cleansing; the moral buffer and the clean slate (Lee & Schwartz, 2011; Zhong & Liljenquist, 2006). The moral buffer theory states that physical cleansing enhances one's moral self-image, which provides a moral buffer that protects one's moral self against moral threats. (Schnall, Benton & Harvey, 2008; Zhong & Liljenquist, 2006; Zhong, Strojcek & Sivanathan, 2010). The clean slate perspective states that physical cleansing removes not only physical contaminants, but also eliminates residues of past behavior, and thus severs the link between one's past behavior and his/her moral self (Lee & Schwartz, 2011). After a moral threat situation, physical cleansing can remove the negative feelings that come with that moral threat and therefore do not have a negative effect on the person. In current research we wanted to explore which of the two aforementioned possible underlying processes best explains the effect of physical cleansing in a moral threat situation.

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### **The moral buffer**

People are motivated to feel and appear as moral beings, and try to act in a way that matches their internal values (Aquino & Reed, 2002; Monin, 2007). They aspire to be morally balanced, and live up to their moral ideas (Zhong et al., 2010). When one's moral self-image is threatened, for example by a moral refuser, people want to restore this imbalance (Monin, Sawyer & Marquez, 2008; Nissan, 1991). One way to prevent a moral threat is physical cleansing (Cramwinckel et al. 2013; Monin, 2007; Zhong & Liljenquist, 2006).

People have the tendency to link abstract concepts to concrete concepts with which they have a direct sensory experience, to guide inferences and make the abstract concept more accessible (Barsalou, 2008; Lee & Schwartz, 2011). This is also the case with the abstract concept 'morality' and the concrete act of 'physical cleansing' (Lee & Schwartz, 2011; Zhong & Liljenquist, 2006). For example, people use words as 'clean' and 'pure' to describe both physical as moral states (e.g. a dirty cop). Therefore, people who cleanse themselves and thus feel physically pure, also feel morally pure. Zhong and Liljenquist (2006) found that people who experience a threat to their moral self-image experience an increased need to cleanse themselves. Also, people who physically cleansed themselves after an objectionable action, experienced less moral threat when they were confronted with a moral refuser. For example, participants who ate a slice of sausage and cleansed their hands before being confronted with a moral refuser, were more positive about the moral refuser and themselves than participants who did not cleanse their hands (Cramwinckel et al., 2013). Conversely, without a moral threat, people who cleansed their hands felt more virtuous and therefore had more severe moral judgments on others than people who did not cleanse their hands (Zhong et al., 2010). These effects can be explained by a moral buffer. Apparently, cleansing provides a moral buffer that protects one's moral self against moral threats. Zhong and colleagues (2010) found

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that the effect of physical cleansing on the severity of moral judgment is mediated by an elevated moral self-image. Because physical cleansing increases the moral self-image, it also prevents a possible reduction in that moral self-image. People therefore do not feel threatened by the moral refuser, and are more positive about that moral refuser and themselves than people who do not cleanse their hands, and thus do feel threatened by the moral refuser.

### **The clean slate**

An alternative explanation for the effect of physical cleansing in a moral threat situation is the clean slate theory, described by Lee and Schwartz (2011). Physical cleansing removes residues from the past, such as feelings of guilt based on actions or doubts about past decisions, and thereby creates a “clean slate”. An implication of this clean slate hypothesis is that the effects of physical cleansing are not restricted to the moral domain. Xu and colleagues (2011) found that people who experienced an episode of bad luck were more willing to take risk after washing their hands, as opposed to not washing their hands, whereas participants who experienced an episode of good luck were less willing to take risk after washing their hands as opposed to not washing their hands. It was argued that the act of physical cleansing would wash away the (good or bad) luck. Lee and Schwartz (2010) found that washing one's hands after making a choice eliminates post-decisional dissonance effect (that is, after choosing between two alternatives, people perceive the chosen alternative as more attractive and the rejected alternative as less attractive), suggesting that hand-washing psychologically removes traces of past behavior, including concerns about past decisions. The clean slate explanation states that in a moral threat situation where people are confronted with a moral refuser, physical cleansing will “wash away” the objectionable behavior or the feelings of guilt after the confrontation with the moral refuser.

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### **Current research**

In this research we wanted to investigate which of the aforementioned explanations is most likely to underlie the effect of physical cleansing in a moral threat situation as described by Cramwinckel and colleagues (2013). The difference between the moral buffer and the clean slate is that a moral buffer increases the moral self-image and therefore provides a protection for a threat beforehand, whereas a clean slates moral self-image is not affected, because the moral objectionable behavior or the cause of the threat (e.g. a confrontation with a moral refuser) is washed away afterwards. Although research showed some support for the notion that the effect of physical cleansing might be explained by a clean slate theory in other domains (Lee & Schwartz, 2010; Xu et al., 2011) we assume it is more likely for the moral buffer theory to explain the effect of physical cleansing in the moral domain, in particular in a moral threat situation. Merrit, Effron and Monin (2010) showed that people feel the need to compensate for an enhanced or a reduced moral self-image. Moreover, Zhong and colleagues (2010) found that people who cleansed their hands had a stronger moral self-image, and therefore more severe moral judgment of others than people who did not cleanse their hands. This harsher moral judgment is not likely to be explained by a clean slate, because there was no previous behavior to wash away and therefore there would be no difference between the cleansing and no cleansing. We expected that this increased moral self-image provides a moral buffer in a threat situation.

By investigating the underlying process we extend the research on the effect of physical cleansing in the moral domain. The moral buffer explanation states that physical cleansing is most effective when it takes place before a moral threat situation, whereas the clean slate explanation states that physical cleansing is most effective when it takes place after a moral threat situation. In order to benefit the most of the positive effect of physical

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cleansing on one's moral self-image, it is important to know how and when the physical cleansing should take place to provide that beneficial effect. Furthermore, while the moral buffer theory would explain the effect of physical cleansing in the moral domain, the clean slate theory goes beyond the moral domain, because it states that it washes away past behavior. To find out if the workings of physical cleansing operate in a specific fashion in the moral domain, or is similar in every domain and findings can therefore be extended to other domains, it is also important to get a better insight into the workings of physical cleansing.

We conducted two experiments to explain the underlying process of physical cleansing. In Experiment 1 we used a similar set-up to that of Cramwinckel et al. (2013). Participants tasted a slice of sausage and were then confronted with a moral refuser. To distinguish between the moral buffer and the clean slate we manipulated the moment when physical cleansing occurred in the experiment. As for the moral buffer, we expected that cleansing before a moral threat would lead to a more positive evaluation of the moral refuser and the self than when cleansing took place after the moral threat or not at all. Alternatively, as for the clean slate, we expected that when the cleansing occurs after objectionable behavior, participants would have a more positive evaluation of the moral refuser and the self than when cleansing took place before objectionable behavior.

In Experiment 2 we further explored the underlying process of physical cleansing when a moral threat occurs. We aimed to investigate to what extent physical cleansing would lead to a moral buffer or a clean slate, when people already have an increased or a decreased moral self-image. In order to do so, we manipulated the participants' moral self-image by providing a boost or a blow, before they physically cleansed themselves or not. We wanted to investigate if physical cleansing only increases the moral self-image when it is needed or has an accumulative effect when the moral self-image already is increased. By doing this we get a

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better insight into the beneficial effect of physical cleansing and in what situations physical cleansing could be (most) useful. We expected that a moral buffer would intensify the moral boost, whereas a clean slate would “wash the boost away”. As for the moral buffer, we expected that cleansing before a moral boost would lead to a more negative evaluation of the moral refuser, and a more positive evaluation of the self, than when cleansing took place after a moral blow. This expectation is based on the findings of Zhong and colleagues (2010), who states that an increased moral self-image causes harsher moral judgment on others.

As for the alternative clean slate, we expected no difference between the two moral manipulations where the cleansing occurred, because both the moral boost and the moral blow manipulation would be washed away.

We further expected for both the moral buffer and the clean slate theory, that a threat after a moral boost manipulation would reduce the enhanced moral self-image, whereas a threat after a moral blow manipulation would further reduce the already reduced moral self-image. We therefore expected that in the no cleansing conditions a moral boost would lead to a more positive evaluation of the moral refuser and themselves than a moral blow.

### **Experiment 1**

In this experiment we used a similar set-up as Cramwinckel and colleagues (2013) did. The moments the cleansing took place varied, in order to investigate what the underlying process of physical cleansing on the evaluation of a moral refuser and the self in a moral threat situation was; the moral buffer or the clean slate. We expected for the moral buffer perspective that cleansing before a moral threat would lead to a more positive evaluation of the moral refuser and the self than when cleansing took place after the moral threat or not at all. Alternatively, we expected for the clean slate perspective that when the cleansing occurs

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after objectionable behavior, this would lead participants to a more positive evaluation of the moral refuser and the self than when cleansing took place before objectionable behavior.

### Method

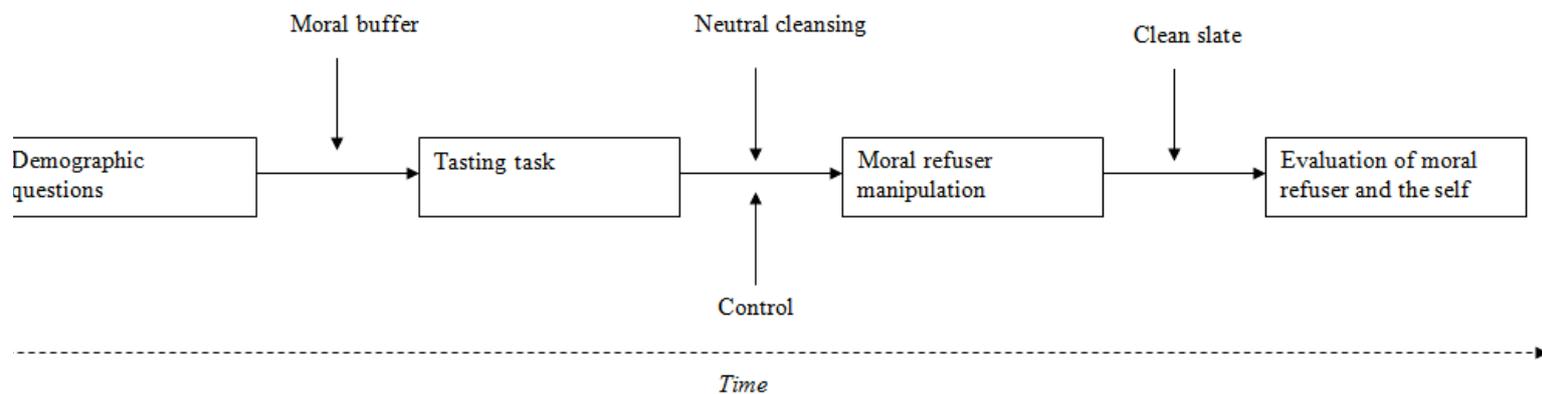
#### Participants and design

One-hundred-and-six participants ( $M_{age} = 20.1$ ; 37 men) participated in an experiment on “food preference and personality” in which they had to judge another participants personality based on his/her food preferences. They were randomly assigned to one of four conditions in a single factor experimental design, respectively the moral buffer condition, which took place before the tasting, the neutral cleansing condition, which took place after the tasting, the clean slate condition, which took place after the moral threat or the control condition. The cleansing after the tasting (neutral cleansing condition) could work both as a moral buffer or as a clean slate and therefore did not differentiate between the two possible explanations (see Figure 1 for an overview).<sup>1</sup>

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<sup>1</sup> Please note that 16 participants were excluded from our main analysis, based on a priori criteria. Participants were excluded from this research when they had already participated in a previous experiment similar to the current experiment, when they refused to taste the sausage (e.g. because they were vegetarian), when they did not realize that the refuser did not taste the sausage or when they did not realize that the reason the refuser did not taste the sausage was on moral grounds. We excluded 4 participants who had already participated in a similar experiment, 10 participants who refused to taste the sausage, 1 participant who did not realize that the refuser did not taste the sausage, and 1 participant who did not realize the reason the refuser did not taste the sausage was on moral grounds. Furthermore, we calculated both

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*Figure 1.* Overview of cleansing opportunities in Experiment 1. Cleansing opportunities were present in three of the four conditions.

### Procedure

This experiment had a similar set-up as Experiment 2 in Cramwinckel et al. (2013) whereby two conditions were exact replications from the ones in Cramwinckel et al. (2013), namely the neutral cleansing and the control condition. The two additional conditions, the moral buffer and the clean slate condition, were added to get a better insight into the

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Cook's and Mahalanobis distances to spot potential multivariate outliers. Potential outliers were based on a Cook's cut-off value of  $p < .10$ , and/or the Mahalanobis distance threshold (cut-off value = 16.27;  $p < .001$ , based on 3 df). All Cook's values were below the cut-off of .10 (all Cook's distances  $< .08$ ) but for the Mahalanobis distances one participant exceeded the threshold, with a value of 20.38. When we checked the scores from this participant on the three dependent variables no extreme or odd results were found. Furthermore, exclusion of the participant did not have a substantial effect on the results compared to no exclusion. Therefore we decided to include the participant in the analyses.

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underlying process of physical cleansing. Participants tasted and evaluated a sausage, which was followed by a confrontation with a moral refuser. Subsequently, they had to evaluate the moral refuser and themselves (for a more detailed description of the procedure, see Cramwinckel et al., 2013).

The important part of this experiment was the moment at which the cleansing took place. Physical cleansing occurred in three out of the four conditions. In the three cleansing conditions the experimenter entered the cubicle and asked the participants to cleanse their hands and gave them antibacterial hand soap. After this, the experimenter started the next part of the experiment and left the cubicle. In the control condition the experimenter entered the cubicle, started the next part of the experiment and left. Finally, the dependent variables were assessed. As in Cramwinckel et al. (2013), *dislike of the refuser*, *agency of the refuser* and *self-evaluation* were measured. Responses were given on a 7-point Likert scales with 1 (*not at all*) to 7 (*completely*) as endpoints. Dislike of the refuser was measured using five items indicating how pleasant (reverse coded), unreasonable, obnoxious and annoying the participants thought the refuser was, and to what extent they despised the refuser (Cronbach's  $\alpha = .84$ ). Perceived agency of the refuser was measured using five items asking to what extent they thought the refuser was strong, confident, dependent (reverse coded), independent, and to what extent they thought the refuser had high self-esteem (Cronbach's  $\alpha = .71$ ). As a measure of self-evaluation fourteen items were used, where the participants were asked to what extent they felt happy with themselves, satisfied with themselves, good, happy, comfortable, confident, determined, disappointed with themselves (reverse scored), annoyed with themselves (reverse scored), disgusted with themselves (reverse scored), angry with themselves (reverse scored), dissatisfied with themselves (reverse scored), self-critical (reverse scored), and guilty (reverse scored), at that moment (Cronbach's  $\alpha = .91$ ).

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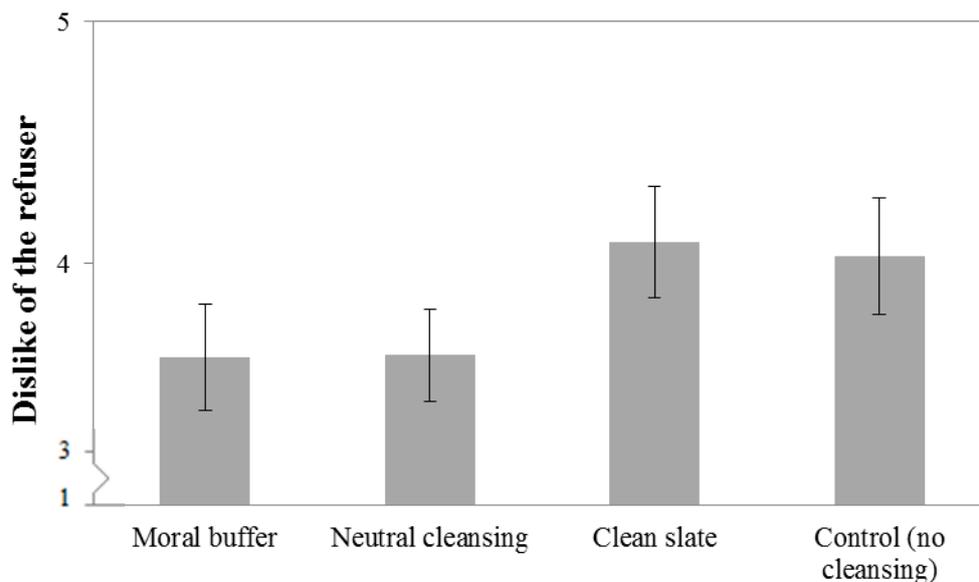
At the end of the experiment participants were thanked, debriefed and paid or got course credits for their participation.

### Results

#### Dislike of the refuser

We submitted the 1-7 scale that measured dislike of the refuser to a one-way ANOVA with physical cleansing as the independent variable. No significant effect was found,  $F(3, 102) = 1.37, p = .26, \eta^2 = .04$ . Because the aim of the experiment was to investigate what the underlying process of physical cleansing was, we inspected the means to find out which explanation seemed better supported by the observed patterns. Means suggested that the moral buffer ( $M = 3.61, SD = 1.12$ ) and neutral cleansing condition ( $M = 3.62, SD = 1.04$ ) seemed to lead to less dislike of the refuser than the clean slate ( $M = 4.09, SD = 1.25$ ) and the control condition ( $M = 4.03, SD = 1.25$ ) as shown in Figure 2. This pattern suggested that participants who cleansed their hands before the moral threat felt less dislike for the refuser than participants who did not cleanse their hands before the moral threat. These patterns thus seemed to be most in line with the moral buffer hypothesis.

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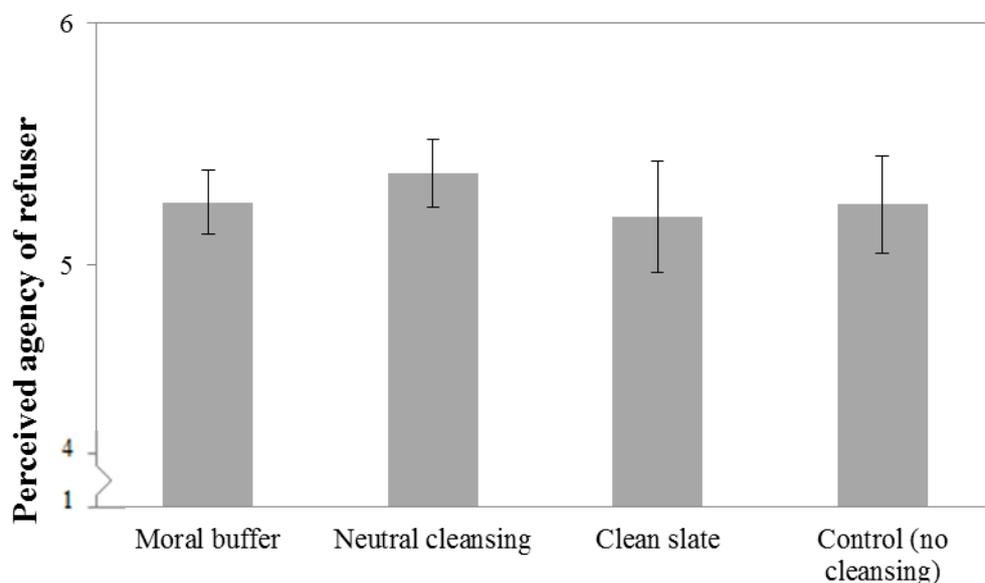
*Figure 2.* Dislike of refuser in the four conditions in Experiment 1. In the moral buffer condition, participants cleansed before the tasting task, in the neutral cleansing condition after the tasting task and in the clean slate condition after the moral confrontation. Error bars are plotted one standard error above and below the mean.

### Perceived agency of the refuser

We submitted the 1-7 scale that measured agency of the refuser to a one-way ANOVA with physical cleansing as the independent variable. No significant effect was found,  $F(3,106) = .19, p = .90, \eta^2 = 0.01$ . Because the aim of the experiment was to investigate what the underlying process of physical cleansing was, we inspected the means to find out which explanation seemed better supported by the observed patterns. Means suggested that participants in the neutral cleansing condition ( $M = 5.38, SD = .73$ ) thought of the refuser as more agentic than participants in the moral buffer ( $M = 5.26, SD = .67$ ), the cleansing after threat ( $M = 5.20, SD = 1.12$ ) and the control condition ( $M = 5.25, SD = 1.03$ ), as can be seen in Figure 3. Because the neutral cleansing condition on itself cannot distinguish between the

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moral buffer and the clean slate explanation, this pattern did not seem to offer support on one account or the other.



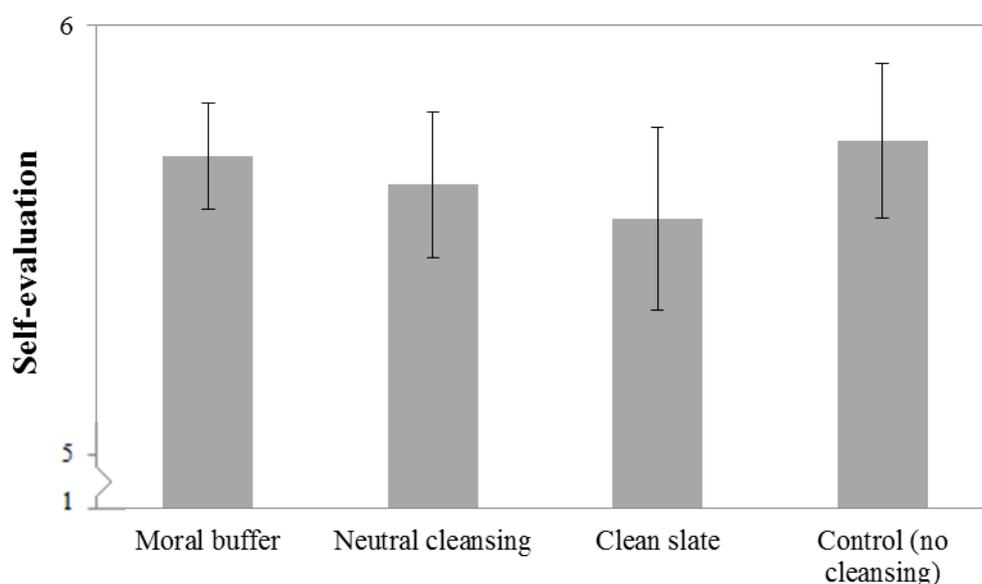
*Figure 3.* Perceived agency of the refuser in the four conditions of Experiment 1. In the moral buffer condition, participants cleansed before the tasting task, in the neutral cleansing condition after the tasting task and in the clean slate condition after the moral confrontation. Error bars are plotted one standard error above and below the mean.

### Self-evaluation

We submitted the 1-7 scale that measured self-evaluation to a one-way ANOVA with physical cleansing as the independent variable. No significant effect was found,  $F(3, 106) = .2, p = .90, \eta^2 = .01$ . Because the aim of the experiment was to investigate what the underlying process of physical cleansing was, we inspected the means to find out which explanation seemed better supported by the observed patterns. Means suggested that participants in the control condition ( $M = 5.76, SD = .84$ ) seemed more positive about themselves than participants in the moral buffer ( $M = 5.73, SD = .57$ ), the neutral cleansing ( $M = 5.67, SD =$

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.82) and the clean slate condition ( $M = 5.60$ ,  $SD = .92$ ), as shown in Figure 4. Again, this pattern does not clarify the underlying process of physical cleansing, because participants in the control condition were unexpectedly most positive about themselves. When looked only at the cleansing conditions, participants in the moral buffer condition seemed more positive about themselves than in the clean slate hypothesis. Again, this pattern seemed more in line with the moral buffer than with the clean slate hypothesis.



*Figure 4.* Self-evaluation in the four conditions in Experiment 1. In the moral buffer condition, participants cleansed before the tasting task, in the neutral cleansing condition after the tasting task and in the clean slate condition after the moral confrontation. Error bars are plotted one standard error above and below the mean.

### Additional analysis

No significant effects were found possibly due to a lack of power in the cells. We therefore conducted additional analysis to find out if there was any significant effect when conditions were combined based on the moral buffer hypothesis or the clean slate hypothesis.

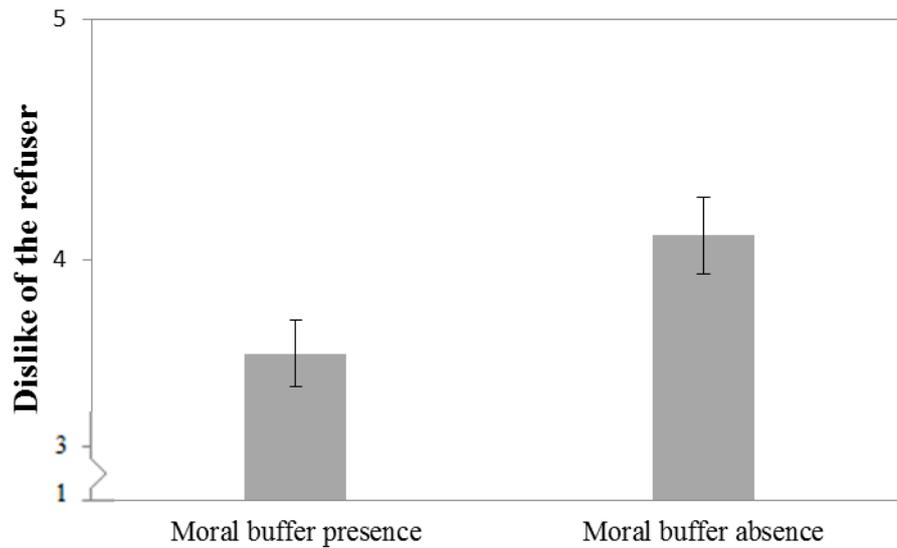
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For the moral buffer perspective, we expected that participants who cleansed their hands before the moral threat would be more positive about the moral refuser and themselves than participants who cleansed their hands after the moral threat or when they did not cleanse their hands at all.

Alternatively, for the clean slate perspective, we expected that participants who cleansed their hands after the objectionable behaviour, would be more positive about the moral refuser or themselves than people who cleansed their hands before the tasting task or not at all. Expected was that in the neutral cleansing and the clean slate condition the previous actions (respectively the tasting and the moral threat) are washed away by the cleansing and therefore would lead to more positive evaluation of the moral refuser and the self than in the other conditions. When the cleansing took place before the tasting task there was nothing to wash away and therefore lead to the same effect as when there was no cleansing at all.

**Moral buffer.** The conditions where the cleansing took place before the moral threat, the moral buffer and the neutral cleansing condition, were combined in a ‘moral buffer presence’ condition. We combined the clean slate and the control condition in the ‘moral buffer absence’ condition, because participants in those conditions did not receive a moral buffer. We performed an ANOVA with moral buffer presence/absence as independent variable. There was a significant effect for the dislike of the refuser,  $F(1,104) = 4.15, p = .04, \eta^2 = .04$ , which meant that people who cleansed their hands before the moral threat liked the refuser more than people who did not cleanse their hands before the threat (see Figure 5). There were no significant effects found for the perceived agency of the refuser,  $F(1,104) = .31, p = .59, \eta^2 = .00$ , or the self-evaluation  $F(1,104) = .006, p = .94, \eta^2 = .00$  (for means see Table 1). These findings offered support for the moral buffer hypothesis.

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*Figure 5.* Dislike of the refuser measured in the presence and absence of a moral buffer (physical cleansing) in the additional data in Experiment 1. Error bars are plotted one standard error above and below the mean.

Table 1

*Means and standard error for the perceived agency of the refuser and the self-evaluation in the moral buffer presence and moral buffer absence condition*

Dependent variables	Moral buffer presence		Moral buffer absence	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceived agency of refuser	5.32	.70	5.23	1.06
Self-evaluation	5.70	.70	5.69	.87

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**Clean slate.** The cleansing neutral condition and the clean slate condition were combined in a ‘clean slate presence’ condition and the cleansing before tasting and the control condition were combined in a ‘clean slate absence’ condition. An ANOVA was submitted with clean slate presence/absence as independent variable. No significant effects were found for either the dislike of the refuser,  $F(1,204) = .00, p = .96, \eta^2 = .00$ , agency of the refuser  $F(1,104) = .06, p = .81, \eta^2 = .00$  or the self-evaluation,  $F(1,204) = .00, p = .96, \eta^2 = .00$ . (for means see Table 2). These findings therefore did not offer support for the clean slate account.

Table 2

*Means and standard error for the dislike of the refuser, perceived agency of the refuser and the self-evaluation in the clean slate presence and a clean slate absence condition*

Dependent variables	Clean slate presence		Clean slate absence	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dislike of refuser	3.83	1.09	3.82	1.19
Perceived agency of refuser	5.30	.92	5.26	.87
Self-evaluation	5.64	.86	5.75	.71

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### Discussion

We expected that the effect of physical cleansing on the evaluation of a moral refuser and the self in a moral threat situation would be best explained by the moral buffer hypothesis. Unfortunately we did not observe any significant differences between the cleansing conditions on our dependent variables. However, the means on dislike of the refuser showed the expected pattern and additional analyses showed that when we combined the moral buffer and the cleansing neutral condition in a ‘moral buffer presence’ condition, and the clean slate and the control condition in a ‘moral buffer absence’ condition, a significant effect on dislike of the refuser was found. When conditions were combined in a ‘clean slate presence’ (the clean slate and the neutral cleansing condition) and a ‘clean slate absence’ condition (the moral buffer and the control condition) to check for the alternative clean slate hypothesis, no significant effects were found. This suggested that the effect of physical cleansing in a moral threat situation as described in Cramwinckel et al. (2013), is most likely to be explained by the moral buffer hypothesis. No other significant effects were found. This could be due to a lack of power, which would explain the significant effect on dislike of the refuser when conditions were combined. The differences between the conditions could be so subtle, that there were not enough participants per cell to obtain a significant effect. Furthermore, in Cramwinckel et al.(2013) there was only a significant effect found on the cleansing manipulation (i.e. cleansing absent and cleansing present condition) for self-evaluation, which was moderated by moral identity. This could also indicate that the effect of physical cleansing as a protection for a moral threat is not very blatant. In the current experiment, physical cleansing took place at three moments in time (i.e. before the tasting, before the threat and after the threat). One might wonder why we included the cleansing before the threat, because it does not provide any insight into the underlying effect of physical

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cleansing. We chose to include that condition, because we wanted to replicate the cleansing condition in Cramwinckel et al. (2013).

To get a better understanding of the underlying process of physical cleansing when a moral threat occurs, another experiment was conducted. The aim of that experiment was to investigate to what extent physical cleansing would lead to a moral buffer, when people already had an increased or a decreased moral self-image. By investigating this, we wanted to get better understanding of the functioning of physical cleansing as a buffer in the moral domain.

### **Experiment 2**

In Experiment 1 we aimed to investigate the underlying process of physical cleansing when confronted with a moral refuser. Experiment 1 indicated that the moral buffer is most likely the underlying process of physical cleansing in a moral threat situation.

In current experiment we further explored the moral buffer hypothesis as the underlying process of physical cleansing. We aimed to investigate to what extent physical cleansing would lead to a moral buffer, when people already had an increased or a decreased moral self-image. We wanted to find out if physical cleansing only provides a buffer when the moral self-image is not already increased or if physical cleansing provides an accumulative effect and therefore causes an extra boost to the moral self-image, when the moral self-image is already increased. By investigating this, we aimed to get a better understanding of the workings of physical cleansing, and in what situations it is a useful tool to protect against moral threats.

In order to do so, we first manipulated the participants' moral self-image by giving it a moral boost (an increased moral self-image) or a blow (a decreased moral self-image), by

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means of a manipulation where they had to recall two moral or immoral past deeds. After that they physically cleansed themselves (or not), whereafter they had to give an anti-gay rights speech, and were confronted with another (bogus) participant who refused to give the speech on moral grounds.

When participants cleansed their hands, we expected that those who received a moral boost would have an increased moral self-image, because of the boosts they received from the boost manipulation and from physical cleansing. People who had an enhanced moral self-image had harsher moral judgment about others. We expected that people who cleansed their hands after receiving a moral boost would be more negative about a moral refuser and more positive about themselves than people who cleansed their hands after a moral blow. When participants did not cleanse their hands, we expected that those who received a moral boost would first experience an increase in their moral self-image. The confrontation with the moral refuser would take away this increase. Those participants who received a moral blow were expected to experience an even stronger decrease in their moral self-image because they experienced both a moral blow manipulation and a confrontation with a moral refuser. For both the moral boost and the moral blow condition the moral self-image was not enhanced. We therefore did not expect that they would have a harsher moral judgment on others, but that the more threatened they felt the more negative they would be about the moral refuser and themselves. Thus, we expected that people who did not cleanse their hands after receiving a moral boost would be more positive about a moral refuser and themselves than people who did not cleanse their hands after a moral blow.

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**Method****Participants and design**

Eighty-seven participants ( $M_{age} = 21.22$ ; 39 men)<sup>2</sup> participated in an experiment on “persuasion strength” in which they had to give a convincing speech about gay rights and judge the persuasiveness of another participants’ speech. Participants were randomly assigned to one of the four conditions of a 2 (Moral manipulation: Boost vs. Blow) X 2 (Cleansing vs. No cleansing) between subjects experimental design.<sup>3</sup>

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<sup>2</sup> Due to an error in the computer task the demographic questions were not assessed for the first ten participants.

<sup>3</sup> Please note that 29 participants were excluded from our main analysis. Twenty-eight exclusions were based on a priori criteria. We had four a priori criteria to exclude participants from this research, namely when they had already participated in a previous experiment similar to the current experiment, when they did not perform the speech (either because they did not want to, or they did not realize they that they had to speak at that moment), when they did not realize that the participant did not perform the speech and when did not realize that the refuser had to perform an anti-gay speech. We excluded 15 participants who had already participated in a similar experiment, 11 participants who did not perform the speech, 1 participant who did not notice that the other participant did not perform the speech, and 1 that did not realize the refuser had to perform an anti-gay speech. As in Experiment 1, we calculated both Cook's and Mahalanobis distances to spot potential multivariate outliers. Potential outliers were based on a Cook's cut-off value of  $p < .10$ , and/or the Mahalanobis distance threshold (cut-off value = 18.47;  $p < .001$ , based on 4 df). All Cook's values were

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### **Procedure**

Participants were seated in separate cubicles. All the cubicles contained a computer on which a webcam was installed. Participants were instructed to perform a simple handwriting task, whereby they experienced a boost or blow to their moral self-image. This moral manipulation was a modified version and a combination of the handwriting prime used by Sachdeva, Iliev and Medin (2009) and a recall prime used by Zhong and Liljenquist (2006). In the boost condition the participants received a list which contained nine positive traits (caring, compassionate, fair, friendly, generous, hardworking, helpful, honest and kind) which are related to morality (Aquino & Reed, 2002). In the blow condition they received a list which contained nine negative traits (indifferent, insensitive, unfair, unfriendly, greedy, lazy, unhelpful, unfaithful and unkind) which are related to immorality (Aquino & Reed, 2002). In both conditions they were told that they had to copy the words on a piece of paper to investigate their handwriting abilities. Subsequently, they had to choose two out of the nine traits in the list. They were asked to recall and write down two moments in the past in which they recognized the two traits in themselves, and describe any feelings or emotions they experienced at that moment. We assumed that asking them to recall a moment where they showed a certain trait would provide a blow or boost to their moral self-image in a more subtle way, than blatantly asking them to recall a moral/immoral moment in their lives, as was

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below the cut-off of .10 (all Cook's distances < .09). One participant exceeded the threshold for the Mahalanobis distances with a value of 23.54 and was therefore excluded from the main analyses.

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the case in Zhong and Liljenquist (2006). After the moral manipulation, a modified version of the product evaluation task by Xu and colleagues (2011) took place, as a cover for the cleansing manipulation. At the start of the experiment participants had received a box and were told not to open it until they were instructed to do so. At this point they were asked to open the box and evaluate the product inside. In the cleansing presence condition there was an antiseptic wipe in the box and participants were asked to evaluate the wipe by using it. In the cleansing absence condition there was a pencil in the box and participants were asked to evaluate the pencil by using it. Zhong and Liljenquist (2006) found that an antiseptic wipe and a pencil are equally attractive products, but an antiseptic wipe was more likely to be chosen when people felt more need to cleanse themselves<sup>4</sup>. As for the cleansing absence condition we chose not to evaluate an antiseptic wipe by solely looking at it (and thus not using it), as was the case in Xu et al. (2011). Instead, we chose to evaluate a neutral product (the pencil), because we assumed that looking at the antiseptic wipe could prime cleansing as well. Participants answered several questions about the product (e.g. “is it a useful product?”), as a cover-up for the real purpose of the product evaluation task.

Next, the participants had to perform a speech task. They were told that they were randomly assigned to defend either a pro-gay or an anti-gay statement and had to deliver a convincing speech on camera to defend the proscribed statement, despite their true beliefs. All participants had to defend the same anti-gay statement, and were asked to try to imagine

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<sup>4</sup> To check whether the two products were indeed judged to be equally attractive, as we assumed, we conducted a one way ANOVA with the evaluation of the product as dependent variable. As expected, no significant effect was found  $F(1, 86) = .47, p = .50, \eta^2 = .01$ .

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that they were a fierce opponent of gay rights, and were convinced that homosexuality was abnormal and unnatural and that homosexuals should not have the same rights as heterosexuals have. They could practice their speech for one minute, after which they had to deliver their actual anti-gay speech on camera. After delivering their speech, they saw the speech of a female confederate, who ostensibly refused to give an anti-gay speech because she thought it was immoral and against her values. After that, participants evaluated the confederates' character, her persuasiveness, and themselves. Responses were given on a 7-point Likert scales with 1 (*not at all*) to 7 (*completely*) as endpoints. As in Experiment 1, dislike of the refuser (Cronbach's  $\alpha = .87$ ) was measured using five items (e.g., how unreasonable the participant thought the moral refuser was). Perceived agency of the refuser (Cronbach's  $\alpha = .86$ ) was measured using five items (e.g., how confident the participant thought the moral refuser was). Also, the perceived persuasion strength of the refuser (Cronbach's  $\alpha = .86$ ) was measured using five items indicating (e.g., to what extent participants thought the confederate was convincing)<sup>5</sup>. Finally, the participants' self-evaluation (Cronbach's  $\alpha = .96$ ) was measured using fourteen items (e.g., how satisfied they felt with themselves).

Lastly, demographics were assessed, participants were thanked, debriefed and paid or received course credits for their participation.

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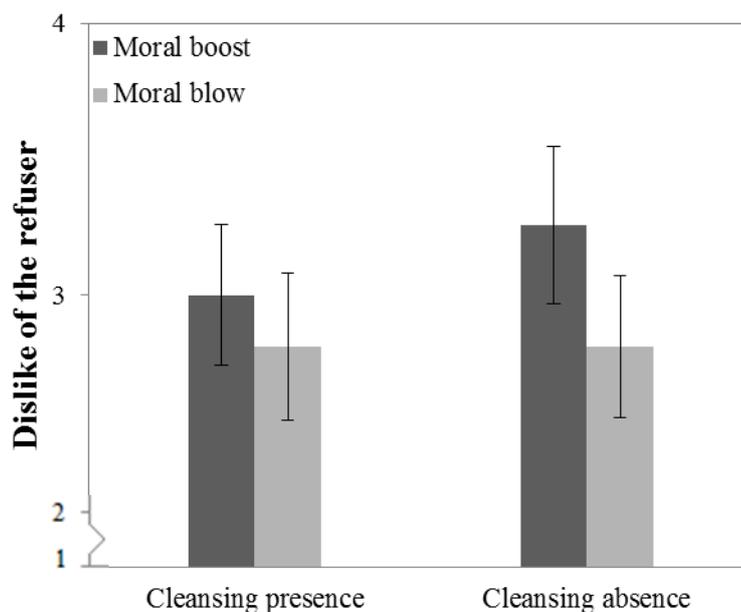
<sup>5</sup> Because all participants saw the same video and the presence or absence of physical cleansing should not influence the perceived persuasion strength, no difference between the four conditions on perceived persuasion of the moral refuser was expected. A two-way factorial ANOVA examined the effect of moral manipulation and cleansing on the perceived persuasion. As expected, no significant effect was found  $F(3, 87) = .57, p = .64, \eta^2 = .02$ .

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**Results****Dislike of the refuser**

A two-way factorial ANOVA examined the effect of moral manipulation and cleansing on dislike of the refuser. No significant effects were found,  $F(3, 87) = .58, p = .63, \eta^2 = .02$ . Because the aim of the experiment was to further investigate the moral buffer effect, we inspected the means to investigate whether the observed patterns matched our expectations. Means suggested that participants who cleansed their hands after a moral boost ( $M = 3.00, SD = 1.29$ ), seemed to experience more dislike for the refuser than participants who cleansed their hands after a moral blow ( $M = 2.81, SD = 1.12$ ). Furthermore, means suggested that participants who did not cleanse their hands after a moral boost ( $M = 3.26, SD = 1.56$ ) seemed to experience more dislike for the refuser than participants who did not cleanse their hands after the moral blow ( $M = 2.81, SD = 1.09$ ). We were surprised to learn that in the cleansing presence condition the difference between the means in the boost and blow condition was smaller than the difference between the means in the boost and blow condition in the cleansing absence condition (Figure 6). This was not in line with our expectations, even though participants who cleansed their hands did experience more dislike for the refuser when they received a moral boost than when they received a moral blow, as was expected.

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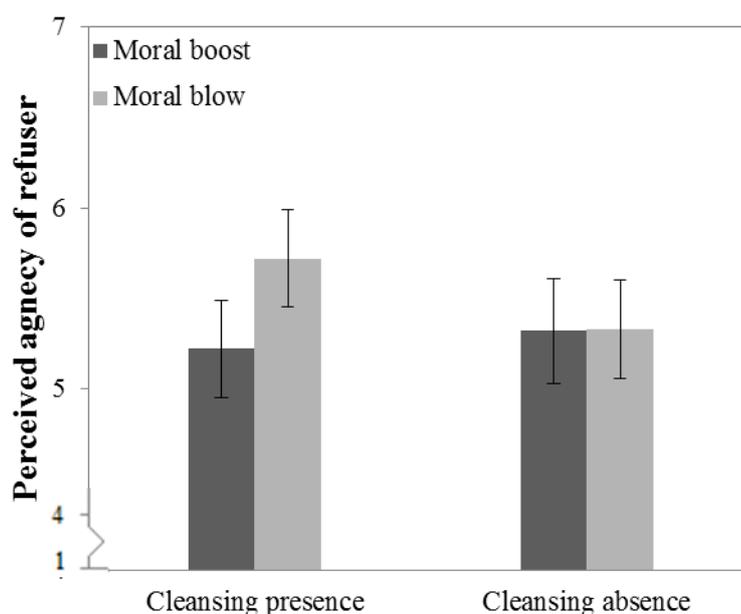
*Figure 6.* Dislike of refuser following the presence or absence of physical cleansing and the experience of a moral boost or blow (Experiment 2). Error bars are plotted one standard error above and below the mean.

### Perceived agency of refuser

A two-way factorial ANOVA examined the effect of moral manipulation and cleansing on perceived agency of the refuser. No significant effects were found,  $F(3, 87) = .662$ ,  $p = .58$ ,  $\eta^2 = .02$ . Because the aim of the experiment was to further investigate the moral buffer effect, we inspected the means to investigate whether the observed patterns matched our expectations. Means suggested that participant who cleansed their hands after a moral boost ( $M = 5.22$ ,  $SD = 1.66$ ) seemed to perceive the refuser as less agentic than participants who cleansed their hands after a moral blow ( $M = 5.72$ ,  $SD = .93$ ). Furthermore, there seemed to be no difference between participants who did not cleanse their hands after a moral boost ( $M = 5.33$ ,  $SD = 1.03$ ) or after a moral blow ( $M = 5.33$ ,  $SD = 1.28$ ). Although the pattern found in the cleansing presence condition seemed in line with our expectations that cleansing

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one's hands can lead to a sense of moral superiority (Zhong et al. 2010) which could lead to less perceived agency of the refuser (Figure 7), means were not in line with our expectations, because there was expected a difference between the boost and the blow condition when participant did not cleanse their hands.



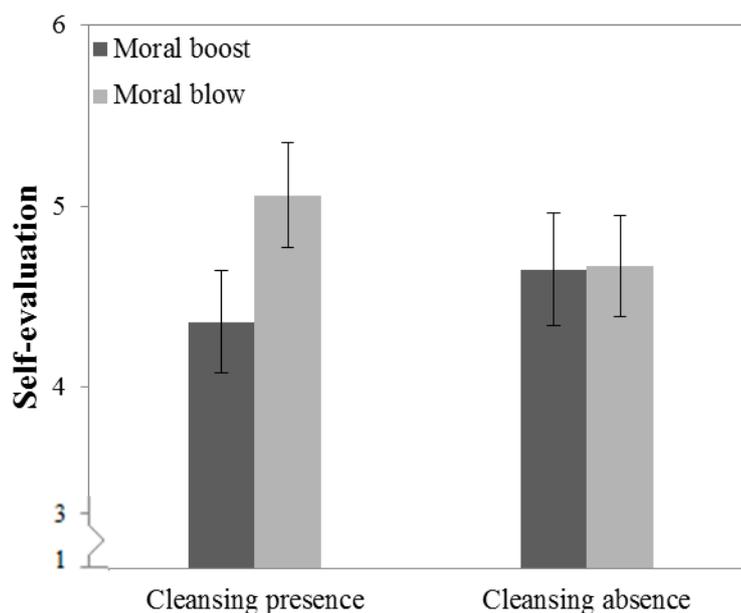
*Figure 7.* Perceived agency of refuser following the presence or absence of physical cleansing and the experience of a moral boost or blow (Experiment 2). Error bars are plotted one standard error above and below the mean.

### Self-evaluation

A two-way factorial ANOVA examined the effect of moral manipulation and cleansing on the self-evaluation. No significant effects were found,  $F(3, 87) = 1.00$ ,  $p = .40$ ,  $\eta^2 = .03$ . Because the aim of the experiment was to further investigate the moral buffer effect, we inspected the means to investigate whether the observed patterns matched our

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expectations. Means suggested that participants who cleansed their hands after a moral boost ( $M = 4.36$ ,  $SD = 1.42$ ) seemed less positive about themselves than participants who cleansed their hands after a moral blow ( $M = 5.06$ ,  $SD = 1.22$ ). Furthermore, there seemed to be no difference between participants who did not cleanse their hands after a moral boost ( $M = 4.65$ ,  $SD = 1.74$ ) or after a moral blow ( $M = 4.67$ ,  $SD = 1.00$ ). This pattern did not seem in line with our expectations that cleansing one's hands can lead to a sense of moral superiority, which could lead to a more positive self-evaluation (Figure 8). Furthermore, in the cleansing absence condition means were also not in line with our expectations that participants who received a moral boost would be more positive about themselves than participants who received a moral blow.



*Figure 8.* Self-evaluation of the participant following the presence or absence of physical cleansing and the experience of a moral boost or blow (Experiment 2). Error bars are plotted one standard error above and below the mean.

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### Discussion

The aim of Experiment 2 was to investigate to what extent physical cleansing would lead to a moral buffer, when people already had an increased or a decreased moral self-image. Participants received a moral boost or a moral blow before they physically cleansed themselves (or not). Because physical cleansing increases the moral self-image (Zhong & Liljenquist, 2006; Zhong et al., 2010), we expected that the cleansing would intensify a moral boost to the moral self-image, and reduce the effect a moral blow would have on the moral self-image. Unfortunately, we did not observe any significant effects in our dependent variables. As in Experiment 1, a lack of power could be the cause of the absence of any significant effect. Because the effect sizes can be classified as small (according to Cohen's standards, 1988), the differences between the four conditions could be so subtle, that more than the required twenty participants per cell (as uttered in Simmons, Nelson & Simonsohn, 2011) were necessary to find any significant effect.

Another possibility is that the moral boost/blow manipulation did not work the way it was supposed to work. This moral manipulation was a modified version and combination of the handwriting prime used by Sachdeva and colleagues (2009) and a recall prime used by Zhong and Liljenquist (2006), and therefore was never tested before in current fashion. Both the combination of the tasks as well as the adjustments made on the tasks could have led to an unwanted effect. One possible explanation is that in the original recall prime used by Zhong and Liljenquist (2006), participants were asked to recall in detail either an ethical or an unethical deed from their past. In current experiment we asked the participants to recall a deed based on nine traits, which were associated to (im)morality (Aquino & Reed, 2002). So, different than in Zhong and Liljenquist (2006), we did not ask the participants explicitly to recall an ethical or unethical deed, because we did not want to give away the true purpose of

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the experiment. The nine traits might not be explicit enough for the recall task and therefore did not lead to a moral boost or a moral blow effect.

### **General discussion**

In two experiments we aimed to investigate the underlying process of physical cleansing when a moral threat occurs. In Experiment 1 we found that participants who received a moral buffer, liked the refuser more than participants who did not receive a moral buffer. This finding provides evidence that the positive effect of physical cleansing on the evaluation of the moral refuser in a moral threat situation (as in Cramwinckel et al., 2013), is due to a moral buffer rather than a clean slate. Although no other significant effects were found, patterns in Experiment 1 seemed in line with the moral buffer theory as well, and not with the alternative clean slate theory. In Experiment 2 we aimed to investigate to what extent physical cleansing would lead to a moral buffer, when people already had an increased or a decreased moral self-image. Unfortunately, no significant effects were found in this experiment. The absence of significant effects in Experiment 2 could be due to the small number of participants and/or the pioneering nature of the experiment.

However, overall results showed more support for the moral buffer than for the clean slate hypothesis. This implies that physical cleansing does not provide its beneficial effect in every moment during a moral confrontation. When preventing the feelings of being morally threatened and its negative effects, it is important that physical cleansing takes place before a moral threat occurs. That way it can reduce the negative effect of that moral threat by providing a moral buffer to the moral self-image. Furthermore, results implied that physical cleansing in the moral domain works in a specific way. Although previous research on physical cleansing in other domains, such as luck and post-decisional dissonance (Lee &

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Schwartz, 2010; Xu, Zwick & Schwarz, 2011), suggested that hand-washing psychologically removes traces of past behavior, in the moral domain it seemed likely that physical cleansing provides a buffer. This could be explained by the link people make between the abstract concept of morality and the concrete act of being physically clean (Basalou, 2008; Lee & Schwartz, 2010; Zhong & Liljenquist, 2006). Different than in other domains, people link physical cleanliness to moral purity. Therefore, a 'boost' to their physical cleanliness (e.g. by washing ones hand) will lead to a boost in their morality.

Further research could focus on the effect of physical cleansing on moral behavior when there is not a moral threat situation. Zhong and colleagues (2010) found that participants who cleansed their hands had more severe moral judgement on others, because they felt superior. Monin & Miller (2001) found that past moral behavior makes people more likely to do potentially immoral things without worrying about feeling or appearing immoral. Research could investigate if people want to compensate their enhanced moral self-image and therefore act immorally (Joosten, van Dijke, van Hiel & De Cremer, 2013; Merrit et al., 2010) or if the enhanced moral self-image would lead to more salience for moral behaviour, and people would therefore act in a more moral way.

We encounter moral dilemmas on a daily basis. When someone makes us feel morally threatened, we have negative feelings towards ourselves and the person who provides the moral threat (Cramwinckel et al., 2013; Monin et al., 2008), which can lead to conflict situations. When one physically cleanses him/herself before a moral threat occurs, a buffer is created so that one does not feel threatened, and the negative feelings one might develop about the person who draws the attention to our immoral behaviour will not occur. Of course one does not always know when a moral threat will occur, and to physically cleanse him/herself before a possible moral threat seems not always possible. However, when one is

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aware of a future moral discussion, physical cleansing can help to discuss a moral issue in a non-hostile manner.

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