

Investigating the Controversial Effects of Safety Behaviors in Anxiety Disorder Treatment. Exposure with Response Prevention versus Exposure plus Safety Behaviors and the Role of Commitment to Continue

Master's thesis

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Investigating the Controversial Effects of Safety Behaviors in Anxiety Disorder Treatment.

Exposure with Response Prevention versus Exposure plus Safety Behaviors and the Role of Commitment to Continue

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Abstract

Background and objectives: Traditionally the practice of safety behaviors by clients in in vivo exposure has widely been regarded as impeding treatment. This view has been challenged by Rachman, Radomsky, Shafran and Zysk (2011). Healthy participants repeatedly touched a contaminant in two sessions, in which half of the participants engaged in safety behavior (cleaning hands) while the other half did not. It was found that scores of contamination, fear, danger and disgust decreased in both sessions, and the effects were not impeded by safety behavior. For contamination, safety behaviors even had beneficial effects. This finding was critically replicated by Van den Hout, Engelhard, Toffolo and Van Uijen (2011), who obtained the same results. The current paper explicated on those findings by proposing 'commitment to continue' as a possible underlying condition, which could determine whether safety behaviors have harmful or helpful effects.

Method: The Van den Hout et al. (2011) study was replicated with 48 participants. As an additional variable, high or low commitment was implemented by means of verbal emphasis as well as the signing of a contract. A group undergoing exposure with response prevention was added.

Results: For contamination, safety behavior plus commitment was superior to mere exposure. Safety behaviors without commitment fell in between. The effects were mainly due to a fast drop for safety behavior plus commitment in the beginning. Towards the end of the trials, groups dropped alike.

Significant effects, but no group differences, were found for fear, danger and disgust.

Limitations: Findings were obtained from a non-clinical sample and no double blind was used.

Conclusion: This study was able to confirm the previous finding that safety behaviors are not always harmful, and may even have beneficial effects. Commitment seems to have an influence, at least for contamination, but the hypothesis that commitment is the determining factor for harmfulness vs. helpfulness of SB's could not be sustained. Clearly, more research in this area is needed.

1. Introduction

Anxiety disorders, defined as the experiencing of irrational fears, causing substantial impairment (American Psychiatric Association, 2000), constitute the most prevalent of mental disorder-clusters; about one third of the general population – at least in Western societies – experiences an anxiety disorder during lifetime, (Kessler, Berglund, Demler, Merikangas & Walters, 2005). Accordingly, these disorders also represent the most common diagnoses in mental health care settings (Kessler, Chiu, Demler & Walters, 2005). This high prevalence makes anxiety disorders an important aspect of clinical psychology, and optimization of its treatment an endeavor of great relevance.

Long-established and widely accepted, *In-vivo-exposure with response prevention* is the *bona fide* method of treatment for most anxiety disorders today. Although its origins lie in the work of Pavlov, Skinner and Watson and their behavioral learning theory of conditioning, Mowrer was the first to apply it to the treatment of anxiety, in the form of his two-factor-theory. According to Mowrer, fear of a certain, inherently harmless stimulus, such as a dog, is acquired through learning (Mowrer, 1951). This harmless, neutral stimulus – the 'conditioned stimulus' (CS) – becomes associated with a naturally frightening stimulus, the 'unconditioned stimulus' (US). This might e.g. be pain resulting from a dog bite through the (repeated) experience of co-occurrence of the two stimuli (CS+US). If CS and US no longer co-occur, as would be the case if one would encounter a number of dogs that do not bite, the association between the two is weakened, and fear of the CS declines or, in behavioral terms, undergoes extinction.

Although this process can obviously be quite adaptive, it nevertheless has its disadvantages, as it may also serve to maintain anxiety disorders. After the CS-US association is established, the CS is avoided: a person bitten by a dog is likely to forgo these animals. Yet, ironically, this avoidance of the feared stimuli has adverse effects, as it actually serves to sustain the fear. Avoiding the CS hampers disconfirmation of the CS-US-association, and this in turn leads to the persisting of avoidance, closing a vicious circle. *In-vivo-exposure* breaks this circle by repeatedly exposing a person to the CS, aiming at extinction.

Apart from avoidance, *safety behaviors* (SB) are another strategy commonly used by anxiety disorder patients in their struggle to handle fearful yet unavoidable situations (confrontations with the CS). Per definition, these behaviors aim at neutralizing or constricting the threatening aspect (CS) of a situation or, as Salkovskis (1991) puts it, they signify „overt or covert avoidance of feared outcomes that is carried out within a specific situation.“ While SB's may offer short-term relief to clients, on longer term they are believed to have adverse effects on anxiety. According to Mowrer's theory, SB's hinder clients from experiencing that feared situations (CS) will not disembody into the anticipated catastrophes (US), which hinders the disconfirmation of their fear, and thereby extinction (Salkovskis, 1991).

A number of studies have found supporting evidence for this presumption. Morgan's and Raffle's (1995) rather small sample of 16 social phobics improved significantly on various outcome-measures when instructions were given to drop safety behaviors, compared to mere exposure. A study by Wells et al., using a within-subjects-design in only 8 social phobics, yielded the same conclusions (Wells, Clark, Salkovskis, Ludgate, Hackmann & Gelder, 1999). Adverse effects of SB's were also found in two independent studies for claustrophobic fear-reduction (Sloan & Telch, 2002, Power, Smits & Telch, 2004). McManus, Sacadura and Clark (2005) found safety behaviors to be ineffective in reducing anxiety in a low-anxiety, as well as in a high-anxiety group. In line with these findings, it is at present generally accepted that during *In-vivo-exposure*, SB's have to be eliminated in order to succeed in reducing the patient's anxiety (*response prevention*).

However, this view has also been repeatedly challenged over the years. One of the first studies ever to rise doubts about the universality of the assumption that safety behaviors are harmful was carried out by De Silva and Rachman, dating back to 1983. In this study, agoraphobic participants were randomly placed either in a group who had to stay in a feared situation until their fear had dropped to a pre-defined level, or in a group that was free to leave the feared situation at any time. Surprisingly, these differences had no influence on fear reduction measured at the end of the experiment. The study was replicated in 1986. In this replication, participants reported even *less* fear in the escape-condition, with the effects still evident at a 3-month follow up (Rachman, Craske, Tallman & Solyom, 1986). Based on these studies, Sartory, Master and Rachman (1989) tested an intervention for social phobia including safety behaviors. They used the therapist as a safety signal and encouraged participants to walk towards the therapist. Although this intervention proved to be comparable effective to a traditional exposure-intervention, the overall-effects for both interventions were very small. This setback may have been the reason why the interest in the subject apparently dwindled as, to the author's knowledge, no further studies on this subject were published for about 20 years, until the end of the 2000's. At that time, a theoretical article was published by Rachman, Radomsky and Shafran, (2008) who pleaded for the use of safety behaviors and a reconsideration of the subject. Following this article, Milosevic and Radomsky (2008) allowed one group of snake-phobics to wear gloves while approaching snakes, while the other half was not allowed to wear any protective gear. Both groups improved equally, but the group wearing the gloves was able to approach the snakes faster and reported less stress in the process. Another study was published shortly after, reporting equal effectiveness of SB's compared to traditional exposure for claustrophobic patients (Deacon, Sy, Lickel & Nelson, 2010). The same authors later also found various positive effects of SB's in claustrophobics, e.g. heightened self-efficacy (Sy, Dixon, Lickel, Nelson & Deacon, 2011). Furthermore, in a study by Hood et al., published in the same year as Deacon's et al.'s first article, participants with a spider-phobia were able to approach spiders more quickly when using SB's (Hood, Anthony, Koemer & Monson, 2010).

The newest addition to this line of research comes from Rachman, Radomsky & Shafran (2011). Their study evaluated the effects of typical OCD-cleaning behaviors in 80 healthy participants. It was hypothesized that adding safety behaviors would not have a negative effects on the reduction of negative feelings, compared to response prevention. Initially, participants had to touch 6 dirty objects and report their feelings of contamination, 'fear', 'danger' and 'disgust' (referred to as CFDD) on a 1-100 scale. The highest rating object was selected for use during two subsequent sessions. Over the course of these two sessions, participants had to touch the object repeatedly. As independent variable, one group was allowed to use hygienic wipes after each trial as long as they wished, until their hands felt clean (SB+). The other group merely reported their feelings after a delay of 30 seconds (traditional exposure with response prevention, ERP). It was found that, for both groups, drops in scores for fear, danger and disgust were similar, whilst the reduction in feelings of contamination in the SB+ group exceeded the reduction in the traditional exposure group. This rendered the use of safety behaviors evenly effective, respectively even more effective than traditional exposure. Rachman's findings suggest that, at least in OCD and under certain conditions, SB's might not be hindering the extinction process. On the contrary, they may even be *beneficial*, especially in early stages of treatment, perhaps especially in reluctant clients who are not able to persevere a full blown exposure at once.

In the same year, this study was replicated by Van den Hout, Engelhard, Toffolo & van Uijen (2011), who identified and addressed some weaknesses of the original study. To make sure that the effects in both groups were not mere artifacts of the assessments, a non-treatment control group was added. Secondly, the cleaning time in the SB+ group was restricted to 30 seconds in order to match the traditional exposure group. Thirdly, only participants in the SB+ group in Rachman et al.'s (2011) study were told that the treatment might have positive effects. To prevent unintended influences due to this fact, the traditional exposure group received the same information in the replication. Regardless of these methodological improvements, the effects mainly held up. Again, both treatments were comparably effective, and both were significantly more effective than no treatment, for all measures. However, SB+ was only more effective for contamination during the first session.

In summary, the available body of research provides a somewhat contradictory, confusing picture that gives rise to the appealing question why SB's seem to be harmful at times, while at others they seem not to be disadvantageous at all. What could be the factor determining the difference between the effectiveness vs. harmfulness of safety behaviors?

One explanation is that the hampering effects of SB's are undermined by an explicit commitment to return into the feared situation after the exposure trial in which the SB is exhibited. The knowledge that one has to return into the feared situation may change the meaning of safety behaviors. One knows that contamination will rise its head again and SBs no longer provide an escape-route. Basically, the prospect of re-contamination should make the SB's irrelevant. In this manner, the disconfirmation-hindering aspect of the SBs, which is believed to undermine effective exposure, is neutralized. Disconfirmation takes place and fear dwindles. Thus, the fear-reducing effects of exposure are not hindered by the SB. SB's may even be beneficial, as the interim relief could enable patients to tolerate intensified and lengthened exposure, thereby facilitating the effects of exposure and reducing dropout. If so, cautious use of SB's might perhaps even advance treatment via exposure, as high drop-out rates surely form a severe problem in the field at this point.

According to this theory, exposure combined with SB's plus commitment to continue should thus be at least as effective as traditional *exposure with response prevention* in reducing CFDD feelings. In concordance with the findings of Rachman (2011) it may even be more beneficial, at least for contamination. On the other hand, exposure with SB's but without commitment to continue should be less effective than the two other interventions. These expectations form the first main hypothesis of this experiment.

Another question is whether the reduced stressfulness of exposure with SB may favor a *faster* reduction of CFDD, especially of contamination. This second hypothesis was suggested by a non-significant trend in Van den Hout et al.'s experiment and would be in line with the above mentioned findings of Milosevic and Radomsky (2008). A faster drop may be especially interesting if ERP and SB+C+exposure prove to have roughly the same overall effectiveness. Naturally, a less stressful and faster treatment would then still be preferable.

The experiment at hand was designed to put these hypotheses to the test, adopting the basic design of Van den Hout et al.'s (2011) experiment.

Once again, feelings of CFDD were the dependent variables, measured on a 1-100 scale. Apart from the first independent variable *utilization of safety behaviors* (vs. *response prevention*), another independent variable, namely *commitment*, was added. Commitment was stressed verbally and in the form of a written contract. As participants could, for ethical reasons, not be obliged to complete the experiment, one group was asked to commit to doing their absolute best to finish. With low commitment, it was stressed that participants might stop at any given time. In the previous experiments, hygienic wipes were used for safety behavior. However, as the credibility of these wipes being antibacterial was not optimal, it was opted for liquid disinfectant instead.

Analogous to the main hypotheses, there were three groups. As in Van den Hout's experiment (2011), there was one group undergoing traditional exposure plus response prevention (SB-C+). Two groups were allowed to use disinfectant as safety

behavior, one of them with commitment (SB+C+) and one without (SB+C-). Contrary to Van den Hout et al.'s experiment, no non-treatment control group was added, as Van den Hout et al.'s experiment (2011) already proved the relative effectiveness of traditional exposure as well as exposure including SB's.

The procedure was adapted from Van den Hout's experiment, (2011): the experiment started with a pre-test, requiring participants to touch 6 different dirty objects. The same objects as in Van den Hout's experiment (2011) were used, yet care was taken to increase perceived dirtiness, as in the previous experiments some of the objects regularly evoked low scores. Subsequently, one item was selected and 20 trials followed. Lastly, participants had to rate all items again during a post-test, while not being allowed to use safety behavior. Contrary to the Van den Hout experiment (2011), only one session was used, as two were not required for the current hypothesis. According to the hypothesis, it was concretely expected that SB+C+ would be comparable or more effective than ERP, whilst SB+C- was expected to be much less effective in decreasing CFDD-scores. The overall effectiveness of the interventions was evaluated by comparing levels of *CFDD-scores* before and after the trials. In the previous experiments participants were allowed to wipe their hands after the post-measurement. As this could have confounded the outcomes, in this experiment, pre-post comparisons were additionally made between pre-test and post-test, where safety behaviors were not allowed. Also, CFDD assessments were made after each of the 20 trials. This allowed to test the second hypothesis, stating that contamination-scores for SB+C+ drop faster than for ERP and less for SB+C-.

Apart from the main hypotheses, the design also allowed for the testing of several additional hypotheses.

An interesting aspect is participants' subjective feeling of control over their emotional reactions. It seems logical that as feelings of CFDD decrease, control over these feelings increase, as was found by Van den Hout et al. (2011). If there are differences in drops between groups, it may be assumed that the magnitude of changes in control mirror these differences.

Lastly, one may wonder whether effects will generalize to other objects. Overall, generalization is an important issue for real-life applicability, as exposure to all occurrences of a feared object is hardly achievable. Van den Hout et al. (2011) investigated generalization of effects in their experiment. They, however, did not find any effects, yet this may likely be due to a methodological weakness. That is, scores for all objects were averaged, but as mentioned before, some objects evoked very low scores at the beginning, leaving little space for further improvement, which could have caused a floor effect. The current experiment therefore excluded very low pretest-scores. Only objects that initially evoked scores higher than 20 (on a 0-100 scale) were averaged and a weighted mean, taking the number of objects into account, was calculated for each participant.

2. Methods

2.1. Participants

The sample of 48 Participants (*mean age 23,98; SD 6,21*) consisted of student volunteers from the University of Utrecht. 31 were female. Participants were given a choice between payment and course credit for their participation. Initially, 62 students were invited to participate. Participants with a score of less than 50 on contamination at the pre-test (see below) were excluded from the study (n=10). Furthermore, 2 participants did not complete the study and another 2 participants were excluded because they did not believe in the effectiveness of the disinfectant.

2.2. Procedure

One 45-minute session was held with each participant, consisting of the introductory sequence (including signing of the contract), the baseline measurement, the experimental trials, the generalization and finally the debriefing.

2.2.1. Introduction & Contract

After welcoming the participant, the procedure was verbally explained to the participant. In line with the concordant condition, obligation to continue or freedom to stop was stressed. For the contract- condition, it was explained that participation was voluntary and completion of the experiment was not required, as the data could be used in any case; this was emphasized both verbally and in the following contract. For the contract+ condition, it was stressed that although participation was voluntary, the data could not be used when the experiment would be terminated early, and that as of this reason the participant was asked to do his/her absolute best to complete the experiment. This was emphasized both verbally and contractually. Subsequently informed consent was obtained from the participant. The informed consent sheet included a paragraph featuring the following texts, version A being included in the contract+ condition and version B in the contract- condition:

A) "Importance completion

Participation in the experiment is voluntary. It is for this experiment however of great importance that participants do not end the experiment prematurely, as the data will otherwise be unusable for the researchers. By lending his/her consent to the experiment, the participant thus declares to perform his/her utmost best to finish the series of 20 trials."

B) "Voluntariness"

The participant is completely free in deciding whether or not to continue with the experiment. If the experiment is experienced as unpleasant or annoying, the participant can quit at any moment. Finishing the experiment is not necessary for the usability of the data. By lending his/her consent to the experiment, the participant declares to know that it is voluntary, and that participant is authorized to quit the trials."

2.2.2. Baseline measurement

Participants were then presented with the 6 objects in a random order and were asked to touch them and rate their feelings of CFDD (see 2.3.1). In order to increase perceived dirtiness, the experimenter wore rubber gloves while handling the objects. Neither rubber gloves nor disinfectant were offered to the participant. Following the baseline measurement the object with the highest contamination-rating was selected for usage in the experimental trials, with a minimum required contamination score of 50.

2.2.3. Experimental trials

After obtaining expectancy-scores participants were presented with the chosen object. Firstly, participants were asked to report their expected decline in CFDD-emotions (see 2.5.2). Following this, the participant was allowed to commence with the first trial: he/she was asked to touch the object and report their feelings of CFDD on the 0-100 scale (see 2.5.1). In the two conditions allowing for safety behavior, disinfectant was offered after each presentation and participants were asked to rub their hands with it for 30 sec (see 2.3.2). In the condition not allowing for safety behavior, participants were asked to wait for 30 sec. After this, all participants were asked to report their feelings of CFDD. This procedure was repeated 20 times. After trial 1 and trial 20, perceived control ratings were obtained from participants (see 2.5.3).

2.2.4. Generalization

After the last trial, participants were asked to reduce any persisting feelings of CFDD. Then the 6 contaminants were presented again in the same order as in the pre-test, and participants were asked to touch them and rate their feelings of CFDD without being allowed to use the soap. Finally, 3 manipulation checks were carried out. The first one entailed perceived effectiveness of the contract; participants were asked to answer the following question on a scale from 1 (not at all) to 5 (extremely): *'The contract I had to sign had a substantial effect on my decision to finish/stop with the experiment.'* The second question was to assess whether participants were considering quitting the experiment at any point during the trials (but continued despite their hesitation): *'I considered quitting the experiment.'* This question was answered on the same 1 – 5 scale.

The final manipulation check was to ensure that participants believed in the effectiveness of the soap: *'I had the feeling that my hands were cleaner after using the soap.'* This question was only asked in the SB+ condition, and if answered in the negative the participant's data set was excluded from the total analysis (N=2). After answering these questions, the participant was told the experiment was over.

2.2.5. Debriefing

Subsequently, participants were debriefed verbally and by letter.

2.3. Materials

2.3.1. Objects

In accordance with Van den Hout and colleagues, a variety of 6 different 'contaminants' (dirty objects) were used:

- 1) *Shoe*. The sole of the participants' own shoes, which the participants were asked to rub three times.
- 2) *Money*. A stained and ripped five Euro bill and some old coins in a plastic bag.
- 3) *Garbage*. A small, old looking garbage can filled with (safe) collected garbage: food wrappers, used coffee cups, straws, tissues and a small empty bottle. To increase dirtiness, a wet tissue was temporarily added to the contents. Also, the opening of the can was rubbed in with a touch of honey.
- 4) *Phone*. An old, dusty, dirty looking phone, whose dial-numbers were also rubbed in with a small amount of honey to make it slightly sticky.
- 5) *Culture sample*. A 50 ml test tube containing water mixed with make-up to provide a non-transparent brown color. The test tube label read "PATH 194, 01.09.08", and it was contained in a small zipped bag labeled "Biohazard".
- 6) *Lab specimen*. A small biohazard zip bag containing a surgical glove, a disposable oral thermometer, open grimly looking band-aid, a 2 ml micro-tube containing a drop of hand sanitizer, a small piece of ripped rolled-up gauze and a cotton stick.

2.3.2. Disinfectant

A 500 ml bottle with dispenser of an antibacterial disinfectant with the brand name 'Sterilium' was used as 'disinfectant'. The bottle actually contained only a small amount of the disinfectant (just enough for the solution to remain having a blue color and a distinctive odor) which was highly diluted with water, to prevent participants' hands from drying out.

2.3.3 Software

For randomization of contaminants, presenting order and condition-assignment, the website <http://www.randomizer.org> was used. To analyze the data, the software: 'Statistical Package for the Social Sciences' SPSS © version 17 by IBM was used.

2.4. Design

The independent variables were *utilization of safety behavior* and *commitment to continue*.

The dependent variables were *feelings of CFDD* as well as *feelings of control*

There were three experimental conditions:

- 1) SB + Contract + (participants were committed to finish the experiment, with soap usage)
- 2) SB + Contract- (participants were under no pressure to finish the experiment, with soap usage)
- 3) SB - Contract+ (participants were committed to finish the experiment, no soap usage)

2.5. Measures

2.5.1 Feelings

To measure the amount of intensity of feelings the CFDD scale was used, which measures contamination, fear (of contamination), disgust and danger on a scale from 0 to 100. Using contamination as an example, it was explained to each participant that 0 equaled no feelings of contamination whatsoever, whereas 100 equaled the maximum amount of contamination the participant could feel. By comparison, 50 equaled a decent amount of contamination, but manageable nonetheless. In order to subsequently gauge the emotions during Pre-test and Post-test, the following question was continually asked right after touching each object: *'How much contamination/danger/fear of contamination/disgust do you feel now (on a scale from 0-100)?'* The same question was asked right after each touch during the trials, with the addition that it was asked again after a 30-second interval during which the participant either washed their hands (SB+) or waited (SB-).

2.5.2. Perceived control

Degree of perceived control was measured with the question: *'How much control do you feel over your feelings of contamination/fear of contamination/danger/disgust on a scale from 0-100?'* This question was asked twice: the first time after the first trial, and secondly after the twentieth trial, in order to assess whether participants' perceived feelings of control underwent a change during the course of 20 trials.

3. Results

3.1 Pre-post changes of CFDD

Pre-post changes were evaluated twice, with two different moments in time as post-measurement : between pre-test and post-test and between pretest and trial 20-pre-measurement, with 8 3x2 split plot ANOVA's, for all CFDD separately. In all ANOVA's, condition (SB+C+, SB+C-, SB-C+) was the between-group factor and time (pretest vs. posttest) the within-group factor. An overall reduction in scores, as well as a difference in reduction between conditions were expected. It was hypothesized that the decrease in scores would be greater or equal for the SB+C+ compared to the SB-C+ condition and that the decrease for the SB+C- condition would be smaller compared to the other two conditions. Additionally, it was of interest whether the results would differ contingent on the use of either posttest or trial 20 as post-rating. The results showed significant main effects for time for all CFDD and both post-measures, indicating an overall reduction in scores, irrespective of condition, as expected: For Pre-test to trial 20 (see also figure 1): Disgust: $F(1, 45) = 92.33, p < .001, \eta^2 = .672$. Contamination: $F(1,45) = 151.15, p < .001, \eta^2 = .771$. Fear: $F(1,45) = 65.89, p < .001, \eta^2 = .594$. Danger: $F(1,45) = 35.10, p < .001, \eta^2 = .438$. For pretest – posttest (see also figure 2): Disgust: $F(1,45) = 76.37, p < .001, \eta^2 = .629$. Contamination: $F(1,45) = 144.36, p < .001, \eta^2 = .762$. Fear: $F(1,45) = 63.00, p < .001, \eta^2 = .583$. Danger: $F(1,45) = 33.31, p < .001, \eta^2 = .425$.

However, in contrast to the hypothesis, there were no differences between conditions for the decrease of scores, for three out of four CFDD measures. The exception was contamination, as indicated by an interaction effect between time and condition. For pretest – trial20: $F(2,45) = 3.30, p = .046, \eta^2 = .128$. For pretest – posttest: $F(2,45) = .95, p = .021, \eta^2 = .157$. All other time x condition interactions $F_s(2,45), p_s > .076$.

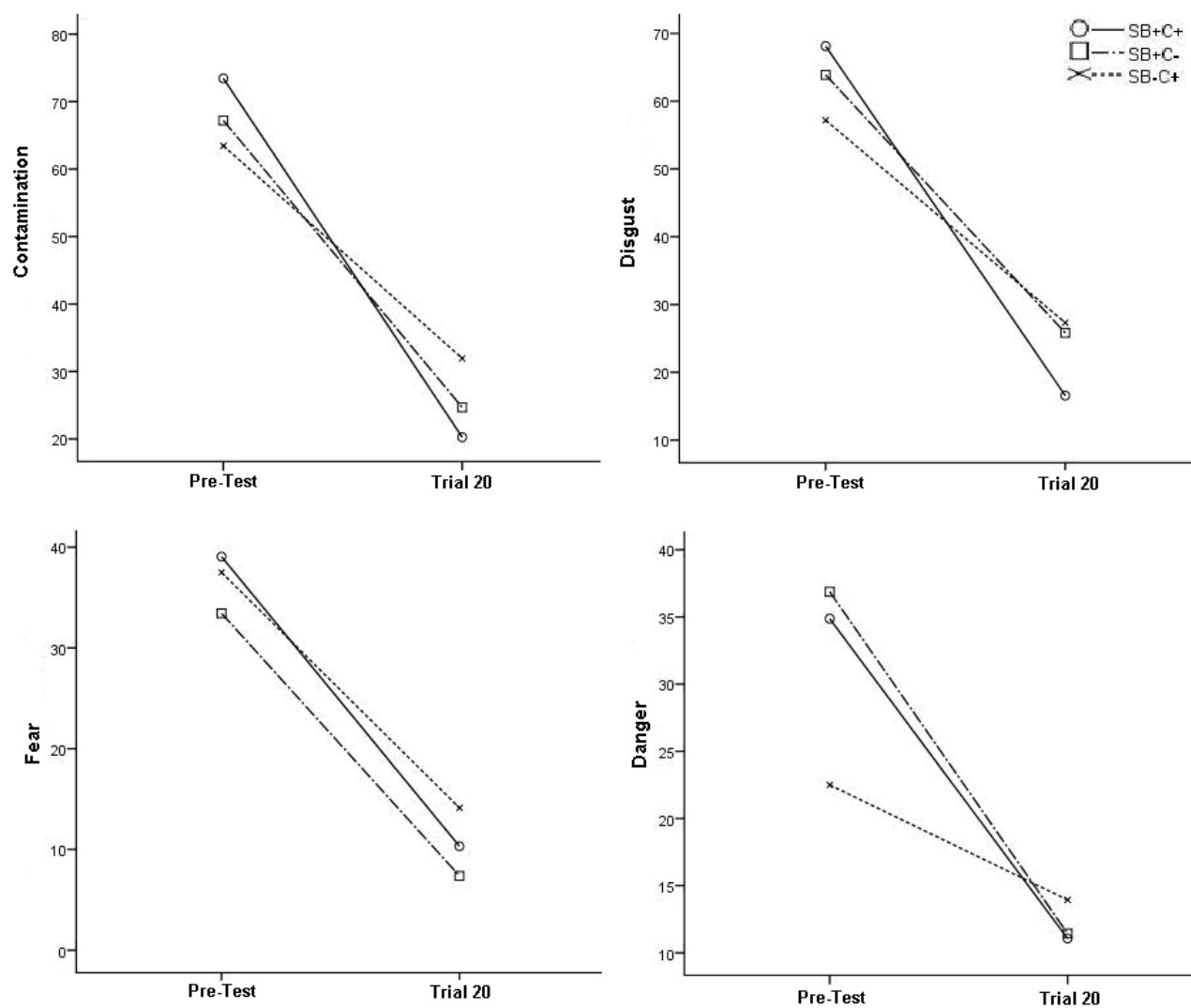


Figure 1. Reported feelings of contamination, disgust, danger and fear respectively at pre-test and trial 20

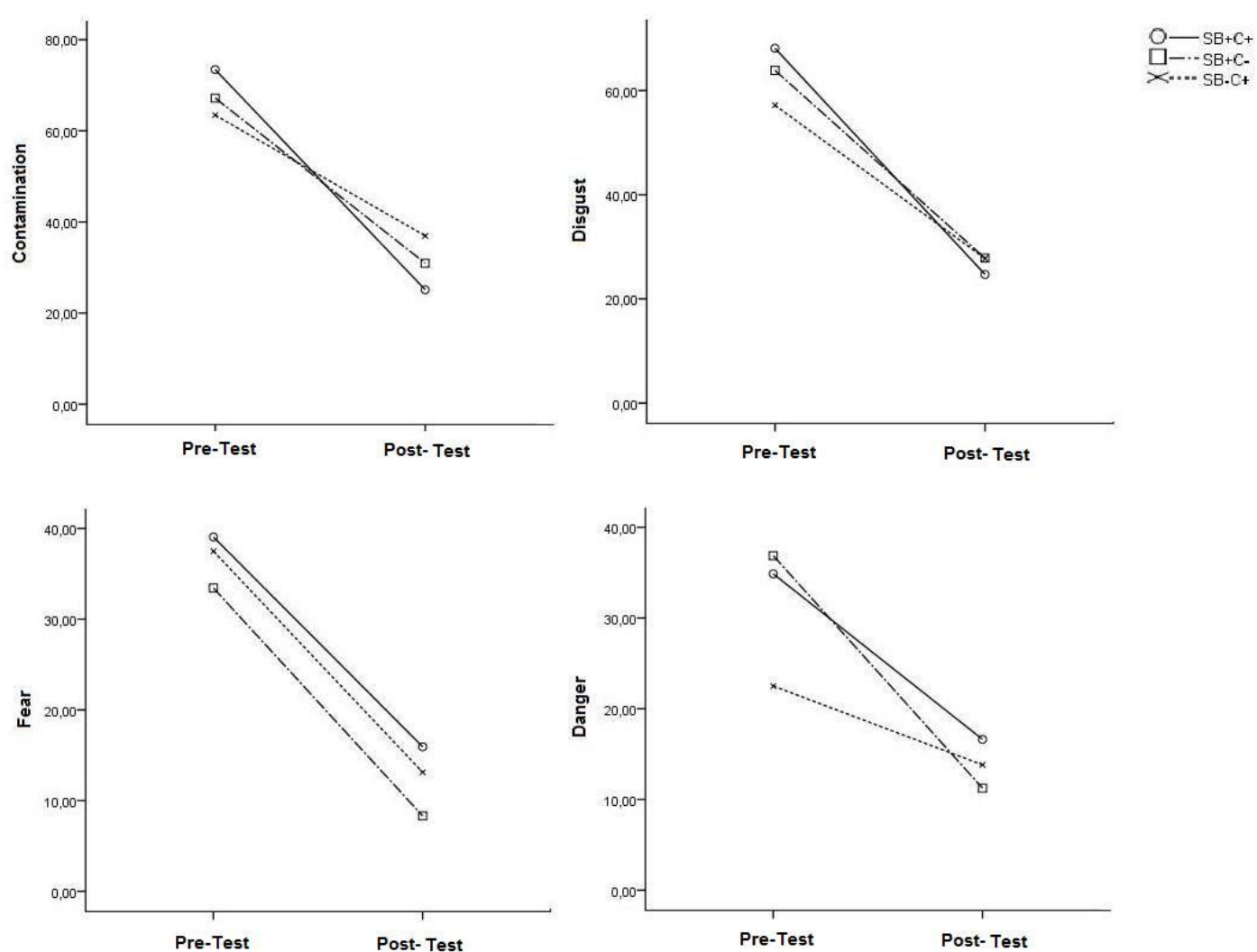


Figure 2. Reported feelings of contamination, disgust, danger and fear respectively, at pre-test and post-test.

To examine which conditions differed for contamination, pair-wise comparisons were made for pre to post and pre to trial 20 difference scores, using t-tests. The results showed that the decrease for SB+C+ was superior to SB-C+: For pre - trial20: $t(30) = -2.289, p = 0.29, d = .81$. For pre - post: $t(30) = -2.861, p = .12, d = .95$. The decrease for SB+C- lay in between SB+C+ and SB-C+ and did not differ from either condition. For pre to trial 20: SB+C- - SB+C+ $t(24.4) = -1.312, p = .202, d = .46$, SB+C- - SB-C+ (equal

variances not assumed) $t(25.81) = -1.445, p = .160, d = .51$. For pre - post: SB+C- - SB+C+ $t(30) = -1.656, p = .108, d = .59$, SB+C- - SB-C+ $t(30) = -1.356, p = .185, d = .48$. Lastly, there were no significant main effects for condition. All $F_s(2,45) < .596, p_s > .556$.

3.2 Time course of effects

To evaluate the time course of effects per condition, quadratic trends were analyzed with a 3x22 MANOVA with condition as between-subject -factor (SB+C-, SB+C+, SB-C-) and time as within subject factor (pretest, trial 1-20, posttest) was carried out for CFDD separately. The quadratic trends for time were significant for all measures: Disgust: $F(1,45) = 47.469$, $p < .001$, $\eta^2 = .513$ Contamination: $F(1,45) = 70.061$, $p < .001$, $\eta^2 = .609$. Fear $F(1,45) = 34.758$, $p < .001$, $\eta^2 = .436$. Danger: $F(1,45) = 29.452$, $p < .001$, $\eta^2 = .396$, indicating a non-linear reduction in scores (see also figure 3). However, there was only one significant time x condition interaction, namely for contamination, indicating differences in the time course of score-reduction between conditions: $F(2,45) = 3.211$, $p = .050$, $\eta^2 = .125$. All other time x condition interactions: $F_s(2,45) < .2554$, $p_s > .084$. In separate trend analyses, the quadratic trend was significant for each condition, indicating that score-reduction in all conditions follow a nonlinear curve. SB+C+: $F(1,45) = 31.620$, $p < .001$, $\eta^2 = .678$. SB+C-: $F(1,45) = 29.238$, $p < .001$, $\eta^2 = .661$. SB-C+: $F(1,45) = 13.078$, $p = .003$, $\eta^2 = .466$. To investigate in which

condition scores dropped fastest, two separate ANOVAS (trial 1-10, 10-20) with the same design as used for the pre - post changes of effects were carried out. The results of the trial 1-10-ANOVA mirrored the overall pre - post effects. There was a main effect for time $F(1,45) = 59.431$, $p < .001$, $\eta^2 = .569$ and a significant interaction effect $F(2,45) = 3.505$, $p = .038$, $\eta^2 = .135$ and the conditions differed from each other in the same way: SB+C- - SB+C+ (equal variances not assumed) $t(24.9) = -1.378$, $p = .180$, $d = .49$. SB+C- - SB-C+ $t(30) = -1.436$, $p = .161$, $d = .85$. SB+C+ - SB-C+: $t(30) = -2.402$, $p = .023$, $d = .51$. However, for the second ANOVA, covering trial 10-20, the results were different. Scores dropped significantly, indicated by a main effect of time, $F(1,45) = 12.533$, $p = .001$, $\eta^2 = .218$, but there was no longer a difference between conditions, indicated by no significant interaction effect between time x condition $F(2,45) = .920$, $p = .406$. Taken together, the effects indicated that scores dropped faster for the SB+C+ condition than for the SB-C+ condition during the first half of the intervention, with the SB+C- condition laying in between, but all conditions decreased to the same degree in the second half.

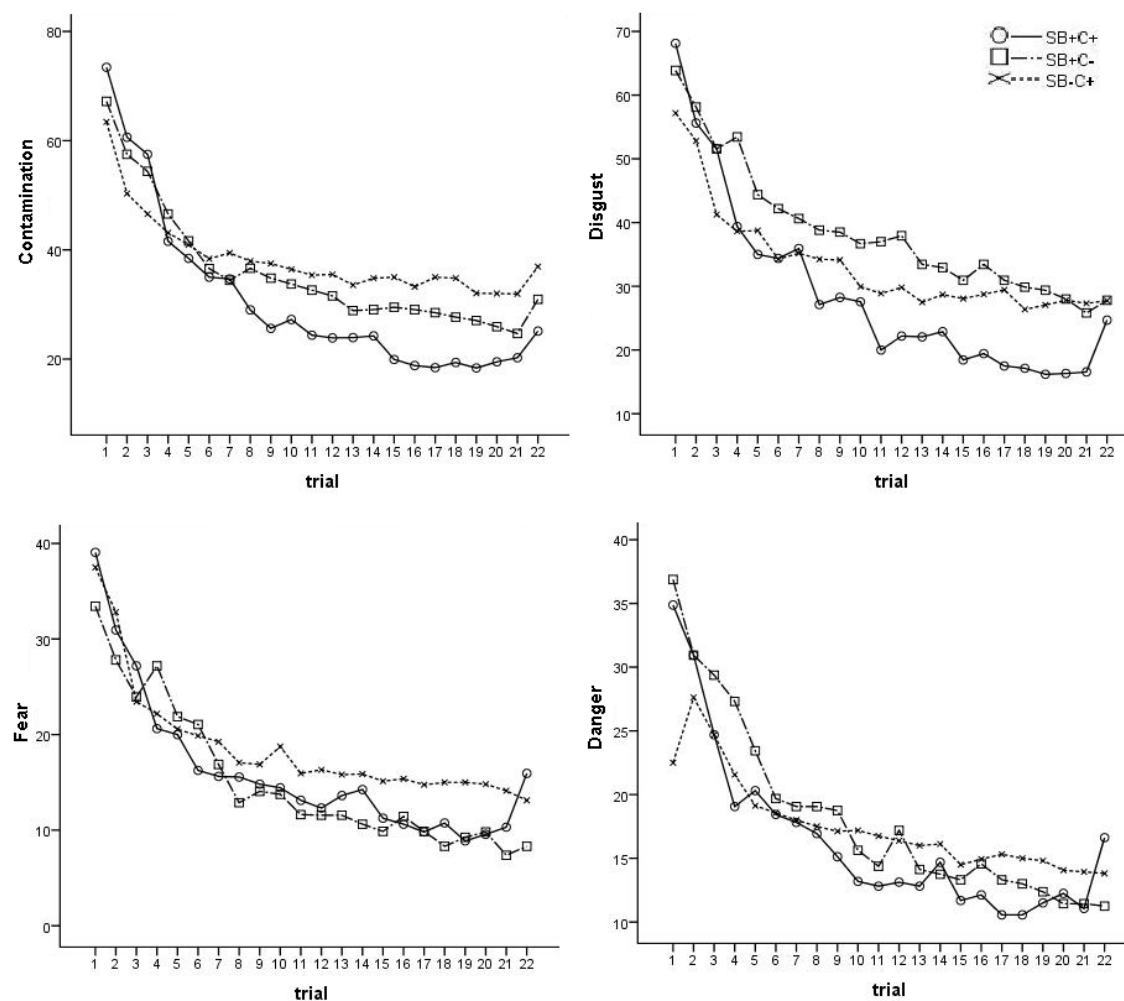


Figure 3. Trend analysis measuring scores of contamination, disgust, danger and fear respectively. Trial 1 indicates pre-test, trial 22 indicates Post-test.

3.3 Generalization

To test whether the effects of the interventions would generalize from the target item to the unselected items, scores on all items from the pre-test, with exclusion of items scoring < 20 , (to prevent a floor effect), were averaged for each participant. The same was done for the post-test. The resulting mean-generalization scores were analyzed with a 3x2 split plot ANOVA with condition (SB+C+, SB+C-, SB-C+) as between-group factor and time (pretest vs. posttest) as within-group factor. This procedure was only carried out for contamination, the most central measure. One participant was excluded from the analysis, as he had no scores ≥ 20 , other than the target item. It was expected that scores would overall be lower at the post-test. Besides that, it was also of interest whether the effects would differ for the conditions. This was not the case. There was neither an interaction effect between condition and time, $F(2,44) = 1.50$, $p = .235$, $\eta^2 = .064$, nor a main effect for condition, $F(2,44) = .717$, $p = .494$, $\eta^2 = .032$. However, the results did show a drop in mean-contamination scores from the pre- to the posttest, indicated by a main effect for time: $F(2,44) = 8.07$, $p = .007$, $\eta^2 = .155$ (see also table 1).

Table 1
Mean (SD) generalization scores for contamination at pre-test and post-test

	Object Generalization	
	Pre-Test	Post-Test
SB+C+	45.5 (14.3)	32.9 (18.1)
SB+C-	44.1 (12.4)	42.0 (20.0)
SB-C+	39.9 (14.8)	33.6 (20.7)

3.4 Subjective feelings of control

Participants' feelings of control over CFDD feelings were compared pre- to posttest, with an ANOVA using the same design as before. It was expected that control would increase inversely proportional to the decrease in scores and would mirror the differences in conditions found for the decrease of scores. However, in contrast to this hypothesis there were no changes over time whatsoever, indicated by no main effects for time for all CFDD. All $F_s(1,45) < 3.102$, $p_s > .085$. Accordingly, there were also no interaction effects between time and condition. All $F_s(2,45) < 2.006$, $p_s > .146$. However, differences emerged between the conditions in feelings of control over disgust (irrespective of time), $F(2,45) = 3.485$, $p = .039$, $\eta^2 = .134$. All other CFDD: $F_s(2,45) < 1.897$, $p_s > .162$. For disgust, pair-wise comparisons were conducted for pre-post control mean scores, using t-tests, to evaluate which conditions differed. The results showed that both SB+ conditions had significantly higher control-scores than the SB- condition. SB-C+ - SB+C+: $t(30) = 2.367$, $p = .025$, $d = .84$, SB-C+ - SB+C-: $t(30) = 2.176$, $p = .038$, $d = .80$. The SB+ conditions did not differ from each other: $t(30) = -.156$, $p = .877$, $d = .06$ (see also table 2).

Table 2
Mean (SD) feelings of control over disgust at Trial 1 and Trial 20

	Feelings of Control (Disgust)	
	Trial 1	Trial 20
SB+C+	65.9 (19.6)	63.1 (24.1)
SB+C-	65.9 (26.8)	65.6 (29.6)
SB-C+	40.6 (25.2)	52.3 (27.2)

4. Discussion

The present study attempted to clarify how safety behaviors seem to be a hindrance in exposure-therapy at some times, while at others they may not only be harmless, but even beneficial.

The main hypothesis stated that the determining factor for this was commitment to continue. Three groups, in which the use of SB's and commitment was manipulated, were compared. It was expected that high commitment combined with SB's would lead to fast and substantial improvement, perhaps even outweighing traditional exposure. On the other hand, low commitment plus SB's was expected to lead to little improvement.

First of all, group differences were only found for one of the four outcome-measures, namely 'contamination'. This was expected, as in both Rachman et al's (2011) and Van den Hout et al's (2011) experiment, group differences were also only found for this measure. Nonetheless, the fact that for 'disgust', as well as for 'fear' and 'danger', the groups performed alike should make one cautious when interpreting the effects for 'contamination'. On the other hand, contamination was the most central measure of the experiment. Rachman et al. mention in their article that fear, danger, and disgust are merely "associated perceptions" (2011). Furthermore, participants often mentioned that they believed they would not be asked to touch actual dangerous objects in an experimental setting, which led them to report low fear and danger, even at the beginning of the experiment. Floor effects for these measures thus seem likely.

Feelings of contamination dropped furthest in the 'commitment plus SB'-group, making this intervention significantly more effective than traditional exposure, very much in line with the expectancies. However, low commitment did not lead to the smallest of effects: the drops in scores for the SB+C-group were *greater* than for traditional exposure, but less than for safety behaviors with high commitment, thus laying in the middle. As a consequence, the low commitment-group did not differ from the other two groups; SB+C- is statistically not more effective than traditional exposure, and at the same time not less effective than safety behaviors with commitment. The results are therefore somewhat inconclusive with regards to the hypothesis that commitment is the crucial factor for the impact of safety behaviors.

In contrast to this conclusion, the results are much clearer solely with regard to the role of safety behaviors. This study provides additional evidence that safety behaviors are not as harmful as previously thought, replicating Rachman et al.'s (2011) and Van den Hout et al.'s (2011) findings. For three out of four measures, the groups with SB's performed equally well as traditional exposure; for contamination it was even more efficient. Moreover, this study provides evidence that the effects hold true, even when participants are not allowed to carry out safety behaviors at the post-test, as was the case in the previous experiments.

The time-course of effects sheds additional light on the effects of safety behaviors. As in Van den Hout et al.'s earlier experiment, quadratic trends were found for all measures, indicating a nonuniform drop, stronger at first and less strong in the end. Of particular interest is the fact that, contrasting to Van den Hout et al.'s earlier experiment (2011), there was also a difference between conditions in the course for contamination. In the first half, the SB+C+ condition was more effective than traditional exposure (SB-C+) and the SB+C- condition lay in between. In the second half, there was still a drop evident, but neither of the conditions dropped faster than the other. Thus, the effects for SB+C+ are, as expected, not only greater but also faster. This advantages safety behaviors over traditional exposure, as it is likely to enhance adherence to treatment. From visual inspection of the data, it can be seen that scores rise a bit in all conditions at the post-test for contamination. This may be due to carry-over effects from other objects, as this test was part of the generalization test. However, for danger, fear and disgust, the effect seems stronger for SB+C+. Therefore, it may be beneficial to split generalization and post-test in future replication and investigate this further.

Another point pleading for the use of safety behaviors is that, at least for contamination, the benefits generalized to other objects. Of course, this is a very important point for external validity and real-life applicability. This effect was not found in Van den Hout's experiment, but this was very likely due to a floor effect, which was addressed in this research.

The effects regarding subjective control over the experienced CFDD-feelings are puzzling. In contrast to the expectation, there was no change over time for all measures. The reasons for this remain unclear; for some measures it might be a ceiling effect, as control often tended to be quite high, even at the pre-measurement. The mode for control over fear at the pre-measurement, for example, was 90 (1-100). However, there was a significant difference between the conditions, regardless of time. Control over feelings of disgust in both safety behavior conditions was much higher than in the traditional exposure condition. In principle, this could speak in favor of the use of safety behavior. Yet, because it is such an isolated result, conclusions should be drawn very carefully – especially so, as only disgust differed. Interestingly, Van den Hout et al. did find increases in control from pre- to post-test for all measures except for fear. For disgust, control increased only for the SB+ condition, solely during session one.

The impending question remains how the found effects with regard to commitment and safety behaviors can be interpreted. This study has some methodological shortcomings that might have played a role.

First, it is possible that the contract did not have enough impact, perhaps because it was not implemented forcefully enough, or because the commitment was not strong enough; for ethical reasons, participants could not be forced to complete the experiment. An argument supporting this possibility is that the majority of participants declared that they were barely or not at all influenced by the contract. On the other hand, the fact that they thought they were not influenced does not have to mean that they really were not.

Another possibility may be that the sheer impact of being in the participant role in an experimental situation overruled the impact of the contract so that participants felt obliged to continue in either condition. If one thinks of Milgram's classical experiment, where participants willingly administered what would have been deadly shocks to a stranger (Milgram, 1963), it should be clear that this role can have a powerful influence. The great majority of participants indeed declared that they did not think of stopping. Additionally, participants were paid for their participation and many declared that it therefore would not have felt fair to them to discontinue participation at an early stage.

Besides these shortcomings the study also had a number of more general limitations that potentially could have influenced the outcome. Because of the nature of the procedure, it was not possible to use a double-blind-design. As the experiment involved a great extent of direct contact between experimenter and participant, it is quite possible that the experimenters unintentionally influenced the participants, for example through mimic.

Nevertheless, it is quite possible that the results are not solely the outcome of methodological limitations, especially as this study had many strong points as well, e. g. a careful design, including manipulation checks and appendant exclusion criteria, control for possible floor effects and a decent sample size. Commitment may have a small effect as the SB-conditions show nonsignificant trends to not perform alike. However, as they may very well add to or modify the effects of SB's a little, it is not reasonable to assume that commitment is a strong moderator to the effects of SB's. An explanation for the small effects may be that commitment heightens the intrinsic motivation of the participants. As they committed to do their absolute best, they may have tried to live up to this promise. Another possibility may be that low commitment somehow has a negative influence. However, a clear statement in this matter could only have been made if a group without SB's and commitment would have been included, so that the effects of commitment could have been looked at separately. In summary, the role of commitment remains somewhat unclear at this moment and more research in this matter is needed.

Unfortunately, it seems that, as this research project was not able to provide a clear answer, the present data render it all in all somewhat unlikely that commitment is the only variable that distinguishes between helpful vs. harmful effects of SB's. But if commitment is not the crucial factor, what is? There are some other possibilities that are worthy of research attention:

Perhaps the difference lies in the nature of safety behaviors. Washing one's hands is an active act. It might be that actively doing something leads to experiencing the self as competent and in control. This experience could lead to having higher self-efficacy and being less vulnerable to negative emotions, such as fear and feelings of danger, etc. Exposure with response prevention, on the other hand, often involves acting passively (f.e. by just staying in a situation). This could lead to feeling incompetent and powerless in the situation, which could lower self-efficacy and make one more prone to experiencing negative feelings. Doing nothing also may be frustrating and stressing, which in turn may make one more prone to fear and negative feelings. Some forms of safety behavior also may involve passivity, for example by fleeing the situation or shoving others into one's place, to be able to stay passive. This line of reasoning would also be in line with findings of Sy et al., who found heightened self efficacy when participants carried out safety behavior (e.g. communicating with the experimenter and being able to utter requests (thus having some control)) during exposure (lying in a box), but not when participants had no possibility for safety behavior. Most interestingly, pure availability, but not usage of safety behavior (thus staying passive), also had no beneficial effects on self-efficacy (Sy, Dixon, Lickel, Nelson & Deacon, 2011). Contrasting passive and active safety behavior experimentally may clarify matters.

Another more specific explanation for the effects found by Rachman, Van den Hout, and in the present experiment may have to do with the fact that washing one's hands is a learned ritual. Starting in early childhood, children are told that after they touched something dirty they have to wash their hands so that they will not get sick. In healthy participants, washing is therefore already strongly associated with a reduction in danger, contamination, etc., when the participant enters the experimental situation. This could be the cause of the strong effects. In clinical populations, this positive association has likely become less strong, as washing one's hands only once is often no longer sufficient to reduce negative feelings. It would therefore be important to replicate this study in a clinical population and investigate whether the effects hold true. Another possibility would be to use some sort of safety behavior that lacks learned associations with e.g. cleanliness.

In summary, this study was able to confirm that safety behaviors are not always harmful, and may even have beneficial effects. Commitment seems to have an influence, at least for contamination, but the hypothesis that commitment is the determining factor for harmfulness vs. helpfulness of SB's could not be sustained. Clearly, more research in the area is needed.

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Pre-post changes of CFDD

Table 1
Means (SD) of contingent feeling and its condition, both trial 20 measurements and post-test measurements taken into account

		Results #1		Results #2
		Pre-Test	Trial 20	Post-Test
Contamination	SB+C+	73.4 (16.6)	20.3 (23.6)	25.1 (24.3)
	SB+C-	67.2 (14.4)	24.7 (20.0)	30.9 (24.5)
	SB- C+	63.4 (16.4)	31.9 (29.9)	36.9 (27.4)
Fear	SB+C+	39.1 (28.4)	10.3 (19.9)	15.9 (22.0)
	SB+C-	33.4 (21.4)	7.4 (10.4)	8.3 (10.8)
	SB- C+	37.5 (25.0)	14.1 (25.7)	13.1 (24.3)
Danger	SB+C+	34.9 (25.8)	11.1 (21.7)	16.6 (22.9)
	SB+C-	36.9 (25.5)	11.4 (15.6)	11.3 (14.0)
	SB- C+	22.5 (22.7)	13.9 (26.0)	13.8 (26.1)
Disgust	SB+C+	68.1 (24.5)	16.6 (25.9)	24.7 (25.5)
	SB+C-	63.9 (21.6)	25.8 (23.2)	27.8 (22.4)
	SB- C+	57.2 (24.4)	27.3 (30.0)	27.8 (28.7)

Table 2
Outcomes of Overall-effect-ANOVA's of contingent feeling, both trial 20 measurements and post-test measurements taken into account

		Pre-Trial 20			Pre-Post		
		F	p	η^2	F	p	η^2
Contamination	Main Effect: Time	(1,45) 151.15	< .001***	.771	(1,45) 144.36	< .001***	.762
	Main-Effect: Condition	(2,45) .04	.96	.002	(2,45) .17	.983	.001
	Interaction-Effect: Time x Condition	(2,45) 3.30	.046**	.128	(2,45) .95	.021**	.157
Fear	Main Effect: Time	(1,45) 65.89	< .001***	.594	(1,45) 63.00	< .001***	.583
	Main-Effect: Condition	(2,45) .34	.714	.015	(2,45) .46	.637	.020
	Interaction-Effect: Time x Condition	(2,45) .23	.793	.010	(2,45) .037	.964	.002
Danger	Main Effect: Time	(1,45) 35.10	< .001***	.438	(1,45) 33.31	< .001***	.425
	Main-Effect: Condition	(2,45) .39	.682	.017	(2,45) .60	.556	.026
	Interaction-Effect: Time x Condition	(2,45) 2.73	.076	.108	(2,45) 2.61	.085	.104
Disgust	Main Effect: Time	(1,45) 92.33	< .001***	.672	(1,45) 76.37	< .001***	.629
	Main-Effect: Condition	(2,45) .08	.921	.004	(2,45) .18	.834	.008
	Interaction-Effect: Time x Condition	(2,45) 2.326	.109	.094	(2,45) .95	.396	.040

*** = significant at the $\alpha = 1\%$ level, ** = significant at the $\alpha = 5\%$ level

Time course of effects

Table 3
Outcomes of Time-course-ANOVA's of contingent feeling.

		ANOVA-Results		
		F	p	η^2
Contamination	Quadratic-Effect: Time	(1,45) 70.06	< .001***	.609
	Quadratic-Interaction-Effect: Time x Condition	(2,45) 3.21	.050**	.125
Fear	Quadratic-Effect: Time	(1,45) 34.76	< .001***	.436
	Quadratic-Interaction-Effect: Time x Condition	(2,45) .49	.613	.021
Danger	Quadratic-Effect: Time	(1,45) 29.452	< .001***	.396
	Quadratic-Interaction-Effect: Time x Condition	(2,45) 2.30	.112	.093
Disgust	Quadratic-Effect: Time	(1,45) 47.47	< .001***	.513
	Quadratic-Interaction-Effect: Time x Condition	(2,45) 2.55	.089	.102

*** = significant at the $\alpha = 1\%$ level, ** = significant at the $\alpha = 5\%$ level

Generalization

Table 5
Outcome of Generalization-ANOVA for contamination

		ANOVA-Results		
		<i>F</i>	<i>p</i>	ηp^2
Contamination	Main-Effect: Time	(2,44) 8.07	.007**	.155
	Main-Effect: Condition	(2,44) .717	.494	.032
	Interaction-Effect: Time x Condition	(2,44) 1.50	.235	.064

*** = significant at the $\alpha = 1\%$ level, ** = significant at the $\alpha = 5\%$ level

Subjective feelings of control

Table 4
Outcomes of ANOVA's of contingent feeling for feelings of control

		ANOVA-Results		
		<i>F</i>	<i>p</i>	ηp^2
Contamination	Main Effect: Time	(1,45) .13	.717	.003
	Main-Effect: Condition	(2,45) 1.90	.162	.078
	Interaction-Effect: Time x Condition	(2,45) .25	.783	.011
Fear	Main Effect: Time	(1,45) 3.10	.085	.064
	Main-Effect: Condition	(2,45) .50	.608	.022
	Interaction-Effect: Time x Condition	(2,45) .86	.432	.037
Danger	Main Effect: Time	(1,45) .37	.547	.008
	Main-Effect: Condition	(2,45) .42	.659	.018
	Interaction-Effect: Time x Condition	(2,45) .437	.649	.019
Disgust	Main Effect: Time	(1,45) .82	.371	.018
	Main-Effect: Condition	(2,45) 3.49	.039**	.134
	Interaction-Effect: Time x Condition	(2,45) 2.01	.146	.082

*** = significant at the $\alpha = 1\%$ level, ** = significant at the $\alpha = 5\%$ level

APPENDIX B: Informed Consent Sheet and Contracts

Informatie voorafgaand aan het onderzoek

Titel onderzoek: Oordelen over alledaagse objecten

Doel van het onderzoek

Dit onderzoek wordt uitgevoerd om gevoelens van besmetting te onderzoeken die voortkomen uit het aanraken van vieze objecten.

Opzet van het onderzoek

Dit onderzoek bestaat uit 1 sessie van +/- 45 minuten.

De sessie bestaat uit de volgende onderdelen:

1. U wordt gevraagd een aantal vieze objecten aan te raken. Vervolgens wordt u gevraagd om aan te geven hoe besmet en angstig u zich voelt, en om aan te geven hoeveel walging en gevaar u ervaart.
2. Hierna wordt u gevraagd om 20 keer eenzelfde object aan te raken, en na elke aanraking wederom aan te geven hoe besmet, angstig enz. u zich voelt. Daarnaast zal u gevraagd worden om een aantal keer aan te geven hoeveel controle u ervaart en wat uw verwachting is.
3. Tot slot wordt u nogmaals gevraagd om alle objecten met beide handen aan te raken, en opnieuw scores van besmetting, angst, walging, en gevaar te geven.

Vertrouwelijkheid en anonimiteit

De van u verkregen informatie wordt anoniem bewaard en geïdentificeerd met een code-nummer. De codenummer-naam combinatie bewaren we op een aparte, beveiligde locatie. Alle verzamelde gegevens worden tot 7 jaar na de laatste publicatie bewaard. Alleen de onderzoekers die onderaan deze brief worden genoemd hebben toegang tot deze informatie. Er worden geen individuele resultaten berekend.

Wat van u gevraagd wordt (belasting)

Het aanraken van de vieze objecten kan als belastend worden ervaren, maar wij kunnen u verzekeren dat dit niet bedreigend voor u is. Het geven van de scores vereist verder enige concentratie. Er kan enig ongemak worden ervaren door het aanraken van de vieze objecten. Het aanraken van de objecten is echter niet schadelijk voor uw gezondheid. Als u spanningen of angst ervaart door deelname aan dit onderzoek en daarover wilt praten, kunt u contact opnemen met de proefleiders.

Vragen

U heeft het recht om op ieder moment voor, tijdens en na het onderzoek vragen te stellen. Als u na het onderzoek vragen heeft, kunt u contact opnemen met Juliane Reininghaus of Diederik van der Stap.

Vrijwilligheid

De participant is volledig vrij om te kiezen om wel of niet door te gaan met het experiment. Als het experiment als onaangenaam of vervelend wordt ervaren kan de participant op elk gewenst moment ophouden. Het afmaken van het experiment is ook niet noodzakelijk voor de bruikbaarheid van de data. Door toestemming voor het onderzoek te verlenen verklaart de participant te weten dat dit experiment vrijwillig is, en dat de participant elk moment gemachtigd is om te stoppen met de trials.

Ik stem toe met deelname aan het onderzoek. Ik weet dat ik het onderzoek voortijdig mag afbreken wanneer ik dat wil.

Naam + voorletter(s):

Handtekening:

Datum:

Leeftijd:

Geslacht: m / v

Onderzoekers

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Belang voltooiing

Deelname aan het onderzoek is vrijwillig. Het is voor dit experiment echter uitermate belangrijk, dat de proefpersonen het experiment niet voortijdig beëindigen, daar de data anders onbruikbaar is voor de onderzoekers. Door zijn/haar toestemming voor het onderzoek te verlenen verklaart de participant dan ook zijn/haar absolute best te doen om de serie van 20 trials af te maken.

Ik stem toe met deelname aan het onderzoek. Ik weet dat het belangrijk is dat ik het onderzoek niet voortijdig afbreek en verklaar mij in principe bereid de 20 trial af te maken.

Naam + voorletter(s):

Handtekening:

Datum:

Leeftijd:

Geslacht: m / v

Onderzoekers

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APPENDIX C: Protocol

- De Sessie bestaat uit de Introductie, Uitleg onderzoek, Voormeting, Experimentele Trials, Generalisatie en Vragen en debriefing.

Er zijn drie condities:

- Exposure + SB + Contract
- Exposure + SB – Contract
- Exposure – SB + Contract

1. Introductie

“Hoi, ik ben en ik zal het onderzoek bij je uitvoeren. Het enige dat ik van tevoren aan je wil vragen is of je ooit een psychiatrische stoornis hebt gehad?” Zo ja, uitvragen en beslissen of de participant mee kan doen. Niet mee laten doen in geval van OCD-achtige klachten.

2.

3. Uitleg onderzoek

“Dit onderzoek gaat dus over gevoelens van **besmetting, angst, gevaar en walging**. Je zult in dit onderzoek herhaaldelijk gevraagd worden een object aan te raken en dan deze gevoelens te rapporteren. Het onderzoek duurt ongeveer 45 minuten. Na afloop kun je kiezen voor 1 proefpersoonuur of 5 euro. De verkregen gegevens zullen **anoniem** verwerkt worden.

CONTRACT +: Het onderzoek is vrijwillig. We kunnen de data echter niet gebruiken als je het experiment niet afmaakt. Daarom is het voor dit onderzoek **heel belangrijk** dat je **niet vroegtijdig stopt** met het experiment

CONTRACT -: Als je het aanraken vervelend vindt worden kan je er gewoon mee ophouden. Voor het onderzoek maakt het niet veel uit of je alle trials afmaakt. Je mag dan weliswaar niet eerder weg, maar we hebben tijdschriften die je kan lezen of je kan studeren, en dan werk ik gewoon verder.

Heb je hier nog **vragen** over? Als je zeker weet dat je mee wilt doen, dan heb ik je toestemming nodig door je naam en handtekening op dit formulier te schrijven.”

-----PROEFPERSOONINFORMATIE GEVEN-----

-----CONTRACT + of CONTRACT – laten tekenen-----

“Zou je je mobieltje uit willen zetten voor we beginnen?”

Voormeting items

“Ik zal je zometeen vragen zes objecten aan te raken en je gevoelens van besmetting, angst, gevaar en walging te rapporteren. Rapporteer deze gevoelens door een waarde tussen 0 en 100 te zeggen, waarbij 0 staat voor ‘helemaal niet’, bijvoorbeeld ‘helemaal niet besmet’, en 100 staat voor ‘extreem’, bijvoorbeeld ‘extreem besmet’. Een waarde van 50 is dan dus gemiddeld. Ik zal je dus steeds om vier waardes vragen. Vertel me dan de waarde die op dat moment het beste jouw gevoel beschrijft. Je kan hiervoor de hele schaal van 0 tot 100 gebruiken. “

De onderzoeker doet hier de rubberen handschoenen aan. De zes items worden in willekeurige volgorde aangeboden aan de participant. Als maar één hand gebruikt is om het item aan te raken wordt de participant gevraagd zijn/haar handen tegen elkaar aan te wrijven. Na aanraking worden steeds de volgende vragen gesteld:

“Hoeveel besmetting voel je nu?”

“Hoeveel angst voor besmetting voel je nu?”

“Hoeveel gevaar voel je nu?”

“Hoeveel walging voel je nu?”

De waardes die de participant rapporteert worden door de proefleider genoteerd op het scoreformulier. Na iedere aanraking wordt de participant gevraagd de CFDD gevoelens kwijt te raken op de volgende manier:

“Neem nu een momentje om van deze gevoelens af te komen. Laat me weten als dit gelukt is, zodat we door kunnen gaan met het volgende object, zonder dat er nog gevoelens overblijven die dit door dit object veroorzaakt zijn.”

“Is de score van ... nu afgenomen tot 0?”

Als de participant niet in staat is om van de gevoelens af te komen, wordt hij/zij wat meer tijd gegeven om de gevoelens zo laag te krijgen als mogelijk is. Voordat verder gegaan kan worden met het volgende item, moeten de waardes gedaald zijn tot 20 of lager.

De volgende items worden aangeboden:

1. Schoen. Participanten worden gevraagd om met één hand langs de onderkant van hun schoen te wrijven. “Wrijf alsjeblieft met één hand over de onderkant van je schoen.”
2. Geld. Een vuil uitziend briefje en wat munten worden aan de participant gegeven in een doorzichtig plastic tasje. “Hier is wat oud geld. Haal het briefje alsjeblieft uit het zakje, en wrijf het tussen je handen. Neem ook het muntgeld dat in het zakje zit even in je handen.”
3. Vuilnis. Een kleine vuilnisbak wordt aangeboden aan de participant. Hierin zit veilig afval verzameld door de proefleider, zoals verpakkingen van koek en snoep, een gebruikt koffiekopje, een rietje, wat verfrommelde tissues met koffievlekken, etc. “Het volgende item is een vuilnisbak. Stop alsjeblieft je hand er in en raak de spullen die erin zitten aan. Raak ook de zijkant en onderkant aan. Er zit niets scherp in.”
4. Telefoon. Een oude telefoon wordt aan de participant gegeven. Deze ziet er verkleurd, oud en vies uit. “Pak alsjeblieft de hoorn op en raak het mond- en oorstuk aan met je hand. Raak ook een aantal toetsen van de telefoon aan.”
5. Kweek monster. Een reageerbuisje met 50 ml desinfecterende handgel (oid) wordt aan de participant gegeven in een kleine, gesealde biohazard tas. Op het label staat PATH 194, 01.09.08. “Dit is een kweek monster van de biologie afdeling. Neem alsjeblieft de reageerbuis uit het tasje en rol het tussen je handen. Raak ook het dopje aan.” Voor participanten die dit niet naar lijken te vinden: “..maar maak de reageerbuis niet open!”.
6. Labspullen. Een tweede kleine biohazard tas met de volgende items wordt aan de participant gegeven: Een operatiehandschoen, een wegwerp orale thermometer, een open pleister, een 2 ml microbuisje met een druppel desinfecterende handgel en een klein stukje opgerold gaas. “Dit zijn wat labspullen van een immunologielab boven in het van Unnik. Steek alsjeblieft je hand in het zakje en raak de meeste items die erin zitten aan.”

Het item waaraan de hoogste waarde van **besmetting** is gegeven wordt gekozen voor de experimentele trials. Als deze waarde voor geen van de items 50 of hoger is kan de participant **niet deelnemen** aan het experiment. **De andere items worden uit het zicht gezet!!**

Experimentele trials

Conditie 1: Exposure + SB + Contract

Conditie 2: Exposure + SB – Contract

“Voor het volgende gedeelte van het onderzoek zullen we gaan werken met één van deze objecten. Dat zal zijn. Ik zal je een aantal keer vragen dit object aan te raken. Iedere keer nadat je het object aanraakt zal ik je vragen je gevoelens van besmetting, angst, gevaar en walging te rapporteren op de 0 tot 100 schaal. We weten dat met herhaling van deze oefeningen deze gevoelens geleidelijk verminderen. Gebruik dan deze desinfectant om je handen te wassen. Dit is speciale zeep die normaal gesproken wordt gebruikt in ziekenhuizen. De makers van deze zeep zeggen dat de zeep antibacterieel is en 99.9% van de bacteriën verwijderd. Je hoeft niet bang te zijn dat je handen uitdrogen – sterilium is extra huidvriendelijk en wordt door artsen ook vele keren op een dag gebruikt. Gebruik zoveel desinfectant als je wilt totdat je handen schoon aanvoelen. Je kan deze tissues gebruiken om je handen droog te maken. Ik zal daarna je gevoelens van besmetting, angst, gevaar en walging weer vragen.

Dan wordt er gevraagd:

We willen graag weten wat je verwacht:

“Hoe overtuigd ben je dat het doen van deze herhaalde oefeningen je gevoelens van besmetting zullen verminderen? Geef weer aan op een schaal van 0 tot 100.”

“Hoe overtuigd ben je dat deze oefeningen je angst voor besmetting zullen verminderen?”

“Hoe overtuigd ben je dat deze oefeningen je gevoel van gevaar zullen verminderen?”

*"Hoe overtuigd ben je dat deze oefeningen je gevoel van walging zullen verminderen?"
Dankje. Dan zullen we nu beginnen met het experiment.*

Na iedere aanraking biedt de proefleider de zeep aan aan de participant.

Aanraken – score geven – 30 sec. wassen – score geven. (20 keer herhalen.)

*"Hoeveel besmetting voel je nu? Geef weer aan op een schaal van 100."
"Hoeveel gevaar voel je nu?"
"Hoeveel walging voel je nu?"
"Hoeveel angst voel je nu?"*

Na trial 1 en trial 20 wordt ook nog naar het gevoel van controle gevraagd.

*"Hoe overtuigd ben je dat je je gevoelens van besmetting onder controle hebt? Geef weer aan op een schaal van 0 tot 100"
"Hoe overtuigd ben je dan je je angst voor besmetting onder controle hebt?"
"Hoe overtuigd ben je dat je je gevoel van gevaar onder controle hebt?"
"Hoe overtuigd ben je dat je je gevoel van walging onder controle hebt?"*

Conditie 3: Exposure – SB + Contract

"Voor het volgende gedeelte van het onderzoek zullen we gaan werken met één van deze objecten. Dat zal zijn. Ik zal je een aantal keer vragen dit object aan te raken. Iedere keer nadat je het object aanraakt zal ik je vragen je gevoelens van besmetting, angst, gevaar en walging te rapporteren op de 0 tot 100 schaal. Ik zal je dan je gevoelens van besmetting, angst, gevaar en walging weer vragen. We weten dat met herhaling van deze oefeningen deze gevoelens geleidelijk verminderen".

Dan wordt er gevraagd:

*"Hoe overtuigd ben je dat het doen van deze herhaalde oefeningen je gevoelens van besmetting zullen verminderen? Geef weer aan op een schaal van 0 tot 100."
"Hoe overtuigd ben je dat deze oefeningen je angst voor besmetting zullen verminderen?"
"Hoe overtuigd ben je dat deze oefeningen je gevoel van gevaar zullen verminderen?"
"Hoe overtuigd ben je dat deze oefeningen je gevoel van walging zullen verminderen?"*

Aanraken – score geven – - ±30 seconden delay + small talk – score geven. (20 keer herhalen.)

*"Hoeveel besmetting voel je nu? Geef weer aan op een schaal van 100."
"Hoeveel gevaar voel je nu?"
"Hoeveel walging voel je nu?"
"Hoeveel angst voel je nu?"*

Na trial 1 en trial 20 wordt ook nog naar het gevoel van controle gevraagd.

*"Hoe overtuigd ben je dat je je gevoelens van besmetting onder controle hebt? Geef weer aan op een schaal van 0 tot 100"
"Hoe overtuigd ben je dan je je angst voor besmetting onder controle hebt?"
"Hoe overtuigd ben je dat je je gevoel van gevaar onder controle hebt?"
"Hoe overtuigd ben je dat je je gevoel van walging onder controle hebt?"*

Generalisatie

Na de laatste trial wordt de participant gevraagd om mogelijke overgebleven gevoelens van besmetting, angst, gevaar en walging af te laten nemen. Hierna worden de zes items van de voormeting in dezelfde volgorde als in de voormeting weer aangeboden aan de participant. De voormeting wordt dus nog een keer op precies dezelfde manier uitgevoerd. Er wordt **geen zeep** aangeboden aan de participant.

Daarna wordt een formulier met vragen aan de participant gegeven. *"Mag ik jou nog vragen, om nog even deze vragen te beantwoorden?"*

APPENDIX D: Scoring forms

Conditie: SB - (RP) Contract +
 Score formulier: PART 1 pre-test
 PPnr:
 Leeftijd:.....jaar
 Geslacht: m / v
 Datum:.....

CTN item	Subjectieve score van 0-100			
	Besmetting	Angst	Gevaar	Walging
Shoe				
Money				
Garbage				
Phone				
Culture Sample				
Lab Specimen				

Gekozen item:

Score : PART 2 exposure
 PPnr:
 Datum:.....
 Item:.....
 (Score van 0-100 direct na instructies)

	Besmetting	Angst	Gevaar	Walging
Verwachting				

(Score 0-100 per item direct na aanraken)

(Score 0-100 na wassen)

Trial	Besmet	Angst	Gevaar	Walging		Besmet	Angst	Gevaar	Walging
1	Control:	Control:	Control:	Control:	30 sec Wachte n	Control	Control	Control	Control:
2						:	:	:	
3									
4					30 sec Wachte n				
5									
6									
7					30 sec Wachte n				
8									
9									
10					30 sec Wachte n				
11									
12									
13					30 sec Wachte n				
14									
15									
16					30 sec Wachte n				
17									
18									
19					30 sec Wachte n				
20	Control:	Control:	Control:	Control:		Control	Control	Control	Control:
					:	:	:		

Score formulier: PART 3 generalisatie
 PPnr:
 Datum:.....

CTN item	Subjectieve score van 0-100			
	Besmetting	Angst	Gevaar	Walging
Shoe				
Money				
Garbage				
Phone				
Culture Sample				
Lab Specimen				

Het contract dat ik ondertekend heb heeft een duidelijke invloed gehad op mijn beslissing wel of niet het experiment af te maken.

1. Heel sterk
2. Sterk
3. Redelijk
4. Een beetje
5. Niet

Ik heb overwogen eerder te stoppen met het onderzoek

1. Heel sterk
2. Sterk
3. Redelijk
4. Een beetje
5. Niet

Conditie: SB+ Contract -/+

Score formulier: PART 1 pre-test

PPnr:

Leeftijd:.....jaar

Geslacht: m / v

Datum:.....

Subjectieve score van 0-100				
CTN item	Besmetting	Angst	Gevaar	Walging
Shoe				
Money				
Garbage				
Phone				
Culture Sample				
Lab Specimen				

Gekozen item:

Score : PART 2 exposure

PPnr:

Datum:.....

Item:.....

(Score van 0-100 direct na instructies)

	Besmetting	Angst	Gevaar	Walging
Verwachting				

(Score 0-100 per item direct na aanraken)

(Score 0-100 na wassen)

Trial	Besmet	Angst	Gevaar	Walging		Besmet	Angst	Gevaar	Walging
1	Control:	Control:	Control:	Control:		Control	Control	Control	Control:
2					30 sec	:	:	:	:
3					Wassen				
4									
5									
6									
7					30 sec				
8					Wassen				
9									
10									
11									
12					30 sec				
13					Wassen				
14									
15									
16									
17									
18					30 sec				
19					Wassen				
20	Control:	Control:	Control:	Control:		Control	Control	Control	Control:
						:	:	:	:

Score formulier Firecracker experiment: PART 3 generalisatie

PPnr:

Datum:.....

Subjectieve score van 0-100				
CTN item	Besmetting	Angst	Gevaar	Walging
Shoe				
Money				
Garbage				
Phone				
Culture Sample				
Lab Specimen				

Het contract dat ik ondertekend heb heeft een duidelijke invloed gehad op mijn beslissing wel of niet het experiment af te maken.

1. Heel sterk
2. Sterk
3. Redelijk
4. Een beetje
5. Niet

Ik heb overwogen eerder te stoppen met het onderzoek

1. Heel sterk
2. Sterk
3. Redelijk
4. Een beetje
5. Niet

Ik had het gevoel dat mijn handen schoner waren na het gebruik van de zeep.

1. Ja
2. Nee

Onderzoek: Oordelen over alledaagse objecten

DEBRIEFING

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Bedankt voor je deelname aan onze studie. Het doel van deze studie is het onderzoeken van gevoelens van besmetting die voort kunnen komen uit het aanraken van vieze objecten.

In deze studie werd je gevraagd om herhaaldelijk een aantal vieze objecten aan te raken en aan te geven hoe angstig en besmet je je voelde. Als je in 1 van de 2 sterillium-condities zat werd je gevraagd om een aantal objecten aan te raken en tussendoor je handen te wassen. Er werd in dit onderzoek gekeken naar het mogelijk positieve effect van de combinatie tussen handen schoonmaken en het ondertekenen van een contract dat je óf aanspoorde het experiment af te maken, óf je eraan herinnerde dat je op elk moment kon stoppen. In de controle conditie werd je gevraagd het herhaaldelijk aanraken van de objecten te tolereren en je handen naderhand niet schoon te maken. Wij willen graag meer te weten komen over het verschil in gevoelens en reacties van mensen in respons op het schoonmaken na het aanraken van vieze objecten. Als je nog vragen hebt over het onderzoek of wanneer je meer informatie zou willen kun je contact opnemen met Prof. Van den Hout.

Wanneer je meer wilt weten over besmetting dan geeft het volgende artikel een goed overzicht van het onderwerp: Rachman, S. (2004) Fear of contamination. *Behaviour Research and Therapy*, 42(11), 1227-1255

Bedankt voor je deelname.