



Responsibility and hand washing behaviour



Jasmine Taylor*, Christine Purdon

Department of Psychology University of Waterloo Waterloo, ON, N2L 3G1, Canada

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ABSTRACT

Background and objectives: Recent research suggests that compulsions persist due to a self-perpetuating mechanism of poor memory confidence and repetition. However, most of this work has examined checking compulsions and findings may not generalize well to washing compulsions. This study examined the role of responsibility in the persistence of washing behaviour.

Methods: Hand washing was examined in undergraduates ($n = 80$) high and low in contamination fears (CF) under conditions of high or low responsibility (RL). Wash duration and number of visits to objects/locations key to the wash (e.g., soap) were examined.

Results: Overvalued responsibility predicted washing duration across groups. Neither wash duration nor number of visits was associated with memory for the wash. Wash duration predicted post-wash certainty that the wash had prevented harm, but only in the high CF group, and that effect varied according to RL: longer wash duration predicted greater certainty under conditions of low RL but predicted less certainty under conditions of high RL. Greater repetition predicted poorer sensory confidence, but only in the high CF group under high RL conditions.

Limitations: The data were collected in an analogue sample of modest size. Replication in a clinical sample is required.

Conclusions: Self-perpetuating mechanisms identified in perseverative checking seem to also be present in perseverative washing, but only under conditions of high responsibility. Sensory confidence may be more important to perseverative washing than memory confidence. More research is required to understand self-perpetuating mechanisms at play when washing to under conditions of high responsibility.

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1. Introduction

Obsessive-compulsive disorder (OCD) is characterized by the persistent need to repeat actions. Leading cognitive models of OCD help us understand why people might initiate compulsive behaviours. Rachman's (2002) model of perseverative checking helps us understand why compulsions are repeated. He first suggested that people with an overvalued sense of responsibility are motivated to ensure that a perceived threat has been removed or reduced, particularly when they are directly in charge of an outcome. As the perceived probability and severity of harm increases, so does the need for certainty. However, it is almost impossible to rule out the possibility of future misfortune, and thus the behaviour has "no natural terminus" (p. 627) so persists. Repetition has the ironic effects of both reducing confidence in memory for the action and

increasing estimates of potential harm and personal responsibility for the outcome. Overall confidence in memory then begins to decline, which in turn increases doubt and uncertainty.

There is considerable empirical support for this model. A clear link has been established between beliefs that one's memory is poor and urge to check (e.g., Alcolado & Radomsky, 2011; Cuttler, Sirois-Delisle, Alcolado, Radomsky, & Taylor, 2013) and between uncertainty and checking (Radomsky & Alcolado, 2010; Toffolo, van den Hout, Hooge, Engelhard, & Cath, 2013). Meanwhile, there is strong evidence that prolonging or repeating a checking behaviour reduces, rather than increases, confidence that it has been done properly. For example, staring at a stimulus, even for as little as 30s, has reliably been found to reduce confidence in memory for it (van den Hout & Kindt, 2003; Van den Hout, Engelhard, de Boer, du Bois, & Dek, 2008; van den Hout et al., 2009). Van den Hout and Kindt (2004) monitored memory accuracy and confidence over trials in which participants checked a virtual stove to ensure its safety. Whereas actual memory accuracy remained stable across trials, memory confidence declined. The effect of repetition on memory

* Corresponding author.

E-mail addresses: j10taylo@uwaterloo.ca (J. Taylor), christine.purdon@uwaterloo.ca (C. Purdon).

confidence has since been replicated (e.g., Dek, van den Hout, Giele, & Engelhard, 2014; Dek, van den Hout, Engelhard, Giele, & Cath, 2015; Van den Hout & Kindt, 2003b, 2004; Linkovski, Kalanthroff, Henik, & Anholdt, 2015; Radomsky & Alcolado, 2010). Collectively, this body of work has found that declining memory confidence is observed after repeatedly checking an actual (as opposed to virtual) stove (Radomsky, Dugas, Alcolado, & Lavoie, 2014; Radomsky, Gilchrist, & Dussault, 2006), in as few as five checks (Coles, Radomsky, & Horng, 2006), and may be especially pronounced under conditions of high responsibility (Boschen & Vuksanovic, 2007).

What accounts for the relationship between repetition and memory distrust? Rachman (2004) suggested that people are quite anxious when conducting compulsions, which makes it more difficult to develop a clear memory for having completed them. Van den Hout and Kindt (2004) proposed that increased familiarity with the action promotes a shift from perceptual to conceptual processing. The result is a less vivid and detailed memory, which is perceived by the individual as untrustworthy. Dek and colleagues have since observed a clear association between repeated checking, increased familiarity, and reduced memory confidence (Dek et al., 2014, 2015). Boyer and Liénard (2006) proposed that behaviours deemed important may become parsed such that rather than being one global action (washing one's hands), the action is mentally broken down into minute steps, each of which must be done properly. Finally, research has shown that compulsions are characterized by the inclusion of unnecessary actions (e.g., Eilam, Zor, Fineberg, & Hermesh, 2012; Zor, Hermesh, Szechtman, & Eilam, 2009; Zor et al., 2009). The level of detail that requires tracking, then, poses a significant tax on working memory.

This work has made a substantial contribution to our understanding of the persistence of repetitive acts, but it has focused almost exclusively on checking behaviour. Some of these findings readily apply to washing compulsions. For example, Rachman (2004) observed that, as with checking compulsions, compulsive cleaning is so well practiced that it becomes automatic and “robotic” (p. 1228). Consistent with van den Hout and colleagues, automatic repetition may result in conceptual, rather than perceptual, processing, which could produce doubt. However, Rachman (2004) also argued that washing is associated with less doubt and indecisiveness than checking, is enacted to remove harm that has already occurred as opposed to preventing future harm, and is primarily intended to protect self, rather than others, from harm. We would also argue that whereas in checking people rely on their visual memory to evaluate whether or not the action was done properly, in washing people may rely more heavily on physical sensations. Thus, confidence in sensory perception (e.g., tactile or visual perception), rather than memory, may be of greater importance to the perseveration of washing.

Very few studies have examined the relationships between responsibility, memory confidence, repetition, and washing behaviour. People with contamination fears/washing have been found to exhibit better memory for “clean” and “dirty” items, compared to anxious and nonclinical controls (Radomsky & Rachman, 1999). However Ceschi, Van der Linden, Dunker, Perroud, and Brédart (2003) did not find that this bias was specific to OCD washers, but rather was observed in all participants with OCD. Furthermore, there is little research on the impact of repetition on washing behaviour, particularly hand washing. In the only study that has, to our knowledge, examined memory confidence and repeated washing, Fowle and Boschen (2011) found that repeated washing was associated with a decline in memory confidence (but not accuracy) for details of the dishes that were repeatedly washed. Repetition did not affect participants' confidence that the dishes had been cleaned properly.

Given that research on checking may not fully generalize to perseverative washing, and that there is a paucity of research on perseverative washing, the current study examined *in vivo* washing behaviour following “contamination” in people high and low in contamination fears under conditions of high or low responsibility. Based on Rachman (2004) we hypothesized that:

1. Higher trait overvalued responsibility and memory and cognitive confidence would predict longer wash duration
2. Longer wash duration and repetition of washing behaviours would be associated with higher post-wash ratings of responsibility and harm, but to a greater extent in those high in contamination fears in the high responsibility condition
3. Greater wash duration and behavioural repetition would be associated with decreased certainty that hands had been washed properly, and less confidence in memory and sensory perception, particularly for those high in contamination fears under conditions of high responsibility.

2. Method

2.1. Participants

Participants were 80 undergraduate students (27% male) enrolled in a variety of large survey courses at the University of Waterloo who received course credit. Participants ranged in age from 17 to 47 ($M = 20.29$, $SD = 3.59$). They were pre-screened with the Concerns about Germs and Contamination subscale of the Dimensional Obsessive Compulsive Scale (described in the Measures section; Abramowitz et al., 2010). In order to ensure equal sampling from the extremes of this dimensional construct, participants who scored more than .5 standard deviations below the student sample mean reported by Abramowitz et al. (2010) were identified as Low Contamination Fear (CF_Low; $n = 43$; $M = .21$, $SD = .41$) and those who scored greater than .5 standard deviations above the mean for the OCD sample were identified as High Contamination Fear (CF_High; $n = 37$; $M = 10.97$, $SD = 1.18$). Prior to arrival at the lab, participants were randomly assigned to the High Responsibility Level group (RL_High; $N = 42$, $n = 23$ from CF_Low) or the Low Responsibility Level group (RL_Low; $N = 38$, $n = 20$ from CF_Low).

2.2. Measures

Dimensional Obsessive Compulsive Scale (DOCS; Abramowitz et al., 2010). The DOCS is a 20-item measure designed to assess OCD symptom severity. The Concerns about Germs and Contamination subscale has good internal consistency and convergent and divergent validity in both clinical and non-clinical samples (Abramowitz et al., 2010).

Memory and Cognitive Confidence Scale. (MACCS; Nedeljkovic & Kyrios, 2007). This measure is designed to assess confidence in memory, concentration and decision making. Participants provide responses based on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (agree very much). The MACCS has demonstrated good internal consistency and adequate validity in initial investigations (Nedeljkovic & Kyrios, 2007).

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item questionnaire designed to measure positive and negative state affect. Participants are asked to use a 5-point Likert scale (1 = very slightly or not at all – 5 = extremely) to rate the extent to which they are currently experiencing positively and negatively valenced emotions. The PANAS has excellent psychometric properties (Crawford & Henry,

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