

Role of Deontological Guilt in Obsessive-Compulsive Disorder-Like Checking and Washing Behaviors

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Francesca D'Olimpio¹ and Francesco Mancini² [AQ: 1][AQ: 2]

¹Department of Psychology, Second University of Naples; and ²Scuola di Specializzazione in Psicoterapia Cognitiva, Associazione di Psicologia Cognitiva, Rome, Italy

Abstract

Obsessions and compulsions are driven by the goal of preventing or neutralizing guilt. We investigated whether inducing deontological versus altruistic guilt in healthy volunteers could activate checking behaviors and physical cleaning. Participants were asked to listen to stories that induced deontological guilt, altruistic guilt, or a neutral control state, and then were asked to classify 100 colored capsules into 12 small pots (Study 1) or to clean a Plexiglas cube (Study 2). Before and after hearing the story and after completing the task, participants completed a visual analog scale that assessed their current emotions. Finally, participants completed a self-report questionnaire about discomfort, doubts, and perceived performance. Participants in the deontological group checked more (Study 1), cleaned the cube more times (Study 2), and scored higher in doubts and discomfort than did participants in the altruistic or control groups. These data suggest that deontological guilt is the mental state specifically related to checking and cleaning compulsions.

Keywords

obsessive-compulsive disorder, cognition and emotion, guilt

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The association between responsibility and behaviors similar to those associated with obsessive-compulsive disorder (OCD) has been broadly reported in the literature: Several studies have shown that the manipulation of responsibility affects checking behaviors and can trigger discomfort and doubting, particularly when both adults and children are induced to think that they did not fulfill a responsibility (Arntz, Voncken, & Goosen, 2007; Ladouceur et al., 1995; Ladouceur, Rhéaume, & Aublet, 1997; Lopatka & Rachman, 1995; MacDonald & Davey, 2005; Mancini, D'Olimpio, & Cieri, 2004; Reeves, Reynolds, Wilson, & Coker, 2010; Shafran, 1997). Induction of responsibility and fear of guilt more often lead to subjective OCD-like experiences and checking behaviors in obsessive-compulsive (OC) patients (independently from patients with OCD subtype) than in non-OCD anxious patients (Arntz et al., 2007). Conversely, OCD patients have reported a decreased urge to perform their rituals when faced with a reduction of responsibility and, thus, of the chance of being guilty (Lopatka & Rachman, 1995; Shafran, 1997).

In the same way, therapeutic interventions that target inflated beliefs of responsibility or acceptance of guilt in nonsymptomatic domains have been shown to significantly reduce OC symptoms (Bouchard, Rhéaume, & Ladouceur, 1999; Cosentino et al., 2012; Vos, Huibers, & Arntz, 2012). Altogether, these findings are consistent with the hypothesis that checking rituals are aimed at preventing or neutralizing a fault. Can we suppose the same for washing rituals? Are they sustained by similar motivations?

In all religions, sin dirties the consciousness and washing the body cleanses the consciousness. Scientific literature has suggested a close relationship between psychological sense of guilt and disgust that goes beyond mere metaphor (Lee & Schwarz, 2011; Schnall, Benton, & Harvey, 2008; Schnall, Haidt, Clore, & Jordan, 2008). It

Corresponding Author:

Francesca D'Olimpio, Department of Psychology, Second University of Naples, Viale Ellittico, 31, Caserta 81100, Italy
E-mail: francesca.dolimpio@unina2.it

has been suggested that “a threat to one’s moral purity induces the need to cleanse oneself” and is revealed “through an increased mental accessibility of cleansing-related concepts, a greater desire for cleansing products, and a greater likelihood of taking antiseptic wipes” (Zhong & Liljenquist, 2006, p. 1451; the “Lady Macbeth effect”). Moreover, and most important, “physical cleansing alleviates the upsetting consequences of unethical behavior and reduces threats to one’s moral self-image” (Zhong & Liljenquist, 2006, p. 1451). In contrast, feelings of dirtiness and the urge to wash can be enhanced by increasing elements of betrayal in a moral context (the “perpetrator effect”), and contamination-related behavioral tendencies can be triggered by threatening participants’ moral self-perceptions (Doron, Sar-El, & Mikulincer, 2012; Rachman, Radosky, Elliot, & Zysk, 2012).

In OCD patients, feelings of guilt are linked to feelings of impurity and, thus, to disgust and washing compulsions in at least two ways: First, guilt increases feelings of contamination and cleansing decreases guilt (the Lady Macbeth effect). Second, because OCD patients believe that contamination is dangerous to their own and others’ health, they also believe that not washing implies the risk of being guilty of not preventing damage. In the latter case, the goal of washing is similar to that assumed in checking rituals: preventing or neutralizing guilt. Physical cleaning has been shown to reduce the willingness to help and to relieve moral emotions. This effect has been shown to be particularly prominent in individuals with OCD and “was not limited to individuals with washing rituals but rather was equally robust in individuals with checking and mixed rituals, suggesting that the relationship between cleansing and morality in OCD may be quite broad” (Reuven, Liberman, & Dar, 2014, p. 228).

Although most of these studies were based on self-report tools and, thus, investigated dispositions toward washing rather than actual behavior, overall, they have suggested that an increase in guilt or the self-perception of being unable to properly fulfill responsibilities (i.e., fear of guilt) triggers obsessivelike behaviors, such as checking and washing, even in nonclinical participants. Furthermore, this effect is more marked in obsessive patients, notwithstanding the type of dominant symptomatology (washer or checker).

Researchers recently have suggested that OCD patients’ mental state is characterized by a specific kind of guilt: deontological guilt. Prinz and Nichols (2010) stated that “the core relational theme for guilt is something like: someone I am concerned about has been harmed and I have responsibility for that in virtue of what I have done or failed to do” (p. 134). According to Prinz and Nichols, the prototype of guilt, at least in today’s Western culture, implies that harm has been caused to others by action or omission and, thus, that a moral norm has been violated.

This position reconciles the intrapsychic and the interpersonal approaches, thereby underlining the role of both harming others and trespassing a moral norm in feelings of guilt.

Most of the guilt feelings individuals experience in everyday life correspond to the prototype of Prinz and Nichols (2010) and usually result from a concurrent perception of having transgressed a moral norm and not having acted altruistically (i.e., harming others). These two kinds of perception can, however, act independently. Altruistic guilt appears when an individual appraises his or her own conduct as not altruistic, and it is characterized by feelings of sorrow and even of anguish for the victim and an inner dialogue of the type that observes, “Poor fellow, how much he is suffering,” and questions, “What have I done to him?” and “What can I do for him?” Altruistic guilt implies a tendency toward both compassion and alleviation of a victim’s suffering at one’s own expense. Deontological guilt arises out of the assumption of having violated one’s own moral rules. It implies feelings of unworthiness and expectations of punishment; is characterized by an inner dialogue of the kind that observes, “How could I have done this!”; and it might be alleviated by confession or apology. Altruistic guilt always involves a victim who suffers and the assumption of not having been altruistic, but there might not have been any violation of moral rules. Whereas deontological guilt might involve no victim at all (e.g., incest between consenting siblings) or might even involve actions taken for the victim’s benefit (e.g., euthanasia). For deontological guilt, it is necessary and sufficient only that the assumption of having violated a moral rule exists.

Some lines of evidence are compatible with the distinction between the two guilt feelings. For instance, deontological and altruistic guilt appear to be associated with two different brain networks: The former includes the insula and the anterior cingulate cortex, and the latter includes the medial prefrontal areas (Basile et al., 2011). Given that the insula is activated when self-reproach and disgust are triggered, it seems that deontological guilt implies self-reproach and self-loathing more than does altruistic guilt (e.g., Rozin, Haidt, & McCauley, 2000). Conversely, medial prefrontal areas are activated in theory-of-mind tasks, in the representation of others’ intentions and in experiencing empathy and compassion, thus suggesting that altruism implies understanding the victim’s mind (Blair, 1995; Moll et al., 2005; Shallice, 2001).

Empirical data, based on behavioral and physiological parameters, have suggested that the type of guilt linked to OCD is specifically associated with disgust (Basile, Mancini, Macaluso, Caltagirone, & Bozzali, 2013; D'Olimpio et al., 2013; Ottaviani, Mancini, Petrocchi, Medea, & Couyoumdjian, 2013). Other suggestions have come from clinical observation. For instance, it has been

frequently reported that obsessive concern quite often is not for victims but for self-reproach, and some experiments have shown that obsessive concern about a harmful event, for instance, a gas explosion, is drastically reduced if responsibility for the event is attributed to someone else (e.g., Lopatka & Rachman, 1995; Shafran, 1997). This suggests that the obsessive concern is not for any victims of the explosion but for self-reproaching. Moreover, it is not uncommon for OC patients' concerns to be more about their own performance than about outcome: It is better for them to do little irreproachably than to do much effectively. Furthermore, patients are often concerned about faults that do not involve harm to anyone. For instance, they are frightened by blasphemous thoughts or by the possibility of having perverse sexual desires, even if such thoughts do not involve harm to anyone (e.g., the thought "I wish to mate with animals").

In the present study, we investigated the relationships between guilt and OCD-like behaviors in nonclinical individuals by quantitatively assessing the effect of induction of altruistic or deontological guilt on actual checking and washing behaviors. If deontological guilt influences checking and washing compulsions more than does altruistic guilt, then the induction of deontological guilt should increase OCD-like behaviors, such as checking and washing, more than the induction of altruistic guilt. Furthermore, we should expect a stronger Lady Macbeth effect (i.e., a decreased guilt feeling after performing washing behaviors postinduction of deontological guilt as opposed to altruistic guilt).

Experiment 1

Many studies on OCD have used classification tasks to assess checking behaviors (see Arntz et al., 2007) and by these means have underlined the role of inflated responsibility on control. Along this line, in our first experiment, we explored the effects of altruistic guilt versus deontological guilt on checking behaviors by inducing deontological or altruistic guilt in healthy participants and then requiring them to perform the pill-classification task developed by Ladouceur et al. (1995).

Method

Participants. The sample comprised 37 nonclinical volunteers (21 females, 16 males; mean age = 24.13 years, $SD = 3.3$, age range = 19–30) whose mean level of education was 16.10 years. Participants were Second University of Naples undergraduate students dwelling in southern Italy, and 98% of them lived in an area near Naples. The participants were randomly assigned to one of three emotion conditions: altruistic guilt, deontological guilt, or neutral control.

All participants were right-handed, had normal or corrected-to-normal vision, had no problems ascertaining colors, and were naive to the purposes and predictions of the experiment. Participants gave their written informed consent to take part in the experiment.

Procedure. Participants were individually tested. The experimenter first briefly explained the general aim of the investigation and then had the participant complete a visual analog scale (VAS) to evaluate his or her emotional state. Next, the experimenter provided the following instruction:

In a moment, I will start the video recorder and leave the room. You have to wear the headphones and start the computer recorder by pressing on "play." You will hear a short story. Please follow the instructions that you will hear. On these sheets, you can find the same summarized instructions, so you can read them anytime you want. You will be required to fill out another scale [VAS] and then go into the next laboratory room in order to start a classification task. After completing the task, you will fill out this booklet [subjective measures and control variables]. I will be in a room near to this one. When you have finished, please call me.

After providing this explanation, the experimenter started the video camera and left the room. The participant listened to a story meant to induce either deontological guilt, altruistic guilt, or no emotional changes (see the Emotion Induction section) and then completed the second VAS. Immediately thereafter, the participant completed a classification task (described in the Classification Task section). When finished with the task, the participant filled out a series of questionnaires (the third VAS and a control questionnaire and a self-report questionnaire on subjective variables). At the end of the experimental session, the participant was debriefed.

Emotion induction. Participants were presented with stories drawn from accounts provided by undergraduate students at a preliminary stage of the research. A group of 120 university students was required to write a story referring to a randomly selected emotion or a story from everyday life (each student was given a description of the target emotion in terms of internal dialogue, action propensity, and recurring thought, but the target emotion was not explicitly named). The request was to write a personal or imagined narrative in which the protagonist feels the target emotion.

The stories were submitted to 10 judges who used a VAS to independently assess emotions referred to and felt in all of the stories. The stories with the highest average

scores on the two emotions (deontological guilt and altruistic guilt) were chosen and modified by adding details that could facilitate identification with the protagonist. For the control condition, we selected a story with low scores in all emotions. The final stories were again judged by 4 evaluators to confirm their suitability.

Classification task. We used a pill-classification task adapted from Ladouceur et al. (1995). A large pot with 100 capsules of 10 color combinations was placed 20 cm in front of the participant on the table. Behind the large pot, 12 smaller pots were placed in a straight line. A video camera sited before the participant at the other side of the table videotaped the participant's behaviors.

Participants were required to classify the pills contained in the large pot into the 12 smaller pots. Task instructions specified that only one pill at a time could be removed from the large pot and that participants could not look into the large pot. Participants were told that each pill should be placed in one of the smaller pots by putting one type of pill in each pot. The task had to be performed as quickly and as accurately as possible. In case of classification doubts, participants were allowed to check the small pots and change the pills in these pots.

Behavioral checklist. Two independent judges reviewed the videotapes recorded during the pill-classification task and assessed the following behaviors on a checklist (from Arntz et al., 2007, and Bouchard et al., 1999): (a) hesitations and checking, defined as closely examining a capsule for more than 2 s or moving the hand for more than 2 s between two or more pots, looking at a small pot for more than 2 s, taking up a small pot to look into it, or emptying the contents of the small pot into the palm of the hand; (b) modifications, referred to as any change, addition, or withdrawal of one or more pills from a given small pot; (c) number of errors made; and (d) time to complete the task. Interrater agreement of these variables, computed on 50% of the observations, was very high ($\kappa = .97$).

Subjective responses. VASs of 100 mm were used to measure the following subjective experiences of emotion: happiness, shame, fear, sadness, disgust, altruistic guilt, deontological guilt, anger, and pity. The VASs were administered three times: at the beginning of the experimental session, to evaluate the general emotional state; after emotion induction, as a manipulation check; and after experimental task completion, to verify the emotional state after checking behaviors. The item order was randomized within the three versions.

Further subjective dependent variables were evaluated with a self-report questionnaire that assessed discomfort perceived during the task, doubts, perceived

responsibility, preoccupation with error outcomes, and perceived task difficulty. Participants' responses were made on a scale ranging from 1 to 7, according to the item content.

Control variables. The Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) measures the presence and severity of depressive symptoms. There is strong support for its reliability (α range = .81–.88) and validity (Kendall, Hollon, Beck, Hammen, & Ingram, 1987).

Form Y of the State-Trait Anxiety Inventory (STAI-Y; Beck, Epstein, Brown, & Steer, 1988) consists of two 20-item scales that measure state and trait anxiety. The STAI-Y State subscale asks respondents to rate how they feel "right now . . . at this moment," using a scale from 1 (*not at all*) to 4 (*very much so*), in response to a series of self-descriptive statements ($\alpha = .93$). The STAI-Y Trait subscale asks respondents to rate how they "generally" feel, using a scale from 1 (*almost never*) to 4 (*almost always*), in response to a series of self-descriptive statements ($\alpha = .90$). Factor analytic validation of the state-trait distinction has been demonstrated, and the improved psychometric properties of the STAI-Y over an earlier version of this inventory have been well documented (Spielberg, Gorsuch, Lushene, Vagg, & Jacobs, 1983).

The Padua Inventory-Revised (PI-R; van Oppen, Hoekstra, & Emmelkamp, 1995) consists of 41 items and provides a total score that indicates the presence of OC features and five subscale scores: Impulses (e.g., "While driving I sometimes feel an impulse to drive the car into someone or something"), Washing (e.g., "I feel my hands are dirty when I touch money"), Checking (e.g., "I check letters carefully many times before posting them"), Rumination (e.g., "I find it difficult to make decisions, even about unimportant matters"), and Precision (e.g., "I feel obliged to follow a particular order in dressing, undressing and washing myself"). The Cronbach's alpha of the scale showed good internal consistency (.92). The PI-R appears to be more suitable for research purposes than does the original Padua Inventory (which contains 60 items; Sanavio, 1988). Its factorial structure is invariant across various clinical samples (i.e., OC, panic disorder, and social phobic patients) and normal samples (van Oppen et al., 1995).

Statistical analyses. All variables were checked on distribution before analysis. Skewed distributions were log-transformed if normality could not be approached. Univariate (on the PI-R total score and the BDI) and multivariate (on the STAI-Y and the PI-R subscales) analyses of variance were used to compare the three groups on the control variables. We conducted a series of 3×3 mixed analyses of variance on scores reported in the

Table 1. Scores for Control and Subjective Variables and for Behaviors on the Pill-Classification Task From Experiment 1

Variable and behavior	Condition		
	Control	Altruistic guilt	Deontological guilt
Depression			
Beck Depression Inventory	10.7 (2.5)	11.7 (2.4)	9.2 (1.9)
Anxiety			
State	34.5 (5.2)	45.3 (4.9)	42.5 (3.8)
Trait	40 (4.1)	46 (3.9)	45.2 (3)
Obsession/compulsion			
Padua Inventory–Revised	23.7 (7.9)	32.5 (7.4)	26.4 (5.8)
Subjective response			
Discomfort	2.6 (0.30)	2.7 (0.30)	2.7 (0.25)
Task difficulty	4 (0.27)	4.2 (0.27)	4.1 (0.21)
Preoccupation with errors	5.2 _a (0.4)	5.1 _a (0.4)	6.4 _b (0.3)
Doubt	1.5 (0.56)	2.7 (0.56)	2.3 (0.44)
Responsibility	2.9 (0.38)	2.2 (0.38)	3.5 (0.30)
Pill-classification task			
Hesitation and control	33.5 _a (8.1)	39.6 _a (8.1)	62.7 _b (6.4)
Modification	2.9 (1.4)	3.6 (1.4)	3.5 (1.1)
Time (ms)	6.9 _a (0.84)	6.1 _a (0.84)	7.7 _b (0.66)

Note: The table presents means for each measure. Standard deviations are shown in parentheses. Within each row, values with different subscripts are significantly different.

VAS, with group as a between-subjects factor and time (preinduction, postinduction, and posttask) as a within-subjects factor. We particularly focused on the deontological and altruistic guilt items of the VAS to assess effectiveness of the manipulation. Further subjective variables (discomfort, doubts, responsibility, preoccupation with errors, and task difficulty) were analyzed by a series of analyses of variance with group (deontological guilt, altruistic guilt, and control) as the independent variable. Further univariate analyses of variance were conducted on classification-task behaviors with group as a factor. A Bonferroni test was used for post hoc contrasts ($p < .05$).

Results

Eight participants were excluded from subsequent analyses because of their VAS scores after emotion induction. Specifically, 2 participants from the control group had scores higher than 6 on guilt items, 2 participants from the altruistic group had scores less than 2 in altruistic guilt, and 4 participants from the deontological group had scores less than 2 in deontological guilt. The final analyses were conducted on a sample that comprised

Table 2. Experiment 1 Emotion Scores for Preinduction, Postinduction, and Posttask

Time/emotion	Condition		
	Control	Altruistic guilt	Deontological guilt
Preinduction			
Happy	4.1 (0.76)	3.9 (0.76)	4.9 (0.59)
Altruistic guilt	0.5 (0.5)	1.0 (0.51)	1.2 (0.4)
Deontological guilt	0.31 (0.5)	1.3 (0.5)	0.99 (0.4)
Shame	1.5 (0.61)	1.0 (0.61)	1.2 (0.48)
Fear	0.66 (0.58)	1.5 (0.57)	1.1 (0.45)
Disgust	0.22 (0.13)	0.59 (0.13)	0.15 (0.10)
Sadness	0.54 (0.52)	1.2 (0.52)	0.29 (0.41)
Anger	0.51 (0.6)	1.2 (0.64)	1.1 (0.5)
Pity	0.4 (0.9)	1.8 (0.9)	2.8 (0.71)
Postinduction			
Happy	5.6 _a (0.66)	0.9 _b (0.66)	1.1 _b (0.52)
Altruistic guilt	1.1 _a (1.1)	6.3 _b (1.1)	4.3 _c (0.87)
Deontological guilt	1.3 _a (1.1)	2.2 _a (1.1)	5.2 _b (0.86)
Shame	0.9 _a (0.99)	1.8 _a (1.0)	3.7 _b (0.78)
Fear	1.3 _a (1.0)	2.1 _a (1.1)	3.6 _a (0.85)
Disgust	1 _a (0.98)	3.8 _a (1.0)	2.4 _a (0.77)
Sadness	1.6 _a (1.0)	3.9 _b (0.98)	4.9 _b (0.81)
Anger	0.5 _a (0.98)	6.6 _b (1.1)	2.7 _c (0.77)
Pity	1.3 _a (1.0)	7.5 _b (1.0)	5.3 _c (0.81)
Posttask			
Happy	2.7 _c (0.84)	2.1 _c (0.85)	4.2 _a (0.66)
Altruistic guilt	0.5 _a (0.63)	1.9 _c (0.6)	1.5 _a (0.5)
Deontological guilt	1.2 _a (0.8)	2.1 _a (1.1)	1.5 _a (0.62)
Shame	1.3 _a (0.67)	1.8 _a (0.67)	1.2 _a (0.53)
Fear	0.60 _a (0.69)	1.6 _a (0.69)	1.4 _a (0.54)
Disgust	0.32 _a (0.55)	1.6 _a (0.55)	0.56 _a (0.43)
Sadness	0.54 _a (0.6)	2.4 _c (0.59)	1.1 _a (0.46)
Anger	0.56 _a (0.67)	2.4 _c (0.67)	1.1 _a (0.64)
Pity	0.66 _a (0.74)	2.1 _a (0.74)	1.6 _a (0.58)

Note: The table presents means for each measure. Standard deviations are shown in parentheses. Within each row, values sharing the subscript “a” do not differ significantly from preinduction and values with different subscripts differ significantly ($p < .05$).

29 participants—8 from the control group, 8 from the altruistic-guilt group, and 13 from the deontological-guilt group. Tables 1 and 2 present mean scores and standard deviations for all dependent variables in the three groups.

Control variables. There were no significant differences for level of depression, $F(2, 26) = 0.53$, $p = .59$, $\eta_p^2 = .04$, anxiety, $\Lambda = .91$, $F(2, 26) = 0.56$, $p = .69$, $\eta_p^2 = .05$, or OCD symptoms, $F(2, 26) = 0.68$, $p = .51$, $\eta_p^2 = .05$, among the groups.

Manipulation check: Scores on emotions. Emotion-score results are reported in Table 2. Happiness decreased in both guilt groups after emotion induction; after task

completion, happiness increased slightly in the altruistic-guilt group, decreased in the control group, and returned to the baseline value in the deontological-guilt group—time: $F(2, 52) = 6.87, p = .002, \eta_p^2 = .21$; group: $F(2, 26) = 2.79, p = .08, \eta_p^2 = .18$; Time \times Group: $F(4, 52) = 7.78, p < .001, \eta_p^2 = .38$. Deontological guilt increased in the deontological-guilt group after emotion induction and decreased after task completion—time: $F(2, 52) = 9.96, p < .001, \eta_p^2 = .28$; group: $F(2, 26) = 1.84, p = .18, \eta_p^2 = .12$; Time \times Group: $F(4, 52) = 4.82, p = .002, \eta_p^2 = .27$. Altruistic guilt increased in the altruistic-guilt group after emotion induction and decreased after the pill-classification task—time: $F(2, 52) = 16.25, p < .001, \eta_p^2 = .38$; group: $F(2, 26) = 5.47, p = .01, \eta_p^2 = .29$; Time \times Group: $F(4, 52) = 2.68, p = .04, \eta_p^2 = .17$.

As regards the other emotions, we found a significant interaction for shame, $F(2, 52) = 2.59, p = .04, \eta_p^2 = .17$, with a small increase in the deontological-guilt group after emotion induction, without main effects of time, $F(2, 52) = 1.61, p = .21, \eta_p^2 = .06$, or group, $F(2, 26) = 0.78, p = .50, \eta_p^2 = .06$. We found a significant effect of time on fear, $F(2, 52) = 3.49, p = .04, \eta_p^2 = .12$, with higher scores after emotion induction, whereas the effect of group, $F(2, 26) = 1.31, p = .29, \eta_p^2 = .09$, or Time \times Group interaction, $F(2, 52) = 0.99, p = .41, \eta_p^2 = .07$, were not significant. Similarly, there was a significant effect of time on disgust, $F(2, 52) = 10.87, p < .001, \eta_p^2 = .29$, with scores higher at postinduction than at preinduction and posttask, without significant effects of group, $F(2, 26) = 3.22, p = .06, \eta_p^2 = .19$, or of Time \times Group, $F(2, 52) = 1.11, p = .36, \eta_p^2 = .08$. Significant effects of time and Time \times Group interaction were observed on sadness—time: $F(2, 52) = 17.29, p < .001, \eta_p^2 = .40$; Time \times Group: $F(2, 52) = 3.06, p = .03, \eta_p^2 = .19$. Whereas there was no significant effect of group on sadness, $F(2, 26) = 2.7, p = .08, \eta_p^2 = .17$. Post hoc comparisons showed that sadness increased in the two guilt groups at postinduction and decreased after task completion; in the altruistic-guilt group, sadness decreased at posttask but was still higher than at preinduction. On anger, we found significant main effects of time, $F(2, 52) = 11.60, p < .001, \eta_p^2 = .31$, and group, $F(2, 26) = 6.69, p = .005, \eta_p^2 = .34$, and a significant Time \times Group interaction, $F(2, 52) = 4.88, p = .002, \eta_p^2 = .27$. The altruistic-guilt group showed higher anger scores than did the other groups after induction. The same pattern was found for pity; results showed a significant increase in both guilt groups after emotion induction and a higher score in the altruistic-guilt group—time: $F(2, 52) = 19.85, p < .001, \eta_p^2 = .43$; group: $F(2, 26) = 6.18, p = .006, \eta_p^2 = .32$; Time \times Group: $F(2, 52) = 3.72, p = .01, \eta_p^2 = .22$.

Subjective responses. Analyses showed a group effect on preoccupation with error outcomes, $F(2, 26) = 3.61, p < .05, \eta_p^2 = .22$. A post hoc comparison showed that participants in the deontological-guilt group thought that they

were not engaged enough and worried about their errors more often compared with the other two groups. No effect was found on discomfort or perceived task difficulty, $F(2, 26) = 0.49, p = .20, \eta_p^2 = .04$, doubts, $F(2, 26) = 0.21, p = .82, \eta_p^2 = .02$, or responsibility, $F(2, 26) = 0.98, p = .38, \eta_p^2 = .07$.

Classification task. Analysis on hesitations and checking behaviors showed a significant difference among groups, $F(2, 26) = 3.09, p < .05, \eta_p^2 = .16$, with the deontological-guilt group showing a higher number of control behaviors than the other groups. No effect was found on modification behavior, $F(2, 26) = 0.05, p = .95, \eta_p^2 = .004$. The total time spent on the task tended to be higher in the deontological-guilt group, $F(1, 26) = 3.07, p = .06$ (planned comparison). No effect was found on numbers of errors made during the task, $F(1, 26) = 1.48, p = .24, \eta_p^2 = .10$.

Discussion

The present findings showed that induction of deontological guilt in nonclinical participants increased their concerns about error outcomes and about their own commitment to the task. Furthermore, this condition yielded a great number of hesitations and checking behaviors. These results support the hypothesis that guilt has strong relationships with the genesis of OCD-like experiences. Moreover, and most important, only the deontological-guilt group reported a significant increase in checking behaviors and in subjective “OCD-like experiences.” Furthermore, it is interesting to note that feelings of responsibility did not differ among groups, thus suggesting that such feelings cannot fully explain OCD behaviors, even though they could be an important component of the OCD mental state (e.g., Arntz et al., 2007). Arntz et al. (2007) showed that high personal responsibility for possibly negative outcomes induces new OC phenomena on both the subjective and the behavioral level and that the influence of high responsibility is specific for patients with OCD and not for other patients or the non-clinical population. Arntz et al. also found that induction of responsibility generally does not lead to slowness or reduction of errors. If we posit that the mental state of OCD patients is characterized by deontological guilt, we can explain why an increase of responsibility could trigger checking behaviors. If this were the case, the mental state of an OCD patient should be independent from the specific symptomatology shown. In our Experiment 2, we tested the hypothesis that deontological guilt would increase washing compulsions too.

Experiment 2

Given the link between moral emotions and physical washing (Reuven et al., 2014; Zhong & Liljenquist, 2006),

in this study, we explored the differential effects of guilt on washing behaviors. We induced deontological guilt or altruistic guilt and asked participants to wash a cube.

Method

Participants. The sample comprised 50 nonclinical volunteers (30 females, 20 males; mean age = 25.00 years, $SD = 4.21$, range = 19–39) whose mean level of education was approximately 16 years. Participants were Second University of Naples undergraduate students dwelling in southern Italy, and 98% of them lived in an area near Naples. Participants were randomly assigned to one of three emotion conditions: altruistic guilt, deontological guilt, or neutral control.

All participants were right-handed, had normal or corrected-to-normal vision, and were naive to the purposes and predictions of the experiment. Participants gave their written informed consent to take part in the experiment.

Procedure. Participants were individually tested. After receiving a brief explanation of the general aim of the investigation, participants completed the VAS to evaluate their emotional state. Next, the experimenter provided the following instruction:

In a moment, I will start the video recorder and leave the room. You have to wear the headphones and start the computer recorder by pressing “play.” You will hear a short story. At the end of the story, auditory instructions will require you to fill out another scale and then to go into the next laboratory room in order to complete a washing task. On the table, you will find a basket containing cleaning products (gloves, handkerchiefs, Kleenexes, Q-tips, paper towels, spray cleaner, leather cloth, cotton cloth, and various sponges) and a 20 × 20 cm cube of Plexiglas, with faces of 6 different colors. You have to clean the cube for the time and following the procedures you choose, without any constraint. After completing the task, you will fill out this booklet [subjective measures and control variables]. I will be in a room near to this one. When you have finished, please call me.

The experimenter then started the video camera and left the room. Participants listened to a story meant to induce either deontological guilt, altruistic guilt, or no changes in emotional state and then filled out the second VAS. Immediately thereafter, participants started to clean the cube. After finishing the task, participants completed a series of questionnaires (the third VAS scale and a control questionnaire and a self-report questionnaire on

subjective variables). At the end of the experiment, participants were debriefed.

Control variables, subjective responses, and emotion induction. The assessment of participants' psychological characteristics, the emotion-induction procedure, and the assessment of participants' emotions on a VAS before and after completing the task (for the manipulation check) were the same as for Experiment 1. As in the previous experiment, we used self-report questionnaires to evaluate discomfort perceived during the task, doubts, perceived responsibility, preoccupation with error outcomes, and perceived task difficulty.

Cleaning task. This experimental task required the participants to clean a 20 × 20 cm cube of Plexiglas that had faces of six different colors. The cube was placed 20 cm in front of the participant on the table; a basket containing cleaning products was located to the right of the cube (gloves, handkerchiefs, Kleenexes, Q-tips, paper towels, spray cleaner, leather cloth, cotton cloth, and various sponges). A video camera placed before the participant at the other side of the table videotaped the participant's behavior. Participants were required to clean the cube within the time allowed and following the procedures they chose without any constraint.

Behavioral checklist. Two independent judges reviewed the videotapes recorded during the cleaning task and assessed the following behaviors on a checklist: (a) number of faces washed; (b) checking, defined as the number of times the participant went back to clean the same face of the cube; (c) time to complete the task; and (d) accuracy, defined as the judges' impression of the task done. Interrater agreement of these variables, computed on 40% of the observations, was very high ($\kappa = .98$).

Statistical analyses. Data checking and analyses on control variables (PI-R, BDI, and STAI-Y), on subjective variables (discomfort, doubts, responsibility, preoccupation, and task difficulty), and on the three completed VASs were performed as in Experiment 1. We used a series of univariate analyses of variance (with group as a factor) to analyze the number of cube faces washed, checking behaviors, time to complete the task, and accuracy. A Bonferroni test was used for post hoc contrasts ($p < .05$).

Results

Six participants were excluded from subsequent analyses because of their VAS scores after emotion induction. Specifically, 2 participants from the control group had scores higher than 6 on guilt items, 3 participants from the altruistic group had scores less than 2 in altruistic

Table 3. Scores for Control and Subjective Variables and for Behaviors Videotaped on the Cleaning Task From Experiment 2

Variable and behavior	Condition		
	Control	Altruistic guilt	Deontological guilt
Depression			
Beck Depression Inventory	6.1 (1.2)	6.3 (1.2)	7.4 (1.1)
Anxiety			
State	41.7 (3.2)	35.9 (3.1)	40.8 (2.9)
Trait	39.9 (2.7)	37.3 (2.6)	42.3 (2.5)
Obsession/compulsion			
Padua Inventory–Revised	21.2 (5.2)	17.1 (4.9)	27.1 (4.5)
Subjective response			
Discomfort	2.6 _a (0.3)	2.8 _a (0.3)	3.9 _b (0.3)
Task difficulty	2.1 (0.3)	2.3 (0.4)	2.3 (0.5)
Preoccupation with errors	3.7 _a (0.5)	2.9 _a (0.6)	5.3 _b (0.6)
Doubt	1.5 _a (0.4)	2.4 (0.5)	3.3 _b (0.5)
Responsibility	4.4 (0.4)	4.4 (0.5)	4.3 (0.5)
Cleaning task			
Faces washed	8.5 _a (0.9)	7.1 _a (0.9)	11.6 _b (0.8)
Checking	1.1 _a (0.4)	0.7 _a (0.4)	3.3 _b (0.4)
Time (ms)	1.43 (0.3)	1.13 (0.3)	1.30 (0.2)
Accuracy	6.9 (0.6)	6.5 (0.6)	7.0 (0.6)

Note: The table presents means for each measure. Standard deviations are shown in parentheses. Within each row, values with different subscripts are significantly different.

guilt, and 1 participant from the deontological group scored less than 2 in deontological guilt. The final analyses were conducted on a sample that comprised 44 participants: 13 from the control group, 14 from the altruistic-guilt group, and 17 from the deontological-guilt group. Tables 3 and 4 present mean scores and standard deviations for all dependent variables of the three groups.

Control variables. There were no significant differences for level of depression, $F(2, 41) = 0.43$, $p = .65$, $\eta_p^2 = .02$, anxiety, $\Lambda = .92$, $F(4, 80) = 0.56$, $p = .48$, $\eta_p^2 = .04$, or OCD symptoms, $F(2, 41) = 1.18$, $p = .32$, $\eta_p^2 = .05$, among the groups.

Manipulation check: Scores on emotions. After emotional induction, happiness decreased in both guilt groups (see Table 3). Happiness remained low in the altruistic-guilt group after the cleaning task, whereas it increased in the deontological-guilt group—time: $F(2, 82) = 11.59$, $p < .001$, $\eta_p^2 = .22$; group: $F(2, 41) = 2.93$, $p = .06$, $\eta_p^2 = .13$; Time \times Group: $F(4, 82) = 3.29$, $p < .05$, $\eta_p^2 = .14$. Deontological guilt increased in the deontological-guilt group only and returned to initial levels

Table 4. Experiment 2 Emotion Scores for Preinduction, Postinduction, and Posttask

Time/emotion	Condition		
	Control	Altruistic guilt	Deontological guilt
Preinduction			
Happy	5.3 (0.76)	4.3 (0.59)	4.7 (0.59)
Altruistic guilt	0.4 (0.5)	1.03 (0.51)	1.08 (0.4)
Deontological guilt	1.02 (0.5)	1.9 (0.5)	1.4 (0.4)
Shame	1.3 (0.51)	1.1 (0.49)	2.2 (0.51)
Fear	1.5 (0.46)	0.39 (0.44)	2.2 (0.46)
Disgust	0.35 (0.31)	0.16 (0.30)	0.81 (0.31)
Sadness	0.49 (0.47)	0.62 (0.45)	1.2 (0.47)
Anger	0.51 (0.51)	1.1 (0.49)	1.1 (0.51)
Pity	1.5 (0.56)	2.3 (0.54)	1.1 (0.56)
Postinduction			
Happy	5.8 _a (0.66)	1.8 _b (0.59)	1.9 _b (0.52)
Altruistic guilt	0.9 _a (1.1)	5.8 _b (1.1)	2.9 _a (0.87)
Deontological guilt	0.4 _a (1.1)	1.0 _a (1.1)	4.9 _b (0.86)
Shame	0.56 _a (0.69)	2.2 _a (0.67)	2.8 _a (0.69)
Fear	0.71 _a (0.56)	2.6 _b (0.54)	2.7 _b (0.56)
Disgust	0.37 _a (0.74)	3.4 _b (0.72)	2.8 _b (0.74)
Sadness	0.74 _a (0.71)	3.5 _b (0.69)	3.6 _b (0.71)
Anger	0.34 _a (0.75)	4.2 _b (0.72)	2.6 _a (0.75)
Pity	1.8 _a (0.83)	6.5 _b (0.80)	3.6 _b (0.83)
Posttask			
Happy	4.8 _a (0.84)	3.4 _c (0.72)	3.6 _a (0.66)
Altruistic guilt	0.7 _a (0.63)	3.1 _c (0.6)	1.8 _a (0.5)
Deontological guilt	0.8 _a (0.8)	0.6 _a (1.1)	1.7 _a (0.62)
Shame	0.53 _b (0.31)	0.31 _b (0.30)	1.5 _b (0.31)
Fear	0.36 _a (0.40)	0.49 _a (0.39)	2.9 _b (0.40)
Disgust	0.38 _a (0.35)	1.1 _a (0.34)	1.0 _a (0.35)
Sadness	0.65 _a (0.56)	1.2 _a (0.54)	1.4 _a (0.56)
Anger	0.46 _a (0.51)	1.7 _c (0.49)	1.1 _a (0.51)
Pity	0.79 _a (0.62)	3.5 _c (0.60)	1.5 _a (0.62)

Note: The table presents means for each measure. Standard deviations are shown in parentheses. Within each row, values sharing the subscript “a” do not differ significantly from preinduction and values with different subscripts differ significantly ($p < .05$).

(preinduction) after the washing task—time: $F(2, 82) = 4.44$, $p = .01$, $\eta_p^2 = .10$; group: $F(2, 41) = 5.83$, $p < .01$, $\eta_p^2 = .22$; Time \times Group: $F(4, 82) = 8.12$, $p < .001$, $\eta_p^2 = .28$. The altruistic-guilt group, instead, showed an increase of altruistic guilt postinduction and a decrease of altruistic guilt after the washing task, although it remained higher than at the preinduction assessment—time: $F(2, 82) = 22.90$, $p < .001$, $\eta_p^2 = .36$; group: $F(2, 41) = 5.02$, $p = .01$, $\eta_p^2 = .19$; Time \times Group: $F(4, 82) = 4.78$, $p < .01$, $\eta_p^2 = .19$.

With regard to the other emotions, shame showed a main effect of time, $F(2, 82) = 5.19$, $p < .01$, $\eta_p^2 = .11$, with a decrease of shame in the posttask assessment versus the pre- and postinduction evaluations, but no significant

effect of group, $F(2, 41) = 3.21, p = .06, \eta_p^2 = .13$, or Time \times Group interaction, $F(2, 82) = 1.54, p = .21, \eta_p^2 = .07$. Fear was higher in the deontological-guilt group, group effect: $F(2, 41) = 4.11, p < .05, \eta_p^2 = .17$, than in either the control or the altruistic-guilt groups and increased after emotion induction in both guilt groups, whereas fear decreased in the altruistic-guilt group at the third assessment—Time \times Group: $F(4, 82) = 2.78, p < .05, \eta_p^2 = .12$. Fear also showed a significant effect of time, given that it decreased at the third assessment, $F(2, 82) = 5.45, p < .01, \eta_p^2 = .12$. Disgust showed significant main effects of time, $F(2, 82) = 11.71, p < .001, \eta_p^2 = .22$, and group, $F(2, 41) = 3.46, p = .05, \eta_p^2 = .15$, and a significant Time \times Group interaction, $F(4, 82) = 2.97, p < .05, \eta_p^2 = .12$. Indeed, disgust increased in both guilt groups, but not in the control group, after emotion induction and decreased after task completion. On sadness, a significant effect of time and a Time \times Group interaction were observed—time: $F(2, 82) = 15.86, p < .001, \eta_p^2 = .28$; Time \times Group: $F(4, 82) = 2.98, p < .05, \eta_p^2 = .13$. Whereas the main effect of group on sadness was not significant, $F(2, 41) = 2.16, p = .13, \eta_p^2 = .09$. Post hoc comparisons showed that sadness increased in the two guilt groups at postinduction and decreased after task completion. Anger showed a significant effect of group, with participants in the altruistic-guilt group showing higher scores than those in the control group, $F(2, 41) = 4.26, p = .02, \eta_p^2 = .17$, and a significant effect of time, with scores at postinduction higher than scores at preinduction and posttask, $F(2, 82) = 6.65, p < .005, \eta_p^2 = .14$, whereas the Time \times Group interaction was not significant, $F(4, 82) = 2.22, p = .07, \eta_p^2 = .09$. Pity too showed a significant effect of group, $F(2, 41) = 6.17, p < .01, \eta_p^2 = .23$, with the altruistic-guilt group scoring higher than the other groups, and a significant effect of time, $F(2, 82) = 18.32, p < .001, \eta_p^2 = .31$, with scores at postinduction higher than at preinduction and posttask; the Time \times Group interaction was not significant, $F(4, 82) = 2.44, p = .053, \eta_p^2 = .10$.

Subjective responses. Discomfort, $F(2, 29) = 4.94, p = .014, \eta_p^2 = .25$, preoccupation with error outcomes, $F(2, 29) = 4.42, p = .02, \eta_p^2 = .23$, and doubts, $F(2, 29) = 4.41, p = .02, \eta_p^2 = .23$, showed a significant effect of group. Post hoc comparisons showed that participants assigned to the deontological-guilt group perceived more discomfort and were more worried about errors than were participants assigned to the other two groups, and they showed more doubts than did control group participants. No significant differences were found on task difficulties, $F(2, 29) = 0.14, p = .87, \eta_p^2 = .01$, or responsibility, $F(2, 29) = 0.02, p = .98, \eta_p^2 = .01$.

Cleaning task. Analysis on cleaning behaviors (see Table 3) showed a significant difference among groups on the number of washed cube faces, $F(2, 41) = 7.95,$

$p = .001, \eta_p^2 = .28$, and on the number of times participants cleaned the same face, $F(2, 41) = 13.17, p = .001, \eta_p^2 = .39$. Participants in the deontological-guilt group washed the cube more times and returned to the same faces more often than did participants in the altruistic-guilt and control groups. Time to complete the task, $F(2, 41) = 0.73, p = .49, \eta_p^2 = .03$, and accuracy, $F(2, 41) = 0.19, p = .83, \eta_p^2 = .009$, did not show a significant effect of group.

Discussion and conclusions

Our principal aim was to investigate whether deontological guilt versus altruistic guilt would activate checking behaviors and physical cleaning. Overall, data from these two studies showed that participants in the deontological group, compared with the other participants, scored higher in doubts and discomfort, checked more, and cleaned an object (the cube) more times.

These findings suggest that altruistic and deontological guilt differ because they imply different needs for control or checking and for cleanliness. Our data showed that deontological guilt, as opposed to altruistic guilt, implies a Lady Macbeth effect, which is consistent with studies that have shown that deontological guilt activates the insula, an area involved in disgust (Basile et al., 2013; Basile & Mancini, 2011). The link between deontological guilt and disgust could explain why moral sins (against the moral authority, God, or the natural order) are dirtier and more washable than are sins against others (altruistic guilt). Several researchers have reported that violations in the divinity's moral domain (the religious and natural order) trigger more moral and physical disgust than do violations in the community domain (the duties and obligations of a social role or class) and in the autonomy domain (the rights of an individual; Hutcherson & Gross, 2011; Rozin, Lowery, Imada, & Haidt, 1999; Russell, Piazza, & Giner-Sorolla, 2013; Shweder, Much, Mahapatra, & Park, 1997).

According to Catholic theology (Benedict XVI, 2013), original sin is due to humans' willingness to replace God and, therefore, concerns the relationship between humans and divinity rather than empathy, altruism, or affection for others. The purification from the original sin is the washing ritual (i.e., the baptism). Pontius Pilate, after having sentenced Jesus Christ unjustly, took water and washed his hands and said, "Innocens ego sum a sanguine iusti huius" ("I am innocent of the blood of this right man"; Mt. 27:24). Hand washing was an attempt to reduce his guilt, presumably related to the awareness of having committed an act against justice. In contrast, Sophie, the protagonist of the novel *Sophie's Choice* and whose guilt arises from having chosen to let her daughter be killed in order to save her son, did not feel dirty and

did not seek relief in the washing but sought relief in death (Styron, 1979). Similarly, Primo Levi, the well-known Italian writer and survivor of the Nazi extermination camps, suffered all his life from the guilt for not having shared the same tragic fate of many of his friends (Gordon, 2010). It does not appear that he felt dirty, and he did not try to cleanse his conscience by washing, but the sense of guilt did lead him to commit suicide. Rachman et al. (2012) found that "the addition of elements of betrayal to the imaginal scenario will enhance the feelings of dirtiness . . . and . . . will enhance the urges to wash" (p. 588); that is, the perpetrator effect is more intense if one adds elements of betrayal, which strengthens its transgressive component.

To our knowledge, ours is the first study to investigate the relationship between specific guilt feelings and effective behaviors, apart from doubts and discomfort. Previous studies have investigated the relationship between generic guilt and control or washing behaviors by means of questionnaires that assessed self-perception of behavior, for example, "I think I'm doing (or I did) other than what I do." On the basis of our findings, we argue that deontological guilt, rather than altruistic guilt, triggers repetition and cleansing behavior, thus possibly explaining the controversial findings reported in the literature (e.g., Arntz et al., 2007; Cougle, Goetz, Hawkins, & Fitch, 2012).

Alternatively, it could be suggested that self-relief, obtained from performing the cleaning/checking behavior, acts as a mechanism that strengthens the behavior itself. In this view, washing for any reason (not necessarily linked to an emotional antecedent) could implement the washing/checking, thereby resulting in a "ritualistic" behavior. Our findings seem to support the argument that deontological guilt, and not altruistic guilt, increases washing and checking behaviors and seem to be consistent with a hypothesis of causal relationship. In fact, we found that both checking and washing behaviors increased whenever people reported feeling stronger deontological guilt and that feelings of deontological guilt decreased and happiness increased after performance of either of these rituals.

We believe that to clarify the direction of the relationship between emotion and behavior, it would be worthwhile to assess whether triggering a wish to wash or to check implies deontological guilt. It might also be interesting to trace emotional and physiological changes during ritualistic behaviors (like washing or control). If a close relationship between behaviors and emotions exists, it is possible that individuals performing these behaviors, by observing what they are doing, could prompt a vicious circle similar to the following:

I clean repeatedly (for example, because my hands are dirty or because I feel discomfort on the hands)

and I feel benefit from washing behavior. So, it has to mean that I need to wipe because I'm dirty. I did not touch any physical contaminants, so I'm morally dirty.

If this is true, induction of washing or checking behavior would imply feelings of deontological guilt, particularly if people were stopped while performing such activities rather than if they were allowed to complete their rituals.

Findings from our studies suggest some alleys for new research, such as investigating whether and how different moral emotions (i.e., disgust, guilt, anger, or shame) act on behavior and thought. For example, Mancini and Gangemi (2011) have suggested that in a trolley-dilemma task, deontological guilt would increase the likelihood for omission options because these choices, easier than action, imply the "not-play-God" principle. Otherwise, altruistic guilt should facilitate the utilitarian choice of reducing the number of crash victims. It would also be interesting to investigate whether deontological guilt is related to physiological changes similar to those connected with physical disgust, which would indicate a further link between moral and physical emotion.

The association between specific kinds of guilt and OCD-like behaviors may have important implications in clinical psychology and suggests that deontological rather than altruistic guilt plays a pivotal role in the genesis and maintenance of OCD. However, given that this study was conducted with a nonclinical sample, any extension of our results to clinical OCD must be made with caution, although current behavioral and cognitive-behavioral theories (Rachman & Hodgson, 1980; Salkovskis, 1989) and data on nonclinical samples (Burns, Formea, Keortge, & Sternberger, 1995) support the notion of a continuum between normal individuals and OCD patients (i.e., a dimensional basis of obsessions and compulsions). Studies of nonclinical individuals suggest some questions regarding the relation between OC behaviors and guilt. Many factors, for instance, cognitive components, such as intolerance to uncertainty, perfectionism, or overestimation of threat, likely contribute to maintenance of this disorder, and it is also plausible that OCD patients could be biased in decoding their emotional states. If deontological guilt is the core of this disorder, patients could read all negative emotional states as guilt feelings, thus starting OC rituals.

Some functional MRI data have suggested that in nonclinical individuals, the neural activation related to deontological guilt is similar to the activation that occurs in obsessive patients after symptom induction (Basile et al., 2011). Moreover, Basile et al. (2013) found anomalies in the activation of the insula in obsessive patients during induction of deontological guilt and no difference

between obsessive patients and nonclinical participants during induction of altruistic guilt. It is interesting that the OCD patients did not suffer from washing compulsions only. In other words, if deontological guilt—the kind of guilt closer to disgust—is strongly involved in OCD, we could easily understand why propensity to disgust and to guilt are related in individuals with OCD but not in non-clinical individuals or in individuals with other anxiety disorders (D'Olimpio et al., 2013).

These observations can help to understand some features of obsessive symptoms, for example, the concern for blasphemy or sexually perverse thoughts, the fact that more interest is paid to execution than to efficacy of the rituals (see also American Psychiatric Association, 1994), or the decrease in worries about damage to and suffering of others if patients believe that they will not experience guilt.

Several factors might limit generalization of our findings. First, our sample was restricted to a single geographical location in Italy and was not representative of all ethnic and racial groups. One might wonder whether different findings would emerge in other Italian regions or other countries in the world. Italy is strongly influenced by the Catholic religion, and in Italy, the educational setting often is based on guilt. The culture, in this case, might explain some of the relationship between guilt and behaviors. However, recall that the influence of responsibility and guilt in general, at least in checking behaviors, also has been found in different samples (e.g., Ceulemans, Karsdorp, & Vlaeyen, 2013). A second problem relates to the low statistical power that might explain the lack of difference between the altruistic-guilt and control groups, as well as the lack of some effects within the deontological groups. This issue warrants exploration in subsequent studies with larger samples, but our results suggest that deontological guilt specifically differs from other emotional states. Third, our study of nonclinical individuals did not allow us to draw strong inferences on OCD, but it seems timely to examine whether in the natural course of OCD, the emergence of doubts, ruminations, and perseverative rituals are in fact related to feelings of deontological guilt. Further examinations are needed to understand the relative importance of these aspects and ultimately integrate them into a comprehensive model of the maintenance and development of OCD. In this sense, it would be appropriate to investigate whether fear of deontological guilt, but not of altruistic guilt, implies changes in obsessive symptoms and to assess whether it occurs in patients with other symptoms. In conclusion, our data suggest that the study of deontological guilt can help to better understand the psychological determinants and the factors of vulnerability involved in obsessive symptoms.

Author Contributions

F. D'Olimpio and F. Mancini developed the study concept and contributed to the study design. F. D'Olimpio collected the data and conducted the primary analyses. Both authors drafted the manuscript and approved the final version of the manuscript for submission.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

[AQ: 3]

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