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Manipulation of responsibility in non-clinical subjects: does expectation of failure exacerbate obsessive–compulsive behaviors?

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Abstract

An exaggerated sense of responsibility is currently considered as the ground for the obsessive–compulsive disorder. Obsessive-like behaviors, such as hesitations and checks, may be induced in non-clinical subjects by increasing perceived responsibility (i.e., perceived personal influence on negative outcomes). In line with Salkovskis' proposal [The cognitive approach to anxiety: threat beliefs, safety-seeking behavior, and the special case of health anxiety and obsessions, in: P.M. Salkovskis (Ed.), Frontiers of Cognitive Therapy, Guilford, New York], we tested the hypothesis that reduced coping abilities (i.e., an exaggerated expectation of failure) are another effectual factor contributing to obsessive-like behaviors. We examined 47 normal volunteers in a visuo-spatial memory task, and manipulated their perceived personal influence and expectation of failure by giving differential instructions and feedback about their performance. Increase of perceived personal influence induced slowness, hesitations and checks without enhancing performance. Expectation of failure exacerbated obsessive-like behaviors, again without affecting performance. These results confirm the role of responsibility in obsessive-like behavior and indicate that reduced coping abilities may contribute to worsen dysfunctional strategies.

Keywords: Responsibility; Coping ability; Checking; Hesitation; Obsessive; Compulsive

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1. Introduction

Salkovskis (1985, 1989) and Rachman (1993) suggested that an exaggerated sense of responsibility could be the ground for the obsessive–compulsive disorder (OCD). Excessive or inflated responsibility was defined as “the belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes. These outcomes are perceived as essential to prevent. They may be actual, that is, having consequences in the real world, and/or at a moral level” (Salkovskis, 1996b).

Several studies found a significant correlation between responsibility and obsessive–compulsive (OC) behaviors in both clinical (e.g., Steketee, Frost, & Cohen, 1998; Bouchard, Rhèaume, & Ladouceur, 1999) and non-clinical subjects (e.g., Wilson & Chambles, 1999; Menzies, Harris, Cumming, & Einstein, 2000). Furthermore, several empirical investigations showed that manipulating perceived responsibility may modulate the severity of obsessive signs.

For instance, Lopatka and Rachman (1995) manipulated perceived responsibility by stipulating that the patient’s actions would be integrally and exclusively on the experimenter’s own responsibility. In this condition, both distress and urges to perform compulsions decreased. Shafran (1997) used a more indirect way to manipulate responsibility: patients were exposed to threatening stimuli either in the presence or in the absence of their therapist. The latter situation induced higher urge to neutralize, discomfort and probability of threat.

Manipulations of responsibility in normal subjects resulted in intriguing findings, showing that responsibility may induce OC behaviors in non-clinical subjects. For instance, Ladouceur et al. (1995) induced an assumption of high responsibility in non-clinical subjects, by telling them that the errors they would make during a classification task would lead to harmful and undeserved outcomes (subjects were told that their performance could directly influence the manufacture of a medication for a virus). Experimental subjects had more hesitations and checks, and reported more preoccupation with errors and anxiety than control subjects. In a subsequent study, Ladouceur, Rhéaume, and Aublet (1997) investigated the effects of two related cognitive distortions (perceived significance of negative outcomes and perceived personal influence on negative outcomes) on perceived responsibility and checking behavior. Expectation of potential negative consequences was manipulated in the same way as in the previous study. Personal influence was manipulated by telling subjects that they were part of a small sample, and hence their errors would have higher impact on the manufacture of the medication.

Several authors have also postulated that an important role in OCD could be the perceived ability to cope with danger, that is a disproportionate perceived probability of making mistakes (e.g., Freeman, Pretzer, Fleming, & Simon, 1990). McFall and Wollersheim (1979) and Guidano and Liotti (1983) have theorized that anxious people underestimate their coping ability. Steketee et al. (1998) found that OCD patients, compared to non-clinical participants and people with other anxiety disorders, underestimate their ability to cope with OCD-related negative occurrences. Recently, Woods, Frost, and Steketee (2002), using an ideographic approach, reported that OC symptoms are negatively correlated to coping ability (as OC symptoms increase, coping ability decreases) both in OCD patients and non-clinical sample. In particular, these authors aimed to test the Salkovskis’ equation (1996a), as the product of probability and severity ratings divided by coping ability, to determine its relationship to OC symptoms. Results showed that higher probability estimation for students, and worse predicted coping ability for OCD patients, was the most predictive variable for OC symptoms.

Having a belief about one's own coping abilities changes the cognitive and emotional status of the responsible agent. In a very high responsibility condition, one will be absolutely serene, if s/he thinks to be able to appropriately face the situation. On the other hand, one will be very anxious if s/he expects to make bad use of her/his influence. In other words, the more one expects to behave inappropriately, the more one will control his own performance and will exhibit obsessive-like behavior.

In the previously quoted experiments (Ladouceur et al., 1995, 1997), one can not rule out the possibility that experimental subjects not only felt more responsible (increasing the perceived personal influence on negative outcomes or the perceived significance of negative outcomes), but were also more inclined to expect to make errors. Thus, their obsessive-like behavior might also depend on this assumption. The aim of the present study is to verify the hypothesis that not only perceived responsibility, but also the fear to behave inappropriately (coping ability underestimation) and thus to be the cause of unfair damage may increase obsessive-like behavior.

We tested three groups of normal volunteers in a visuo-spatial memory task, and manipulated their perceived personal influence (responsibility) and expectation of failure (coping ability underestimation) by giving differential instructions and feedbacks about their performance. Personal influence was manipulated by falsely informing participants that the experimenter would be victim of unjust damage if they did not perform their best in specific experimental trials. Expectation of failure was manipulated by falsely informing participants, before the experimental session, that they had performed very badly in the training session. We expected that both manipulations would induce obsessive-like behaviors, measured through the performance in the experimental task and a self-report questionnaire.

2. Method

2.1. Participants

Participants were 47 students recruited at the University of Rome (mean age 22.5 years, s.d. = 4.68, 13 males and 34 females). They were asked to participate in a visuo-spatial memory task and randomly assigned to three experimental groups: the personal influence group (PI), the personal influence plus expectation of failure group (PI + EF), and the control group (C).

2.2. Visuo-spatial memory task

The task was a modification of Postma and De Haan's (1996) object location memory task. In each trial, eight items were presented on a computer screen. The eight items could be either eight identical squares, or eight different objects, or eight stars drawn in different colors. These three stimulus types were randomly intermixed. At the beginning of each trial, the eight items were placed at the top of the screen. Subjects held the computer mouse and clicked on a "Start" button to start the trial. The eight items simultaneously moved on the screen to predefined target positions. This target configuration was available for 12 s, and then the items moved back to the starting position. The task was to rearrange the items to match the target spatial configuration, by dragging them using the computer mouse. Instructions stressed the importance of accuracy in reconstructing the target configuration. To this aim, participants had no time limits and were allowed to come back and see the target configuration every time they wanted to, by clicking on a “Back” button. Participants had to click on a “Forward” button to end the trial.

2.3. Procedure

At the beginning of the experimental session, a research assistant briefly explained the procedure and participants filled in the informed consent form. Then, participants were asked to complete two different “fictitious” attention tests. In the former, they had to find and mark the differences in two near-identical pictures. The latter was a letter cancellation test. Participants were requested to complete both tests as accurately as possible in 20 s each. Next, participants were trained in the visuo-spatial memory task (see above). During this training, they completed six trials (two “square”, two “object”, and two “star” trials). After the training, they received differential instructions depending on group.

While control subjects were only told that this study concerned visuo-spatial memory, participants assigned to the PI group were falsely informed that the examiner was a victim of unjust damage. The laboratory director had forced the examiner to test a lot of subjects in a short time, since the laboratory would have an important grant only if the experiment was completed within a week and if the results were the expected ones. Furthermore, the examiner would be dismissed if he was not able to obtain results conforming to the experimental hypothesis within a week. Participants were also told that, if they wanted to help the examiner, they had to perform as best as they could, especially whenever the items to rearrange were the stars. It was underlined that everything was up to the participant. In this situation, participants should feel to have the power to prevent damage to the examiner, who was not responsible for eventually incorrectly formulated hypotheses.

Participants assigned to the PI + EF group received the same instructions as the PI group, but were also falsely informed that they had obtained very low scores both in the training session and in attention tests, because they were inattentive. This kind of information was given to make participants expect they were not able to face the situation and to prevent damage to the examiner.

After receiving instructions, participants completed 15 trials of the visuo-spatial memory task (five “square”, five “object”, and five “star” trials). Then, they were requested to fill in a 16-item self-report questionnaire, ranged on a seven-point Likert scale, assessing discomfort perceived during the task (seven items), doubts (six items), and perceived performance (three items).

A further questionnaire was administered in order to check whether the instruction manipulation was effective. The questionnaire included questions on perceived responsibility (one item), on preoccupation with the outcome of their errors (one item), and on perceived task difficulty (three items, one per stimulus type). If the manipulation was effective, PI and PI + EF subjects should report more perceived responsibility and more preoccupation with the outcome of their errors, and should judge star trials easier than square and object trials.

Finally, the examiner explained the rationale of the experiment and asked participants whether they had believed the story about the laboratory manager, and (for the PI + EF group) whether they had believed they had performed badly in the training session. On the basis of this interview, 11 subjects were excluded from the analysis.

2.4. Dependent variables

Five behavioral dependent variables related to the performance in the visuo-spatial memory task were considered: (1) execution speed (measured as the mean time spent for each trial), (2) number of checks (measured as the number of times per trial participants came back and looked at the target configuration again), (3) number of hesitations (measured as the mean number of "moves" per item), (4) accuracy of each configuration (measured as the mean distance of each rearranged item from its target position), and (5) number of errors (defined as the number of items per trial placed more then 1.5 cm away from their target positions).

Furthermore, we considered three subjective dependent variables evaluated through the self-report questionnaire: (1) discomfort perceived during the task, (2) doubts, and (3) perceived performance. Finally, we considered three control variables evaluated through the manipulation check questionnaire: (1) perceived responsibility, (2) preoccupation with error outcomes, and (3) perceived task difficulty.

3. Results

Group mean scores of the behavioral, subjective, and control variables are shown in Table 1.

The analysis conducted on the control variables (manipulation check questionnaire) revealed that the manipulation of perceived responsibility and expectation of failure was effective. Both PI + EF and PI subjects perceived more responsibility ($F_{2,33} = 6.19$, $p < 0.01$) and preoccupation with the outcomes of their errors ($F_{2,33} = 4.52$, $p < 0.05$) than control subjects. Perceived task difficulty was analyzed through a 3 by 3 mixed analysis of variance with group (PI, PI + EF, and C) and stimulus type (squares, objects, and stars) as factors. Significant group by stimulus type interaction was found ($F_{4,66} = 2.50$, $p < 0.05$). Planned comparisons ($p < 0.05$) revealed that star trials were judged easier by PI and PI + EF subjects than by control subjects, while the perceived difficulty of square and object trials were the same across groups. These results show that subjects from both PI and PI + EF groups understood and adhered to instructions, and accordingly perceived more responsibility and preoccupation for error outcomes.

For each of the five behavioral variables (execution speed, checks, hesitations, accuracy, and number of errors), a 3 by 3 mixed analysis of variance was conducted, with group (PI, PI + EF, and C) and stimulus type (squares, objects, and stars) as factors. Since the differential information provided to the three groups was intended to increase their perceived personal influence and/or expectation of failure for the "star" trials only, we expected a group by stimulus type interaction, with the three groups differing only in the star condition.

Indeed, significant group by stimulus type interactions was found for speed ($F_{4,66} = 7.00$, $p < 0.01$), checks ($F_{4,66} = 5.84$, $p < 0.01$), and hesitations ($F_{4,66} = 5.04$, $p < 0.01$), while no significant effects were found for accuracy and errors. Planned comparisons ($p < 0.05$) revealed that, as expected, in the star condition PI subjects were slower and showed more checks and hesitations than control subjects, and PI + EF subjects were slower and showed more hesitations

Table 1
Mean scores and standard deviations (in brackets) of behavioral, subjective, and control variables, in the C, PI, and PI + EF groups

Dependent variables		Trial type	C		PI		PI + E	
Control variables (manipulation check questionnaire)	Perceived responsibility		3.64	(0.6)	4.70*	(2.0)	5.00*	(2.3)
	Preoccupation with errors		1.30	(1.3)	2.50*	(0.7)	2.60*	(0.8)
	Perceived task difficulty	Objects	4.00	(1.7)	3.80	(1.9)	3.82	(1.5)
		Squares	3.71	(1.2)	3.90	(1.5)	3.50	(1.1)
		Stars	3.92	(1.3)	5.20*	(1.8)	5.20*	(1.1)
Behavioral variables	Execution speed (s)	Objects	18.87	(7.9)	15.43	(4.29)	14.76	(3.87)
		Squares	19.99	(7.9)	19.88	(6.75)	23.74	(13.12)
		Stars	19.36	(10.4)	30.34*	(12.43)	36.48***	(19.42)
	Number of checks	Objects	0.85	(0.32)	0.72	(0.15)	0.66	(0.08)
		Squares	0.89	(0.30)	0.93	(0.42)	1.30	(0.57)
		Stars	0.86	(0.4)	1.30*	(0.65)	1.62***	(0.96)
	Number of hesitations	Objects	14.29	(4.7)	12.22	(4.8)	12.37	(3.9)
		Squares	15.28	(4.7)	13.75	(4.7)	15.86**	(7.6)
		Stars	14.23	(6.0)	18.28*	(3.8)	20.99***	(9)
	Accuracy (mm)	Objects	477.8	(70.3)	510.3	(61.7)	533.2	(33.6)
		Squares	497.2	(49.3)	489	(44.9)	482.2	(45)
		Stars	490.2	(68.0)	498.4	(65.8)	494.0	(54.4)
	Number of errors	Objects	21.9	(7.38)	28.4	(4.8)	25.69	(3.7)
		Squares	21.3	(5.78)	23.4	(1.6)	24.2	(3.9)
		Stars	20.6	(5.9)	23.78	(5.3)	20.8	(4.9)
Subjective variables (self-report questionnaire)	Discomfort		2.6	(0.8)	2.7	(1.1)	2.6	(0.7)
	Doubts		2.1	(0.6)	3.1*	(1.4)	3.0*	(0.9)
	Perceived performance		3.8	(0.9)	4.0	(1.3)	3.6	(0.8)

* Significantly different ($p < 0.05$) from the control group.
** Significantly different ($p < 0.05$) from the PI group.

and checks than both PI and control subjects. Conversely, there was no effect of group in the square and symbol conditions, except that the PI + EF subjects showed more hesitations than the two other groups also with square stimuli.

These results show that: (a) perceived personal influence induces a tendency to slowness, hesitation and checks; (b) the expectation not to be equal to the situation exacerbates these tendencies; (c) both factors do not influence performance accuracy (defined in either of two different ways); and (d) the effects of both factors do not manifest themselves during the whole experimental task, but selectively affect performance during the target trials.

For each of the three self-report variables, group differences were evaluated through one-way analyses of variance. A significant difference among groups was found only for doubts ($F_{2,33} = 4.27$, $p < 0.05$), with both PI and PI + EF subjects reporting more doubts than control subjects.

4. Discussion

The aim of the present study was to investigate the role of personal influence (responsibility) and of expectation of failure (coping ability) on OC behaviors. To this end, we induced responsibility (PI group) and responsibility combined with expectation of failure (PI + EF group) in non-clinical volunteers, involved in a visuo-spatial memory task. Subjects from both experimental groups, in which excessive responsibility had been induced, presented significantly more hesitations, more checking behaviors, and more doubts about their performances, and took more time to rearrange sequences than control subjects. Furthermore, the PI + EF group showed more checks and hesitations and took more time than the PI group. These behaviors have been considered characteristics of OCDs.

We believe that the experimental paradigm takes account of some typical characteristics in OCD. The situation elicited by the experimental paradigm seems to be very similar to the one faced in every-day life. Dipping in their obsessive doubts, patients do not have a direct feedback on whether they have or have not done something, and/or on how they have performed. In these conditions, they often come back and check their doubts (with overt and/or covert actions). Similarly, subjects of the present study can not see the target configuration while they are reconstructing it. However, they can switch back and check the target configuration whenever they feel doubtful about their performance or memory, and this happens more often in the experimental than in the control groups.

Importantly, the paradigm was designed as to enhance responsibility and expectation of failure through differential instructions, not only in the experimental groups relative to the control group, but also in one specific target condition relative to two control conditions. Indeed, experimental subjects showed an OC like pattern and reported more doubts only in the target condition, which was presented as particularly “dangerous” for the experimenter. Thus, the effect of responsibility and expectation of failure remained specific and did not generalize over all the situations faced by the same subjects during the experiment. This pattern parallels the behavior of many patients, whose OC behaviors are limited to specific classes of events.

Our findings are in line with previous experiments which have manipulated responsibility (Ladouceur et al., 1995, 1997; Lopatka & Rachman, 1995; Shafran, 1997). The new aspect of our results is that coping ability (personal expectation of being inadequate or achieving an inadequate performance in subjectively perceived important outcomes) yielded a further increase of control on own behavior and doubts, even in non-clinical subjects. Woods et al. (2002) found that the coping ability was a factor strongly contributing to the prediction of OC behaviors only in OCD patients, whereas the factor contributing to the prediction of OC behaviors in non-clinical subjects was the probability of a subjectively dangerous/severe event to occur. A possible explanation for this discrepancy is the ideographic methodology used by Woods et al. (2002). As they comment, "events written by students seem objectively less severe than those written by patients". Their approach could have drawn non-clinical participants to write down events they subjectively evaluate more probable and less severe.

To our knowledge, our study represents the first evidence for a relationship between coping ability and obsessive-like behaviors in non-clinical subjects. This link strengthens cognitive models of OCD, suggesting that feeling of inflated responsibility is necessary but, maybe, not sufficient to show a complex obsessive-like behavior. The expectation of failure (coping ability underestimation), when added to an increase of responsibility, enhances the control strategies engaged by responsibility itself. This finding could imply that people having a general assumption of inadequate perceived competence could show obsessive-like behaviors, at least in situations where personal responsibility is increased.

In summary, our findings seem to confirm that personal influence plays an important role in obsessive-like behaviors, that is, some behaviors and thoughts could vary and have an increase depending on manipulation of responsibility (Ladouceur et al., 1995, 1997). Furthermore, according to Woods et al. (2002), they suggest an important role of perceived inadequate performance (coping ability) to increase some typical behaviors and thoughts of OC disturb. In paraphrasing Salkovskis' words, our results give a straight evidence in non-clinical subjects that OCD behavior could be caused or justified by the belief that "one has power which is pivotal to bring about or prevent subjectively crucial negative outcome" (Salkovskis, 1996b), when s/he has the conviction that s/he could act in the wrong way and is afraid not to be able to face his own responsibility (Salkovskis, 1996a).

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