



## An Empirical Investigation into Pathological Worry and Rumination: Guilt, Shame, Depression, and Anxiety

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### Abstract

Worry and rumination are maladaptive cognitive strategies with the purpose to manage negative emotions and threatening events (Wells & Matthews, 1994), and studies have shown that they are associated with an increasing of anxiety and depression (Fresco et al., 2002; Nolen-Hoeksema, 2000). Although the relationship between guilt and shame with depression and anxiety is well documented (Câdea & Szentagotai-Tătar, 2018; Thibodeau, & Jorgensen, 2011), only few studies (Orth et al., 2006; Mor & Winquist, 2002; Spasojevic & Alloy, 2001) investigated the mediational role of worry and rumination in the relationship between guilt and shame and depression and anxiety. We hypothesized that worry and rumination correlate with all types of interpersonal guilt and with shame and that they mediate the effects of these moral emotions on depression and anxiety disorders.

**Methods.** We recruited a sample of 343 subjects, to whom we administered the *Interpersonal Guilt Rating Scale-15s* (IGRS-15s; Gazzillo et al. 2018), *The Other as Shamer Scale* (OAS; Goss, Gilbert, & Allan, 1994), *The State-Trait Anxiety Inventory* (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), *The Beck Depression Inventory II*, *The Penn State Worry Questionnaire* (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) and *The Ruminative Response Scale* (RRS; Nolen-Hoeksema & Morrow, 1991; Treynor et al., 2003) and an ad hoc form for assessing socio-demographic and anamnestic information.

**Results.** In line with our hypotheses (Gazzillo, Leonardi, Bush, 2020), worry and rumination correlated with all types of interpersonal guilt. Moreover, worry and rumination were positively correlated with depression and anxiety disorders; specifically, rumination emerged as a mediating factor between self-hate and depression, while worry was a mediating factor in the relationship between omnipotence and trait anxiety. Finally, our hypothesis that, in worrying and ruminating, shame had a relevant impact, was also confirmed.

**Conclusions.** This study suggests that guilt and shame may be a powerful component of mental health problems and that worry and rumination represent risk factors for the maintenance and exacerbation of these disorders.

**Keywords:** worry; rumination; Control-Mastery Theory; guilt; shame; depression; anxiety.

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## Introduction

Worry and rumination are considered transdiagnostic psychological processes (Kertz, Bigda-Peyton, Rosmarin, & Björgvinsson, 2012; Watkins, 2008) and as factors maintaining and exacerbating many disorders linked to negative mood and feelings (Nolen-Hoeksema & Watkins, 2011; Watkins, 2009). Research studies have particularly emphasized the strong correlation of worry and rumination with depression and depressive symptoms (Gladstone et al., 2005; Mor & Winquist, 2002; Nolen-Hoeksema & Watkins, 2011; Starcevic, 1995) and with anxiety disorders (Barlow, 2002; Starcevic et al., 2007). Worry is more future-oriented and is often focused on a cascade of uncontrollable negative thoughts and images, representing a mental problem-solving strategy toward issues whose outcomes are uncertain but believed to be probably negative. Indeed, it seems that people who worry are uncertain about their capacity to control events and unable to tolerate this uncertainty (Dugas, Gagnon, Ladouceur, & Freeston, 1998), and so worry is also strictly connected to fear (Borkovec, Robinson, Pruzinsky, & DePree, 1983) and to the attempt to devise coping strategies which ultimately prove to be unsuccessful, producing other significant problems (Borkovec, 1985; Roemer & Borkovec, 1993). Rumination is more past-oriented, focused on losses and failures and on the reasons why something happened, trying to attribute meaning and causes to these events (Beck, 1967, 1976; McLaughlin & Nolen-Hoeksema, 2011; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins, 2004; Watkins, Moulds, & Mackintosh, 2005). Ruminating people believe that important outcomes are definitely impossible to reach (Lyubomirsky, Tucker, Caldwell, & Berg, 1999), and so rumination is characterized by negative thinking, a maladaptive cognitive style, and the use of inflexible coping strategies. Problem solving and instrumental behaviors are impaired, hindering the achievement of goals (Watkins & Nolen-Hoeksema, 2014) and negatively affecting social relationships (Nolen-Hoeksema & Davis, 1999).

Summarizing, both worry, and rumination are overgeneralizing and abstract ways of thinking (Stöber, Tepperwien, & Staak, 2000; Watkins & Teasdale, 2001). They may be thought of as coping strategies aimed at managing negative emotions and threatening events (Wells & Matthews, 1994), and are associated with an exacerbation of anxiety and depression (Abbott & Rapee, 2004; Barlow, 2002; Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Harrington & Blankenship, 2002; Nolen-Hoeksema, 2000) and inhibit effective emotional processing (Segerstrom, Tsao, Alden, & Craske, 2000).

Research (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) has proven that worry and rumination are associated with reflection, but while reflection is an active problem solving strategy, they represent a passive comparison of one's current or past situation with some unachieved standard. Moreover, the strong association between worry and rumination with depression, guilt and shame on the other side has been empirically shown (Alexander, Brewin, Vearnal, Wolff, & Leff, 1999; Ghatavi, Nicolson, MacDonald, Osher, & Levitt, 2002; Allan, Gilbert, & Goss, 1994; Andrews & Hunter, 1997; Andrews, Qian, & Valentine, 2002; Cheung, Gilbert, &

Irons, 2004; Fontaine, Luyten, De Boeck, & Corveleyn, 2001; Harder, Cutler, & Rockart, 1992; Jarrett & Weissenburger, 1990; Stuewig & McCloskey, 2005; Tangney, Wagner, & Gramzow, 1992).

In line with these aspects, Control-Mastery Theory (CMT; Gazzillo, 2016; Silberschatz, 2005; Weiss, 1993; Weiss, Sampson, & Mount Zion Psychotherapy Process Research Group, 1986) underlines how worry and rumination are distortions of normal reflexive thinking, often caused and sustained by pathogenic beliefs that support interpersonal guilt, in many cases with the unconscious aim of self-punishment (Gazzillo, Leonardi & Bush, 2020).

CMT identifies five types of interpersonal guilt (Gazzillo et al., 2019), based on psychoanalytic hypotheses (Asch, 1976; Loewald, 1979; Modell, 1965, 1971; Niederland, 1981):

- *Survivor guilt*, based on the pathogenic belief that having more success, satisfaction, good fortune, or other positive qualities than important others may hurt them.
- *Separation/disloyalty guilt* based on the pathogenic belief that separating physically or psychologically from loved ones can cause them harm.
- *Omnipotent responsibility guilt*, based on the pathogenic belief that one must, and has the power to, make loved ones happy, so that putting the satisfaction of one's own needs to the fore means being selfish and hurting them.
- *Burdening guilt*, which derives from the pathogenic belief that one's emotions and needs are a burden to loved ones, and that one's own problems, emotional expressions and fragilities cannot be expressed because this would hurt others.
- *Self-hate*, which is based on the pathogenic belief of being bad, rotten, inadequate, and worthless. Unlike the others, this is a self-accusation about what one is, rather than what one has done or might potentially do; its interpersonal origin derives from the fact that in the presence of neglectful or abusive parents, it is safer for a child to think that he or she deserves the mistreatment s/he suffers rather than feeling dependent on parents who are actually bad (Fairbairn, 1943).

About *shame*, Tangney, Wagner, Hill-Barlow, Marschall, and Gramzow (1996) argued that it is an intense feeling which causes a great sense of inferiority, implying an overall judgment of the self (e.g., I am bad) and so making it easy to want to hide from others. People who are prone to shame show greater anger arousal and are likely to respond to this anger in a destructive way (Tangney et al., 1996). They also imagine a negative evaluation of the self from the perspective of significant others, and for this reason shame is a dejection-related emotion, arising from a perceived discrepancy between what one is and what one should be (Higgins, 1987). Tangney, Burggraf, and Wagner (1995) differentiate the effects of shame and guilt on depression, arguing that shame, involving a negative evaluation of the self, implies causal attributions that are internal, global, and stable. In contrast, guilt, involving a negative evaluation of a specific behavior, implies causal attributions that are internal, specific, and rather unstable.

Orth, Berking, and Burkhardt (2006) empirically showed the direct effect of shame on rumination, which substantially

mediates the effect of shame on depression: shame elicits rumination, which in turn leads to greater depression. In their study, Orth et al. (2006) underline how shame, and not guilt, involves a global negative evaluation of the self in relation to significant others, with a deep impact on self-esteem, which warns the person about his/her relational value that is perceived to be at risk. So, shame may be a strong indicator of the fear of social rejection and may lead to withdrawal or irascible behaviors, causing the loss of important relationships, and ultimately increasing depression.

However, both guilt and shame are tied to the perception of the self, having a fundamental impact on the dynamics of interpersonal relationships (Tangney & Dearing, 2002; Bush, 2019). Studies have indeed shown that the effects of both guilt and shame may be mediated by rumination in relation to maintaining and causing negative affect (Mor & Winquist, 2002) and depression (Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1991, 2000; Nolen-Hoeksema & Morrow, 1991; Spasojevic & Alloy, 2001; Trapnell & Campbell, 1999).

The goal of this study is to show empirically that worry and rumination correlate with interpersonal guilt and to confirm that they are relevant factors in depression and anxiety disorders (Gazzillo, Leonardi, Bush, 2020).

It is expected that worry correlates more with omnipotent responsibility, due to the fact that people with omnipotent responsibility have, as their primary concern, the satisfaction of others' needs, and feel a duty and a power to do so, and with survivor guilt, considering that for people affected by this kind of guilt having more than loved ones is a source of concern for the less fortunate others. We expect that worry correlates also with self-hate, given that it may be supported by the belief of not being capable of doing something good. We then expect that rumination correlates more with self-hate, as it is more connected to a self-blame dimension, and omnipotent responsibility, due to brooding over what one has not been able to do for, and to give to, significant others. Finally, we expect that rumination correlates also with survivor guilt insofar as ruminating may be a way for punishing and diminishing the self.

Furthermore, we hypothesize the mediating effect of rumination on the relationship between self-hate and depression, and the mediating effect of worry on the relationship between omnipotence and anxiety.

Finally, in line with prior findings (Orth et al., 2006), we want to test the hypothesis that when worrying or ruminating, it may be important even the feeling of shame, which we assume is strictly connected to self-hate, as showed in previous studies (see Faccini et al., 2020).

## Methods

### Sample

The inclusion criteria for our study were: to be over 18 years old, with no form of addiction, an absence of psychotic syndromes or symptoms, and no damage to the central nervous system.

Our sample was composed of 343 subjects, recruited from both college students and the general population. Their

average age was 32.22 years ( $SD = 15.67$ ; range 18–68); 211 were female (61.5%) and 132 were male (38.5%). In respect of the educational level of our sample, 11 (3.2%) had completed first grade school, 160 (46.6%) had completed middle school, 154 (44.9%) had completed high school, and 18 (5.2%) had completed college. In terms of socioeconomic status, 30 (8.7%) were poor, 291 (84.8%) were working-middle class people, and 21 (6.1%) were upper class. The data for one subject were missing. Finally, 67 subjects in our sample (19.5%) were in psychotherapy, with their treatments ranging between 1 and 96 months, while 276 (80.5%) were not. All the data were collected in Italy before the COVID-19 emergency lockdown, which occurred in the country from March 2020.

### Measures

*The Interpersonal Guilt Rating Scale-15s* (IGRS-15s; Gazzillo et al., 2018; Faccini, Gazzillo, & Gorman, 2020) is a 15-item self-report rating scale which assesses interpersonal guilt as conceived in CMT. Each item is rated on a five-point rating scale, ranging from 1 (not representative at all) to 5 (completely representative). Earlier factor analyses conducted on two different Italian samples pointed to a three-factor solution differentiating survivor guilt, omnipotence guilt (comprising both omnipotent responsibility guilt and separation/disloyalty guilt), and self-hate. The concurrent and discriminant validity of the IGRS-15s were determined using as criterion measures the Interpersonal Guilt Questionnaire-67 (IGQ-67; O'Connor, Berry, Weiss, Bush, & Sampson, 1997) and the Fear of Punishment/Need for Reparation Scales (FPNRS; Caprara, Perugini, Pastorelli, & Barbaranelli, 1990). Its construct validity was assessed using the Affective Neuroscience Personality Scale (ANPS; Davis, Panksepp, & Normansell, 2003) and the Psychological General Well-Being Index (PGWBI; Dupuy, 1984). The internal consistency of the three guilt factors (Cronbach's alpha values) were acceptable to good: survivor guilt = 0.82; omnipotence guilt = 0.73; self-hate = 0.78. The alpha level of the overall scale was good (0.83) (Faccini et al., 2020). The test-retest reliability at four weeks was good, ranging from  $r = 0.70$  to  $r = 0.76$ .

*The revised socio-demographic schedule* (Gazzillo & Faccini, 2019) is a brief ad hoc self-report tool composed of eleven forced choice questions aimed at collecting data about age, gender, instruction, socioeconomic status, and the self-reported presence of traumas in early childhood.

*The Other as Shamer Scale* (OAS; Goss, Gilbert, & Allan, 1994), with the Italian version by Balsamo et al. (2015), includes 18 items chosen from the 25-item ISS (Cook, 1993) to measure global judgments on how the self is evaluated by others. Respondents are asked to rate on a five-point Likert-type scale, ranging from 0 (never) to 4 (almost always), the frequency with which they make certain evaluations. The total score, calculated by totaling the item scores, ranges from 0 to 72, higher scores indicating greater external shame. Goss et al. (1994) found this scale to have a Cronbach's alpha of 0.92. The OAS factor structure is composed of three main factors which account for 60.4 percent of the total variance: inferiority, comprising seven items related to being seen as inferior;

emptiness, consisting of four items related to being seen as empty; and mistake, which consists of six items relating to how vigilant others to mistakes one makes (Goss et al., 1994).

*The Penn State Worry Questionnaire* (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) has 16 items, each of which is rated on a scale from 1 (*not at all typical of me*) to 5 (*very typical of me*). Eleven items are worded in the direction of pathological worry, with higher scores indicating more worry (e.g., ‘Once I start worrying, I cannot stop’), while the remaining five items are worded to indicate that worry is not a problem, with higher scores indicating less worry (e.g., ‘I never worry about anything’). Total score is calculated by totaling the first 11 items and the reverse-scores of the latter five items. Higher PSWQ scores reflect greater levels of pathological worry. The PSWQ has been shown to have good internal reliability in samples consisting of older adults with generalized anxiety disorder, community samples, and undergraduates, with Cronbach alphas ranging from 0.88 to 0.95 (Startup & Erickson, 2006).

*The State-Trait Anxiety Inventory* (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) consists of two 20-item scales that aim to measure state and trait anxiety. The STAI state subscale asks respondents to rate on a four-point scale how they feel “right now” in response to a series of self-descriptive statements. Each of the items is rated from 1 (not at all) to 4 (very much so). In contrast, the STAI trait subscale asks respondents to rate how they feel “generally” on a four-point scale, from 1 (almost never) to 4 (almost always). Higher scores indicate greater anxiety. Internal consistency coefficients for the scale range from 0.86 to 0.95; test-retest reliability coefficients range from 0.65 to 0.75 over a two-month interval (Spielberger et al., 1983). In the mediation model we will consider only trait anxiety. However, the results are substantially similar even considering state anxiety.

*The Beck Depression Inventory II* (BDI II; Beck, Steer, & Brown, 1996) has 21 items and is one of the most widely used self-report instruments to study depression symptoms. The BDI instructs individuals to select one statement that best corresponds to their situation out of four. Each of the 21 items from the inventory reflects a distinct aspect of depression. Participants respond using a four-point scale (0 to 3), higher scores indicating more severe depressive symptomology. The test also has high internal consistency ( $\alpha = 0.91$ ).

*The Ruminative Response Scale* (RRS; Nolen-Hoeksema & Morrow, 1991; Treynor et al., 2003) provides a measure of dispositional tendencies to ruminate in response to negative affect. The RRS consists of 22 possible responses to sad mood that are focused on the self, on one’s symptoms, and on the possible causes and consequences of the mood state. It also assesses behavioral responses to dysphoria. Responses are rated on a scale from 1 (almost never respond in this way) to 4 (almost always respond in this way). The RRS has three factor-analytically derived subscales. The 12-item depression subscale captures content related to depressive symptoms; the four-item brooding subscale involves “moody pondering” on personal shortcomings and life setbacks; and the six-item reflection subscale involves items designed to assess efforts to analyze one’s self, feelings, thoughts, and events in a resolution-oriented perspective (Treynor et al., 2003). In previous studies, total RRS has achieved a test-retest correlation of 0.67 over a two-

year period and satisfactory convergent and predictive validity (Nolen-Hoeksema & Morrow, 1991; Treynor et al., 2003).

### Hypotheses

Our hypotheses were as follows.

- 1) The three-factor structure of the IGRS-15s, which differentiates survivor guilt, omnipotence guilt, and self-hate, would be confirmed in this new sample.
- 2) All the IGRS-15s scales are positively and significantly correlated with the OAS (shame).
- 3) There is a significant positive correlation between IGRS-15s factors and rumination and worry; in particular, we suppose that rumination has a stronger correlation with self-hate and omnipotence guilt, and that worry has a stronger correlation with omnipotence guilt and survivor guilt.
- 4) Shame, as assessed by the OAS, has strong correlations with worry and rumination.
- 5) There are significant positive correlations between interpersonal guilt, shame, and depression, and between interpersonal guilt, shame, and anxiety.
- 6) Worry and rumination are involved in the development and maintenance of anxiety and depression.
- 7) Rumination may be a mediator in the relationship between self-hate and depression.
- 8) Worry may be a mediator in the relationship between omnipotence guilt and anxiety.
- 9) Shame has a strong effect on worry, rumination, anxiety, and depression.

### Procedure

In order to check the factor structure of the tool, we performed a confirmatory factor analysis (CFA). To assess the relationship between the different empirically derived factors of the IGRS-15s—the BDI II, the STAI, the OAS, the RRS, and the PSWQ—we used the Spearman’s rho correlation coefficient.

Finally, we calculated a mediation model to investigate the possibility that interpersonal guilt, worry, and rumination are involved in the genesis and maintenance of anxiety and depression; we then repeated the analysis with shame instead of interpersonal guilt.

All the analyses were performed with JASP 0.12.1.0.

### Results

The CFA using 369 cases was computed using the R *lavaan* package (Rosseel, 2012) included in JASP (JASP Team, 2020).

As the IGRS-15s items are ordered, categorical items, they were estimated using diagonally weighted least squares (DWLS; Muthén, 1993) fit criterion. The item wordings and loadings are displayed in Table 1. A three-factor confirmatory analysis solution model (survivor guilt, omnipotence guilt, self-hate) was confirmed, based on previous research with the IGRS-15s (Faccini et al., 2020; Gazzillo, Gorman, De Luca, & Faccini, 2018) and CMT hypotheses (Gazzillo, 2016; Silberschatz, 2005; Weiss, 1993; Weiss et al., 1986).

The quality of the measurement model was examined through the fit indices estimates of Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). According to literature (Hu & Bentler, 1999), a model is considered to have a good fit if the comparative fit index (CFI) is >0.90; and the root mean square error of approximation (RMSEA) values are <0.08. All items were statistically significantly correlated with their purported factors. The fit of the three-factor model was excellent (CFI = 0.98, TLI = 0.97, RMSEA = 0.038,  $\chi^2 = 128.51$ ,  $df = 87$ , RMR = 0.06).

Tab. 1. Three-factor confirmatory factor analysis

Factor	Item	Item Wording	Loadings
Survivor	igrs7	The idea of being envied makes me acutely uncomfortable.	0.47
Survivor	igrs2	I feel uncomfortable feeling better off than other people.	0.68
Survivor	igrs4	I feel uncomfortable when I believe that I am better than others.	0.67
Survivor	igrs12	I conceal or minimize my successes out of concern for making less successful people feel bad.	0.63
Survivor	igrs15	I feel uncomfortable when I receive better treatment than others.	0.64
Omnipotence	igrs5	I feel selfish and insensitive if I am not the person who takes care of other people.	0.58
Omnipotence	igrs13	I would feel badly if I doubted about the values and beliefs of my family	0.46
Omnipotence	igrs9	I feel overly responsible for other people's well-being.	0.72
Omnipotence	igrs3	I feel it is my responsibility to fix other people's problems.	0.73
Omnipotence	igrs8	I feel I should visit my parents as often as they wish.	0.60
Omnipotence	igrs14	I think I should not separate from loved ones because this would be hurtful, disloyal, or make them feel abandoned.	0.33
Omnipotence	igrs10	I tend to put aside my interests, needs and passions to take care of other people.	0.45
Self-hate	igrs1	I believe that if other people really know me, they would want nothing to do with me.	0.69
Self-hate	igrs11	I do not deserve to be happy.	0.47
Self-hate	igrs6	I believe I have tricked other people into liking me.	0.69

Note. All loadings were statistically significant at the .05 level or less.

Covariances among the factors are shown in Table 2 and indicate that the factors were mutually correlated. Therefore, the IGRS-15s items are shown to have a hierarchical structure in which three distinct factors can be seen to be nested in an overall general guilt factor.

Tab. 2. IGRS-15s factor covariances (n=343)

	1.	2.	3.
Survivor guilt	1		
Omnipotence guilt	.46**	1	
Self-hate	.17**	.28**	1

Note. \*\* p < 0.01

The internal consistency (Cronbach's alpha values) of the three guilt factors was acceptable: survivor guilt = 0.75; omnipotence guilt = 0.75; self-hate = 0.65. The alpha level of the overall scale was good (0.80).

The average scores of these different kinds of guilt in our sample were: survivor guilt 2.30 (SD = 0.72), omnipotence guilt 2.59 (SD = 0.66), and self-hate 1.46 (SD = 0.56).

The average score of shame, as measured by the OAS, was 1 (SD = .54). The average score of depression, as measured by BDI, was 9.32 (SD = 6.46); the average score of state and trait anxiety, as measured by the STAI-Y, were, respectively, 39.81 (SD = 10.56) and 42.93 (SD = 10.23).

Finally, the average score of rumination and worry were, respectively, 45.71 (SD = 12) and 50 (SD = 12.5).

We calculated the correlations of the IGRS-15s with other measures using the Spearman's rho coefficient. First of all, we calculated the correlation between the IGRS-15s and the measure of shame (the OAS), already validated on an Italian sample. We expected a low to moderate levels of correlation between the two measures and the data supported our hypothesis. Moreover, the correlations between interpersonal guilt, shame, and worry were calculated, assessed with the PSWQ, and rumination, assessed with the RRS. Data are shown in Table 3.

Tab. 3. Spearman Rank-Order Correlations between interpersonal guilt, shame, worry and rumination (n=343)

	Shame	Worry	Rumination
Survivor guilt	.27***	.27***	.23***
Omnipotence guilt	.35***	.31***	.26***
Self-hate	.42***	.22***	.27***
Shame	1	.45***	.46***

Note. \*\*\* p = 0.001

We also expected to find a positive and significant correlation between interpersonal guilt, shame, and the measure of depression, assessed with the BDI, and between interpersonal guilt, shame, and anxiety, assessed with the STAI-Y. Data are presented in Table 4.

Tab. 4. Correlations between interpersonal guilt, shame, and anxiety (n=343)

	Depression	State Anxiety	Trait anxiety
Survivor guilt	.20**	.28**	.27**
Omnipotence guilt	.30**	.32**	.37**
Self-hate	.35**	.33**	.37**
Shame	.50**	.52**	.61**

Note. \*\* p = 0.01

To investigate the correlations between rumination, worry, depression, and anxiety, we calculated the Spearman's rho between rumination (RRS), worry (PSWQ), depression (BDI II), and state and trait anxiety (STAI-Y). We expected to find positive and significant correlations between these variables.

Tab. 5. Spearman Rank-Order Correlations between rumination, worry, depression and anxiety

	Depression	Sate anxiety	Trai anxiety
Rumination	.46**	.45**	.63**
Worry	.46**	.58**	.77**

Note. \*\* p = 0.01

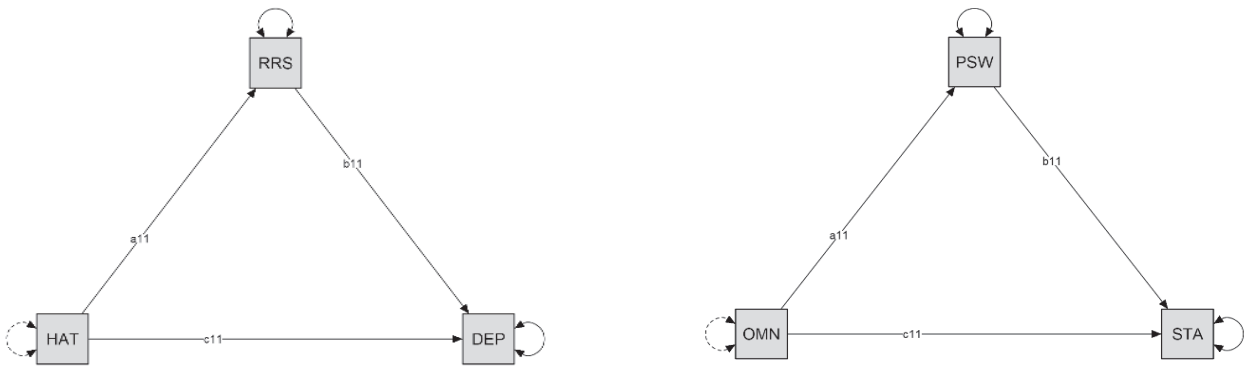
To test the hypothesis that rumination could be a mediator of the relationship between self-hate and depression, and that worry could be a mediator of the relationship between omnipotence and anxiety, we performed a mediation analysis. We choose to investigate the relationship between self-hate and rumination and omnipotence and worry on the basis of

theoretical and clinical reasons (Gazzillo, Leonardi, & Bush, 2020). However, a stepwise model of linear regression confirms that, among the three kinds of guilt assessed by IGRS-15s, self-hate was the best predictor of rumination and omnipotence was the best predictor of worry. Along the same line, self-hate was the best predictor of depression, and omnipotence was the best predictor of trait anxiety<sup>1</sup>.

The total effect of self-hate on depression was statistically significant and the results of mediation showed that the indirect effect of rumination on the relationship between self-hate and depression was also significant. (See Table 6)

The total effect of omnipotence on trait anxiety was statistically significant and the results of mediation showed that the indirect effect of worry on the relationship between omnipotence and trait anxiety was significant, too. (See Table 7)

Fig. 1. Mediations involving self-hate, omnipotence, rumination, and worry



Tab. 6. Simple mediation results for rumination in the relationships between self-hate and depression

Direct effects

						95% Confidence Interval		
			Estimate	Std. Error	z-value	p	Lower	Upper
Self-hate	→	Depression	0.448	0.085	5.291	< .001	0.259	0.641

Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

Indirect effects

							95% Confidence Interval			
				Estimate	Std. Error	z-value	p	Lower	Upper	
Self-hate	→	Rumination	→	Depression	0.189	0.043	4.416	< .001	0.118	0.279

Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

Total effects

						95% Confidence Interval		
			Estimate	Std. Error	z-value	p	Lower	Upper
Self-hate	→	Depression	0.637	0.089	7.149	< .001	0.452	0.843

Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

R-Squared

Self-hate	R <sup>2</sup>
Depression	0.272
Rumination	0.074

<sup>1</sup> For the results of these regression models, please contact the last author of this paper.

Tab. 7. Mediation results for worry in the relationships between omnipotence and anxiety

**Direct effects**

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Omnipotence	→ Trait Anxiety	2.469	0.234	0.053	< .001	0.129	0.338

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

**Indirect effects**

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Omnipotence	→ Worry → Trait Anxiety	0.340	0.059	5.766	< .001	0.224	0.456

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

**Total effects**

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Omnipotence	→ Trait Anxiety	0.574	0.076	7.533	< .001	0.425	0.456

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

**R-Squared**

Omnipotence	R <sup>2</sup>
Trait Anxiety	0.619
Worry	0.095

Due to the strong relationship that shame has with both depression and anxiety, we later investigated also the role of this variable in the mediation models. The results are shown in Tables 8 and 9.

Tab. 8. The mediating role of rumination in the relationship between shame and depression

**Direct effects**

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Shame	→ Depression	4.400	0.597	7.373	< .001	3.231	5.570

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

**Indirect effects**

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Shame	→ Rumination → Depression	1.593	0.320	4.970	< .001	0.965	2.221

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

**Total effects**

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Shame	→ Depression	5.993	0.556	10.781	< .001	4.903	7.083

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

**R-Squared**

Shame	R <sup>2</sup>
Depression	0.320
Rumination	0.210

Tab. 9. The mediating role of worry in the relationship between shame and trait anxiety

Direct effects

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Shame	→ Trait anxiety	0.614	0.063	9.806	< .001	0.491	0.736

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

Indirect effects

			Estimate	Std. Error	z-value	p	95% Confidence Interval	
							Lower	Upper
Shame	→ Worry	→ Trait anxiety	0.052	0.062	8.370	< .001	0.398	0.641

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

Total effects

		Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Shame	→ Trait anxiety	1.133	0.079	14.434	< .001	0.979	1.287

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

R-Squared	
Shame	R <sup>2</sup>
Trait anxiety	0.686
Worry	0.205

Discussion

The data presented in this study confirmed some of the hypotheses of Control-Mastery Theory about worry and rumination and their relationships with guilt (Gazzillo, Leonardi, Bush, 2020). All types of guilt assessed by the IGRS-15s, and also shame, assessed by the OAS, positively correlated with rumination and worry.

As expected, we found in our sample that rumination is a mediator of the relationship between self-hate and depression. We interpreted the data by assuming that the tendency to ruminate on the reasons why something happened, mainly focusing on negative aspects of the self, may be supported by, and may support in turn, particularly maladaptive pathogenic beliefs about oneself, associated with self-criticism, self-blame, and feelings of low efficacy. These beliefs negatively influence the interpretation of situations, making thoughts more pessimistic and exacerbating negative emotions and moods.

We also found that worry is a mediator in the relationships between omnipotence and trait anxiety. This finding can be interpreted by assuming that excessive anxiety about possible future outcomes is influenced by the belief of having the duty and power to make other people feel happy and stay safe. And that the more a person is anxious, the more s/he will be preoccupied with the wellbeing of other people and his/her own capacity to make other people feel fine.

Unlike guilt, shame involves a negative evaluation of the entire self and not of a specific behavior (Lewis, 1971), so that it seems to represent a construct which may be closely connected to what CMT describe with the terms self-hate. And in this sample, as in previous research (Faccini et al.,

2020; Giammarco & Vernon, 2015), shame correlated with all the interpersonal kinds of guilt, and in particular with self-hate. Self-hate, in fact, is the guilt about what one is, rather than what one has done or might potentially do, implying, like shame, a global and stable internal causal attribution, and a strong and painful self-focused feeling. Therefore, we supposed that the tendency to ruminate on past events, mainly focusing on loss and failure and the tendency to worry may be exacerbated by, and may exacerbate, a negative self-representation characterized by inadequacy and low self-efficacy, which is the basis of shame.

In line with these hypotheses and with previous studies (Cheung et al., 2004; Orth et al., 2006), we found that rumination mediates the effect of shame on depression. To explain this finding, it is possible to hypothesize that since shame implies an imagined and possibly distorted negative evaluation from the perspective of significant others, the individual feels his/her relational value threatened, fearing social rejection. The perceived threat to the satisfaction of a fundamental need, such as the need for belongingness (Baumeister & Leary, 1995), elicits and maintains rumination about the problematic situation (Joireman, 2004). And persistent attention to the negative aspects of the self substantially influences negative mood and depression (Mor & Winquist, 2002), which may in turn exacerbate rumination and self-criticism.

In the same way, to explain the finding that worry mediates the effect of shame on anxiety, it is possible to hypothesize that a negative global evaluation of the self that engenders feelings of shame can be the basis of a system of negative expectations about oneself in terms of adequacy and efficacy, which can lead the person to experience excessive concern about possible



future outcomes, which, although uncertain, are perceived as potentially negative, increasing the levels of anxiety experienced by the person. And anxiety, in turn, may exacerbate shame.

Future research on clinical samples should prove the causal link between interpersonal guilt, shame, worry, rumination, and psychopathology.

#### Author Contributions

The authors contributed equally to this manuscript.

#### Compliance with Ethical Standards

#### Conflict of interest

The authors declare that they have no competing interests.

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#### Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval for the study was provided by the Department of Dynamic and Clinical Psychology, Sapienza University of Rome.

#### Informed Consent

Each participant dealt with the process of informed consent.

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