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## Worry and associated cognitive features in Italian university students: Does gender make a difference?



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### ABSTRACT

Worry is frequently observed in undergraduates, especially in female students who usually show a lower adjustment to college life than male ones. The current study explored gender differences in worry and its associated cognitive features in a large sample of Italian university students and assessed whether different mechanisms may occur in the path from Intolerance of Uncertainty (IU) to worry according to gender. A sample made up of 243 male and 406 female undergraduates entered the study. Comparisons on measures assessing worry, IU, Positive Beliefs about Worry (PBW), Negative Problem Orientation (NPO), and Cognitive Avoidance (CA) were performed. Furthermore, two moderated mediation models (one for each sample) wherein IU was the independent variable, worry the dependent variable, PBW, NPO, and CA parallel mediators, were tested. Females showed higher levels of worry, NPO, and CA than males, but effects were small. Whilst PBW and NPO, but not CA, mediated the relationship between IU and worry in both samples, IU moderated the mediations only in females. Overall, results suggest the existence of a differential interplay between worry and associated cognitive features according to gender in Italian undergraduates.

### 1. Introduction

Most lifetime mental diseases have their peak onset during young adulthood, especially during the typical college age (Hunt & Eisenberg, 2010; Kessler et al., 2005; Mackenzie et al., 2011). In such a period of life, undergraduates deal with a novel, uncontrollable, and changeable context; indeed, they usually need to cope with a number of stressors, such as academic requirements, separation from family, financial concerns, different eating and sleeping habits, new social environment and personal health, and post-graduation plans (Ahern & Norris, 2011; Blanco et al., 2008; Hurst, Baranik, & Daniel, 2012; Kumaraswamy, 2013). All these factors are likely to trigger psychological distress and worry, thus negatively impacting on well-being.

The Intolerance of Uncertainty Model (IUM; Dugas, Gagnon, Ladoceur, & Freeston, 1998) is one of the most systematically validated explanatory models of Generalized Anxiety Disorder (GAD) and worry; a significant portion of its development and testing was carried out on undergraduate samples (e.g., Bottesi et al., 2016; Buhr & Dugas, 2002; Carleton, Norton, & Asmundson, 2007; Freeston, Rhéaume, Letarte, Dugas, & Ladoceur, 1994). Most studies on the IUM have considered gender only in descriptive terms and/or partially controlling it in statistical analyses; nonetheless, literature on anxiety suggests that women are more likely to experience higher levels of worry, physiological

hyperarousal, catastrophic cognitions, and anxiety sensitivity than men (Armstrong & Khawaja, 2002; McLean & Anderson, 2011). With specific regard to undergraduates, research documents that females usually show a lower adjustment to university life than males (Clinciu, 2013; Enochs & Roland, 2006; Gadzella & Carvalho, 2006).

The IUM postulates that Intolerance of Uncertainty (IU), Positive Beliefs about Worry (PBW), Negative Problem Orientation (NPO), and Cognitive Avoidance (CA) are associated with the development and maintenance of excessive worry, with IU playing a prominent role (Bottesi et al., 2016; Koerner & Dugas, 2008). IU is the dispositional inability to tolerate the aversive reactions triggered by a perceived lack of sufficient/salient information, maintained by the related perception of uncertainty (Carleton, 2016a, 2016b), and currently it is considered a trans-diagnostic factor spanning emotional disorders (e.g., Carleton, 2016a; Hong & Cheung, 2015; Shihata, McEvoy, Mullan, & Carleton, 2016). Overall, no gender differences in IU levels in undergraduate samples have been observed across cultures (Bottesi et al., 2015; Buhr & Dugas, 2002; Gosselin et al., 2007; Helsen, Van den Bussche, Vlaeyen, & Goubert, 2013; Robichaud, Dugas, & Conway, 2003; Rotomskis, 2014; Wright, Lebell, & Carleton, 2016). PBW refers to unrealistic beliefs regarding the usefulness of worrying (Borkovec & Roemer, 1995; Freeston et al., 1994); PBW usually fosters worry, since the presence of worry may intermittently coincide with efficacious problem-solving and the

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non-occurrence of feared events might maintain false beliefs that worrying in and of itself prevents negative events (Freeston et al., 1994). Studies about the association between PBW and gender are lacking, with the only available data revealing no gender differences in undergraduates (Basevitz, Pushkar, Chaikelson, Conway, & Dalton, 2008; Robichaud et al., 2003). NPO consists in the general individual tendency to interpret problems as threatening and unsolvable, to doubt one's own personal ability to successfully solve problems, and to easily experience frustration and distress when problems arise (D'Zurilla, Maydeu-Olivares, & Kant, 1998); some evidence supporting that females experience higher NPO levels than males have been reported (D'Zurilla et al., 1998), despite later research failed in detecting gender differences (Robichaud & Dugas, 2005). Lastly, CA is conceptualized as both an automatic process of avoiding threatening concrete thoughts and as an effortful strategy aimed to suppress worrisome thoughts (Borkovec & Roemer, 1995); since worry is a semantic-verbal process, it is usually employed as a CA strategy, thus promoting its maintenance (Dugas et al., 1998). Overall, most studies concluded that female students have a higher tendency to use CA strategies than males (Blumberg, 2000; Fernandez-Berrocal & Extremera, 2004; Gosselin et al., 2002; Sexton & Dugas, 2009; Wegner & Zanakos, 1994); only a few studies failed to detect gender differences (Altin & Gençöz, 2009; Rafnsson & Smari, 2001; Sexton & Dugas, 2009).

The current study was designed to investigate whether and how these variables differentially interact in Italian male and female undergraduates. Bottesi et al. (2016) explored whether PBW, NPO, and CA could be better conceptualized as mediators of the path from IU to worry in a sample of Italian undergraduates and they found that both PBW and NPO were significant mediators. Nonetheless, they did not address the gender issue, although they observed that females endorsed higher levels of worry than males. In light of previously reviewed literature, it is reasonable to assume that male and female undergraduates might differ not only in their mean levels on the IUM components, but also in the way such components interact leading to different levels of worry.

Therefore, we aimed at investigating whether: 1) males and females differ in the IUM components (i.e., differences in means). Specifically, we expected females reporting higher levels of worry, NPO, and CA, but not IU and PBW; 2) the path from IU to worry is differently mediated by PBW, NPO, and CA (i.e., differences across associations) according to gender. In line with Bottesi et al. (2016), we expected that PBW and NPO, but not CA, would mediate the relationship between IU and worry also in the current samples. We did not formulate any specific hypothesis with regard to gender, given the exploratory and preliminary nature of the study and the absence of previous literature specifically focusing on this issue. Lastly, since higher IU leads to higher levels of worry (Bottesi et al., 2016; Koerner & Dugas, 2008), we assessed whether the contribution of PBW, NPO, and CA might depend on the level of IU.

## 2. Materials and methods

### 2.1. Subjects and procedure

A sample made up of 649 Italian undergraduates (243 males and 406 females), aged between 18 and 27 years ( $M = 21.37$ ,  $SD = 1.72$ ), entered the study. They were all Caucasian individuals attending their university studies at the School of Psychology; their mean years of education was 13.74 ( $SD = 1.57$ ). Marital status was 85.8% single/living alone, 13.9% married/in a domestic relationship, and 0.3% separated/divorced.

All undergraduates provided written informed consent before entering the study; then they filled in a socio-demographic schedule and questionnaires administered in counterbalanced order to control for order effects. No incentives were offered for participation. The research was conducted in accordance with the Declaration of Helsinki and it

was approved by the Ethics Committee of Psychological Sciences of the local university.

### 2.2. Measures

The *Penn State Worry Questionnaire* (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990; Morani, Pricci, & Sanavio, 1999): a 16-item questionnaire designed to measure the tendency to worry excessively and uncontrollably. The Italian version showed adequate internal consistency ( $\alpha = 0.85$ ). In the current samples, Cronbach's alpha emerged to be acceptable (males:  $\alpha = 0.68$ ; females:  $\alpha = 0.76$ ).

The *Intolerance of Uncertainty Scale-12* (IUS-12; Carleton et al., 2007; Bottesi et al., 2015): a 12-item self-report measure evaluating the tendency to find uncertainty upsetting and distressing. The Italian version of the IUS-12 demonstrated to possess good internal consistency ( $\alpha = 0.80$ ), construct and discriminant validities, and gender invariance. Internal consistency in the current samples was excellent (males:  $\alpha = 0.86$ ; females:  $\alpha = 0.89$ ).

The *Why Worry-III* (WW-III; Riley, 2010): a 37-item revised version of the Why Worry questionnaire (Freeston et al., 1994) and the Why Worry-II (Gosselin et al., 2003), designed to assess positive beliefs about worry. Preliminary evidence of good internal consistency of the Italian translation of the WW-III ( $\alpha = 0.94$ ) was provided (Bottesi et al., 2016; Bottesi, De Dominicis, Man, Novara, & Freeston, 2014). In the current samples, Cronbach alpha for the total score was excellent in both samples (males:  $\alpha = 0.95$ ; females:  $\alpha = 0.95$ ).

The *Negative Problem Orientation Questionnaire* (NPOQ; Robichaud & Dugas, 2005; Bottesi & Ghisi, 2017) a 12-item measure assessing beliefs that problems are threatening, low self-confidence about abilities to solve problems, and pessimism about problem resolution. In the Italian version, the NPOQ demonstrated adequate internal consistency ( $\alpha = 0.93$ ), one-month test-retest reliability ( $r = 0.73$ ), convergent, and discriminant validity. The internal consistency observed in the present samples was excellent (males:  $\alpha = 0.86$ ; females:  $\alpha = 0.94$ ).

The *Revised Cognitive Avoidance Questionnaire* (R-CAQ; Heary, 2011): a 35-item revised version of the Cognitive Avoidance Questionnaire (Gosselin et al., 2002), measuring an individual's use of cognitive avoidance strategies. Similar to the WW-III, preliminary evidence supported that the Italian R-CAQ has good internal consistency (Bottesi et al., 2014:  $\alpha = 0.92$ ; Bottesi et al., 2016:  $\alpha = 0.93$ ). In the current samples, internal consistency was excellent (males:  $\alpha = 0.93$ ; females:  $\alpha = 0.93$ ).

### 2.3. Statistical analyses

All statistical analyses were performed using the software Statistical Package for the Social Sciences (SPSS) version 22.

Distributions on measures were considered normal according to figures of skew and kurtosis. Generally, scores were normally distributed with all items demonstrating acceptable levels of skewness and kurtosis ( $\leq |1|$ ). Only the IUS-12 and the NPOQ evidenced significant skewness in both samples; therefore, total scores of these variables were transformed to a normal distribution by applying a log10 transformation.

Internal consistency was assessed by computing Cronbach alphas ( $\alpha$ ) coefficients. Univariate Analyses of Variance (ANOVAs) were performed in order to compare males and females on all measures; partial eta squared were reported to evaluate the magnitude of the effects: following Cohen (1988)'s criteria, 0.01 was considered a small effect size, 0.06 a medium one and 0.14 a large one.

Lastly, mediation models were tested using a bootstrapping approach through the PROCESS macro for SPSS. Mediation occurs when 95% confidence intervals (CIs) of the indirect effect estimated from the bootstrap procedure excludes zero (Hayes, 2013). Two mediation models were tested, one in the male and one in the female sample. In each model, the IUS-12 was entered as the independent variable, the

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