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Metacognitions, intolerance of uncertainty and worry: An investigation in adolescents

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ABSTRACT

Background: Cognitive models of Generalized Anxiety Disorder have mainly been tested in adult samples to date. Studies investigating whether the concepts are also applicable to worry in adolescents are largely lacking. The goal of the present study was to test the relationship between worry and key cognitive variables (positive and negative metacognitions; intolerance of uncertainty) in adolescents.
Method: Secondary school students ($N = 521$) completed self-report measures of worry frequency, metacognitions, intolerance of uncertainty, and depression.
Results: Results showed a significant association between metacognitions, intolerance of uncertainty and worry, even after controlling for depression. In regression analyses, a substantial proportion of the variance of worry could be accounted for by the cognitive variables of interest.
Conclusions: The findings support the relevance of metacognitions and intolerance of uncertainty for understanding cognitive mechanisms underlying worry in adolescents. It appears useful to combine them into a more comprehensive integrated model.

1. Introduction

Worry is an everyday phenomenon that has been defined as "talking to ourselves a lot about negative things, most often about negative events that we are afraid might happen in the future" (Borkovec, Ray, & Stöber, 1998, p. 562). Excessive and seemingly uncontrollable worry is also a defining feature of Generalized Anxiety Disorder (GAD) (American Psychiatric Association, 2013). Although some differences in characteristics of worry have been identified between non-clinical vs. clinical samples (e.g., Ruscio & Borcovec, 2004), most researchers conceptualize this process as a continuum, with quantitative rather than qualitative differences between the different populations (Ehring & Watkins, 2008).

In recent years, a number of theoretical models have been proposed to account for the development and maintenance of excessive worry in GAD (for a review, see Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). Current cognitive models suggest that worry becomes excessive if key cognitions related to this process, such as metacognitions about worry and/or intolerance of uncertainty, are present.

According to the *Metacognitive Model of GAD* (Wells, 1995), metacognitive beliefs, i.e. cognitions about worrisome thinking, play a key role in the maintenance of excessive worry. When activated by anxiety-related cues, *positive beliefs* (i.e., "Worrying helps me to avoid problems in the future.") are thought to initiate worry about external or internal noncognitive events as a coping strategy (*type-I-worry*; e.g., "My husband may have an accident."). When worrisome thinking is then ongoing, *negative beliefs* about worry (i.e., "My worrying thoughts persist, no matter how I try to stop them.") are activated. According to Wells (2004), these negative metacognitive beliefs are a specific and important process involved in the maintenance of pathological worrying as they trigger worrying about worry (*Type-II-worry* or *meta-worry*; e.g., Worrying will drive me crazy"). Importantly, meta-worry is thought to lead to secondary distress, avoidance, and engagement in dysfunctional thought control strategies (e.g., thought suppression) that are aimed at avoiding worry, but ultimately maintain it.

Empirical support for the model comes from a series of cross-sectional studies in clinical and nonclinical samples (for reviews, see Behar et al., 2009; Wells, 2004). The association between worry and negative metacognitive beliefs focusing on uncontrollability and danger has turned out to be particularly robust (e.g., Cartwright-Hatton & Wells, 1997; Davis & Valentiner, 2000). Longitudinal studies testing the model are still sparse (Behar et al., 2009); however, in one of the few exceptions, Sica, Steketee, Ghisi,

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Chiri, and Franceschini (2007) found evidence for a strong predictive power of negative metacognitive beliefs for future levels of worry. Similarly, negative beliefs about worry – but not positive ones – have been shown to convey a discriminate function in distinguishing individuals with GAD from non-clinical controls (Davis & Valentiner, 2000; Ruscio & Borcovec, 2004).

A second influential cognitive model of GAD is the *Intolerance of Uncertainty Model* (e.g., Dugas, 2007). Intolerance of uncertainty (IoU) is defined as "the tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events" (Dugas & Koerner, 2005, p. 62). According to the model, individuals who are intolerant of uncertainty are stressed by ambiguous situational cues, leading to the activation of *positive beliefs about worry* (e.g., beliefs in worry as an aid to problem solving and motivation) and the initiation of worrisome thinking. The model describes negative problem orientation and cognitive avoidance as additional processes that contribute to the maintenance of worry and anxiety. Importantly, IoU is seen as the cornerstone of the model with direct as well as indirect (via positive beliefs) routes to worry. Cross-sectional studies show that IoU is indeed related to worry (Dugas, Freeston, & Ladouceur, 1997; Ladouceur, Gosselin, & Dugas, 2000) and significantly distinguishes high-worriers with vs. without GAD as well as GAD from other disorders (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Ladouceur et al., 1999).

In sum, there is evidence that cognitive factors, especially negative metacognitions and IoU, play an important role in the development and maintenance of excessive worry. The models differ in the importance they ascribe to positive metacognitions. The evidence regarding this process is somewhat less clear-cut and therefore warrants closer investigation (Iijima & Tanno, 2013; Ruscio & Borcovec, 2004). Methodological limitations of existing research into the role of cognitive factors in excessive worrying and GAD include the paucity of prospective designs and the lack of experimental studies testing the models.

The two models that both primarily focus on cognitions as the key components that cause the development and maintenance of excessive worry and GAD have mostly been investigated in isolation to date. However, it is conceivable that they are not mutually exclusive. A combined perspective would suggest that IoU is a vulnerability factor that interacts with positive metacognitions to trigger worry. Once an individual has engaged in a longer period of worry, negative metacognition come into play, leading to the maintenance of worry via meta-worry and dysfunctional attempts at thought control. In one of the few studies that have explored negative metacognitions and IoU within one study, Gerlach, Andor, and Patzelt (2008) found additive effects of the different cognitive variables on worry, with negative metacognitions having the largest impact. Interestingly, Ruggiero et al. (2012) also found significant associations between the constructs. However, in their study the effect of negative metacognitions and IoU on worry was not merely additive, but the two variables interacted in predicting worry.

It is of note that most studies to date have tested assumptions derived from the cognitive models in adult samples. It therefore remains unclear whether the same cognitive processes operate in adolescents. Studying worry in adolescent samples appears especially relevant as adolescence is a period in life entailing major changes, such as physiological alterations associated with pubertal development, social status and role expectations, and behavioral affect regulation (Cameron, 2004), which has been shown to lead to high levels of worry (Hunt, Wisocki, & Yanko, 2003). Worry content in adolescents includes personal matters (e.g., school performance, social relationships) as well as extensive concerns about fundamental issues (e.g., death, global affairs) (Henker, Whalen, & O'Neil, 1995). An identification of processes involved in excessive worry in adolescents points towards promising therapeutic and/or preventive interventions targeting these phenomenon (Bahramand, 2008; Topper, Emmelkamp, & Ehring, 2010).

Preliminary evidence testing the metacognitive model of GAD in child or adolescent samples shows that negative metacognitive beliefs about worry are related to the severity of worry and anxiety symptoms, and distinguish between adolescents with vs. without an anxiety disorder (Cartwright-Hatton et al., 2004; Ellis & Hudson, 2010; Wilson et al., 2011). Similarly, a handful of studies to date have tested the role of IoU in adolescent samples, with results showing significant associations between the two variables (Fialko, Bolton, & Perrin, 2012; Laugesen, Dugas, & Bukowski, 2003). In a five-year longitudinal study in adolescents, Dugas, Laugesen, and Bukowski (2012) found a bidirectional reciprocal relationship between IoU and worry and underline the influence of IoU in the development of excessive worrying. Finally, there is some evidence for an association between positive metacognitive beliefs and worry in adolescents (Bahramand, 2008; Gosselin et al., 2007).

In sum, whereas both cognitive models have extensively been studied in adult samples, evidence on the role of metacognitive beliefs and IoU in adolescent worry is still limited. In addition, very few studies to date have directly compared the association of worry with cognitive variables derived from the two models. The current study therefore aimed at investigating the applicability of the key assumptions derived from the metacognitive and the intolerance of uncertainty models of GAD to an adolescent sample.

In line with earlier findings, we hypothesized that the key components of both models (i.e., negative beliefs about worry, positive beliefs about worry, IoU), show significant correlations with levels of worry. In addition, we expected that positive metacognitions show an incremental effect on the prediction of worry when controlling for negative metacognitions. Similarly, it was hypothesized that IoU further improves the prediction of worry when controlling for both types of metacognitions.

As interactive effects of metacognitions and intolerance of uncertainty were found in an earlier study (Ruggiero et al., 2012), we also conducted exploratory analyses testing possible interactive effects between the different cognitive factors on worry.

2. Method

2.1. Participants

Participants were 521 adolescents (80.4% female[1]) between 15 and 20 years of age (M = 17.24; SD = 0.95). At the time of testing, participants had spent an average of 12.11 years in full-time education (SD = 0.82; range: 10–13), and 89% were attending an academic high school (called *Gymnasium* in the German educational system). The mean PHQ depression score relating to the last two weeks was 8.92 (SD = 4.86).

Participants were recruited while attending an open day at the University of Münster (Germany). A total of 526 adolescents completed the questionnaire. However, four participants were outside of the intended age range and therefore excluded from the analyses. In addition, one participant was excluded because of incomplete data, leaving a final sample of N = 521.

2.2. Measures

The *Penn State Worry Questionnaire (PSWQ*; Meyer, Miller, Metzger, & Borkovec, 1990; German version: Stöber, 1995) is a

[1] This gender distribution is representative for the population of psychology students at Münster University (77–82% female students in the last ten years).