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Ironic effects of performance are worse for neurotics

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ABSTRACT

Objectives: To conduct the first examination of neuroticism as a predictor of (1) the incidence of what Wegner (1989, 2009) terms *ironic processes of mental control* and (2) the precision of ironic performance errors under high- and low-anxiety conditions.
Design: Across two studies we employed a repeated-measures design.
Method: In a football penalty-shooting task (Study 1) and a dart-throwing (Study 2) task, under high-anxiety and low-anxiety conditions, participants gained maximum points for hitting a *target* zone and fewer points for hitting a designated *non-ironic* error zone. Additionally, we instructed participants to be particularly careful *not* to hit a designated *ironic* error zone, because such hits would score minimum points.
Results: Across both studies within-subjects moderation analyses revealed a consistent moderating effect of neuroticism on the incidence of ironic errors in the high-anxiety condition. Specifically, when anxious, neurotics displayed a significant increase in *ironic* performance error and a significant decrease in *target* hits. Importantly, *non-ironic* error did not differ across anxiety conditions. Additionally, Study 2 results revealed that neuroticism moderated the *precision* of ironic errors when anxious. Specifically, when anxious, neurotics' ironic error zone hits were significantly farther from the target zone and significantly farther into the ironic error zone than their relatively emotionally stable counterparts' errors.
Conclusion: We provide the first evidence that neuroticism moderates both the *incidence* and *precision* of ironic performance errors. These results will enable practitioners in coaching environments to make evidence-based predictions and interventions regarding which individuals are most prone to ironic performance breakdown when anxious.

> The greatest mistake you can make in life is to be continually fearing you will make one (Elbert Hubbard, 1927, p. 94).

Bill is a PGA tour golfer; he is also a worrier and most aspects of Bill's life are characterized by frequent concerns. So it was unsurprising that Bill felt anxious as he placed his golf ball on the 18th tee, knowing that he needed only to make par to secure victory. Bill recognized that the biggest threat on this final hole was the lake to the right of the fairway. As Bill readied himself to take his tee shot he said to himself, "Right, whatever you do, just don't slice the ball into the lake." As soon as Bill hit the ball, he knew; he knew he'd hit the one shot he was trying to avoid; he then saw the splash of water as confirmation of his worst fear. He knew immediately that his chances of victory were lost in the water. As this example demonstrates, under pressure certain individuals exhibit not just a generalized decrease in performance but rather a decrease in performance that is precisely counter-intentional.

Wegner's (1989, 1994, 1997, 2009) theory of *ironic processes of mental control* was developed with the aim of understanding counter-intentional error. To date researchers have given relatively little research attention to Wegner's theory in a performance domain. This may be in part due to the expressed reservations (e.g., Hall, Hardy, & Gammage, 1999) that Wegner's theory offers little over and above more established theories of stress-performance such as cognitive processing (Baumeister, 1984; Masters, 1992), attentional control (Eysenck, Derakshan, Santos, & Calvo, 2007), and catastrophe models (Hardy, 1990; Hardy, Mullen, & Jones, 1996). However, this reservation is somewhat surprising given that the alternate established theories cannot adequately explain

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why, under pressure, certain performers make errors that are *ironic* in nature; that is, a performance breakdown that is precisely counter-intentional (Janelle, 1999).

Wegner's theory of ironic processes of mental control asserts that "the ironies of mental life are not just happenstance examples of the frailty of human endeavors but rather logically arise due to the nature of mental control" (Wegner, 1994, p. 34). Specifically, foundational to Wegner's theory is the premise that mental control requires two processes in order to work effectively. First, the cyclical *operating* process carries out intentional, effortful regulation by consciously searching for, and directing the individual toward, mental contents that will yield a desired outcome or intended emotional state; known as the desired state. It is through active engagement in this mentally demanding search that regulation will most likely be maintained and the desired state will be reached. Second, the *monitoring* process subconsciously searches for mental contents that indicate a failure to achieve the desired state. If this *monitor* identifies any such failures it reactivates the *operating* process with the aim of filling the mind with mental contents that are relevant to the desired state, and thus reestablishing a regulated mind. Both processes work within one control system and operate together as part of a feedback loop that, under normal circumstances, provides effective mental control (Wegner, 1994).

Wegner (1994) suggested that these very processes that enable an individual to exercise mental control are also, under certain conditions, responsible for undermining intentional mental control. Specifically, under conditions of mental load (e.g., anxiety), some of the cognitive space that is required for the effortful operating process to operate effectively is consumed by the mental load. As such, the operating process becomes less effective at introducing the desired content into awareness. Conversely, the functioning of the monitoring process – because it is both unconscious and not easily interrupted – remains largely unaffected under mental load. Thus, under mental load the monitoring process becomes more salient and the search for thoughts or sensations that conflict with the desired state are enough to bring them into consciousness and thereby undermine the intended control (Wegner, Erber, & Zanakos, 1993). This is *ironic* because the (monitoring) process that normally ensures that the to-be-avoided state is kept at bay is the very process that increases an individual's awareness of – and thus likelihood of bringing about – the to-be-avoided state (Woodman, Barlow, & Gorgulu, 2015). The result is that one is more likely to do specifically what one intends not to do, when one least wants to do it.

Several studies have provided evidence in support Wegner's theory (e.g., Binsch, Oudejans, Bakker, & Savelsbergh, 2009; Dugdale & Eklund, 2003; Wegner, Ansfield, & Pilloff, 1998; Woodman et al., 2015). For example, in a dart throwing task, Oudejans, Binsch, and Bakker (2013) demonstrated that the combination of negatively worded instructions ("Be careful not to hit …") and induced anxiety (participants threw their darts whilst positioned high on a climbing wall) significantly increased the proportion of darts landing in the specifically to-be-avoided zone when compared to negatively worded instructions under conditions of low-anxiety (participants threw their darts whilst positioned at a low-level on a climbing wall). However, manipulating height-off-the-ground is clearly not an ecologically valid stressor in a dart-throwing task. Interestingly, other studies have failed to demonstrate effects consistent with Wegner's postulate. Indeed, across two studies, using a golf putting task, de la Peña, Murray, and Janelle (2008) revealed findings that were seemingly counter to Wegner's theory. Specifically, when instructed 'not to putt long' or 'not to putt short' participants compensated by putting significantly *shorter* or *longer* respectively. To explain their results, which are in direct contrast to the prediction from Wegner's theory, de la Peña et al. (2008) proposed the *implicit overcompensation* hypothesis (see also Russell & Grealy, 2010; Toner, Moran, & Jackson, 2013). de la Peña et al. (2008) argued that the negatively worded self-instruction "don't putt it short" subconsciously exaggerates the negative connotation (i.e., "leaving the putt short is a failure") thus activating an overriding *implicit* counter message (i.e., "to avoid failure, it is better to err on the side of putting too long"). This implicit counter message generates an implicit command that guides movement execution under the notion that, in this example, it is better to overshoot the hole.

Researchers have suggested that such equivocal results regarding the incidence, or not, of ironic performance effects may be attributed to a failure to manipulate anxiety (e.g., de la Peña et al., 2008; Woodman et al., 2015). Additionally, a failure to differentiate clearly between ironic and non-ironic error (e.g., Dugdale & Eklund, 2002; Wegner et al., 1998) has hampered the research examining ironic processes in performance settings: a limitation that has only recently been addressed by Woodman et al. (2015).

It is also worth considering factors beyond methodological limitations that may lead to such equivocal findings. Indeed, a growing body of evidence indicates that under specific environmental conditions (e.g., anxiety), personality may exert differential effects on performance (see Roberts & Woodman, 2015). Thus, it is a theoretical shortcoming that previous research in this area has failed to consider personality as a potential moderating factor on the incidence of ironic performance errors. Since Wegner proposes that ironic errors occur when cognitive load occupies the critical mental capacity required to maintain the salience of the operating process, examining personality traits that are associated with elevated cognitive load is theoretically the most natural starting point for this line of investigation.

In this regard neuroticism is a personality trait that is worthy of research attention regarding its potential moderating role in the incidence of ironic performance errors (cf. Roberts & Woodman, 2015; Woodman et al., 2015). Neuroticism is a broad dimension of personality – appearing in both the Big Five (Costa & McCrae, 1987) and Giant 3 (Eysenck & Eysenck, 1985) – characterized by the tendency to experience negative, distressing emotions (Costa & McCrae, 1987), anxiety (Watson & Clark, 1984), and a lack of emotional stability (Eysenck & Eysenck, 1985). Research suggests that neurotic individuals experience stress and anxiety more frequently (Bolger & Schilling, 1991), demonstrate greater sensitivity to criticism and negative stimuli (O'Sullivan, Zuckerman, & Kraft, 1998; Tellegen, 1985), have lower self-confidence (Bandura, 1977), and have larger negative reactions to anxiety (Bolger & Zuckerman, 1995; Ormel & Wohlfarth, 1991). Indeed, research has shown neuroticism to be an undesirable trait in relation to successful performance in sport (Davis & Mogk, 1994; Silva, Shultz, Haslam, Martin, & Murray, 1985).

The neurotic individual's emotional experience in everyday life is such that cognitive space is consumed by generalized worries and concerns (cf. John & Srivastava, 1999). The chronic negative affective state of the neurotic may itself act as a mental load, soaking up some of the mental resources necessary to maintain mental control (cf. Dalgleish, Yiend, Schweizer, & Dunn, 2009). Despite this, under normative conditions – that is with no additional load of anxiety – we argue that the neurotic individual will have sufficient cognitive space for the operating process to work effectively. However, under anxiety-provoking conditions – in which the neurotic individual's experience of distressing emotions is increased and less cognitive space remains for the operating process to operate effectively – the neurotic individual's monitoring process will become salient and ironically bring into