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Psychophysiological Reactivity and Heartbeat Awareness in Anxiety Sensitivity

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Abstract — Anxiety sensitivity refers to the degree to which an individual fears symptoms of anxiety because of beliefs about anxiety's aversive consequences. Heart-rate reactivity and sensitivity to physiology were investigated in 59 female undergraduate participants. It was predicted that compared to women with low anxiety sensitivity, women with high anxiety sensitivity would exhibit higher heart rates and greater cardiac awareness during a mental arithmetic and caffeine manipulation. Women high on anxiety sensitivity were significantly more accurate at counting heartbeats during arithmetic than women low on anxiety sensitivity, although absolute heart rate did not differ across groups. Self-report data for caffeine-induced physical sensations support the use of caffeine challenge tasks in future research on anxiety sensitivity.

Anxiety sensitivity refers to the degree to which an individual fears physical sensations associated with anxiety because of beliefs about negative consequences of anxiety (Reiss & McNally, 1985). Reiss and McNally (1985) hypothesized that individuals with "greater reactivity" (i.e., greater autonomic reactivity) might also be more likely to develop concern about anxiety reactions. Additionally, others have suggested that individuals with panic disorder or those high on anxiety sensitivity may exhibit an increased awareness of internal stimuli

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("interoceptive sensitivity" hypothesis) that signal anxiety and its unpleasant consequences (Ehlers, 1993; Reiss, Peterson, Gursky, & McNally, 1986).

Unfortunately, empirical support for the role of physiological mediating factors in anxiety sensitivity has been discouraging. Two investigations failed to find support for the "greater reactivity" hypothesis (Asmundson, Norton, Wilson, & Sandler, 1994; Shostak & Peterson, 1990). Shostak and Peterson (1990) investigated the relationship between anxiety sensitivity and physiological changes in nonclinical subjects following a mental arithmetic task and found comparable muscle activity and systolic blood pressure across three levels of anxiety sensitivity. Similarly, Asmundson et al. (1994) failed to find heart-rate reactivity differences between high and low anxiety sensitive nonclinical subjects following a hyperventilation challenge.

However, both of these studies have limitations that make it difficult to conclude that there is no relationship between "greater reactivity" and anxiety sensitivity. Shostak and Peterson (1990) used a reliable arousal induction task (mental arithmetic) but failed to measure heart rate, an especially relevant variable in anxiety research. It could be argued that muscle activity and systolic blood pressure are not sensitive enough to capture subtle physiological reactivity differences in nonclinical subjects. Asmundson et al. (1994), on the other hand, measured heart rate but failed to use a reliable arousal induction task. Using hyperventilation to induce physiologic arousal, they did not find a main effect for anxiety sensitivity group. However, they also failed to demonstrate a main effect for task (or phase). In other words, they did not successfully induce arousal. Therefore, it cannot reasonably be concluded from this study that there is no relationship between "greater reactivity" and anxiety sensitivity.

With at least one exception (Antony et al., 1995), studies failing to find support for the "interoceptive sensitivity" hypothesis have used signal detection methodology for the assessment of cardiac awareness (Asmundson, Sandler, Wilson, & Norton, 1993; Barsky, Cleary, Sarnie, & Ruskin, 1994; Butler & Rapee, 1991; Ehlers, Margraf, Roth, Taylor, & Birbaumer, 1988). However, encouraging data collected by Tyrer, Lee, and Alexander (1980) using a heartbeat tracking (counting) task to assess cardiac awareness, found that anxious and hypochondriacal patients were more aware of heart rate than phobic patients. And, more recently, in two studies using a heartbeat tracking task with discretely defined groups, Ehlers and Breuer (1992) found greater accuracy of heartbeat detection in individuals with panic disorder and generalized anxiety disorder as compared to individuals with depression, and in a panic disorder group as compared to infrequent panic, simple phobia, and normal control groups. Although anxiety sensitivity was not assessed directly in these studies and groups were formed by diagnosis rather than classified as high versus low on anxiety sensitivity, there is ample evidence to suggest that the diagnostic groups with greater acuity in the Ehlers and Breuer (1992) studies (panic disorder and generalized anxiety disorder) have reliably higher scores on the Anxiety Sensitivity Index (ASI; Reiss et al., 1986) as compared to nor-