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.
("interoceptive sensitivity" hypothesis) that signal anxiety and its unpleasant con-
sequences (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 physiolog-
ical changes in nonclinical subjects following a mental arithmetic task and
found comparable muscle activity and systolic blood pressure across three lev-
eels of anxiety sensitivity. Similarly, Asmundson et al. (1994) failed to find
heart-rate reactivity differences between high and low anxiety sensitive non-
clinical subjects following a hyperventilation challenge.

However, both of these studies have limitations that make it difficult to con-
clude that there is no relationship between "greater reactivity" and anxiety sen-
sitivity. Shostak and Peterson (1990) used a reliable arousal induction task
(mental arithmetic) but failed to measure heart rate, an especially relevant vari-
able in anxiety research. It could be argued that muscle activity and systolic
blood pressure are not sensitive enough to capture subtle physiological reactiv-
ity 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 sup-
port 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 heart-
beat 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 accura-
cy 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 ver-
sus low on anxiety sensitivity, there is ample evidence to suggest that the diag-
nostic 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-
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