

Component fears of claustrophobia associated with mock magnetic resonance imaging

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Abstract

A conceptualization of claustrophobia [Rachman, S., & Taylor, S. (1993). Analyses of claustrophobia. *Journal of Anxiety Disorders*, 7, 281–291] was evaluated in the context of magnetic resonance imaging. One hundred eleven students responded to questionnaires that quantified fear of suffocation, fear of restriction, and sensitivity to anxiety symptoms. Sixty-four of them were then exposed to a mock magnetic resonance imaging assessment; maximum subjective fear during the mock assessment was self-reported, behavioral reactions to the mock assessment were characterized, and heart rates before and during the assessment were recorded. Scores for fear of suffocation, fear of restriction, and anxiety sensitivity were used to predict subjective, behavioral, and cardiac fear. Subjective fear during the mock assessment was predicted by fears of suffocation and public anxiousness. Behavioral fear (escape/avoidance) was predicted by fears of restriction and suffocation, and sensitivity to symptoms related to suffocation. Cardiac fear was predicted by fear of public anxiousness. The criterion variance predicted was impressive, clearly sufficient to legitimize both the research preparation and the conceptualization of claustrophobia that was evaluated.

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Magnetic resonance image (MRI) scanning is a widely used procedure for diagnosing pathologies in the body (see Friday & Kubal, 1990). The protocol for MRI scanning typically entails inserting the patient into a small, tunnel-like chamber after having provided instructions to remain motionless while inside. Many MRI scans are failures due to patients' refusals and premature terminations (Katz, Wilson, & Frazer, 1994).

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Refusal and premature termination of an MRI scan can reflect motives such as avoidance of diagnostic information and avoidance of discomfort during the procedure (Flahery & Hoskinson, 1989; Katz et al., 1994). Some reasons for refusal and premature termination reported by patients are emblematic of claustrophobia, for example being confined or being alone (Thorp, Owens, Whitehouse, & Dewey, 1990).

Estimates concerning the numbers of failed MRI scans that result from claustrophobia are as high as 6.5% (Nazemi & Dager, 2003). Moreover, MRI scanning sometimes produces claustrophobia (Dager & Steen, 1992; Fishbain et al., 1988; Kilborn & Labbé, 1990).

The fear-related problems associated with MRI scanning prompted McGlynn, Karg, and Lawyer (2003) to evaluate mock MRI assessment of college students as a context for studying MRI-related claustrophobia. Two hundred students without panic disorder or ongoing medical problems were chosen randomly from among 336 psychology students who self-selected in return for course credit. On arrival they completed several psychometric instruments related to anxiety and claustrophobia. Later they participated in a mock MRI assessment while various measures of arousal and fear were recorded. Seven of the 200 students failed the mock scan behaviorally, 7 completed the mock scan but reported criterional fearfulness retrospectively, and 17 others completed the mock scan but manifested excessive heart-rate change while doing so. A logistic regression showed that total scores on the Claustrophobia Questionnaire (below) served to predict a student's membership among the 31 students who were fearful in one way or another versus the 169 who were not. On the basis of those results, the authors suggested that mock MRI assessment among college students provides a feasible and conceptually relevant procedure for research on the nature of MRI-related claustrophobia.

Rachman (1990) argued that a unidimensional conceptualization of claustrophobia is not appropriate; rather, a conceptualization is needed that incorporates partially independent influences from fears related to restriction and fears related to suffocation. There are ample data that support Rachman's view. For example, restriction and suffocation have emerged as somewhat independent themes in factor analyses of responses on fear questionnaires (e.g., Valentiner, Telch, Petruzzi, & Bolte, 1996), and fears of restriction and suffocation have responded independently to treatments that target one but not the other (Harris, Robinson, & Menzies, 1999). The empirical literature suggests further that a complete picture of claustrophobia will include a role for cognitive elaborations such as catastrophic misappraisals of bodily anxiety symptoms (Booth & Rachman, 1992; Craske, Mohlman, Yi, Glover, & Valeri, 1995; Craske & Sipsas, 1992; Curtis, Hill, & Lewis, 1990; Rachman, Levitt, & Lopatka, 1988) and exaggerated expectations of danger (Öst & Csatlos, 2000; Valentiner et al.). Indeed, Rachman and Taylor (1993) argued that something akin to "anxiety sensitivity" (Reiss, Peterson, Gursky, & McNally, 1986) might need to be added to fears of restriction and suffocation in order to describe claustrophobia adequately.

The purpose of the work reported here was to evaluate the Rachman and Taylor (1993) account of claustrophobia as it occurs in the mock MRI assessment of college students. Students were assessed psychometrically and exposed to a mock MRI scan while arousal and fear were measured. The psychometric scores were then used as predictor variables and fear-measurement values used as criterion variables in several data analytic procedures. Some of the psychometric instruments selected were revised/improved versions of the questionnaires used by McGlynn et al. (2003). Arousal and fear measures were selected so as to sample the three standard domains of fear responding (i.e., subjective experience, behavior, and physiology). Other changes from the methods used by McGlynn et al. were made so as to afford clear-cut opportunities for measures of fear of restriction, fear of suffocation, and cognitive elaboration of anxiety symptoms to account for variance in measures of fear.

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