

Virtual Reality Graded Exposure in the Treatment of Acrophobia: A Case Report

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This is the first case report to test the efficacy of computer-generated virtual reality (VR) for the treatment of acrophobia (fear of heights). The subject was a 19-year-old undergraduate student with a fear of heights, particularly of elevators. Twice weekly, sessions were conducted for 3 weeks, for a total of 5 sessions. Outcome was assessed on measures of anxiety, avoidance, attitude, distress, and included a behavioral avoidance test. VR graded exposure was successful in reducing fears of heights. VR graded exposure is proposed as a new medium for exposure therapy.

Acrophobia, a simple phobia, is characterized by marked anxiety upon exposure to heights, avoidance of heights, and a resulting interference in functioning (American Psychiatric Association, 1987). Behavioral therapy of

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acrophobia usually includes some form of exposure. Systematic desensitization has long been found to be effective in treating individuals with simple phobias (Marks & Gelder, 1965), but a large body of evidence indicates that in vivo exposure has proven consistently effective for individuals with height phobias (Abelson & Curtis, 1989; Emmelkamp & Felten, 1985; Marshall, 1985; Williams, Dooseman, & Kleinfeld, 1984; Williams, Turner, & Peer, 1985).

Exposures to heights usually require leaving the therapist's office, often proving to be difficult and expensive. Therefore, it is important to identify alternatives to these exposures. One variation effectively utilized lenses to magnify apparent height during in vivo exposure to allow more control and exposure to seemingly greater heights than was physically possible (Schneider, 1982). Another alternative may be in the form of virtual reality (VR).

VR integrates real-time computer graphics, body tracking devices, visual displays, and other sensory input devices to immerse a participant in a computer-generated virtual environment (VE; Kalawsky, 1993). Participants usually wear a head-mounted display fitted with an electromagnetic sensor. The user is presented with a computer-generated view of a virtual world that changes in a natural way with head and body motion. For some environments, users may also hold a second position sensor in their hand that allows them to manipulate a virtual hand to interact with the environment, for example, to push an elevator button and ascend.

As such a new technology, the applications of VR are still being explored. An uncontrolled report from Japan described the use of VR to simulate the sand play projective technique with autistic children. No data were presented, but the authors contended that the VR sand play was useful (Kijima, Shirakawa, Hirose, & Nihei, 1994). In a controlled study applying VR to the treatment of a psychological disorder, VR graded exposure (VRGE) was incorporated in the treatment of acrophobia (Rothbaum et al., 1995). Subjects were repeatedly exposed to virtual foot bridges of varying heights and stability, outdoor balconies of varying heights, and a glass elevator that ascended 50 floors. VRGE was effective in significantly reducing fear of heights and improving attitudes toward heights, whereas no change was noted in the wait-list control group.

This paper represents the first known data-based case report of VR in the treatment of a psychological disorder. The purpose of this study was to examine the efficacy of a treatment for acrophobia using VRGE. VRGE has the advantages of conducting time-consuming exposure therapy without leaving the office and offering more control over exposure stimuli. Thus, it may offer a time- and cost effective manner to conduct exposure therapy, with implications for the treatment of many disorders, especially anxiety disorders.

Method

Subject

The subject was a 19-year-old white male undergraduate student who indicated fear and avoidance of heights and a desire to participate in a treatment study. He was offered treatment after participating in the wait list control condition of a larger controlled study of VRGE in the treatment of acrophobia

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