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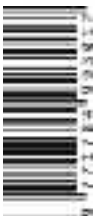
Online Counseling for Eating Disorders

A Psychodynamic View of VR Exposure Therapy

Adaptation of the Trier Social Stress Test to VR



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EDITORIAL

Let me take this opportunity to welcome readers to the Winter 2010 issue of the Journal of CyberTherapy & Rehabilitation (JCR). Our peer-reviewed academic journal continues to promote and explore advanced technologies for therapy, training, education, prevention and rehabilitation. With the end of 2010 drawing to a close, we take this time to reflect on the advancement and recognition JCR has received. We have seen our exposure grow, partly as a result of newly acquired indexing with Scopus and Embase, Cabell's, Gale, EBSCO and PsycINFO. JCR continues to reach an ever-expanding number of readers around the globe, both as subscribers and at various academic conferences.

In the first article of this issue, Cho and Lee describe the creation and implementation of a virtual optokinetic stimulation program to treat pseudoneglect in healthy individuals. Results and whether the program might be applicable in a clinical setting are addressed as well.

In the second paper, Valtchanov and Ellard explore physiological and affective responses to immersion in Virtual Reality (VR) to determine which environments, natural versus urban, have the most soothing effects on stress.

Next, Lister, Piercey, and Joordens discuss the effectiveness of VR to treat fear of public speaking and expound on future areas of application.

The following paper by Kündiger et al. addresses an online counseling system to treat eating disorders, and how it can complement more traditional methods of treatment and therapy. Level of acceptance for patients is discussed and ways in which to make the program more effective and user-friendly.

An interesting study by Wiederhold, Gavshon, and Wiederhold explores the combination of psychodynamic psychotherapy and VR. Often VR is used in combina-

tion with cognitive behavioral therapy, but its use with other types of therapy have found success as well.

A final paper by Santos-Ruiz et al. explores whether the Trier Social Stress Test can be integrated with VR environments to effectively measure levels of stress and anxiety.

I would like to send a sincere thanks to contributing authors for their inspiring work and dedication to this field of research. I also want to thank JCR's Associate Editors – Professors Botella, Bouchard, Gamberini and Riva for their continued leadership and hard work, as well as our internationally renowned Editorial Board for their contributions. Our board continues to grow, representing diverse disciplines, countries, and areas of expertise.

We continue to strive to provide readers with engaging, informative material, as well as extra supplements, including the newly added continuing education quizzes and book reviews. As always, we welcome your input and suggestions on ways to strengthen JCR's scientific rigor and visibility. As well as input and recommendations, we welcome new submissions from scholars, researchers, and academics, instructions for which can be found in the back of the journal.

We look forward to providing our readers with cutting-edge studies and information in the upcoming year, and thank you for your continued support.

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THE DEVELOPMENT OF VIRTUAL OPTOKINETIC STIMULATION AND ITS EFFECTIVENESS ON PSEUDONEGLECT

Ara Cho¹ and Jang-Han Lee¹

“Pseudoneglect” is a small leftward bias, similar to hemispatial neglect, in healthy individuals. Optokinetic stimulation (OKS) is an effective technique based on coherently-moving stimuli used to treat neglect patients. However, OKS effects are temporary, and the task is uninteresting. In this study, we developed a virtual OKS (V-OKS) program that easily generalizes treatment effects to daily life, and is also interesting. Our aim was to examine the V-OKS program’s effectiveness on pseudoneglect. 31 healthy individuals conducted a line-bisection test and a cancellation test at baseline, and were tested again after receiving six versions of V-OKS differing in speed and orientation. All speeds of rightward V-OKS made corrections of the leftward bias, the slow speed being most effective. Also, participants made initial cancellations from the left after leftward V-OKS in the cancellation test. Results revealed that V-OKS effectively regulates pseudoneglect and has potential to be clinically applicable to neglect patients.

Keywords: OKS, Pseudoneglect, Hemispatial Neglect, Virtual Reality, Leftward Bias

INTRODUCTION

Hemispatial neglect is characterized by the impaired or lost ability to react to or process sensory stimuli presented in the hemispace contralateral to the lesioned cerebral hemisphere, even in the absence of basic sensory or motor deficits. For example, when asked to place a mark at the center of a horizontal line, patients with neglect following right hemisphere damage show a rightward bias from the center (Bultitude & Davies, 2006). Interestingly, similar to the hemispatial neglect, healthy individuals also incorrectly bisect space in visual line-bisection or similar tasks, commonly erring to the left of the center of horizontal lines (Bowers & Heilman, 1980). Also, healthy individuals showed leftward bias during driving simulation (Jang et al., 2008). This phenomenon was first referred to as “pseudoneglect” by Bowers and Heilman (Bradshaw, Nathan, Nettleton, Wilson, & Pierson, 1987). The most supported theory of pseudoneglect is the activation-orientation hypothesis (Reuter-Lorenz, Kinsbourne, & Moscovitch, 1990), which proposes that the allocation of attention

is biased in the opposite direction to the more activated hemisphere. According to the activation-orientation hypothesis, the left half of the horizontal line in a line-bisection test receives greater attention than the right because visuospatial tasks (e.g., line-bisection) cause the activation of the right hemisphere (Bultitude & Davies, 2006). It explains why healthy individuals tend to lean to the left side of the line during line-bisection tests.

There are some techniques used to treat neglect, such as a Caloric test, neck muscle vibration, transcutaneous electrical nerve stimulation (TENS), prism adaptation, visual scanning training (VST), and optokinetic stimulation (OKS). VST has been known to be the most effective technique for treating patients with neglect (Antonucci et al., 1995). However, VST has drawbacks including numerous laborious treatment sessions and being only effective for visual neglect. In addition, since VST is based on top-down mechanisms involving use of conscious strategies, VST is often challenging for patients with neglect who

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PHYSIOLOGICAL AND AFFECTIVE RESPONSES TO IMMERSION IN VIRTUAL REALITY: EFFECTS OF NATURE AND URBAN SETTINGS

Deltcho Valtchanov¹ and Colin Ellard¹

With the rapid advancements in technology, researchers are seeking new ways to incorporate modern high-tech solutions such as Virtual Reality (VR) into treatment paradigms for stress. The current experiment explores the beneficial effects of immersing an individual into VR after a stressful encounter. The potential restorative effects of three unique immersive VR environments were examined by inducing stress and negative affect in 69 participants, and then randomly assigning them to freely explore one of three environments (a virtual nature setting, a virtual urban cityscape, or a neutral environment composed of solid geometric shapes) for 10 min. Participants who explored the nature environment were found to have significantly improved affect (as measured by a standardized questionnaire), and significantly lower stress levels (as measured by self-report and skin conductance levels) compared to those who explored the urban and geometric environments. The results suggest that virtual nature has restorative properties similar to real nature, and that simply immersing participants into a virtual nature setting can reduce stress. These results also suggest that the content of the VR experience (i.e., whether it contains nature) is important in promoting restoration, and that in the absence of nature, stress levels remain unchanged.

Keywords: Biophilia, Restorative Effects, Stress Management, Virtual Reality, Nature

INTRODUCTION

Over the last 30 years, researchers have provided empirical evidence suggesting that surrounding oneself with nature can have restorative effects on emotional, physiological and cognitive states. The restorative effects of exposure to nature have been classified as a reduction in cognitive fatigue, decreases in both physiological and cognitive stress, a decrease in negative affect, and an increase in positive affect (Gullone, 2000; Hartig, Mang & Evans, 1991; Berman, Jonides & Kaplan, 2008). For example, recent research by Berman, Jonides and Kaplan (2008) comparing the effects of interacting with natural versus urban environments has found that individuals performed better on a working memory task after taking a walk in a local park versus taking a walk in a local downtown area. Furthermore, Berman et al. found that individuals' executive attention (as measured by the Attention

Network Task) improved after viewing pictures of nature when compared to individuals who viewed pictures of urban areas (Berman et al., 2008) which suggests that simply viewing nature pictures can have restorative effects. Other studies by Ulrich et al. (Ulrich, 1981; Ulrich, Simons, & Losito, 1991) have also shown that viewing photographs and videos of nature scenes can promote significant reductions in physiological stress (shown by reductions in skin conductance level) and improvements in emotional states of individuals (shown through self-report on the Zuckerman Inventory of Personal Reactions).

Kaplan (1995, 2001) delineates how and why nature is restorative in his Attention Restoration Theory (ART), which states that when a person is immersed and interacting with a surrounding environment that contains fascinating stimuli, the stimuli modestly capture attention in an

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THE EFFECTIVENESS OF 3-D VIDEO VIRTUAL REALITY FOR THE TREATMENT OF FEAR OF PUBLIC SPEAKING

Heather A. Lister¹, C. Darren Piercey¹, and Chantele Joordens¹

Virtual reality (VR) has been utilized in conjunction with cognitive behavioural therapy (CBT) to decrease symptoms for people with specific phobias or anxiety disorders. Many studies investigating VR have employed complicated head-mounted displays with intricate software. This study investigates the effectiveness of presenting a 3-D video of a virtual audience to participants who experience the fear of public speaking. The VR environment was presented with a cost effective, standard CRT television using polarized shutter glasses. Results indicate that skin conductance and heart rate measures increased, which suggests that the VR 3-D video is effective in eliciting a fear response. Also, a decrease in anxiety and a decrease in negative self beliefs about public speaking ability suggest that VR 3-D video can provide an effective treatment. Future studies may combine this user-friendly technology with a therapeutic element, such as CBT, to treat anxiety disorders successfully and more cost effectively.

Keywords: Virtual Reality, CBT, Anxiety, Social Phobia, Fear of Public Speaking

INTRODUCTION

Social phobia is the third most common anxiety disorder (Hofmann et al., 2006) in which "exposure to social or performance situations almost invariably provokes an immediate anxiety response" (American Psychiatric Association, 2000). Social phobia can present itself in general situations in which a person fears all social situations, or in particular areas, in which a person fears specific situations such as performing in front of an audience, eating in public, or writing in front of others. The onset of social phobia generally ranges from the ages of 15 to 20, with the difference between genders being approximately equal (males – 11%; females – 15%) (Kessler, Stein, & Berglund, 1998).

People with social phobia experience physiological sensations and cognitive distortions. These may include difficulty breathing, pounding and racing heartbeat, shaking hands, mild to intense sweating, and blushing (Kessler, Stein, & Berglund, 1998). Cognitive distortions are evident in socially anxious people as social situations are un-

realistically perceived as dangerous. The individual misjudges the reactions of others which contribute to underestimating their own ability to function, and overestimating the threatening nature of the situation (Clark & McManus, 2002). To avoid the bodily sensations and negative self-perception accompanied by faulty cognitions, people with social phobia will evade most or all social situations. This consistent avoidant behavior may lead to complications such as alcoholism, depression, and suicide (Davidson, et al., 2004; Kessler, Stein, & Berglund, 1998), and if not treated can be unremitting (Pollack, 1999).

People with social phobia reportedly have difficulty making social networks, and indicated the disorder interfered with their ability to generate close relationships. Some individuals noted an interference with their school performance (Tillfors & Furmark, 2007; Stein & Keen, 2000; Stein, Walker, & Forde, 1996) which may inevitably lead to early dropout due to the demands of academic presentations. Although treatable, few individuals seek out ther-

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ONLINE COUNSELING FOR EATING DISORDERS - AN ESTABLISHED SERVICE COMPLEMENTING TRADITIONAL SETTINGS

Christine Kündiger¹, Dorette Wesemann¹, Ruth Verhey² and Martin Grunwald¹

Online counseling has gained more recognition in many areas of general and specialized health care. The German ab-server was established in 1998 and offers a highly professional anonymous online counseling service for people suffering from, or wanting to learn about, eating disorders (ED). The aim of the following analysis was to represent an actual user characteristic.

Methods: 1,055 inquiries sent to online counsellors of the ab-server by individuals affected by ED and their relatives were evaluated. The inquiries were received between December 2007 and December 2008 and all inquiries were analysed both qualitatively and quantitatively.

Results: The symptom descriptions given by persons suffering from an ED mostly referred to bulimia nervosa (BN) (44%); inquiries sent in by relatives of affected persons also mostly referred to BN (42%).
Conclusions: The easy access to a professional counseling service online has made it accepted by individuals suffering from ED and their relatives.

Keywords: Online Counseling, Eating Disorder, Relatives, Internet, Text Analysis

INTRODUCTION

With the Internet having brought about the most sustainable change in information-related behavior since the invention of the letter press, it also made extensive information on almost all medical disorders and mental illnesses available. Internet-based information on aspects such as health advice and medical information is consistently sought by up to 40% of Internet users (Khorrami, 2002). Besides the availability of descriptive, statistical, objective, and also subjective information, the Internet also offers other forms of Internet-based interventions with Internet counseling being one of the crucial aspects (Grunwald & Busse, 2003; Grunwald & Wesemann, 2006a; Grunwald & Wesemann, 2006b; Grunwald & Wesemann, 2007; Wesemann & Grunwald 2008; Wesemann, Grunwald & Grunwald, 2009; Young, 2005). Other forms of intervention are made up of virtual realities (Perpiná,

Botella, Banos, Marco, Alcaniz & Quero, 1999; Choi, Jang, Ku, Shin, Kim, 2001), self-help-groups (Cavaglioni, 2008) and online therapy (Griffiths, 2005). In Germany, online counseling services focusing on a plethora of psychosocial challenges are available to Internet users. These services were mainly established as primary and secondary prevention measures (Domsch & Lohaus, 2009; Gerö & Zehetner, 2009). There are various specialized programs of online counseling regarding a certain disease or problem area (Nock 2006; Kostenwein & Weidinger, 2006; Brunner, 2005), aftercare (Kordy, Golkaramnay, Wolf, Haug & Bauer, 2006) or for relatives of affected patients (Musiat, Grover & Schmidt, 2008).

As the Internet allows (1) anonymity in communication, (2) rapid information exchange, (3) independence of time and place for the communicating individuals, and (4) low

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A PSYCHODYNAMIC VIEW OF VIRTUAL REALITY EXPOSURE THERAPY

Brenda K. Wiederhold¹, Lauren Gavshon² and Mark D. Wiederhold²

Fear of flying impacts an estimated 10-20% of the U.S. population. Those suffering from this fear either avoid flying or endure flights with intense anxiety and distress, often relying on alcohol or medication to transcend the experience. Virtual Reality Exposure Therapy (VRET) has been used successfully to treat fear of flying for the past fifteen years. Clinical case reports and controlled studies have shown VR to be highly effective in treating this phobia, since patients can actively practice new coping skills while engaging in a controlled exposure experience. The stimulus of the virtual environment has been found to trigger a dissociative state in patients prone to react this way when confronted with an anxiety-provoking situation. A case report examining the impact of dissociation on VRET for fear of flying will be presented. This case will incorporate physiological data as well as patient information obtained through self-report measures, and will be discussed through modern psychoanalytic theory. VR has typically been thought of as a useful adjunct to traditional cognitive behavioral therapies, however, it is also proving beneficial as an additive to psychodynamic therapy. Viewing a patient through the lens of psychodynamic theory can be particularly helpful in understanding the effectiveness of VRET.

Keywords: Virtual Reality Exposure Therapy, Anxiety, Exposure, Psychodynamic Therapy, Aviophobia

INTRODUCTION

Virtual Reality (VR)-based therapy has been used in the mental health field for the past two decades, and is now recognized as a valuable form of treatment and adjunct to traditional psychotherapy. The use of Virtual Environments (VE's) has shown to be particularly effective in treating anxiety-related disorders, such as specific phobias and panic disorder (Hodges, Rothbaum, Watson, Kessler, Opdyke, 1996; North, North, Coble, 1996; Wiederhold & Wiederhold, 1999; Wiederhold & Wiederhold, 2003; Wiederhold & Wiederhold, 2005). One phobia in particular, fear of flying, impacts an estimated 10-20% of the U.S. population (Agras, Sylvester & Oliveau, 1969; Boyd, et al., 1990; Howard, Murphy & Clarke, 1983). Those suffering with this fear either avoid flying or endure flights with intense anxiety and distress, often relying on alcohol or medication to help them through the experience. Virtual Reality Exposure Therapy (VRET) has been successfully used to

treat fear of flying for the past 15 years. Clinical case reports and controlled studies have shown the use of VR to be highly effective in treating this phobia (e.g., Hodges, et al., 1996; North, North & Coble, 1996; Wiederhold, Wiederhold & Gevirtz, 1998, Wiederhold & Wiederhold, 2003; Wiederhold & Wiederhold, 2005). Theoretical understanding of why VR is effective has primarily been discussed through the viewpoint of Cognitive Behavioral Theory (CBT), focusing on solidly established concepts such as systematic desensitization and cognitive retraining. As most researchers in the field have focused on combining CBT and VR for phobias, little has been written about VR through the perspective of Psychodynamic Theories.

The existing literature comprising modern Psychoanalytic thinking provides a vast pool of information that can be used to explore and understand new treatment methods. The intention of this paper is to present an an-

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ADAPTATION OF THE TRIER SOCIAL STRESS TEST TO VIRTUAL REALITY: PSYCHO-PHYSIOLOGICAL AND NEUROENDOCRINE MODULATION

Ana Santos Ruiz,¹ Maria Isabel Peralta-Ramirez¹, Maria Carmen Garcia-Rios²,
Miguel A. Muñoz³, Nuria Navarrete-Navarrete⁴ and Antonia Blazquez-Ortiz⁵

The Trier Social Stress Test (TSST; Kirschbaum et al., 1993) is currently the most commonly used psychosocial stressor to generate a response of the axes involved in stress. The TSST has proven effective in the activation of the hypothalamic-pituitary-adrenal axis. In addition, new technologies, such as virtual reality (VR), are being integrated into stress research protocols (Kelly et al., 2007).

To determine whether TSST as applied to VR leads to the sympathetic and neuroendocrine activation in a group of healthy individuals. Also, this study aims to connect this response with different psychological variables regarding stress vulnerability, psychopathology, and personality. Twenty-one university students (6 male and 15 female) were exposed to a modified version of the TSST adapted to a virtual environment (VE), in which they have to deliver a speech. Electrodermal activity and salivary cortisol secretion were simultaneously registered at different instances.

After the task, sympathetic activation was observed in all participants, as well as increase in the cortisol secretion in 14 of the students. This increase was statistically significant in the moment prior to the speech and the moment after in the responder group. In the same fashion, statistically significant differences were found in the responder group only regarding obsession and compulsion scales and extroversion, which were higher in the responder group. Our findings support the use of the TSST paradigm in VR as an experimental situation appropriate to research designs in laboratory aiming to study the modulation of the axes implied in response to stress.

Keywords: TSST, Virtual Reality, Hypothalamic-Pituitary-Adrenal Axis, Psychophysiological Activation, Salivary Cortisol

INTRODUCTION

In recent decades, neuroscientific research on stress has notably increased. In order to induce psychophysiological responses to stress similar to those in real life a great number of stressor agents has been used, such as acute psychological stressors that activate the sympathetic-adrenomedullary system and affect the immune

system (Cacioppo, 1994). The tasks that have been used most often are public speaking, arithmetic, Stroop test, video-games, problem solving, and reaction time (Moya-Albiol & Salvador, 2001). In the same fashion, response to stress originated in the hypothalamic-pituitary-adrenal (HPA) axis has been widely used in the increase of blood or salivary cortisol levels when an in-

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