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EDITORIAL

As we begin 2009, I want to say "vielen herzlichen Dank" to all those who believed in our new Journal of CyberTherapy & Rehabilitation (JCR) and encouraged its formation. JCR was founded after many requests from the community and exists to support the community. Our inaugural year, 2008, is now behind us, and I am pleased at the reception given by those already in the community, as well as those just discovering the benefits of adding technology to existing healthcare methods and protocols. JCR has thus far published articles by researchers and scientists from around the globe, and is disseminating its newest findings and research through advanced technologies to multiple continents and over thirty-nine countries. Led by an internationally renowned Editorial Board, JCR's authors and board members currently hail from Australia, Belgium, Canada, Croatia, Denmark, Germany, Greece, Israel, Italy, Mexico, the Netherlands, Portugal, South Korea, Spain, Switzerland, the United Kingdom and the United States. JCR is truly international and our aim is to disseminate premier research findings to all corners of the globe.

I am also proud to say that our companion publication, CyberTherapy & Rehabilitation (C&R) Magazine, was launched in December 2008. While JCR is a peer-reviewed, scientific journal, C&R serves as the voice of our association and covers clinically focused and practice-driven articles, congress reports, news and other relevant topics appealing to a wider readership including industry professionals, policy makers, clinicians, and individual citizens.

In 2008, I had the sincere pleasure of participating in many international conferences, in addition to organizing the 13th annual CyberTherapy Conference in San Diego. Each conference was for me an enjoyable learning experience, and I left each full of amazement at how far we have come. It is inspiring to hear both newcomers and veterans of cyber-psychology, therapy, training, and rehabilitation reporting on new discoveries; expanding this seemingly infinite field.

As Editor-in-Chief of the official journal of the 14th annual CyberTherapy & CyberPsychology conference (CT14), I am especially looking forward to the upcoming international conference which is being held in beautiful Lago Maggiore (Verbania), Italy 21-23 June 2009. CT14 has already gained much attention from international organizations and, as in years past, promises to host an international crowd of pre-eminent scientists and industry leaders.

This issue of JCR encompasses research from some of the finest scholars in the field. With submissions detailing some of the most promising applications for technology in therapy, rehabilitation, gaming, and online studies, we are proud to publish studies that have laid the groundwork for this ever-changing field up to this point. This year we are focusing on more in-depth studies, while in 2008, many of our articles served as a review of specialty areas in cybertherapy and rehabilitation. I am grateful for all the authors' hard work, groundbreaking ideas, and scientific rigor in disseminating findings to help progress our community. I am both pleased and honored to publish the articles in this issue knowing full well the time, energy, and countless hours these papers required.

In our first paper, Tarnanas et al. describes the basic system architecture used for virtual reality (VR) emotional human agents and develops a new method of a relative-

scored personality measure. The article discusses the use of VR as a potential tool for personnel screening and selection in organizations.

The second article by King and Delfabbro evaluates the status of heavy game players in comparison with Australian normative data. The physical and mental health of over 400 users, described as "heavy" video game players, was assessed.

Next, Hoffman et al. studies how interactivity influences the magnitude of VR analgesia. Hoffman explores immersive VR as an alternative to traditional pain medications for burn victims during their treatment. The use of a high-tech helmet has broken ground on this interactive vs. non-interactive VR study.

The fourth article by Kott et al. uses a VR system combined with treadmill training for children with cerebral palsy. This pilot study combines treatment with the element of playful gaming to incorporate rehabilitation and technology with a level of fun.

Dr. Griffiths, in our fifth article, examines Internet addiction behavior and the use of Internet help and therapy for those suffering from it. It also investigates various types of online help and therapy available for online problem gamblers and evaluates their overall effectiveness.

Next, Russoniello et al. investigates the effectiveness of casual video games in improving mood and decreasing stress. Russoniello et al. discusses the possible use of games to help treat stress-related medical disorders, including diabetes and depression. This study points to the potential of video games to both prevent and treat stress-related medical orders.

Our final paper, by Zurlo and Riva, discusses electronic brainstorming for creative idea generation. The study examined how the personality traits of group members and the characteristics of the communication process may impact both group creativity and productivity.

Once more, I would like to thank the authors for their incredible work and dedication to this growing discipline. I also want to thank JCR's Associate Editors: Professor Botella, Professor Bouchard, Professor Gamberini, and Professor Riva for their leadership and hard work; as well as our internationally renowned Editorial Board for their many contributions. Our next issue will continue to explore the ways in which technology influences and enhances the healthcare of citizens throughout the world. JCR is interested in original research and ideas for future thematic issues from you, our readers. This is your journal, so please contact us with your interesting manuscripts and ideas. Thank you for your continuing support of JCR. The possibilities and potential for advanced technology in healthcare are unlimited, and I am proud to be a part of such a thriving and groundbreaking community. To employ a famous quote: "Together, we can make a difference!" We can change healthcare as we know it!

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USING VIRTUAL REALITY EMOTIONAL HUMAN AGENTS AS A RELATIVE-SCORED PERSONALITY MEASURE

Ioannis Tarnanas, Ph.D.[1], James Wasserstrom, M.Sc.[1] and Orestis Giotakos, Ph.D.[2]

There are a variety of old and recent studies, which indicate that self-report measures of personality appear susceptible to biased responses, especially when administered in competitive environments (e.g., Barrick & Mount, 1996; Ones, Viswesvaran, & Reiss, 1996; Hirsh & Peterson, 2008). According to these studies, respondents can typically selectively enhance their positive traits while downplaying negative ones. Consequently, it can be difficult to achieve an accurate representation of personality when there is motivation for favorable self-presentation. There has been one recent attempt to address the problem of biased responses and the lack of success in detecting and controlling this tendency, by using a new method of comparative scaling techniques, in which each trait domain was scored relative to all the others, rather than being scored separately (Hirsh & Peterson, 2008). Previous research suggests that these relative-scored, or ipsative, survey formats may be less susceptible to distortion than their Likert scored counterparts (Christiansen, Burns, & Montgomery, 2005; Jackson, Wroblewski, & Ashton, 2000). In this paper we introduce a virtual reality strategy for relatively scoring an individual's personality by means of virtual emotional human agents. Over the last five years, the technology for creating virtual humans (VHs) has evolved to the point where they are no longer regarded as simple background characters, but rather can serve a functional interactional role. Our current project involves the construction of a virtual emotional human agent that animates a personality description. The virtual human's personality descriptors used in the current study were taken from the IPIP five factor questionnaires, including the IPIP NEO, BFI, and the Big Five items from the Seven Factor questionnaire. The relative-scored personality strategy used in the project will be comprised of the following three different comparative scaling methods: paired comparisons, forced-choice, and rank order techniques. Inside the virtual world, the participants will have different methods of interacting with the virtual humans relative to the three different comparative scaling methods used. For example in the first relative-scored method, the participants have to design a "custom" virtual human by choosing the most appropriate self-description from two different trait categories (e.g., "I see myself as someone who is depressed" vs. "Am full of ideas" contrasts Emotional Stability with Openness, respectively). In the rank order method, participants will be presented with five animated virtual human's personalities (one from each trait domain) and will be asked to rank them with regards to how well they applied to their own personality. The data collected from this virtual world will not only be the participant's "active" interactions with the virtual humans but also "passive" monitoring and recording of behavioral patterns inside the virtual world during the "active" interaction (e.g. "virtual point of gaze", "point of gaze activity" and "reaction times for the virtual human personality selection process"). Because an individual's score on any personality scale is a function of the true score plus measurement error or response bias, the data collected above offer an additional method of detecting such strategic response manipulations. Overall, then, the present paper aims to describe the basic system architecture used for this virtual reality emotional human agents (VREHA) scored measure of the Big Five, which can be constructed as an alternative to questionnaire responding. As a future study we would like to compare our method with some new personality measures with predictive power, such as the "fake proof" Hirsh and Petersen construct. Herein however we proffer a description of our iterative design process and outline our long-term vision.

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THE GENERAL HEALTH STATUS OF HEAVY VIDEO GAME PLAYERS: COMPARISONS WITH AUSTRALIAN NORMATIVE DATA

Daniel King[1] and Assoc. Prof. Paul Delfabbro[1]

The health-related quality of life among heavy users of electronic entertainment has not been well described in literature. This research examined the general health status of heavy video game players. "Heavy" video game playing was defined as (a) playing for over 30 hours per week, (b) playing for at least 4 days per week, and (c) playing for an average duration of 3 hours in a typical sitting. A total of 411 participants were drawn from video game outlets and gaming cafes, and administered a survey package. The heavy playing subgroup (N=45) scored significantly lower on measures of physical functioning, mental health, vitality, general health and social functioning than normal Australian adults. The majority of this subgroup also did not meet national guidelines for weekly exercise and reported some sleep-related problems.

INTRODUCTION

Video game playing is an increasingly prevalent national pastime. However, among health professionals and the lay public, there is concern that frequent sedentary behavior associated with screen-based entertainment like television and video games may displace regular physical activity and therefore contribute to general health problems such as obesity. In the last two decades, numerous studies have examined patterns of video game play among children and adolescents to identify the effects, if any, of video game playing on general health, emotional well-being and development. Previous research has identified a weak relationship between television and video game use and health risks by taking an epidemiological approach, such as surveying large random samples of schoolchildren (e.g. Wake, Hesketh & Waters, 2003). In these studies, individuals commonly report low to moderate television or video game use, typically 30 to 120 minutes per day. In explaining the apparent lack of a strong statistical relationship between sedentary behavior and obesity, Vandewater, Shim and Caplovitz (2004, p. 83) stated:

It could be that the youth obesity status is linked to television only at the highest levels of such use (e.g. 20-30 hours or more weekly) as some research has indicated.

Little is known regarding the health-related quality of life in persons who report playing video games on a more frequent basis, i.e. over 30 hours per week. Thus, the present study sought to investigate the general health status of this subgroup of "heavy" video game players, and consider their general health profile in the context of the normal Australian adult population.

Vandewater, Shim and Caplovitz (2004) advanced three main hypotheses concerning why television and video game use may be related to obesity and other health problems. The first is known as the "couch potato" hypothesis, a theory which has been termed an "intuitive belief" (Tremblay & Willms, 2003), which states that sedentary behavior displaces physical activity, thereby directly decreasing (or perhaps reducing opportunities for) energy expenditure. This hypothesis provides the most commonly used rationale for health-oriented studies of media use and is widely cited within the mass media.

The second hypothesis attempts to link television and video game use to increased risk of unhealthy food consumption. It is thought that children who spend a lot of time watching television or playing video games are more

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INTERACTIVITY INFLUENCES THE MAGNITUDE OF VIRTUAL REALITY ANALGESIA

Regina Wender[1], Hunter G. Hoffman[2], Harley H. Hunner[3], Eric J. Seibel[4], David R. Patterson[5], and Sam R. Sharar[1]

Despite medication with opioids and other powerful pharmacologic pain medications, most patients rate their pain during severe burn wound care as severe to excruciating. Excessive pain is a widespread medical problem in a wide range of patient populations. Immersive virtual reality (VR) distraction may help reduce pain associated with medical procedures. Recent research manipulating immersiveness has shown that a high tech VR helmet reduces pain more effectively than a low tech VR helmet. The present study explores the effect of interactivity on the analgesic effectiveness of virtual reality. Using a double blind design, in the present study, twenty-one volunteers were randomly assigned to one of two groups, and received a thermal pain stimulus during either interactive VR, or during non-interactive VR. Subjects in both groups individually glided through the virtual world, but one group could look around and interact with the environment using the trackball, whereas participants in the other group had no trackball. Afterwards, each participant provided subjective 0-10 ratings of cognitive, sensory and affective components of pain, and the amount of fun during the pain stimulus. Compared to the non-interactive VR group, participants in the interactive VR group showed 75% more reduction in pain unpleasantness ($p < .005$) and 74% more reduction in worst pain ($p < .005$). Interactivity increased the analgesic effectiveness of immersive virtual reality.

Keywords: Virtual Reality, Analgesia, Distraction, Immersiveness, Attention

Perspective: Pain during medical procedures such as severe burn wound care is often excessive. Adjunctive use of immersive virtual reality can substantially reduce the amount of procedural pain experienced. The results of the present study show that a more immersive interactive VR system reduced pain more effectively than a less immersive, non-interactive VR system.

Introduction

Despite aggressive use of pharmacologic analgesics, excessive pain during medical procedures performed on awake patients remains a widespread medical problem.[1,2] Although increasing the dose of analgesics (e.g., opioids) often increases analgesia, side effects of the pain medications (e.g., nausea, constipation, cognitive dysfunction, disturbance of sleep cycles, etc) become increasingly problematic with higher opioid analgesia doses.[2] Adjunctive use of psychological techniques such as distraction may help reduce patient suffering without increasing side effects.

Immersive virtual reality (VR) distraction provides computer-generated multi-sensory input (sight, sound, manual interactivity) to participants. There is growing clinical evidence that adjunctive use of VR reduces pain during interventions as disparate as burn-wound dressing changes, endoscopic urological procedures, and dental pain.[3,4,5,6,7,8] Laboratory studies provide converging evidence that VR reduces pain. Functional brain imaging (fMRI) studies reveal that significant reductions in subjective pain ratings during VR immersion are accompanied by similar decreases in pain-related brain activity.[9] And opioids + VR reduce pain ratings and pain-related brain activity more than opioid analgesia alone.[10]

Pain requires attention.[11] Hoffman, Patterson and colleagues[7] propose that VR is unusually attention grabbing,

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COMBINING A VIRTUAL REALITY SYSTEM WITH TREADMILL TRAINING FOR CHILDREN WITH CEREBRAL PALSY

Karen Kott, Katrina Lesher[1] and Gianluca DeLeo[2]

This pilot study is a report of the combination of a virtual reality (VR) system with treadmill training for children with cerebral palsy. The VR system includes an element of gaming to serve as a playful context to motivate the children to walk for longer periods of time in treatment sessions. The children all expressed pleasure in reaching the goal of saving the princess after walking for 9 hours. The intensive treadmill practice helped the children make significant changes in walking performances (p=.02) and capabilities (p=.05) as measured by the Standardized Walking Obstacle Course and Gross Motor Function Measure-88, respectively. This virtual reality system, in the form of DVDs, provides additional support for the feasibility and use of a virtual reality system in locomotion rehabilitation.

INTRODUCTION

The development and value of walking is taken for granted by most people. For the child without developmental disabilities, walking is a skill demonstrated at about 12 months of age (Stout, 2006). While a new walker may be a bit unsteady at first, with unlimited practice the child soon develops stability and ease of mobility that carries her from one place to another without much thought. For many individuals with cerebral palsy (CP), the ability to walk may not be a skill that is easily developed. Approximately 30% of individuals with CP do not have the ability to walk. Of the 70% who do walk, many have limitations in their walking ability (Beckung, Hagberg, & Uldall, 2008). Some individuals may also regress in their walking abilities limiting their mobility especially out of the home (Day, Wu & Strauss, 2007).

Repetitive practice of the pattern of walking is what takes a toddler from the initial unsteady steps of walking to fully mature walking at 7 years of age (Stout, 2006). Once that toddler learns to initially walk, upright mobility on two legs is the preferred pattern of movement. This accounts for endless hours of practice making walking automatic and allowing for variations of its components, such as speed, to be expressed with ease. While repetitive practice is not the only component that improves a skill like walking, it is still a key component for motor learning (Valvano, 2005).

For the individual with CP, it may be very difficult to learn the initial pattern of walking due to lack of motor control and coordination. Frequently children with CP receive physical therapy services to help them learn the pattern of walking, with the therapist compensating for the child's limitations (Olney & Wright, 2006). The physical therapist acts to facilitate balance control, weight shifting, and forward progression of the legs. A limitation of this method is inherent in the coordination of elements by both the therapist and child. The physical therapist may impose a walking rhythm upon the child that is not the child's own. A major restriction of this method may be that the move-

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INTERNET HELP AND THERAPY FOR ADDICTIVE BEHAVIOR

Mark Griffiths, Ph.D.

Counselling and psychotherapy have entered the computer age. Psychological advice, help and treatment for those with addictive behaviors are no exception. The paper overviews the main issues in the area and approaches the discussion acknowledging that online therapy has to be incorporated within the overall framework of the need for clinical assistance. The paper also provides brief overviews of what types of online help and therapy are available. This paper makes particular reference to online help for problem gamblers and will overview a recent study that evaluates the effectiveness of an online help and guidance service for problem gamblers.

Keywords. Online therapy, Online help, Addiction, Problem gambling, GamAid

Internet help and therapy for addictive behavior

Many therapists remain suspect about the new and growing field of 'behavioral telehealth'. Some have claimed that Internet therapy is an oxymoron because psychotherapy is based upon both verbal and nonverbal communication (Segall, 2000). Since online relationships can be as real and intense as those in the face-to-face world (Griffiths, 2001), there is little surprise that clinicians are beginning to establish online therapeutic relationships.

To date there have been a growing number of non-empirical papers about various issues concerning online therapy, including challenges and initiatives in this growing field (Sanders & Rosenfield, 1998; Griffiths, 2001; Ritterband, Gonder-Frederick, Cox, et al, 2003; Carlbring & Andersson, 2006), ethical issues (Bloom, 1998), mediation of guidance and counselling using new technologies (Tait, 1999), and perspectives on family counselling (Oravec, 2000). There have also been a growing number of empirical reports utilising online therapy. These include its use in providing cognitive behaviour therapy for depression and social phobias (Carlbring, Westling, Ljungstrand, et al, 2001; Andersson, Bergström, Holländare, et al. 2005; Andersson, Carlbring, Holmström, et al, 2006; Andersson, 2009; Berström, Hollander, Carlbring, et al, 2003; Carlbring, Gunnarsdóttir, Hedensjö, et al, 2007; Spek, Cuijpers, Nyklicek, et al, 2007; Titov, Andrews & Schwencke, 2008), treating anxiety and panic disorders (Klein & Richards, 2001), eating disorders (Winzelberg, Eppstein, Eldredge, et al, 2000; Celio, Winzelberg, Wilfley, et al, 2001; Zabinski, Pung, Wilfley, et al, 2001; Robinson & Serfaty, 2001), stress disorders (Lange, Rietdijk, Hudcovicova, et al, 2000; Lange, Van De Ven, Schrieken, et al, 2000; Zetteqvist, Maanmies, Ström, et al, 2003), back pain (Buhrman, Faltenhag, Ström, et al, 2004), insomnia (Ström, Pettersson & Andersson, 2004), public speaking (Botella, Baños, Guillén, et al, 2003; Botella, Hofmann & Moscovitz, 2004; Botella, Guillén, Baños, et al, 2007), and individuals with recurrent headaches (Stroem, Pattersson & Andersson, 2000; Andersson, Lundström & Ström, 2003). These empirical studies tend to show significant improvements for those treated using online therapy.

Psychological advice, guidance, help, and treatment for addicts are no exceptions. This paper therefore gives an overview of some of the main issues involved. The paper also makes particular reference to online help for problem

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THE EFFECTIVENESS OF CASUAL VIDEO GAMES IN IMPROVING MOOD AND DECREASING STRESS

Carmen V. Russoniello[1], Kevin O'Brien[1] and Jennifer M. Parks[1]

Stress related medical disorders such as cardiovascular disease, diabetes and depression are serious medical issues that can cause disability and death. Techniques to prevent their development and exacerbation are needed. Casual video games (CVGs) are fun, easy to play, spontaneous and are tremendously popular. In this randomized controlled study we tested the effects of CVGs on mood and stress by comparing people playing CVGs with control subjects under similar conditions. Electroencephalography (EEG) changes during game play were consistent with increased mood and corroborated findings on psychological reports. Moreover, heart rate variability (HRV) changes were consistent with autonomic nervous system relaxation or decreased physical stress. In some cases CVGs produced different brain wave, heart rate variability and psychological effects. These finding have broad implications which include the potential development of prescriptive interventions using casual video games to prevent and treat stress related medical disorders.

Keywords. Casual Video Games, Electroencephalography (EEG), Heart Rate Variability (HRV), Psychological Mood

BACKGROUND

According to the Casual Video Game Association there are more than 200 million casual game players worldwide. Gamers from a multitude of cultures, ages, and lifestyles play electronic casual games using consoles, PCs and online communities, handhelds and mobile phones. One example of the popularity of casual video games can be found in the fact that Microsoft Solitaire for Windows is the most commonly opened application on Windows XP (Casual Games Association, 2008). Casual video games sometimes referred to as coffee-break or web games are a booming business that is expected to grow to $55 billion by 2009 (JWT Intelligence, 2006).

Casual video games (CVGs) defy a standard definition because of the diverse nature of the games. Instead the Casual Games Association, 2007 offers a functional definition that asserts that CVGs must be considered fun, quick to access, easy to learn, and require no previous special video game skills, expertise, or regular time commitment to play. CVGs are based around familiar game concepts that consumers played as children in arcades. They are usually easy to pause, stop and restart. Casual games are usually played in short increments at home and at work. Some people, however, play for hours on end (Casual Games Market Report, 2007).

According to anecdotal evidence and survey research, people play CVGs for varied reasons including cognitive exercise, fun, relaxation, and to reduce stress and improve mood. The Casual Games Association says CVGs are viewed as important in stress reduction during lunch or after work and CVG play has begun to replace TV in this respect. A survey of gamers conducted in 2006 (n= 2,191) revealed that casual game players (71% daily use) view CVGs as more important in their leisure time activities than TV, reading, or spending time with family and friends. The survey also found that 88% of respondents derived stress relief from playing. While casual gaming is popular among all groups they are particularly attractive to women over 30. Retired men and woman also represent a large group of casual gamers (Casual Video Games Association, 2007).

Stress and Health

A strong link between physical health and stress was established more than a quarter century ago when researchers

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ONLINE GROUP CREATIVITY: THE LINK BETWEEN THE ACTIVE PRODUCTION OF IDEAS AND PERSONALITY TRAITS

Roberta Zurlo[1] and Giuseppe Riva, Ph.D.[1]

This article extends the findings in electronic brainstorming about the impact of personality traits on productivity and creativity in a web-based context of synchronous electronic brainstorming (instant messaging, MSN messenger). The sample included 60 students (M= 20, F= 40, average age of 18 years old) from a graphic advertising school. Participants were randomly assigned to ten groups of six subjects each. Each group was asked to solve the shipwreck task using MSN messenger (text communication only), to identify which objects and which actions were required to survive on a desert island after a shipwreck.

Results showed that group productivity and group creativity are strictly related both to the personality of the users and to the characteristics of the communication process. On the one hand, extroverted personality had a positive influence on the active production of ideas online. On the other, the choice of specific words able to convey real-time feedback and strengthen discussion was a predictor of productivity and creativity performance. These findings provide some useful recommendations for improving productivity and creativity in the context of computer-supported collaborative tasks over the Internet.

INTRODUCTION

Group creativity has quite short background history of research and studies. From the middle of the 90's, literature started to show an interest in it. At the beginning, attention focused on how the group was a restriction and limitation on individual production. During this period, organizations started to focus on group work and collaboration and with Osborn (1963), the literature's attention focused on a defined technique of idea generation which could improve individual creativity: brainstorming[1]. One of the reasons why Osborn (1957, 1963) believed idea groups would be highly creative is that he assumed there would be a great deal of stimulation by mutual associations. The intuition that groups might facilitate (or "prime") their members to think thoughts they might not have had in the context of solitary brainstorming is reminiscent of the notion from cognitive psychology that certain ideas are more accessible than others (Tulving & Pearlstone, 1966). The concepts we have stored in our long-term memory can be thought of as being connected in a semantic network in such a way that related concepts are more strongly connected and thus more likely to activate each other (Collins & Loftus, 1975). Thus concepts that are more closely connected to those that are currently active should be more accessible than those that are less strongly related to current ideas. This way of representing the idea-generation process also implies that it is situation or context-dependent: the ideas currently accessible depend upon what is currently active in working memory.

The central assumption underlying our study is that idea generation is essentially a cognitive or mental process that

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[1]Group brainstorming is a popular technique for creative idea generation developed by Osborn (1957).
This technique consists in following a set of rules designed to establish a non-evalutative setting and to enhance the idea generation process: (a) criticism is ruled out, (b) free thinking is welcome, (c) quantity is wanted, and (d) combination and improvement are sought