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FOR THE TREATMENT OF POST-TRAUMATIC STRESS DISORDER, VIRTUAL REALITY EXPOSURE

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Abstract

Research indicates an interlink between traumatic experiences and criminal behaviour (Ardino, 2011; Foy, Furrow & McManus, 2011; Weeks & Widom, 1998, 1989) revealing that offenders present a higher prevalence of Post-traumatic Stress Disorder (PTSD; APA, 1994) and associated symptoms when compared with the general population (Wright, Borrill, Teers & Cassidy, 2006). (Wright, Borrill, Teers & Cassidy, 2006). Available research, however, seldom give evidence regarding particular pathways that relate trauma and PTSD to criminal activity. This topic cluster of articles Offending behaviour: the role of trauma and PTSD'' intends to study such trajectories and post-traumatic processes in offenders. Victims of violence are prone to a constellation of consequences including dissociation, drug misuse, depression, and PTSD (Foa, Ehlers, Clark, Tolin & Orsillo, 1999; Roth, Newman, Pelcovitz, Van der Kolk & Mandel, 1997). (Foa, Ehlers, Clark, Tolin & Orsillo, 1999; Roth, Newman, Pelcovitz, Van der Kolk & Mandel, 1997). Chronic and extended exposure to violence may grow into a dysfunctional habit conducted in both familial and community contexts generating ''a connection between experiences of violence as victims and subsequent experiences of violence as a perpetrator'' (Garbarino, 2002) via which

trauma continuously appears to be the linking element for various forms of violence*endured or inflicted (Ardino, 2011). (Ardino, 2011).

Introduction

A substantial amount of work has demonstrated the association between trauma/child abuse and eventual violent and criminal behaviours (Widom & Maxfield, 2001; Smith, Ireland & Thornberry, 2005; Showyra & Cocozza, 2006). (Widom & Maxfield, 2001; Smith, Ireland & Thornberry, 2005; Showyra & Cocozza, 2006). Child abuse and neglect, poverty, sexual molestation, and witnessing violence are, among others, the most prevalent risk factors for post-traumatic reactivity, aggressiveness, and antisocial behaviour.

In 1989, Widom conducted a pioneering study on 900 individuals with experience of abuse prior to the age of 11 years, and she demonstrated a clear link between trauma and antisocial behaviour, showing that such children were at a greater risk of being arrested in adolescence (Maxfield & Widom, 1996). (Maxfield & Widom, 1996). Early studies by Widom and colleagues have been supported by other recent findings demonstrating that incarcerated male adolescents often have a history of trauma, including chronic victimisation along with an intergenerational experience of violence.. In adult populations, Browne, Miller, and Maguin (1999) have presented a thorough analysis of abuse in the lives of 150 female convicts. They observed that 70% of the women suffered serious physical assault from childhood caretakers or parents. Jordan, Schlenger, Fairbank, and Cadell (1996) observed that 78% of their sample of jailed women had encountered at least one incident in their lives that satisfied the DSM-IV-R criteria for an extreme event with the potential to predispose an individual to PTSD. Such research suggest that criminals are very commonly exposed to traumatic occurrences as a result of being or having been in a problematic social situation (Garbarino, 1995). (Garbarino, 1995). The viewpoint of offenders' environmental factors is mirrored in the high prevalence of PTSD, as emphasised in a review by Vermeiren (2003), ranging from 4% (Richards, 1996) to 65% lifetime PTSD (Cauffman, Feldman, Waterman & Steiner, 1998). (Cauffman, Feldman, Waterman & Steiner, 1998). According to the findings of a recent comprehensive study conducted by Goff, Rose E., Rose S., and Purves (2007), the prevalence of post-traumatic stress disorder (PTSD) in condemned convicts ranges from 4% (Brink, Doherty, and Boer, 2001) to

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21.4%. (Butler, Levy, Dolan & Kaldor, 2003). Other studies looked at the prevalence of post-traumatic stress disorder (PTSD) in a variety of forensic populations, including incarcerated women and men (Brewer-Smyth, Burgess, and Shults, 2004; Teplin, Abram, and McClelland, 1996; Zlotnick, 1997) and incarcerated women.

(Gibson et al., 1999). According to the findings of Powell, Holt, and Fondacaro (1997), 33% of their sample fulfilled the criterion for lifelong PTSD, whereas 21% of their sample met the criteria for 6-month PTSD. There have been a few studies that have looked at post-traumatic stress disorder (PTSD) rates in conjunction with substance abuse. These studies have shown that incarcerated men who have both substance abuse problems and PTSD are more likely to have higher recidivism rates than those who only have substance abuse disorders. Similarly, incarcerated women who have both disorders are more likely to relapse than those who only have substance abuse disorders (Kubiak, 2004). Therefore, jailed persons who suffer from both post-traumatic stress disorder and substance use disorder are at a greater risk of becoming mired in the criminal justice system (Ouimette, Finney & Moos, 1999). According to research that have been conducted on prevalence in Europe, PTSD symptoms are more prevalent in prison populations than they are in clinical and community samples. A lifetime incidence of PTSD of 36% was discovered in a German research that evaluated 54 delinquents who were being held in forensic mental institutes, while a point prevalence of 17% was identified in the same study (Spitzer et al., 2001). A research on the incidence of post-traumatic stress disorder (PTSD) was conducted in Switzerland with 86 offenders, and the results indicated a point prevalence of PTSD that was conservatively calculated at 27%. (Urbaniok, Endrass, Noll, Vetter & Rossegger, 2007).

Expert treatment guidelines for post-traumatic stress disorder (PTSD) were first published in 1999. At the time that the attacks on the World Trade Center (WTC) took place, these guidelines recommended that cognitive behavioural therapy (CBT) with imaginal exposure should be the first-line therapy for PTSD.

The effectiveness of cognitive behavioural therapy (CBT) with imaginal exposure had been demonstrated in a variety of studies with different trauma populations, such as female victims of

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sexual assault,2–4 victims of motor vehicle accidents,5–8 Vietnam combat veterans,9–14 and mixed trauma populations.

In spite of the fact that its effectiveness has been demonstrated,16 imaginal exposure is an insurmountable obstacle for certain individuals. According to the standard protocols used in PTSD treatment outcome research3, effective imaginal exposure requires that patients tell their trauma in the present tense to their therapist, over and over again; however, it is inherent in PTSD to avoid reminders of the trauma (such as thoughts, emotions, or places). As a result, the vast majority of people who suffer from PTSD never seek therapy. 17 Some patients who seek therapy will not participate in the treatment, while others will say they are eager to participate but will be unable to engage their emotions or sensations, instead giving a story that is soulless and uninteresting as a reflection of their numbness. Patients that fit this profile almost never show signs of improvement.

It has been hypothesised that an important aspect of exposure treatment is the emotional involvement of the patient, namely the activation of their fears. Foa and Kozak18 propose that in order for there to be a reduction in fear, fear-relevant information associated with the patient's memory of the traumatic event (i.e., the fear structure) must be accessed and activated through emotional engagement. This is necessary in order for there to be a reduction in fear. The patient's memory structure is then updated with fresh or corrected information once the fear structure has been stimulated through emotional involvement. According to the findings of these authors, in order for the fear structures to be altered and for long-term habituation to become possible, it is important to have several encounters with the feared stimuli while in a secure setting. 18 The limited amount of research that has been done on the topic of treatment failures has led researchers to the conclusion that an inability to engage emotionally is a good predictor of a poor treatment outcome. One of the few studies that looked at treatment variables that mediated outcome looked at the impact that emotional engagement and habituation had on the successful outcome of exposure therapy for chronic PTSD in female assault victims. This study was one of the few that looked at treatment variables that mediated outcome. 19 The findings showed that even though every participant benefited from the treatment, those who had therapeutic emotional engagement in the treatment and habituation to emotion-eliciting stimuli were eight times more likely to meet stringent criteria for good end-state functioning. These criteria included a

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reduction of PTSD symptom scores by at least 50% and normal scores on measures of depression and anxiety. The technology known as virtual reality (VR) might give a tool that helps to enable high levels of emotional involvement. Virtual reality settings provide chances not just to capitalise on the patient's creative and memorization abilities, but also to supplement such capacities with experiences that are created by the computer that are visual, audio, and even tactile in nature.

Virtual reality (VR) provides a sensory-rich environment, which may enhance emotional involvement in patients who are reluctant to participate in recollections of frightening experiences. In addition, unlike the real world, the environs of virtual reality may be altered in a variety of unconventional ways. Patients have been shown to be more ready to explore VR treatment than other kinds of exposure therapy due to the fact that the virtual reality world does not involve the same hazards as returning to the frightened environment in the real world. 20,21,24 The effectiveness of virtual reality exposure therapy as a treatment for anxiety disorders has been demonstrated by a significant number of research. The effectiveness of virtual reality (VR) exposure has been established for a variety of phobias, including a fear of heights a fear of flying claustrophobia and a fear of spiders. Patients suffering from certain phobias avoid the feared stimuli, yet in order to recover from their condition, they must encounter the dreaded stimulus. Rothbaum, Hodges, and their other coworkers In an open study involving Vietnam War veterans with persistent PTSD who had not improved after receiving treatment with various modalities, researchers 35 and 36 established the potential effectiveness of VR augmented exposure therapy for the treatment of chronic PTSD. Taking into account the fact that not all of those people who would require therapy for PTSD in the wake of the assaults on the WTC 37–40 of the patients would have a favourable response to the empirically established first-line treatment of extended exposure therapy. We wanted to conduct preliminary research on the application of virtual reality (VR) technology to the treatment of post-traumatic stress disorder (PTSD) in survivors of the attacks on the World Trade Center that occurred on September 11, 2001. The first case of this treatment was published in 2002. 43 The primary objective of this research was to investigate whether or not exposure therapy using virtual reality (VR) is effective in the treatment of post-traumatic stress disorder (PTSD). The individuals with post-traumatic stress disorder (PTSD) as a direct result of having observed the attacks on the World Trade

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Center on September 11, 2001 were the focus of the study. To the best of our knowledge, this is the first controlled trial that has been conducted on the treatment of PTSD following the attacks on the World Trade Center.

In the United States military, as well as in the fields of psychology and psychiatry, there is a significant amount of focus placed on returning service members who suffer from post-traumatic stress disorders (PTSD). Recent studies have shown that post-traumatic stress disorder (PTSD) is becoming more prevalent among U.S. service members returning from deployments in Iraq and Afghanistan. 2 Some of the symptoms include hypervigilance, trouble sleeping, and difficulty concentrating, amongst others. 3 On a more fundamental and clinical level, such as the one found in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), "post-traumatic stress disorder" (PTSD) is defined as "the development of characteristic symptoms, such as distressing memories or dreams about the traumatic event, flashbacks, psychological distress produced by internal or external cues that symbolise the traumatic event, physiological reactions, avoidance of associated stimuli, and negative acculturation." These symptoms manifest themselves when an individual is subjected to one or more traumatic experiences (for example, exposure to war in either a combatant or civilian capacity,.

Treatment regimens for combat-related PTSD have been around for a long time, and so have the related therapeutic techniques. However, treatment regimes are becoming increasingly informed by the application of digital media technologies, which more recently have included virtual simulations employing head-mounted displays (HMDs). The treatment of post-traumatic stress disorder (PTSD) in the postwar era, whether through psychoanalytic therapy or exposure therapy, presupposed certain ideas about trauma, therapy, and subjectivity. Critical historical reflections have revealed this to be the case. 5 As a result of the development and application of virtual reality (VR) technologies and head-mounted displays (HMDs), virtual therapy, also known as cybertherapy, has gained both scientific and public attention. This attention has not only been in relation to the treatment of combat-related post-traumatic stress disorder (PTSD), but also for other types of anxiety disorders, such as the fear of flying. 6 Virtual reality exposure therapy (VRET) applications typically used for military purposes, such as Bravemind, which was developed by the Institute for Creative Technologies at the University of Southern California, make use of virtual scenarios that are "experienced" by a patient while they are wearing a head-

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mounted display (HMD). HMDs are used in this context to "trigger" traumatic events in order to re-engage with those situations that induce anxiety, and it is this act of re-experiencing those situations that assists patients in processing their fears and reducing the psychosomatic stress symptoms that are a direct result of those fears.

The so-called "efficacy" of this type of exposure treatment is recorded in subject-specific texts that sell and record the good outcomes to lessen PTSD symptoms using quantitative clinical trials. These texts also market and record the "effectiveness" of the exposure therapy. According to the research, a high success rate may be achieved when utilising this form of virtual treatment in conjunction with HMDs: "Results indicated post-treatment improvement on all measures of PTSD and maintenance of these gains at a 6 month follow-up," with a 34% decrease in clinician-rated symptoms of PTSD and a 45% decrease on self-reported symptoms of PTSD. "Results indicated post-treatment improvement on all measures of PTSD."

DISPOSITIONS OF ACCEPTANCE—PERSONALIZED DIGITAL MEDIA TECHNOLOGIES IN HEALTH-RELATED CONTEXTS

It is reflective of a larger tendency to integrate (and customise) digital media technologies in medicine and healthcare that there is a rising interest in using virtual reality and head-mounted displays in therapeutic situations. A concept that tries, in broad terms, to combine healthcare-related procedures and processes with digital media technology is suggested by umbrella phrases such as eHealth, Health 3.0, and digital health. These terms are all examples of digital health. 9 But in order to understand the sociocultural context in which virtual reality simulations, mobile media technologies, and HMDs are gaining acceptance as components of exposure therapy, it is necessary to examine the use of digital media technologies in health-related contexts. This will allow you to understand the sociocultural context in which exposure therapy is gaining acceptance. "Smart" and adaptive technologies are being used by increasingly larger segments of the population to individually measure and monitor health-related parameters. With the proliferation of mobile technologies such as tablets, smart watches, and other types of body sensors, "smart" and adaptive technologies are becoming more widespread. 10 Even if there are certain digital tools that seem to be effective in the therapeutic setting, a significant number of these technologies encourage a quantitatively limited viewpoint on what makes a "healthy

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existence." However, in the middle ground, between the two extremes of serious clinical usage and a more hedonistic lifestyle-inspired use, several forms of individualised digital monitoring gadgets have gained both popularity and instructional purposes.

THE VIRTUE OF VIRTUALITY: SCENARIOS AND INTERFACES OF VIRTUAL THERAPY

Traditional exposure treatment has a number of drawbacks, some of which may be ameliorated by the utilisation of digital media technologies in the form of virtual therapy; more specifically, the usage of VR in conjunction with head-mounted displays (HMDs). According to one definition of exposure therapy, it "is a set of treatment programmes that are commonly used to reduce pathological fear and related emotions, such as guilt," which are symptoms of post-traumatic stress disorder (PTSD) and other anxiety disorders (such as obsessive-compulsive disorder). Patients "actively encounter feared, but otherwise safe, things, circumstances, thoughts, sensations, and memories with the purpose of lowering fear and other unpleasant reactions to the same or comparable stimuli in the future." This is done in order to achieve the aforementioned goal. Depending on the patient's underlying disease and the symptoms they're experiencing, the exposure process can take a number of various shapes and utilise a variety of different procedures.

TECHNICAL BACKGROUND AND DEVELOPMENT HISTORY

The utilisation of the previously existing graphic assets from the ICT Full Spectrum Warrior as the foundation for the construction of the clinical VR application is one of the development guidelines that are included in this project. The application that is currently being used requires two Pentium 4 laptop computers, each with one gigabyte of random access memory (RAM), and three DirectX 9–compatible graphics cards in order to function properly. A null ethernet connection is what connects the two machines together in this setup. The programme that controls the therapist is being run on one of the notebooks, while the other laptop is being used to drive the user's head-mounted display (HMD) and orientation tracker. We are looking at three different HMDs to see which one will work best for this application. Our goal is to locate an HMD that is both inexpensive and has a resolution that is satisfactory. The following head-mounted displays (HMDs) are now being evaluated for this specific purpose:

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- The 5DT HMD 800 is capable of a resolution of 800x600 (SVGA).
- Icuiti v920 Head-Mounted Display (HMD) with a resolution of 640x480 (VGA)
- OLED z800 HMD from eMagin, capable of 800x600 resolution (SVGA)

REVIEW OF LITERATURE

Vittoria Ardino 2016. There is a wide range of psychopathological consequences that can be precipitated by traumatic life events, along with a variety of symptom combinations. The purpose of this study was to evaluate the association between early trauma, symptoms of PTSD, and the likelihood of future criminal behaviour in populations of incarcerated individuals. The overarching hypothesis was that dysfunctional cognitions, such as concern and a negative impression of the support of others, may act as a mediator between post-traumatic stress disorder and the likelihood of committing more crimes. In addition, the personal construct explanatory model of PTSD was investigated in this study. This model is based on Kelly's theory (1995), which states that a person who goes through a traumatic event that cannot be construed in relation with other life events may create a fragmented trauma-related construct subsystem as a result of the experience. Results showed a role of negative perception of other's support in the mediation between post-traumatic stress disorder (PTSD) and reoffending risk. This hypothesis was partially verified by these results. Participants who were experiencing signs of PTSD had a more difficult time incorporating their painful event and the crime they had committed into their construct system.

Eric Rassin 2018. The post-traumatic stress disorder (PTSD) is not only something that might afflict victims of crime, but criminals may also claim having it. Offenders who are in the postappeal phase of the appeal process may assert that they were suffering from persistent PTSD at the time of the index offence and argue that this demonstrates decreased criminal culpability. We have just lately come across two cases in which post-traumatic stress disorder (PTSD) was presented as fresh evidence that would warrant a reopening of the case. This was our experience as members of a Dutch criminal cases review committee. In this paper, we suggest that such assertions are problematic due to the fact that the clinical decision making that results in a PTSD diagnosis conforms to completely different norms than those that dictate forensic fact-finding. This dichotomy creates a difficulty for the validity of such claims. The two incidents highlight

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the differences between investigative procedures used in the criminal justice system and healthcare settings.

Omri Berger, Dale E. McNiel and Renée L. Binder 2012. There are a number of legal arguments that can be based on post-traumatic stress disorder (PTSD), including insanity, unconsciousness, self-defense, impaired capacity, and punishment mitigation. When used as a defence against criminal charges, post-traumatic stress disorder (PTSD) has been met with a variety of responses from the courts when it has been the subject of case law (for example, appellate rulings). Testimony regarding PTSD has frequently been accepted by courts as having a scientifically solid basis. In addition, post-traumatic stress disorder (PTSD) has been acknowledged as a viable cause for insanity, unconsciousness, and self-defense by appellate courts in many jurisdictions in the United States. However, the presenting of PTSD testimony has not always been deemed to be relevant, admissible, or persuasive in such situations by the courts. This is especially the case when expert testimony has failed to establish how PTSD fulfilled the requirement for the specific defence. In situations that did not fulfil the requirements for one of the complete defences, post-traumatic stress disorder (PTSD) has been used as a partial defence or mitigating circumstance, again with varying degrees of success.

RESEARCH METHOLODOGY

BACKGROUND TO THE EMPIRICAL STUDIES

The epidemiology of posttraumatic stress disorder

The following are the three most important issues that are addressed by epidemiological research: How prevalent is the illness in the population? Who is affected by this condition? Why does it happen? When doing research on the epidemiology of PTSD, the researcher must overcome two obstacles. The first step is to determine the level of trauma exposure, or to put it another way, to evaluate the level of trauma experience in accordance with criteria A in the DSM-IV. The identification of each individual instance is the second obstacle. Comparisons of cases to controls are at the core of epidemiological research. In this context, the term "case" refers to a person who satisfies the diagnostic criteria for post-traumatic stress disorder (PTSD). Because of the variety of symptoms that may accompany PTSD and the fact that the condition

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itself can be difficult to diagnose, researchers are need to conduct thorough examinations. Although the syndromes of post-traumatic stress disorder (PTSD) are fairly distinct and identifiable, as described in the DSM-IV (see Table 3.1), people who suffer from PTSD can vary greatly in their overall pattern of symptoms, the degree to which they are impaired, and the degree to which they show symptoms.

Trauma prevalence

The form of trauma that has been examined the most in relation to post-traumatic stress disorder (i.e., papers indexed in Entrez PubMed, June 2003) is war exposure, particularly that which was experienced by male Vietnam veterans. There are 1177 publications on this topic (Vietnam veterans: 629 articles; male Vietnam veterans: 543 articles). Another sort of trauma that is often researched is the aftereffects of childhood sexual and physical abuse in adulthood (sexual abuse: 197 articles; physical abuse: 91 articles). The third most frequent area of emphasis has been placed on physical and sexual assault, in particular with women as victims (physical assault: 86 articles; on women: 80 articles; sexual assault: 141 articles; on women: 133 articles).

The National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, and Nelson, 1995) found that 60.7% of men and 51.2% of women had experienced at least one traumatic event at some point in their lives. This was determined by using the DSM-III-R criteria and a modified version of the Diagnostic Interview Schedule (DIS), which measured an extensive number of psychiatric disorders in addition to PTSD. The most recent research that looked at a large community sample of younger adults in the United States (aged 18–45) and examined DSM-IV-diagnosed PTSD by using the Distress Inventory for Survivors (DIS) and the Composite International Diagnostic Interview (CIDI), found that the prevalence of total traumatic events was 89.6%. (Breslau et al. 1998).

The life-time prevalence of trauma and posttraumatic stress disorder (PTSD) in community samples from the general population

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Sample features	Exposure to at least one traumatic event % Male	Female	Total	Prevalence % Male	Female	Total	Risk of PTSD after exposure to trauma %	Reference
USA community sample 2493 persons				0.5	1.3	1.0		Helzer et al. 1987
USA community sample 2985 persons aged 18-95			2.3	0.9	1.7	1.3		Davidson et al. 1991
USA national sample 4.008 women aged 18 -		68.9	68.9		12.3	12.3	17.9	Resnick et al. 1993
USA national sample 5.877 persons aged 15-54	60.7	51.2	55.8	5.0	10.4	7.8		Kessler et al. 1995
USA community sample 2181 persons aged 18-45			89.6			8.3	9.2	Breslau et al. 1998
Germany community sample 3021 persons aged 14-24	25.2	17.7	21.4	1.0	2.2	1.3	7.8	Perkonigg et al. 2000
Sweden national sample 1.824 persons aged 18-70	84.8	77.1	80.8	3.6	7.4	5.6	6.9	Frans et al. 2003

Both the kinds of traumatic experiences that are most closely linked to PTSD and the sociodemographic factors that are connected with it are not well understood. It has been hypothesised that certain traumatic experiences, such as sexual abuse, are more likely to result in post-traumatic stress disorder (PTSD) than others, and that the perceived severity of the traumatic event might be a primary component in the development of PTSD (cf. Norris, 1992). There have been reports of gender differences in the risk factors for post-traumatic stress disorder (PTSD), with combat experience being the most usually connected factor in males, while rape and sexual assault carry larger risks in women (Kessler, Sonnega, Bromet, Hughes, and Nelson, 1995). Therefore, gender disparities may, at least in part, represent exposure to different kinds of traumatic events or exposure rates, or, alternatively, they may reflect differential impacts of the perceived impact of the event.

DATA ANALYSIS

THE EMPIRICAL STUDIES

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General aspects of the method in Studies I, II, and III

Samples

The sample for all three investigations included 3,000 people: 1,500 men and 1,500 women, with ages ranging from 18 to 70 years old. These people were chosen at random from the general population in Sweden by making use of a population-based register run by the Sema Group. Each participant was sent an explanation letter, a questionnaire, a separate identification sheet, two postage-paid return envelopes, and a questionnaire, which are all described further down in this article. The purpose of the study was explained in the letter, and participant anonymity was ensured. In order to protect the respondents' privacy, we requested that they send the questionnaire and the ID sheet back in two different envelopes. After a period of three weeks, those who had not yet responded received a courtesy reminder in the mail. The surveys and pre-paid return envelopes were resent to nonrespondents after a period of six weeks, and then another reminder was sent to them after an additional two weeks had passed.

It was requested of the respondents that they provide their names and addresses, along with their willingness or unwillingness to be contacted in the future. In order to analyse the test-retest reliability, the questionnaire was sent to the 157 individuals who responded to the survey six months following the original evaluation. In addition, they filled out the PTSD checklist (PCL) (Blanchard, Jones-Alexander, Buckley, and Forneris, 1996; Weathers, Litz, Herman, Huska, and Keane, 1993), which is a questionnaire that is used in the diagnosis of PTSD and has been validated against the CAPS (Blake et al., 1990). This questionnaire was developed by Blanchard, Jones-Alexander, Buckley, and Forneris. As a result, the responses from the second cohort's questionnaire were used in an investigation of the test-retest reliability and validity of the questionnaire (also known as sensitivity and specificity). Seventy-five participants, or 2.5 percent of the total, returned their ID papers but declined to take part in the research. Eight participants, or 0.26 percent of the total, had relatives who thought they were too sick to take part in the study. It was not possible to get in touch with sixty-six persons (2.2%) via the mail, thus their surveys were returned as undelivered. It was not feasible to make sense of the responses provided by five responders (0.16%), while 1,022 individuals (34% of the total) did not provide any feedback at all. Therefore, a total of 30 1 824 people (60.8% of the population)

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met the requirements for the analyses (863 males and 961 women, with a mean age of 42.99 and a standard deviation of 14.85).

The second sample, which was solely utilised in research III, was processed exactly the same as the first, with the exception that TRA-related items were left out (see 3.3.2). This sample included 1,000 adult males and 1,000 adult females, ranging in age from 18 to 70 years old, and was randomly chosen from a population-based registry in Sweden that included the greater Stockholm region (Enator). 1,207 persons' questionnaires could be interpreted, which is a 60.4% response rate.

Questionnaire design and diagnostic process

The questionnaire was divided into two portions with their own specific questions. The first section of the report was devoted to providing a descriptive analysis of the following sociodemographic factors: gender, age, place of residence (city, urban vs. countryside, rural), educational level (low, medium, and high, corresponding to 1–9 years of elementary school, high school or trade school, and university or university college training, respectively), and immigration status (whether the respondent was born in the United States or somewhere else), and immigration status.

The diagnosis was presented in the second segment. The DSM-IV was used as a guide for the diagnostic process. To begin, in order for the individual to satisfy criteria A, they needed to confess that they had gone through, observed, or been faced with an occurrence that included real or threatened death or significant harm, or a danger to the bodily integrity of themselves or others. In addition to this, the individual's reaction had to be described as "extreme dread, helplessness, or terror." After that, there was a series of true/false (yes or no) questions that used all of the DSM-IV items for criterion B–D. If at least one of the five different kinds of questions that were asked revealed that a symptom of reliving the traumatic experience was present, then criterion B was satisfied. The first category was comprised of inquiries on "intrusive pictures, ideas, or perceptions." The second re-experience question asked the subject whether or not they had been having disturbing nightmares about the traumatic event. A third inquiry inquired about whether or whether the individual had any sensations that the horrific experience was happening again. The fourth question questioned the presence or absence of psychological suffering in

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circumstances that were analogous. Last but not least, we investigated whether or whether there were any physiological responses to trauma-related stimuli.

In order to satisfy the avoidance/numbing criteria, also known as criterion C, at least three symptoms have to be validated on a constant basis. The first round of inquiries focused on the avoidance of ideas, emotions, and discussions that were connected to the traumatic experience. In order to have a better idea of the second symptom, the participants were asked whether they tried to steer clear of things, locations, or persons that brought up memories of the traumatic event. The inability to remember a crucial feature of the traumatic event was the third symptom that was investigated, and the lack of interest in taking part in significant activities was the fourth symptom. The fifth and sixth sets of questions confirmed that the respondent was experiencing emotions of separation from other people as well as limited affect or 31 numbness, respectively. At last, the participants were questioned on whether or not they had a perception of a limited amount of time remaining.

If at least two signs of increased arousal were recorded, then Criterion D was considered to have been satisfied. The following topics were covered in the questionnaire: having trouble falling asleep or staying asleep, having outbursts of rage or impatience, having trouble focusing, and being hypervigilant. The last question that was asked of the participants was whether or not they experienced an excessive startle reaction.

In order to meet the requirements of criteria E, the length of the disruption required to be more than one month.

If the individual stated that they had suffered significant distress or functional impairment in at least one of the three life areas, then the criterion F was considered to have been satisfied (personal, social, or professional life).

Therefore, the assessment of event prevalence and PTSD symptoms were handled in separate sections of the questionnaire. This was done rather than instituting a method that required the subject to make a connection between a specific traumatic event and PTSD symptoms, such as the DIS, which was utilised in the research project dealing with the Epidemiologic Catchment Area (Helzer, Robins, and McEvoy, 1987). The Dissociative Identity Scale (DIS) has been

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criticised due to the fact that the traumatic event and PTSD are not evaluated independently from one another. Instead, the events that induce the symptoms of PTSD are required to be subjectively perceived as being related to the traumatic event that preceded the symptoms. This requirement has led to the DIS coming under fire.

The categorical definitions of symptoms in DSM-IV call for a categorical assessment arrangement, which verifies the presence or absence of the events or symptoms. The alternatives for answers on the questionnaire were "yes" or "no," which were appropriate response choices since these definitions call for categorical assessment arrangements.

Trauma event evaluation

Seven distinct traumatic experiences were evaluated using true/false alternatives as part of the process of assessing trauma experiences. If the real option was chosen, the next set of questions focused on the depth of the trauma that was experienced. This was measured on a scale of ten points that ranged from "no distress" (1) to "highest anguish" (10). Robbery, physical assault, sexual assault (including any sort of unwanted sexual interaction), abrupt unexpected loss of a loved one (tragic death), military experience, and TRAs were all regarded as traumatic experiences. A blank field was provided for "other traumas," and it was expected for the slot to be evaluated appropriately. Every single person who mentioned a "other trauma" also mentioned at least one other painful experience in their report. As a result, the variable "other traumas" was used in the process of calculating the frequency of traumatic experiences as well as the severity of those experiences, but it is not reported separately.

Psychometric qualities and characteristics

The test-retest reliability of the questionnaire was determined to be 0.86 (n=157) after being administered over a period of six months.

Using the PCL (Weathers, Litz, Herman, Huska, and Keane, 1993) as a point of reference, the sensitivity of the questionnaire was estimated to be 100% (19 of 18), while the specificity was estimated to be 99% (136 of 137) for the DSM-criteria IV's B–D (n=155). Diagnosis based on the questionnaire resulted in one false positive and one false negative. A total correlation of 0.93 was found between the PTSD assessment tool known as the CAPS and the PCL, which is

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considered to be one of the most reliable tools available (Blanchard, Jones-Alexander, Buckley, and Forneris, 1996). Accordingly, it was determined that the questionnaire has adequate psychometric qualities (see to Mueser et al., 2001 and Ventureyra, Yao, Cottraux, Note, and De MeyGuillard, 2002 for references).

CONCLUSIONS

Around one in ten traumatic experiences will result in post-traumatic stress disorder (PTSD), giving Sweden a lifetime prevalence of 5.6% for the condition. Traumatic experiences are widespread in the Swedish community, as is PTSD. The ratio of females to males is two to one. When there is a significant emotional effect linked with the traumatic event, the likelihood of developing PTSD goes up significantly. The likelihood of getting PTSD is increased not just by moderate but also by severe TRAs. It suggests that women are more susceptible to the disturbing effects of a particular traumatic event than males are. This might point to a higher susceptibility in females, which would explain for some of the variations between the sexes. The PTSD symptomatology may be explained for just as well using any of the factor analytic models that have so far been reported in the scientific literature; the DSM-IV does not give a better match to the data than any of the other models. It is possible that the prefrontal and paralimbic cortices are responsible for mediating the anxiolytic impact of SSRIs on the symptoms of PTSD. The data imply that therapy with SSRIs may restore the abnormalities in rCBF that are produced by provocation in regions of the brain involved in memory, emotion, attention, and motor control.

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