

Assessing the Psychometric Properties of a Supplementary PK Scale Embedded in
the Minnesota Multiphasic Personality Inventory- Adolescent (MMPI-A) in Detecting
Post-Traumatic Stress Disorder (PTSD)

By

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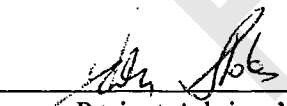
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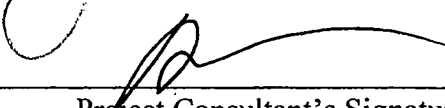
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ABSTRACT

This study explored the validity of the Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A; Butcher et al., 1992) PK Scale (Cashel, Ovaert and Holliman, 2000) to assess symptoms of Post-Traumatic Stress Disorder (PTSD) within an inpatient adolescent sample. The present research sought to expand upon the Cashel et al. (2000) study by assessing the predictive and comparative validity of the MMPI-A PK Scale. Information was gathered from the archival data of 631 adolescents who were referred to the assessment service of Four Winds Hospital. Adolescents were 13-18 years old and predominantly female (57.9%).

The MMPI-A PK Scale significantly related to the following self-reported traumas measured by the Children's Trauma Questionnaire (CTQ; Bernstein & Fink, 1998): emotional abuse ($r = .31, p < .01$), sexual abuse ($r = .14, p < .01$) and physical abuse ($r = .08, p < .05$), respectively. Significant negative relationships between emotional neglect ($r = .23, p < .01$) and physical neglect ($r = .09, p < .05$) were also found. The MMPI-A PK Scale significantly related to the Trauma Content Index (TC/R; Armstrong & Loewenstein, 1990), which was applied to Rorschach protocols ($r = .14, p < .01$) scored using Exner's Comprehensive System (CS; Exner, 2003).

The relationships between the MMPI-A PK Scale and features associated with the presence of trauma, as measured by the Trauma Symptom Checklist for Children (TSCC; Briere, 1996), were explored. The MMPI-A PK Scale correlated highest

with the Depression (DEP) clinical scale of the TSCC ($r = .69, p < .01$). The relationship between the MMPI-A PK Scale and the Posttraumatic Stress (PTS) clinical scale of the TSCC ($r = .59, p < .01$) was also significant and indicative of a moderate correlation. As a measure of PTSD symptoms, the MMPI-A PK Scale evidenced low to typical predictive validity ($AUC = .696$) when compared to the PTS scale. Other significant relationships between the MMPI-A PK Scale and the clinical scales of the TSCC were discussed.

The MMPI-A PK Scale, as a diagnostic measure, performed similarly to the PTS scale. ROC analyses compared both the MMPI-A PK Scale and the PTS to discharge chart diagnosis. Both measures evidenced low to typical predictive validity ($AUC = .613$ and $AUC = .621$, respectively). The sensitivity and specificity of the MMPI-A PK Scale was also reviewed and compared to the sensitivity and specificity of the other measures. Implications, limitations and additional directions for future research were discussed.

CHAPTER I

INTRODUCTION

The present study seeks to explore the psychometric properties of the MMPI-A, including its capacity to assess PTSD symptoms in an adolescent inpatient sample. Cashel et al. (2000) conducted a preliminary study examining the utility of the MMPI-A for identifying PTSD in incarcerated adolescents. Specifically, they modified the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher, Dahstrom, Graham, Tellegen & Kaemer, 1989) supplementary PK scale (Keane, Malloy & Fairbank, 1984), which had been previously developed for identifying PTSD and was adapted and evaluated for applications with the MMPI-A.

The current study will explore the capacity of the MMPI-A PK Scale to inform the research as to how PTSD manifests within an inpatient adolescent sample. The MMPI-A PK Scale will be compared with other known measures of trauma in order to assess its predictive capacities. Additionally, the present study seeks to add to the limited research concerning the presentation of PTSD in adolescents.

The definition of PTSD has undergone many changes since it first appeared in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III;* American Psychiatric Association, 1980). PTSD came to encompass different forms of trauma, experienced by children and adolescents, as well as adults. The MMPI-A would be a useful clinical tool when seeking to assess PTSD in youth. The MMPI-A

has recently been found to be the most widely used objective personality assessment instrument with adolescents (Archer & Newsom, 2000). As will be discussed further in the upcoming section, the MMPI-A is based upon the original versions of the test and consists of clinical scales and content scales.

Both the MMPI and MMPI-2 incorporated the use of a supplementary PK scale, which was used to identify PTSD. While previous studies with the MMPI and MMPI-2 have suggested that the PK scale is a valid, reliable measure (Albrecht et al., 1994; Litz et al., 1991), there currently exists little research concerning the evaluation of PTSD in adolescents using the MMPI-A PK Scale (Cashel et al., 2000).

When the PK scale was modified and applied to the MMPI-A, results indicated it was moderately successful at identifying post-traumatic stress reactions in juvenile delinquents and could potentially serve as a useful screening measure (Cashel et al., 2000). Therefore, its capacity to assess for PTSD in other adolescent populations, in order to accrue information and add to the research, would be beneficial.

In summary, the current study seeks to add to the limited data concerning the the MMPI-A PK Scale. First, the literature pertaining to the definition and effects of PTSD, with respect to adults, children and adolescents will be outlined. Then, the assessment of PTSD within these populations will be reviewed.

CHAPTER II

REVIEW OF THE LITERATURE

Post-Traumatic Stress Disorder

The symptoms that comprise PTSD have existed long before the diagnosis was formalized with the release of the *DSM-III* (1980). Throughout history, wars have been fought and veterans returned from such combat with what had been described as shell shock and chronic stress reaction. Even in the early 1900s, some clinicians sought to apply formalized interventions to veterans who were evidencing PTSD symptoms and unable to return to battle (Jones & Wessely, 2003). To do so, however, one first had to confirm that a soldier had PTSD.

Noted stress reactions were conceptualized as a gross stress reaction in the *DSM-I* (1952) and as a transient situation disturbance in the *DSM-II* (1968). It was then assumed that symptoms occurred in response to environmental stress and resolved with time (Selye, 1936). In contrast, persistent symptoms were interpreted as reflecting an underlying neurosis that could not be directly attributed to event exposure, but was merely precipitated by it (Selye, 1936).

The appearance of PTSD as a formal psychiatric diagnosis with the *DSM-III* (1980) was indicative of a paradigm shift in what was known about the symptoms of distress that sometimes occurred after exposure to a trauma. The *DSM-III* (1980) described PTSD as a normal response to catastrophic trauma (Yehuda & Flory, 2007).

The PTSD diagnosis soon came under scrutiny since only a minority of persons exposed to traumatic events developed or maintained PTSD, according to the *DSM-III* (1980) criteria (Yehuda & Flory, 2007). Specifically, many asymptomatic persons exposed to trauma were evidencing psychological resilience. Psychological resilience was generally characterized by the ability to bounce back from a negative experience, or even significant adversity, through a form of flexible adaptation to the changing demands of life (Block & Kremen, 1996). The early conceptualization of resilience essentially came to undermine the notion that exposure to traumatic life events alone is sufficient to develop PTSD (Yehuda & Flory, 2007).

Once formalized, the PTSD diagnosis became applicable to other types of non-combative trauma seen across the lifespan. Based on the *DSM-III* (1980) criteria, persons of varying ages and experiences were evidencing similar symptomatology. Therefore, clinicians who helped form the *DSM-IV* (1994) had the task of applying the diagnosis to other forms of traumatic exposure.

Currently, the *DSM-IV-TR* (2000) defines the diagnostic criteria for PTSD in adults, children and adolescents to include exposure to a traumatic event; the subjective experience of fear, helplessness, and horror; and symptoms in each of three symptom clusters: reexperiencing (intrusive, distressing recollections of the event, including images, thoughts, or perceptions), avoidance/numbing (avoiding thoughts, feelings, or conversations associated with the trauma), and hyperarousal (hypervigilance or exaggerated startle response).

The *DSM-IV* (2000) further illustrated children's unique presentation of PTSD symptoms. Nonetheless, how symptoms vary across the developmental trajectory has yet to be elaborated. Rather, the *DSM-IV-TR* briefly acknowledges that children may show symptoms different from those of adults, such as repetitive play in which themes or aspects of the trauma are expressed. According to the *DSM-IV-TR* (2000), for diagnostic criteria to be met, each of the aforementioned criteria must be present for at least 1 month and be sufficiently severe to cause functional impairment, for example, in school performance or interpersonal relationships.

Thus far, the evolution of the PTSD diagnosis has been reviewed. As a psychiatric diagnosis, PTSD is unique in that it is a response to an external agent: the traumatic event. Still, what constitutes a traumatic event required further investigation, even with the publication of the *DSM-IV-TR* (2000).

Trauma

The breadth of traumatic events that can result in the diagnosis of PTSD is a broad area of discussion. Several clinicians began to realize that PTSD does not occur solely within the veteran population. Rather, persons exposed to different types of trauma (e.g. abuse) also evidenced similar symptomatology. These findings begged the question: How do PTSD symptoms vary depending on the trauma experienced?

The *DSM-IV* (1994) expanded the definition of trauma stressors to include events within the range of normal experience that are capable of causing death, injury, or threaten the physical integrity of a child or a loved one. Nonetheless,

clinicians' understanding of trauma and PTSD was vague and further complicated by the fact that many persons exposed to a traumatic event did not develop PTSD. Specifically, clinicians wondered if a patient's ability to adaptively deal with trauma related to the duration or severity of the trauma experienced, in addition to, internal psychological factors (Terr, 1991).

Terr (1991) proposed a framework for classifying trauma according to the chronicity of the trauma. Terr hypothesized that "Type I" traumas are single occurrence incidents, whereas "Type II" traumas involve prolonged or repeated experience of the traumatic event. Type I traumatic conditions typically follow from unanticipated single events. Symptoms most often associated with Type I childhood traumas are: 1) fully detailed verbal memories that can be delivered in an amazingly clear and detailed fashion, 2) omens or, in other words, reason for the event to have occurred and, 3) misperceptions or time distortion. Type II traumatic conditions follow from repeated exposure to long-standing external events such as physical or sexual abuse. According to Terr (1991), disorders followed by Type II traumas are characterized by heavy use of defenses and coping operations such as denial, repression, dissociation, self-anesthesia, self-hypnosis, identification with the aggressor and aggression turned against the self.

Terr (1991) also hypothesized that specific psychiatric symptoms are characteristic of Type I and Type II traumas and that greater chronicity of the traumatic event will yield more severe symptoms (i.e. dissociation and emotional numbing). While this conceptualization makes sense intuitively, it is unclear when

reading Terr's (1991) research as to how she came to this conclusion; many of her hypotheses were based solely on qualitative data gathered during her interviews with children who were victims of the Chowchilla school-bus kidnapping.

The notion of different types of trauma has also been documented in research concerning the presence of complex trauma (Hermann, 1992a). Complex trauma refers to a type of trauma that occurs repeatedly and cumulatively, usually over a period of time and within specific relationships and contexts. The term came into being over the past decade as researchers found that some forms of trauma were much more pervasive. According to Hermann's (1992a, 1992b) review of the literature, the main type of trauma that precipitated this change was child abuse.

Mitigating Factors

Confusion related to PTSD and trauma often stems from the fact that not all persons exposed to trauma develop PTSD. Resiliency has been viewed as a protective factor against PTSD. It has been defined in numerous ways including: the capacity for successful coping (Cederblad, Dahlin, Hagnell & Hanson, 1994), the ability to sustain normal development despite long-term stress, adversity, or maltreatment (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003), possession of selective strengths or assets to help an individual survive adversity (Connor & Davidson, 2003) and the adult capacity to maintain healthy functioning following potentially traumatic events (Bonanno, Galea, Bucciarelli & Vlahov, 2006). The aforementioned authors hypothesized internal factors are either protective from, or, vulnerable to developing PTSD after a traumatic event (Bonanno et al., 2006).

Verhaeghe and Vandeule (2005) offered two major hypotheses: (1) the development of PTSD in adults is necessarily predicated on the preexistence of an actual neurosis that predisposes them to experience this type of disorder and (2) this neurotic structure is constituted in the early child-parent dyad as a failure of the parent to appropriately provide mirroring functions necessary for arousal and affect regulation that informs the symbolic formation of self-identity. Verhaeghe and Vandeule's (2005) hypotheses are based on their work with clients who had been diagnosed with PTSD, not on quantitative research. Therefore, one is left to wonder if other factors, such as the intergenerational transmission of trauma, are at play.

Biological explanations have also been applied to PTSD. Prior to the 1980's, it was hypothesized that the degree of stress hormone response provided direct information on the severity of the stressor. The idea of individual differences in response to a similar provocation was only popularized in the late 1980s and 1990s (Meaney et al., 1985). Subsequently, physiological reactions that occurred with PTSD were examined. One such biological explanation of PTSD has to do with cortisol levels and their subsequent effect on memory, which will be discussed in the following chapter.

Mills (2008) has a somewhat differing perspective. He argues that what predisposes patients to experience future PTSD symptoms is predicated on earlier deficits in personality structure due to developmental traumas that threaten the child's sense of safety and take place within the attachment system. In his opinion, such traumas predispose the child to develop differential organizations and trajectories of

psychic structures that eventually instantiate themselves as traumatic, fragmentary, depleted, vacuous, and aggressive valences. In other words, Mills (2008) believes that in order to have adult PTSD, some form of trauma must have occurred as a child. While this chain of events is plausible, it is unclear as to why numerous children who were exposed to developmental traumas do not develop PTSD in their adult years. Furthermore, how Mills (2008) developed his hypotheses is unknown.

The experiences that constitute trauma and the mitigating factors that can either protect a person, or, make them vulnerable to PTSD are multifaceted. Researchers have been seeking to understand the diagnosis in terms of who develops PTSD and how often the diagnosis occurs within the general population. The prevalence rates of PTSD and how they differ between genders will now be discussed.

Prevalence and Gender

Epidemiological research with civilian populations has found lifetime PTSD prevalence rates to be 9.2 for adults belonging to an urban healthy maintenance organization (Breslau, Davis, Andreski, & Peterson, 1991), 12.3% for a nationally representative sample of women in the National Women's Study (NWS; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993), and 7.8% in the National Comorbidity Study (NCS; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), which was a nationally representative study of 5,877 people aged 15 to 45 years. The prevalence of PTSD is high among immigrants and refugees, particularly those who immigrated because of armed conflict or political repression, with a community study indicating

that 52.0% of Central American refugees from war or political persecution met criteria for PTSD (Cervantes, Salgado de Snyder, & Padilla, 1989).

The results of the NCS are noteworthy due to: (1) the disparity between exposure to trauma; 69% of respondents reported having been exposed to a traumatic event at some point in their lives while their overall lifetime prevalence of PTSD was only 7% and (2) the discrepancy between lifetime prevalence rates. According to Ozer, Best, Lipsey and Weiss (2008), women's rates were twice that of men.

Several epidemiological studies have suggested that PTSD is more prevalent among women and girls than among men and boys (Breslau & Davis, 1992). Horowitz, Weine, and Jekel (1995) found that female participants of any age were approximately five times more likely to develop PTSD after exposure to trauma or violence than were their male counterparts. Despite level of exposure, these authors hypothesized that girls are more likely to report symptoms of distress after experiencing violent incidents overall.

Tolin and Foa (2008) conducted a meta-analysis of studies yielding sex-specific risk of potentially traumatic events (PTEs) and PTSD. The results indicated that female participants were more likely than male participants to experience sexual assault and child sexual abuse, but less likely to experience accidents, non-sexual assaults, witnessing death or injury, disaster or fire, and combat or war. Among victims of specific PTEs (excluding sexual assault or abuse), female participants also exhibited greater PTSD. While this finding supports previous prevalence rates, Tolin and Foa (2008) failed to discuss the exclusion of sexual assault and abuse and how