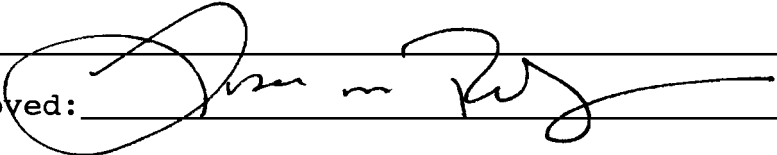


AN ABSTRACT OF THE THESIS OF

R. Enrrique Varela for the Master of Science

in Psychology presented on July 12, 1996

Title: Posttraumatic Stress Disorder: Vulnerability and  
Temperament

Abstract approved: 

Research indicates that behavioral inhibition in the face of novelty may denote a proneness to anxiety disorders. The present study tested the hypothesis that extremely inhibited individuals are predisposed to posttraumatic stress disorder (PTSD) by using a measure of inhibition as an indicator of vulnerability to PTSD. The Retrospective Self-Report of Inhibition and the Adult Self-Report of Inhibition were administered to a group of war combat veterans ( $n=29$ ) diagnosed with PTSD and to a control group of non-PTSD war combat veterans ( $n=26$ ). The two groups did not differ in childhood inhibition, but they did differ in adult inhibition.

POSTTRAUMATIC STRESS DISORDER:  
VULNERABILITY AND TEMPERAMENT

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A Thesis  
Presented to  
the Division of Psychology and Special Education  
EMPORIA STATE UNIVERSITY

---

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science

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by  
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August 1996

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## CHAPTER 1

## INTRODUCTION

Exposure to an unusually distressing event, such as a natural disaster, death of a relative, or rape could lead to the development of persistent nightmares, physiological arousal, phobias related to the event, and flashbacks. To a medical professional, these symptoms are characteristic of posttraumatic stress disorder (PTSD). A person suffering from PTSD has responded with intense fear, helplessness, or horror to a traumatic stressor in which the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. Following the extreme trauma, the victim persistently reexperiences the traumatic event in various ways and persistently avoids stimuli associated with the trauma, sometimes through diminished responsiveness to the external world, known as "psychic numbing." Accompanying these symptoms is anxiety or increased arousal not present before the trauma (American Psychiatric Association, 1994).

While a wide variety of situations (e.g., robbery, mugging, severe automobile accidents, being kidnapped, torture, or industrial accidents) may result in such persistent symptoms, PTSD studies have mainly centered around victims of war and its aftermath (Boehnlein, 1989). A fascinating aspect of PTSD etiology, however, is that only

some of the individuals who experience war or other trauma develop PTSD. Foy, Carrol, and Donahoe (1987) discovered that the major etiological factor in the development of PTSD appears to be the severity of the trauma itself. Of recent interest to etiological research, however, has been a vulnerability to acquire PTSD (Barlow, 1988; Choy & de Bosset, 1992).

Potentially related to a vulnerability to PTSD is that childhood behavioral inhibition to the unfamiliar (Kagan, 1994; Kagan, Reznick, & Snidman, 1987, 1988) may predispose an individual to future development of anxiety disorders. While the present study reviewed some literature dealing with physiology, the purpose of this study was to examine the relationship between behavioral inhibition and PTSD through non-physiological means. First, the paper examined evidence demonstrating that behaviorally inhibited children may be inherently predisposed to anxiety disorders. Then, current research on the reactivity of PTSD patients to stress-inducing stimuli was presented. Finally, recent findings on behavioral responsivity to stressors were examined.

#### Inhibition and Anxiety Disorders

A review of family and genetic studies indicates a nonspecific genetic vulnerability that interacts with a variety of psychosocial factors to produce anxiety disorders (Barlow, 1988). The disorder is not inherited, but rather



an underlying vulnerability which, when given the right environmental conditions, may lead an individual to develop an anxiety disorder. Strong correlations between parental anxiety and children's inhibition (Kagan et al., 1988) suggest behaviorally inhibited children may possess this "vulnerability" to anxiety disorders. Rosenbaum et al. (1988) compared the rates of behavioral inhibition in children of parents with panic disorder with or without agoraphobia (PDAG) to those of children of parents with major depressive disorder (MDD), and to those of children of parents without MDD and PDAG (non-MDD). They found the children of parents with PDAG with or without comorbid MDD were significantly more inhibited than the children of both comparison groups (MDD only and non-MDD). The children of the parents with MDD only did not differ significantly in behavioral inhibition from the children of the parents with non-MDD. Further, parents of inhibited children are at higher risk for multiple anxiety disorders, continuous anxiety disorder, social phobia, and childhood avoidant and overanxious disorders than parents of uninhibited children and normal controls (Rosenbaum, Biederman, Hirshfeld, Bolduc, & Chaloff, 1991). Finally, parents of children with behavioral inhibition and anxiety have higher rates of anxiety disorders than parents of children with behavioral inhibition only and parents of children with no behavioral inhibition and no anxiety (Rosenbaum et al., 1992).

If indeed behavioral inhibition denotes a proneness to anxiety disorders, behaviorally inhibited children should exhibit higher rates of anxiety disorders than uninhibited children. Supporting this hypothesis, Biederman, Faraone, Knee, and Munir (1990) found that compared to normal controls, inhibited children have higher rates of over-anxious disorders and phobic disorders. When inhibited children are compared to consistently uninhibited children, the differences are more robust (Hirshfeld et al., 1992). In a three year longitudinal study, Biederman et al. (1993) further discovered the rate of multiple anxiety disorders and avoidant disorders for inhibited children increased significantly higher from baseline to follow-up assessments than the rate for uninhibited children.

Behavioral inhibition appears to be a precursor to, or at least an indicator of, future anxiety disorders. However, one must approach this hypothesis with a caveat in mind. That behavioral inhibition is highly correlated to development of future psychopathology does not imply behavioral inhibition is sufficient or necessary for development of anxiety disorders. Even as an indicator of future anxiety disorders, whether this behavioral characteristic is due to biological or environmental factors is not clear (Rosenbaum et al., 1988). The offspring of adults with specific anxiety disorders (AD) are more inhibited than the children of non-AD parents, and highly

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inhibited children have higher rates of anxiety disorders than uninhibited children. If indeed behavioral inhibition leads to future psychopathology, one could identify children at risk, and possibly prevent onset. This possibility merits further study of the relation between behavioral inhibition and future psychopathology.

The literature reviewed does not specifically link behavioral inhibition to PTSD. Nonetheless, one may hypothesize that since PTSD is an anxiety disorder, behavioral inhibition may also predispose individuals to PTSD or at least serve as an indicator of PTSD vulnerability. The current literature concerning the physiological reactivity of PTSD patients, as well as findings on physiological reactivity to stress-inducing situations as it relates to behavioral inhibition in children provide support for the latter.

#### Physiological Reactivity of PTSD Patients

PTSD research done with combat veteran populations consistently indicates that a reliable form of PTSD assessment may be through the use of physiological responses to combat related stimuli. Blanchard, Kolb, Pallmeyer, and Gerardi (1982) found that a group of male combat veteran PTSD patients differed in heart rate (HR), systolic blood pressure (BP), and forehead electromyogram (EMG) responses from a matched control group of non-veterans when exposed to combat sounds. Other researchers have obtained similar

results when comparing PTSD combat veterans with non-PTSD combat veterans (Blanchard, Kolb, Gerardi, Ryan, & Pallmeyer, 1986; Malloy, Fairbank, & Keane, 1983; Pallmeyer, Blanchard, & Kolb, 1986; Pitman, Orr, Forgue, deJong, & Claiborn, 1987) and non-PTSD anxiety disorder patients (Pitman et al., 1990).

The Diagnostic and Statistical Manual of Mental Disorders (4th ed.) (1994) requires that at least two persistent symptoms of arousal be present for a diagnosis of PTSD to be made. One of the most common symptoms of 'arousal' is that of physiological reactivity upon exposure to stimuli symbolic of an aspect of the original traumatic event. The study by Pitman et al. (1990) is therefore critical because it demonstrates that HR, BP, and EMG responses may possibly be used to differentiate PTSD patients from other anxiety patients of veteran populations when exposed to a combat-related stimulus.

#### Temperament and Behavioral Inhibition

Recent research has documented accompanying physiological activity with certain temperamental qualities. Of great importance to the study of PTSD etiology is the relationship between physiological responses to stress-inducing situations and temperament. Kagan et al. (1987, 1988) have documented at least one developmentally stable temperamental quality (behavioral inhibition/uninhibition) in children that has discriminating

concomitant physiological activity upon exposure to unfamiliar people, procedures, and objects. These stress-inducing situations will be referred to as novel situations throughout the paper. Kagan et al. (1987, 1988) conducted a longitudinal study of two cohorts of 60 children to test for differences in selected behavioral and peripheral physiological reactions to unfamiliar and cognitively challenging events. Prior to testing, the children were categorized as either extremely cautious and shy (inhibited) or fearless and outgoing (uninhibited). Based on the participants' consistent withdrawal or approach to a variety of incentives, and in developmental accordance with their age levels, inhibition and uninhibition were defined. Cohort 1 was assessed at 21 months, 3.5, and 5.5 years of age. Cohort 2 was assessed at 31 months and at 4 years of age. Both cohorts were assessed at 7.5 years of age.

The index for inhibited and uninhibited behavior at 21 months for cohort 1 was based on observations of the child's behavioral reaction to an unfamiliar female examiner, unfamiliar toys, a woman model displaying a trio of acts that were difficult to remember, a talking robot, and temporary separation from the mother. For cohort 2, at 31 months of age, the index was based on behavior shown with a peer of the same sex and age, and an unfamiliar woman. For the original sample, about 10% of the children were

categorized as inhibited by consistently displaying prolonged clinging to or remaining close to the mother, cessation of vocalization, and reluctance to approach or actual retreat from the unfamiliar person or object. About 10% of the children were labeled uninhibited as a result of consistently not displaying these behaviors. Characteristic behavior of inhibited and uninhibited children was found to be preserved up to the last assessment at 7.5 years of age for both cohorts (Kagan, 1994; Kagan et al., 1987, 1988).

Assessment of physiological parameters generally demonstrated that an aggregate index of eight physiological variables is discriminative of behavioral inhibition. That is, inhibited individuals display a much higher level of response at the sympathetic nervous system and hypothalamic-pituitary-adrenal (HPA) axis level than uninhibited individuals (Kagan, 1994; Kagan et al., 1987, 1988). Only upon exposure to novelty does inhibition appear to be a developmentally stable characteristic of personality (Kagan et al., 1987).

#### Synthesis of Past Research

Given the high correlation between behaviorally inhibited individuals and rate of anxiety disorders, and between parents with anxiety disorders and high inhibition in their offspring, individuals displaying inhibited behavior in the face of novelty should have a vulnerability to PTSD. This hypothesis is further supported by the

similar pattern of heightened physiological responsivity between inhibited individuals and PTSD victims. The purpose of the present study was to examine the relationship between PTSD and behavioral inhibition. However, this study did not focus on physiological measures to determine vulnerability to PTSD. Rather, the validity of childhood inhibition status (inhibited, uninhibited, normal) as a predictor of PTSD vulnerability was assessed. There are several ways to look at the relationship between behavioral inhibition and PTSD vulnerability. Because of ethical and practical reasons, a direct method of testing whether inhibited individuals are more vulnerable to PTSD than uninhibited persons and normal controls is presently not possible. The means for such a study are beyond the present study, nor may one expose inhibited individuals and controls to a traumatic experience in the hope of ascertaining the existence of a vulnerability.

Another method would involve a longitudinal study in which a large number of inhibited children and a matched control group would be assessed as adults to determine exposure to a traumatic event and consequential development of PTSD symptomatology. Currently, Kagan and colleagues are employing this method as they follow their two cohorts of inhibited and uninhibited children into adulthood to verify stability of inhibition. In doing so, they will also be able to determine the relation between inhibition and



psychopathology. However, there are some limitations to this method which include: the low prevalence of PTSD in the general population, time, recruiting difficulties, attrition, and high costs.

The use of a retrospective measure of behavioral inhibition as an indicator of vulnerability to PTSD is currently the most pragmatic approach to determine the relationship between inhibition and PTSD. The present study, then, examined the relation between behavioral inhibition and PTSD vulnerability through retrospective means. If inhibited individuals are more vulnerable to PTSD than uninhibited individuals, then this difference in vulnerability may be assessed through a retrospective scale of inhibition.

A criticism of using retrospective means to assess childhood inhibition is that retrospective self-reports of inhibition may be more a reflection of current mood or problems than an accurate recollection of actual childhood behavior, particularly with clinical populations (Reznick, Hegeman, Kaufman, Woods, & Jacobs, 1992). One form of disclaiming that retrospective self-reports of inhibition are a reflection of present mood or problems is to compare these to contemporary self-reports of inhibition. Adults reporting contemporary inhibition would also report childhood inhibition. Yet, Reznick et al. (1992) found that despite high correlations between retrospective and

concurrent measures of inhibition in non-clinical samples, many participants were able to discriminate between these two domains as evidenced by their inconsistent responses across the two measures. The present study also assessed contemporary inhibition to further discern the relationship between adult self-reported inhibition and retrospective self-reported childhood inhibition.

The Retrospective Self-Report of Inhibition (RSRI) (Reznick et al., 1992), a measure of childhood behavioral inhibition and uninhibition as defined by Kagan et al. (1988), was used in the present study. Reznick et al. (1992) detected two reliable factors in the RSRI. Factor 1 of the RSRI, referred to as the Social/School factor, loads on questions related to school and other social situations. Factor 2, referred to as the Fear/Illness factor, loads on questions related to fears and illness. The present study also investigated the relationship between these two factors and PTSD development. While a retrospective self-report may be at times a reflection of the present condition, the available data maintain the validity of the RSRI as a means of retrospectively assessing childhood inhibition (Reznick et al., 1992). For the purpose of assessing contemporary inhibition, the Adult Self-Report of Inhibition (ASRI) (Reznick et al., 1992) was also be utilized in the present study. Both the RSRI and the ASRI were administered to a group of war combat veterans ( $n=29$ ) diagnosed with PTSD and

to a matched group of war combat veterans with no PTSD (n=26).

Kagan et al. (1987, 1988) define inhibition and uninhibition as the consistent withdrawal from or consistent approach to the unfamiliar, respectively. Their findings indicate inhibited or uninhibited individuals compose only either extreme 10-15% of the general population. If our participant pool (N=55) would have been drawn from the general population, we would have expected to find 10-15% of these participants to be consistently inhibited since childhood and another 10-15% to be consistently uninhibited. In the present study, however, approximately 50% of our participants were PTSD patients. Because these patients would have presumably reported more childhood and adult inhibition than the general population, it was expected that as one unit, the entire sample (N=55) would have reported more inhibition than the general population.

Specifically, four hypotheses were examined: (a) the PTSD patients would score significantly higher on the RSRI than the other group, (b) few of the PTSD participants would score high in uninhibition as measured by the RSRI, (c) the PTSD patients would also score significantly higher on the two RSRI factors than the other group, and (d) the PTSD patients would score significantly higher on the ASRI than the other group.

## CHAPTER 2

## METHOD

Participants

The original sample for this study consisted of: (a) 32 male war combat veterans diagnosed with posttraumatic stress disorder (PTSD), as defined by the DSM-IV (1994) and (b) 27 male war combat veterans with no PTSD diagnosis. While PTSD is a gender nonspecific disorder, most studies done on PTSD patients have centered around war veterans, most of whom are men. This was the population most easily identified as having a high incidence of PTSD and was also the most accessible for the current research project. For this reason, the present study used only male war veterans. The exclusion of women does limit the ecological validity of the present study; nonetheless, the results have aided in the clarification of the relationship between temperament and PTSD.

The PTSD war combat veterans were recruited from the inpatient Vietnam Stress Treatment Unit at the Colmery O'Neil Department of Veterans' Affairs Medical Center, Topeka, Kansas. These veterans were diagnosed with PTSD by the staff psychiatrist through a clinical interview according to DSM-IV criteria. To further verify their PTSD status, these participants were administered the Mississippi Scale for Combat Related PTSD (Mississippi Scale) (Keane, Caddell, & Taylor, 1988). Keane and colleagues found that

veterans who had a PTSD diagnosis scored above 107 in the Mississippi Scale, that is, a score of 107 was found to be discriminatory of PTSD. However, a study by Kulka et al. (1988) indicated a cut-off score of 94 is also discriminatory of PTSD. For the present study, the average of these two suggested cut off scores was used as a cut-off score (100). Only those participants originally classified as PTSD and achieving a score of 100 or higher in the Mississippi Scale were included in the PTSD group. This excluded three of the participants, leaving 29 members in the PTSD group.

The non-PTSD combat veterans were recruited from the Emporia community. They were initially contacted by phone and if they agreed to participate in the study, a time was set up for the testing. At this point they were screened for PTSD through an interview (Watson, Juba, Manifold, Kucala, & Anderson, 1991) by the author. Only those not meeting the PTSD criteria were included in the study as the non-PTSD group. As with the PTSD group, these veterans were also given the Mississippi Scale to further verify their non-PTSD status. Only those participants originally screened as not having PTSD scoring below the 100 cut-off score were included in the study. Only one individual scored higher than 100 leaving the non-PTSD group with 26 members.

Of the entire sample ( $N=55$ ), the majority of

participants were White (74%). There were nine Blacks (16%), one Hispanic (2%), two Native Americans (4%), and two individuals of Asian origin (4%). The mean education level of the entire sample was 14 years of school. Comparisons of demographic characteristics for the two groups are depicted in Table 1.

All of the participants were classified as combat veterans because they were all exposed in some form to combat, either directly or its aftermath. Combat exposure was measured through the Combat Exposure Scale (Lund, foy, Siprelle, & Strachan, 1984). While the PTSD group ( $n=29$ ) experienced more traumatic events during combat, as measured by the Combat Exposure Scale (see Table 1), than the non-PTSD group, all members of the non-PTSD group were exposed to a traumatic event related to combat. For instance, one veteran had to bag and transport the bodies of KIAs (killed in action) back to Saigon. Three medical doctors (2 orthopedics, 1 general practitioner) were exposed to badly wounded soldiers- several dismembered- coming in from battle. Another veteran witnessed two individuals being killed; one of them was crushed between two ships. All veterans in the non-PTSD group witnessed the death or injury of a U.S. serviceman while in Vietnam.

### Materials

The Retrospective Self-Report of Inhibition (RSRI) is a set of 30 questions about behaviors reflecting inhibition in

Table 1

Characteristics of Combat PTSD Veterans and Non-PTSD Combat Veterans Experiencing a Traumatic Event

Variable	PTSD ( <u>n</u> =29)		non-PTSD ( <u>n</u> =26)		F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Age	47.77	2.44	50.71	5.75	5.84*
Education	13.22	3.00	15.38	4.85	3.72
Combat	6.19	.79	4.08	1.47	41.73**
Income	8841.00	12208.83	55833.33	43862.10	28.57**

Note. Education=number of years in school; Combat=score on Combat Exposure Scale; PTSD=posttraumatic stress disorder

\*p < .05

\*\*p < .01.

childhood. The questions reflect five domains relevant for behavioral inhibition: (a) sympathetic nervous system activity, with questions about general illness and specific complaints such as allergy, constipation, and poor sleep; (b) fear of things, situations, and potential events, with questions about fear of darkness, animals, school, group activities, and being abandoned; (c) behaviors to alleviate fears, with questions about use of night lights or transitional objects; (d) behaviors that reflect a fear of the unknown, with questions about sleep-overs, trying new foods and being afraid in school; and (e) behaviors that reflect poor social skills, with questions about play at school, behavior at parties, popularity, after-school activities, and interactions with peers. Each question is answered on a 5-point scale, along a dimension including never, rarely, sometimes, often, and always or comparable terms appropriate for the question. Response alternatives are always presented from least to most inhibited. Validity ( $r = .63$ ) was based on third party accounts (Reznick et al., 1992).

The Adult Self-Report of Inhibition (ASRI) is a set of 31 specific questions about contemporaneous behavior related to inhibition, reflecting four aspects of inhibition: (a) fears, with questions about specific fears such as of animals, of crossing busy streets, of thunderstorms, or of airplanes; (b) behaviors that reflect fear, such as



discomfort when speaking in public, not trying new foods, and avoiding risky activities; (c) behaviors that reflect social assertiveness, such as expressing anger or hurt, meeting new people attending parties, and initiating conversations; and (d) experiencing anxiety, with questions about the experience of speaking to people in authority, being watched, and adjusting to routine. Each question is answered on a 5-point scale, along a dimension including never, rarely, sometimes, often, and always or comparable terms appropriate for the question. On a random half of the questions, extreme inhibition was indicated by the first response alternative; on other questions, it is indicated by the last response alternative. The ASRI was found to be significantly related to the RSRI ( $r = .56$ ; Reznick et al., 1992).

The Mississippi Scale for Combat Related Stress is a 35 item self-report scale derived from DSM criteria. It has been demonstrated to have high internal consistency ( $\alpha = .94$ ) and high test-retest reliability ( $r = .97$ ; Keane et al., 1988).

The Combat Exposure Scale is a seven item Guttman scale that measures the nature and intensity of trauma related to combat exposure. Reliability was determined by figuring a coefficient of reproducibility (CR), a measure of fit between the ideal response pattern for a cumulative scale and the response patterns actually observed. The seven item

scale yielded a CR of .93 (Lund et al., 1984). The participants also responded to a demographics questionnaire.

### Procedure

All participants were screened individually and tested in groups in the case of the PTSD group, and individually in the case of the non-PTSD group. After having been screened and having signed the informed consent form, the participants were told generally about the study, and any questions the participants had were answered. If there were no questions, they were then given a packet that included these materials in the following order: the RSRI, the ASRI, the Mississippi Scale, the Combat Exposure Scale, the demographics questionnaire. Each of the questionnaires had its own instructions. The participants were invited to ask any questions that would surface during the session. It must be noted the scales were not counterbalanced when administered. This is a limitation of the study since it allows for possible order effects.

## CHAPTER 3

## RESULTS

A childhood behavioral inhibition score was calculated by assigning response levels of 1 to 5 and averaging the responses across all questions of the RSRI. An adult inhibition score was computed by assigning numbers to the five levels of response of all ASRI items, reversing the order when appropriate, such that high scores indicated inhibition, and averaging the responses across items. The first analysis assessed the internal consistency of the RSRI and the ASRI. Cronbach's coefficient alpha for the 30 questions of the RSRI was .88, and .89 for the 31 questions of the ASRI, indicating acceptable internal consistency for both measures. These measures were expected to be related to each other. However, as indicated in Table 2, the correlation coefficient  $r = .06$  indicates almost no relationship. This finding is not in accord with the finding of Reznick and colleagues (1992), which indicates a high correlation between childhood and adult inhibition. A  $t$ -test was used to determine whether the ASRI mean was significantly different from the RSRI mean for both groups as presented in Table 3. For the PTSD group, the ASRI mean of 2.96 was significantly higher than the RSRI mean of 1.95,  $t(53) = 8.16$ ,  $p < .01$ . For the non-PTSD group, the ASRI mean of 2.26 was also significantly higher than the RSRI mean of 1.99,  $t(53) = 4.25$ ,  $p < .01$ . The RSRI scores and

Table 2

Correlations Among Measures of Inhibition

	RSRI	S/School	F/Illness	ASRI
RSRI	1.00	.91*	.81*	.06
S/School		1.00	.53*	.00
F/Illness			1.00	.07

Note. RSRI=Retrospective Self-Report of Inhibition;  
 S/School=Social/School factor; F/Illness=Fear/Illness  
 factor; ASRI=Adult Self-Report of Inhibition

\*p < .01.

Table 3

Comparisons of Combat PTSD Veterans and Combat Non-PTSD Veterans on Adult and Childhood Inhibition, and PTSD Symptoms

Variable	PTSD (n=29)		Non-PTSD (n=26)		F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
RSRI	1.95	.46	1.99	.32	.18
S/School	2.31	.62	2.41	.51	.44
F/Illness	1.47	.44	1.44	.33	.06
ASRI	2.96	.47	2.26	.34	38.79*
MSPTSD	116.72	10.38	81.00	9.13	181.75*

Note. PTSD = posttraumatic stress disorder; RSRI = Retrospective Self-Report of Inhibition; S/School = School/Social; F/Illness = Fear/Illness; ASRI = Adult Self-Report of Inhibition; MSPTSD = Mississippi Scale for Combat Related Stress

\*p < .01.

the ASRI scores were not related to each other and differed significantly from each other for both groups.

As expected, the Social/School factor and the Fear/Illness factor of the RSRI were significantly related to the RSRI as a whole,  $r = .91$ ,  $p < .01$ ,  $r = .81$ ,  $p < .01$ , respectively. These two factors were also related to each other as expected,  $r = .53$ ,  $p < .01$ . Neither of the two factors was related to the ASRI.

The PTSD and non-PTSD groups were compared on childhood inhibition (RSRI), including behaviors relating to social and school behaviors (Social/School factor of RSRI) and behaviors relating to fears and illnesses (Fear/Illness factor of the RSRI), and adult inhibition (ASRI). As seen in Table 3, the RSRI means for the PTSD and non-PTSD groups were not significantly different from each other. The mean for the PTSD group was 1.95 ( $SD = .46$ ) and the mean for the non-PTSD group was 1.99 ( $SD = .32$ ). Further, the two groups did not differ significantly from each other in their scores on the Social/School factor and on the Fear/Illness factor. Hence, the hypothesis that childhood behavioral inhibition is predictive of PTSD vulnerability was not supported. Analysis of ASRI scores, however, indicated the two groups differed significantly in reported adult inhibition, with the PTSD group being more inhibited than the non-PTSD group,  $F(1, 51) = 38.79$ ,  $p < .01$ . This supports the

hypothesis that the PTSD veterans would report more adult inhibition than the non-PTSD veterans.

One major difference between both of the groups was the intensity of combat experience as measured by the Combat Experience Scale. The intensity of the trauma itself is the best predictor of whether or not an individual will develop PTSD symptomatology. While all the PTSD veterans were exposed to intense combat, not all of the non-PTSD veterans were exposed to the same level of combat intensity. Although those non-PTSD veterans who did not experience the same intense combat as the PTSD veterans were included in the study because they had experienced a traumatic event other than combat, the argument can be made for a qualitative difference between combat and other traumatic experiences. Because the PTSD and non-PTSD groups differed significantly in their exposure to combat, two new groups were formed which were compatible in combat exposure. In order to match these two groups in combat exposure and to have enough veterans in both groups, the author selected veterans who scored 5-6 in the Combat Exposure Scale. It was felt by the author that such a score reflected enough intensity of combat experience to produce PTSD; 17 of the 29 veterans in the PTSD group scored within this range.

As seen in Table 4, once again the two groups did not differ significantly in scores in the RSRI, Social/School factor, and Fear/Illness factor. As in the previous

Table 4

Comparisons of Combat PTSD and Combat Non-PTSD Veterans on  
Childhood and Adult Inhibition when Combat is Controlled

Variables	PTSD (n=17)		Non-PTSD (n=8)		F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
RSRI	2.04	.48	1.8	.27	1.64
S/School	2.42	.65	2.16	.40	1.08
F/Illness	1.51	.52	1.32	.24	.88
ASRI	3.04	.36	2.11	.33	38.79*

Note. PTSD = posttraumatic stress disorder; RSRI = Retrospective Self-Report of Inhibition; S/School = Social/School; F/Illness = Fear/Illness; ASRI = Adult Self-Report of Inhibition

\*p < .01.



analysis, the two new groups did differ in their scores on the ASRI,  $F(1, 21) = 38.79, p < .01$ . Pearson's  $r$  correlations for the RSRI, Social/School factor, Fear/Illness factor, and the ASRI were very similar to those of the previous two groups. The Social/School factor and the Fear/Illness factor were highly correlated to the RSRI,  $r = .93, p < .01, r = .87, p < .01$ , respectively. These two factors were also correlated with each other,  $r = .65, p < .01$ . The ASRI was not significantly correlated with any of the other three variables.

Intensity of combat exposure did not make a difference in reported childhood behavior or reported adult behavior. The two groups did not differ in reported childhood behavior, and they maintained their difference in reported adult behavior even after intensity of combat experience was controlled.

## CHAPTER 4

### DISCUSSION

The results of the present study indicate that possibly childhood behavioral inhibition is not a predictor of a vulnerability to PTSD. The analysis done on the RSRI scores of the two groups when combat was not controlled and when combat was controlled clearly indicates no difference exists between reported childhood inhibition of the PTSD and non-PTSD groups. These results were not expected given past research pointing to a possible vulnerability to PTSD in inhibited individuals.

One possible explanation for these results is that the sample was composed only of men. Men are less likely to be inhibited than females, and they are more likely to lose inhibition as they grow (Reznick et al., 1992). For instance, men were shown to be disproportionately represented in the consistently uninhibited group (60%) when a coed population of college students was assessed for continuity in inhibition (Reznick, et al., 1992). In Reznick's study males were also more likely to become less inhibited as adults than women. This pattern explains the childhood uninhibition reported by both groups, but it fails to explain the increase in inhibition from childhood to adulthood shown by both groups. In fact, the current findings are opposite of what would be expected.

Another possible explanation for these results is that

in spite of the effort to have two equal groups differing only in PTSD, the two groups were different in some characteristics. While the differences were minor, they were still statistically significant. These differences could have made a difference in reporting inhibition. For instance, the two groups were different in age, with the non-PTSD group being significantly older than the PTSD group. Although research has also shown that age is not significant in determining PTSD (Foy et al., 1987), the differences in age cannot be dismissed as unimportant. Events stored in long-term memory are more difficult to retrieve as one gets older (Jenkins & Dallenbach, 1924). These older veterans may have remembered their childhood differently by virtue of being older.

Another difference between both groups was their income level for the past year. The non-PTSD group had a significantly higher level of income than the PTSD group. A high income typically means a more secure and comfortable environment than if the income is low. A report of low childhood and adult inhibition in a high income level environment could be a reflection of current circumstances and not a true index of temperament. In the present study, the non-PTSD group had a significantly higher level of income as well as a significantly higher level of reported adult uninhibition than the PTSD group. Therefore, determining whether the reported childhood and adult

inhibition was a function of temperament, a reflection of current economic condition, or a reflection of current clinical condition (PTSD or non-PTSD) is not possible.

That reported childhood inhibition was not significantly different for both groups brings clarification to the aforementioned issue of the origin of reported inhibition. If reported childhood and adult inhibition were merely a reflection of contemporaneous mood or state stemming from clinical status and economic level, then both childhood and adult inhibition would be highly correlated. However, the results show childhood and adult behavioral inhibition were not significantly correlated. Both groups had lower childhood inhibition scores than adult inhibition scores. This fact, while discrediting the continuity of inhibition in the combat veteran population, also gives credit to the theory that self reports of inhibition are not just a reflection of current mood or state.

While the results of the present study imply that childhood behavioral inhibition is not a good predictor of PTSD, the notion of a vulnerability to PTSD should not be readily dismissed. There were several limitations to the present study that could have clouded the relationship between reported childhood inhibition and PTSD.

For instance, pinpointing the cause for a lack of a correlation between the RSRI and the ASRI is difficult. Since both of these scales purport to measure the same

construct, they were expected to be at least moderately correlated in the present study. However, the correlation for the present study is almost zero. A possible explanation is that the scales' psychometric properties do not apply to the present sample. The samples used to validate both scales were composed of college students. The sample used for the present study is composed of Vietnam war veterans.

Another limitation of the present study is that the PTSD group and the non-PTSD group were significantly different in some characteristics such as income level and age. These differences made discerning the true nature of reported inhibition difficult. While the argument was made that the scale scores were not merely a reflection of contemporaneous mood or state, it was not clear to what extent the reported inhibition was influenced by the present condition, particularly the reported adult inhibition.

Aside from the aforementioned limitations, the present sample could not have tapped into the population that Kagan and colleagues name behaviorally inhibited. According to Kagan and his colleagues, behavioral inhibition is only characteristic of an extreme 10% of the population. With a PTSD sample of only 29, none of these individuals may have been inhibited or came close to being inhibited as children.

Future studies should include more participants to have a better chance of tapping into the behaviorally inhibited

population and also attempt to control for spurious variables such as age and income level. Validity studies of the ASRI and RSRI should be continued, particularly with clinical populations including war veterans suffering from PTSD.

The aforementioned limitations notwithstanding, the most likely explanation for the present results is all the veterans were uninhibited as children, but after experiencing the atrocities of war, they became more inhibited, particularly those who developed PTSD. Given the limited sample, the questioned applicability of the RSRI and ASRI to the veteran population, and the differences between both groups, concluding that childhood behavioral inhibition is not a good predictor of PTSD when an individual is exposed to a traumatic event is not possible.

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R. Enrique Varela  
Signature of Author

July 26, 1996  
Date

Posttraumatic Stress Disorder:  
Vulnerability and Temperament

Doug Cooper  
Signature of Graduate Office Staff  
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July 24, 1996  
Date Received

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