TRAUMA, POSTTRAUMATIC SYMPTOMS, AND HEALTH IN HAWAII:

GENDER, ETHNICITY, AND SOCIAL CONTEXT

by

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A DISSERTATION

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Prior research finds that exposure to traumatic stress negatively impacts physical and mental health, and that the social context in which trauma occurs is an important predictor of symptom development. Eight-hundred thirty-three members of an ethnically diverse longitudinal cohort study in Hawaii were surveyed about their personal exposure to several types of traumatic events, socioeconomic resources, mental health symptoms, and health status. Rates of trauma exposure were predicted to vary as a function of type of trauma and participant gender and ethnicity. In addition, access to social resources and the relational context of trauma were predicted to be associated with symptom reports in this ethnically diverse sample of men and women. Results replicated findings that while men and women are exposed to similar rates of trauma overall, women report more exposure to traumas high in betrayal, while men report exposure to more lower-betrayal traumas. Women also reported more mental health symptoms, and traumas higher in betrayal were

generally more predictive of symptoms. Ethnic group variation in trauma exposure and physical and mental health symptoms was also present: ethnic groups with lower socioeconomic status generally reported more trauma exposure and symptoms, although in some cases the pattern of results was not straightforward. This study adds new information about the prevalence of traumatic stress and mental health symptoms across ethnic groups in Hawaii, and how these relate to social context. In addition, this study provides preliminary information on the independent contribution of neglect and household dysfunction to the prediction of symptoms. The relevance of these results can be summarized with three main arguments. First, measures of trauma exposure must include events that occur across relational contexts if they are to be gender equitable and most predictive of symptoms. Second, gender and ethnic group differences in symptoms are largely explained by differential trauma exposure and differential access to educational and economic resources. Third, prevention and intervention efforts must address both trauma exposure and social context, as each is implicated in the presentation of symptoms.

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CHAPTER I

INTRODUCTION

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Defining Trauma

In order to study the effects of trauma, it is first necessary to define and operationalize what is meant by trauma. Researchers must be able to distinguish those who have experienced trauma from those who have not, in order to determine whether trauma exposure correlates with outcomes. While to some this may seem simple, trauma tends to be notoriously difficult to assess, partly due to a lack of a widely accepted definition (Briere, 2004). In this section, I will describe several definitions of trauma and explain how trauma is defined for the current study.

The DSM-IV-TR definition of a traumatic event, taken from criterion A of the posttraumatic stress disorder (PTSD) diagnosis, includes in the definition characteristics of events as well as the person's reaction to experiencing such an event (American Psychiatric Association, 2000). For an event to be considered traumatic by that definition, it must be life-threatening or involve threat of physical harm, and evoke a response of fear, helplessness, or horror. However, even within the DSM-IV definition of trauma, a few exceptions to this rule are made. Sexual assault can be considered traumatic even if the assault is not life-threatening, and in children, the response can

involve disorganized or agitated behavior instead of fear, helplessness, or horror (American Psychiatric Association, 2000).

The DSM-IV definition of trauma varies considerably from the definition used in DSM-III. In the DSM-III, traumatic events were defined as events outside the range of normal human experience (American Psychiatric Association, 1987). However, it is now known that around 70% of all people in the general population have experienced at least one major traumatic event, and thus that part of the definition was changed to be consistent with current research (Carlson, 1997). Indeed, as more becomes known about traumatic stress, it seems likely that the definition will continue to evolve (L. S. Brown & Freyd, 2008). The facts that the definition of trauma has evolved over time, that the current definition includes both characteristics of the stressor and subjective reactions to it, and that exceptions to the rule were included from the outset of the definition, lead to a relative state of confusion in understanding what qualifies as a DSM-IV PTSD criterion A stressor (Briere, 2004; Carlson, 1997).

Further confusion arises because some events that are not life-threatening may be subjectively experienced as traumatic, and can lead to symptoms of posttraumatic distress including PTSD (Banks, 2006; Barker-Collo & John Read, 2003; Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). Freyd and colleagues have suggested that it is unnecessary for an event to be life-threatening for the event to be traumatic, in that being the victim of misuse of power in the context of relational trust can be just as overwhelming and damaging as fear of threat to life or limb (Birrell & Freyd, 2006; L. S. Brown & Freyd, 2008; DePrince & Freyd, 2002; Freyd, 1996). Brown and Freyd (2008)

have recommended a change in the definition of trauma used by the DSM to reflect this reality. They have suggested that the current DSM definition poses problems to professionals who must rely on standardized trauma definitions when describing and providing services to their clients. Indeed, researchers in the field of trauma have begun to note that current treatment guidelines for PTSD are not necessarily appropriate for (and have generally not been tested with) people whose traumas are more chronic and relational in nature (Keane, Weathers, & Foa, 2000). This disparity results at least in part from such traumas having been excluded from standard definitions of trauma used in research trials (Keane et al., 2000). Significant debate has occurred over the past 15 years or so with regard to the DSM-IV definition of PTSD and the types of events that qualify as traumatic stressors (Briere, 2004; Carlson, 1997; Herman, 1997).

In choosing a definition to use for the current study, the purpose of the study must be considered. This research aims to explore the impact of trauma on physical and mental health symptoms, including a variety of symptoms beyond PTSD as defined by DSM-IV. Thus it makes sense to use a definition of trauma that is somewhat more inclusive than the DSM-IV definition. However, it is also important to differentiate between traumatic stressors and everyday life stress, and thus an overly inclusive definition must also be avoided.

Theoretical and empirical support for using multiple dimensions to define trauma come from the PTSD and betrayal trauma literatures. Events that evoke strong fear responses have long been considered hallmark traumatic events. Theories such as pathological fear structure theory, have been developed to describe why individuals

develop symptoms following trauma and to help explain what makes an event traumatic (Riggs, Cahill, & Foa, 2006). Tests of such theories show that these fear-based events lead to post-traumatic responses typified by PTSD (Riggs et al., 2006). Fear based traumas include those that involve actual or threatened death or serious injury, or witnessing such an event occurring to another person.

Betrayal trauma theory describes a class of traumatic events that involve victimization by someone with whom the victim has a relationship. Such victimization involves violation of explicit or implied trust, and may involve varying degrees of dependence between victim and perpetrator (Freyd, 1996). Victimization by a close other (for example a parent or spouse) is classified as trauma with a high degree of betrayal, and victimization by an acquaintance or stranger is classified as having less betrayal. Non-interpersonal traumas are classified as not involving a betrayal component. Betrayal trauma theory posits that the source of symptoms linked to betrayal-related traumas lies in avoidance of awareness of the trauma, in order to preserve attachment to the perpetrator (Freyd, 1996). Tests of betrayal trauma theory have shown that betrayal traumas lead to a variety of post-traumatic symptoms typified by avoidance responses including depression, anxiety, and dissociation (Freyd, Klest, & Allard, 2005). Betrayal traumas include such events as sexual abuse, abuse by a caregiver, and emotional abuse.

An additional class of potentially traumatic events includes chronic acts of omission—that is, failing to have one's basic needs met, or experiencing chronically stressful living conditions (Briere & Scott, 2006). Traumas are typically described in terms of things that *happen to* a person, and it is more difficult to describe as traumatic an

event that fails to happen but should have happened. These events are by definition events that unfold over longer periods of time (e.g., chronic neglect), unlike some traumatic events that occur in a matter of minutes or even seconds (e.g., an assault, or a motor vehicle accident). It is more difficult to determine when and whether such events have occurred, and thus they have frequently been left out of trauma research (Briere & Scott, 2006). Nonetheless, acts of omission such as neglect and household dysfunction (e.g., living with an alcoholic family member) have been shown to precede posttraumatic symptoms, and have been associated with patterns of distress similar to those observed following other types of traumatic events (Edwards, Holden, Felitti, & Anda, 2003).

For the purposes of the current study, the definition of trauma includes both fear-based and betrayal-based traumatic events. While fear and betrayal may be relatively independent dimensions, many traumatic events include aspects of both (DePrince & Freyd, 2002). Thus many traumatic events are classified as traumatic using either definition, and a few events are captured by the inclusion of both types that would have been missed by including only one definition. Events will be classified as those involving more betrayal and those involving less betrayal, to determine whether fear-based and betrayal-based events function differently in predicting symptoms. In addition, acts of omission will be assessed separately from other types of traumatic events. While it seems that such events are indeed traumatic, it is not yet clear whether such events predict

symptoms in the same way as other traumatic events. Analyses in the current study will add to a growing body of research that will ultimately be used to determine how to classify different types of traumatic events.

Gender and Trauma Exposure

Most studies assessing exposure to traumatic events find that men have higher rates of trauma exposure than women overall, or that men and women have roughly equal rates of exposure to trauma in general (Goldberg & Freyd, 2006; Hatch & Dohrenwend, 2007; Manson, Beals, Klein, & Croy, 2005; Tolin & Foa, 2008). However, when assessing exposure to specific types of traumatic events, substantial gender differences are evident. In general, women are far more likely than men to have experienced sexual abuse, sexual assault, and physical assault by a spouse or partner, whereas men are more likely to have witnessed violence, experienced physical assault by a non family member, and been involved in combat, an accident, or a disaster (Flett, Kazantzis, Long, C. MacDonald, & Millar, 2004; Goldberg & Freyd, 2006; Manson et al., 2005; Tolin & Foa, 2008). When looking specifically at interpersonal violence, women are more likely to have experienced violence perpetrated by someone with whom they had a close relationship, whereas men are more likely to experience violence perpetrated by an acquaintance or stranger (Goldberg & Freyd, 2006).

Ethnicity and Trauma Exposure

Ethnic group differences in exposure to traumatic events have been observed in several studies. Research on the effects of natural disasters has found that members of ethnic minority groups are more likely than majority groups to be exposed to life threat and injury during disasters (Perilla, Norris, & Lavizzo, 2002). Researchers in New Zealand have found that members of the indigenous Maori tribes experience higher lifetime rates than Caucasians of child sexual assault, physical assault, domestic assault, motor vehicle accidents, and tragic death of a loved one, as well as having experienced more recent sexual assault (Flett et al., 2004). In urban areas of the United States, members of minority groups have a two-fold greater likelihood of exposure to assaultive violence than Caucasians (N. Breslau et al., 1998). Native Americans have similarly high rates of violence exposure, and interestingly, among Native Americans there are no gender differences for overall rates of trauma exposure (Manson et al., 2005).

Asian Americans have been studied relatively less than other minority groups with regard to trauma exposure (Kulkarni & Pole, 2008). Some research has found that Asian Americans are less likely than Caucasians to be exposed to traumatic events (Rheingold et al., 2004). However, Asian Americans are not a homogeneous ethnic group, and thus making generalizations is problematic. The history and culture of Japanese Americans differs greatly from the history and culture of Native Hawaiians, for example, and yet typically these two groups are both included in the group Asian Americans. One study, comparing combat exposure and PTSD in Caucasians, Japanese Americans, and Native Hawaiians, found that rates of exposure and PTSD were lowest

for Japanese Americans and highest for Native Hawaiians (Friedman, Schnurr, Sengupta, Holmes, & Ashcraft, 2004). To date, this appears to be the only study comparing rates of trauma exposure between different Asian American groups. Grouping these two disparate cultural groups together (and together with numerous other distinct cultural groups) leads to confusing results regarding trauma exposure.

Trauma Exposure and Symptoms

A substantial number of people in the general population experience serious posttraumatic symptoms. Symptoms associated with exposure to trauma fall into a variety of categories, including mental health, physical health, and social functioning. In this section, some of the most common trauma-related symptoms are described.

Mental Health Symptoms

Posttraumatic stress disorder (PTSD) is relatively common in the general population. Although rates vary somewhat depending on gender and ethnic or socio-cultural group (Friedman et al., 2004), approximately 30% of military veterans develop PTSD over the course of their lifespans, and there is around 5-12% lifetime prevalence of PTSD in the general population (Keane et al., 2000). Untreated PTSD symptoms have a tendency to persist in a chronic form for 15 years or more (Rothbaum, Meadows, Resick, & Foy, 2000).

The DSM-IV (American Psychiatric Association, 2000) implicates traumatic stress in several psychiatric disorders in addition to PTSD. Acute stress disorder (ASD),

PTSD, and brief psychotic disorder with marked stressors (BPDMS) are the three DSM-IV recognized "stress disorders" in that by definition they are diagnosed following traumatic events (Briere & Scott, 2006). Several other disorders mention trauma in their DSM-IV descriptions as an assumed component of etiology, including dissociative amnesia, dissociative fugue, dissociative identity disorder, and depersonalization disorder. A few other DSM-IV disorders have been linked with significant empirical research to trauma, although trauma is not specifically mentioned in their diagnostic criteria. These disorders include conversion disorder, somatization disorder, and borderline personality disorder (Briere, 2004).

In addition, there are a number of psychological disorders where trauma exposure is not typically implicated as a necessary etiological component, but which are highly associated with exposure to traumatic events. For example, depression is among the most common disorders observed following trauma, but depression is more commonly referred to as a problem comorbid with trauma as opposed to a posttraumatic disorder (Van der Kolk, 2002). Recent research has found that people with documented trauma histories have higher rates of almost all psychiatric conditions, including psychotic symptoms and schizophrenia (Mueser et al., 2004), substance dependence (Nelson et al., 2002), personality disorders (J. G. Johnson, Cohen, J. Brown, Smailes, & Bernstein, 1999), and nearly every other psychiatric diagnosis (Spataro, Mullen, Burgess, Wells, & Moss, 2004).

People with histories of trauma also have higher risk of negative outcomes that are not defined psychiatric disorders, but that nonetheless create significant impairment in

functioning. Trauma is a risk factor for suicide attempt, revictimization (i.e., experiencing another interpersonal trauma), and divorce (Nelson et al., 2002). Other psychological distress reactions to trauma have been captured in the proposed diagnostic category of complex PTSD, first proposed by Herman (1997). Complex PTSD includes difficulty with affect regulation, dissociative symptoms, changes in self-perception and perception of others, difficulty with relational functioning, and changes in systems of meaning (Herman, 1997). It is generally agreed upon by researchers and clinicians that these are common posttraumatic symptoms (Wilson, 2004), and nine of the twelve "associated features" of PTSD listed in DSM-IV are symptoms of complex PTSD (Roth et al., 1997). In general, studies of adverse psychological and psychosocial outcomes find worse outcomes for people who have experienced trauma regardless of the specific outcome measured.

Physical Health Symptoms

Beyond psychological distress, physical health is also adversely affected by trauma. A large and growing body of research finds that experiencing trauma has significant negative impacts on physical health in multiple domains (e.g., Kendall-Tackett, 2004). There have been three distinct literatures on this topic developing relatively independently of one another until recently, but all finding converging evidence that trauma exposure is bad for your health (Schnurr & Green, 2004). The first line of research has involved the study of the impact of stress on physical health, studying mainly events that are considered stressful but not traumatic, and finding that stress

negatively impacts immune functioning (e.g., Pennebaker, Kiecolt-Glaser, & Glaser, 1988). The second line of research is related to PTSD, and has been conducted primarily with military veterans (Green & Kimerling, 2004), and the third is primarily focused on the health effects of interpersonal trauma, child abuse, and family violence (Kendall-Tackett, 2004).

The results are striking in that all three literatures have come to similar conclusions. Trauma appears to affect health functioning in a variety of domains, from self-rated health to health-related quality of life (Green & Kimerling, 2004), and medically unexplained symptoms (Meagher, 2004) to cancer and heart disease (Bullock & R. A. Bell, 2005; Edwards, Anda, Felitti, & Dube, 2004; D. E. Ford, 2004). Physiological and biological evidence point to a few main causal mechanisms that might explain the link between trauma and health (Bremner, 2003; Danese, Pariante, Caspi, Taylor, & Poulton, 2007; Dougall & Baum, 2004).

Trauma exposure activates physiological stress responses of the sympathetic nervous system (Dougall & Baum, 2004), and over time can impact functioning of the corticotropin-releasing factor (CRF) system. Increased CRF appears to be related to depression, anxiety, and immune, autonomic, and behavioral stress responses (Nemeroff, 2004). In addition, CRF hypersecretion can lead to dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, which is implicated in a number of psychological (e.g., depression, PTSD) and physical (e.g., autoimmune disease, cancer) health problems (Dougall & Baum, 2004). In addition, trauma has been linked to a variety of health-risk behaviors that can exacerbate or cause such health problems (J. L. Davis, Combs-Lane, &

Smith, 2004), and a direct link independent of health-risk behavior also appears to exist between trauma exposure and immune function (Danese et al., 2007). Finally, at times a life-threatening trauma is one that involves physical injury, as is frequently the case with combat veterans (Green & Kimerling, 2004). Physical health is clearly negatively affected by experiencing trauma, and interestingly, it appears that some of the same systems that impact physical health are also those that impact psychological health.

Gender and Ethnic Differences in Symptoms

Although it has been assumed that men tend to experience higher rates of trauma overall, women are consistently more likely than men to develop PTSD (Tolin & Foa, 2008). This gender difference tends to persist regardless of the type of study, or the population being examined (Tolin & Foa, 2008). Similarly, members of ethnic minority groups tend to be more likely to experience symptoms following trauma than members of dominant groups (Perilla et al., 2002; Rheingold et al., 2004). These findings vary by ethnic group, with some studies find radical differences among different ethnic minority groups in rates of PTSD and posttraumatic symptoms (Friedman et al., 2004; Perilla et al., 2002). One study of ethnic minority status and PTSD risk found that Japanese Americans had less risk of developing PTSD than their Caucasian counterparts (Friedman et al., 2004). However, another study found the opposite effect for Asian Americans, who were more than twice as likely to report significant posttraumatic symptoms as Caucasians (Kulkarni & Pole, 2008). This suggests that it is not simply

ethnic minority status itself that results in higher risk of symptoms, but that perhaps minority status is often but not always associated with the causes of increased risk for PTSD and symptoms.

Research from outside the field of trauma also finds general gender and ethnic group differences in symptoms. According to epidemiological data within the U.S., women are more likely than men to experience depression and anxiety disorders, whereas men are more likely to report impulse-control and substance use disorders (Harvard School of Medicine, 2007). Due to the high prevalence of depression and anxiety disorders, women are more likely overall to meet criteria for one or more mental disorders. Research on the rates of psychiatric disorders in ethnic minority groups has been somewhat mixed, and varies based on ethnic group. One large study found that African Americans and Hispanics are both less likely to have a psychiatric disorder than Caucasians (J. Breslau et al., 2006). These results stand in contrast to research on PTSD, which finds higher rates in both groups (Pole, Gone, & Kulkarni, 2008). Recently, Native Hawaiians have been found to be more likely than Caucasians to have depression and other forms of psychiatric distress (Andrade et al., 2006; Kanazawa, White, & Hampson, 2007).

Gender and ethnic group differences also exist is self-rated health status and mortality. Women are more likely than men to rate their health status as poor, and members of minority ethnic groups (African American, Hispanic, and Native American)

are more likely to report poor health than Caucasians or Asian Americans (McGee, Liao, Cao, & R. S. Cooper, 1999). Members of ethnic minority groups also have higher age-adjusted mortality rates than majority group members (Adler & Rehkopf, 2008).

Theories Explaining Differences in Trauma Exposure and Symptoms

The fact that rates of trauma exposure and symptoms vary among ethnic groups and across genders suggests that cultural and social variables must be at play that impact likelihood of exposure to traumatic events as well as developing posttraumatic symptoms. Some of these determinants of trauma exposure are relatively easy to understand, with clear causal links between social factors and trauma exposure. However, most relationships between gender, ethnicity, trauma exposure, and symptoms are quite complicated, and several theories that attempt to explain these relationships are described in this section.

Differential Trauma Exposure

One major factor that predicts severe PTSD is having experienced multiple traumatic events (Briere & Scott, 2006). Some have hypothesized that differential rates of exposure to traumatic events may explain observed differences in posttraumatic symptoms. For example, among veterans, ethnic differences in rates of PTSD are mostly explained by differential exposure to war-zone stress (Dohrenwend, Turner, Turse, Lewis-Fernandez, & Yager, 2008). Another research group found that members of ethnic minority groups are more likely to live in less desirable neighborhoods where they are at

greater risk in the face of natural disasters, which partially explains ethnic group differences in rates of PTSD following disaster (Perilla et al., 2002). Members of minority groups may be more likely to be exposed to trauma in general, explaining ethnic group variation in the rates of posttraumatic symptoms. However, these same researchers have found that differential exposure to trauma, as they measured it, does not fully explain the increased likelihood of developing symptoms, and additional explanation is required (Dohrenwend et al., 2008; Perilla et al., 2002).

The role of differential exposure is also important in explaining gender differences in posttraumatic symptoms. While overall, men and women report similar rates of exposure to trauma, they tend to report exposure to different types of traumatic events (Goldberg & Freyd, 2006; Hatch & Dohrenwend, 2007; Tolin & Foa, 2008). Type of trauma exposure appears to partially explain gender differences in PTSD. Sexual assault is more strongly related to developing PTSD than other types of traumas, and women tend to report higher rates of sexual assault and abuse (Kimerling, Prins, Westrup, & T. Lee, 2004). Additionally, traumas with a high degree of betrayal tend to be associated with more symptoms, and women are more likely to experience traumas high in betrayal (Freyd et al., 2005; Goldberg & Freyd, 2006). In particular, betrayal trauma is highly associated with symptoms of avoidance (Lindblom & Gray), and avoidance is strongly implicated in depression and anxiety, which are both more common among women (Harvard School of Medicine, 2007).

Careful examination of a number of studies reporting gender differences in rates of PTSD has led researchers to conclude that these differences are substantially attenuated when type of trauma exposure is taken into consideration (Pimlott-Kubiak & Cortina, 2003). However, gender differences in rates of PTSD cannot be fully explained by trauma exposure (as measured in the studies surveyed) alone (Tolin & Foa, 2008).

Cultural Differences

Some research has suggested cultural differences in how trauma and symptoms are reported. For example, Asian Americans are less likely than members of other ethnic groups to use labels such as "abuse" for their experiences, even when providing similar behavioral descriptions of their experiences (Lau et al., 2006). Some have suggested that Asian cultural values attach shame and stigma to trauma exposure, and that Asian Americans may be more reluctant to disclose trauma (Pole et al., 2008). In addition, some religious and cultural values shared by a number of Asian American cultural groups tend to discourage strong displays of emotion, as well as expression of distress (Pole et al., 2008). It is possible that differences in labeling and reporting style are partially responsible for the lower rates of exposure reported for Asian Americans. However, given the great variety of cultural groups represented by the term "Asian American," caution should be taken in making any generalizations about this group.

Cultural group differences in how traumatic events interface with cultural values and beliefs may also be important in determining symptoms. A cultural group's degree of valuation of collectivism and interpersonal harmony, for example, may impact coping

strategies following traumatic events (Perilla et al., 2002). It is possible that in some circumstances, collectivist attitudes may be protective against developing symptoms, as social support may be better built in to collectivist cultures. Lack of social support availability is a strong predictor of developing posttraumatic symptoms (Tarrier & Humphreys, 2003). However, it has also been argued that members of collectivist cultures may be more vulnerable in the absence of adequate social support. This may lead to greater symptoms of PTSD if an individual becomes alienated from the social group as a result of trauma exposure, or if resources are severely depleted in the contest of a collective trauma such as a disaster (Perilla et al., 2002; Pole et al., 2008).

Gender Bias and Gender Role Socialization

Masculine identity development and role socialization are important in determining the perpetration of violence, which is in turn related to violence exposure. A strong traditionalist masculine identity impacts likelihood of perpetration of violence, such that greater masculine identification is associated with more perpetration of all forms of violence, including sexual violence, and is also associated with greater likelihood of exposure to community violence (Barker & Loewenstein, 1997; Próspero, 2008). Young men, particularly those from marginalized backgrounds (e.g., poor, ethnic minority), are more likely to be involved in gang violence. The role of gang membership in forming an identity and self-concept has been implicated in the likelihood of

committing violence as well as being exposed to violence (Stretesky & Pogrebin, 2007). Thus masculine role socialization may be important in explaining the greater likelihood of exposure to community violence among men than women.

Gender bias and role socialization are also important in explaining sexual aggression against women (Barker & Loewenstein, 1997; Próspero, 2008; Reidy, Shirk, Sloan, & Zeichner, 2009). Masculine role socialization strongly predicts men's sexual aggression against women. Men who identify strongly with masculine role ideals are more likely to perpetrate sexual aggression, and it is the case that a vast majority of sexual violence is perpetrated by men against women (Barker & Loewenstein, 1997; Próspero, 2008; Reidy et al., 2009). In addition women who fail to conform to feminine gender role stereotypes are more likely to be targets of the aggression of hypermasculine men (Reidy et al., 2009).

Racism

Racial discrimination is an important predictor of both exposure to trauma, and posttraumatic symptoms. While there are no studies that directly assess racism as a contributor to trauma exposure, it has been suggested that racism has played a role in the greater likelihood of combat exposure for ethnic minority military personnel (J. Ford, 2008). Additionally, a very cursory look at the history of race relations in the U.S. and around the world finds numerous incidents of violence and even genocide perpetrated against particular ethnic groups (J. Ford, 2008). Historical traumatization may also play a

role in recent trauma exposure, in that trauma perpetrated against one's ethnic group in the past may lead to the intergenerational transmission of trauma and violence (Manson et al., 2005).

Racism and race-related stress are also factors in the development of symptoms, including posttraumatic symptoms. A number of studies have found that race-related stress is a significant predictor of PTSD (Khaylis, Waelde, & Bruce, 2007; Pole et al., 2008), and recent research has also found that experiences of racism predict eating disorder symptomatology (Harrington, Crowther, Payne Henrickson, & Mickelson, 2006). Interestingly, stronger identification with one's ethnic group increases the relationship between race-related stress and PTSD (Khaylis et al., 2007).

Social Context Theories

The social contexts in which traumatic events occur may help to explain differential exposure to traumatic events as well as differential symptom presentations across genders and ethnic groups. Social context theories suggest that characteristics of the social environment, as well as access to resources, make a difference when it comes to trauma exposure, physical and mental health symptoms, and resilience in the face of trauma (Adler & Rehkopf, 2008; Bonanno, 2004; N. Breslau et al., 1998; Dohrenwend, 2000). A substantial body of research has used this basic premise to examine disparities in both exposure to traumatic events and symptoms of psychological distress. For example, research pitting social selection against social causation in the explanation of increased rates of psychological distress among members of lower socioeconomic classes

has employed such theoretical perspectives for several decades (J. G. Johnson, Cohen, Dohrenwend, Link, & Brook, 1999). However, a well-developed integrated theory that relates social context factors, trauma exposure, and psychological distress, has yet to be proposed and adopted. Thus for the purposes of this study, I use the term "social context theories" to apply broadly to frameworks that implicate contributions of the social environment to trauma exposure and posttraumatic symptoms. I use the term "social resource theory" to refer to a particular aspect of social context—access to socioeconomic resources and social support—and the role that lack of access to resources plays in likelihood of exposure to trauma and development and maintenance of posttraumatic symptoms.

Social context is sometimes described in terms of status, a concept that may be applied to an individual or an entire demographic group, and which includes both socioeconomic status and status within a social hierarchy. Socioeconomic status refers to the availability of tangible resources (e.g., education, income), and is most often measured using indicators of educational attainment, income, and financial resources. Status within a hierarchy is a concept more difficult to define, but perhaps equally important in understanding how social context impacts trauma exposure and symptoms. Discrimination, lack of personal or political power, and the attendant poor treatment by others of higher status likely contribute to exposure to trauma (e.g., interpersonal violence, hate crimes) and development and maintenance of posttraumatic symptoms. As an example, one study found that experiencing racism contributed significantly to posttraumatic symptoms after controlling for other factors (Khaylis et al., 2007). In

general, groups that are socioeconomically disadvantaged also have lower status within social hierarchies, and it is often impossible to disentangle these two types of status. In Hawaii, for example, Native Hawaiians, other Pacific Islanders, and Filipino Americans have lower status by all measures than Caucasians and those of East Asian descent (Okamura, 2008). For the purposes of this study, "status" refers to both socioeconomic and hierarchical indicators of social status. Research examining the roles of social context, social resources, and status in trauma exposure and psychological distress is described below.

Level of educational attainment is a consistent predictor of exposure to violence, in that less education corresponds with greater violence exposure, (e.g., N. Breslau et al., 1998; W. C. Wilson, Rosenthal, & Battle, 2007). Members of ethnic minority groups are more likely to be among school dropouts, and less likely to have access to higher education (Manson et al., 2005). Related to educational attainment, members of minority groups are less likely to have access to financial resources. This impacts ability to choose a safe neighborhood to live in, which impacts likelihood of exposure to community violence as well as vulnerability to natural disasters (Gill & Page, 2006; Perilla et al., 2002). Lower income individuals and are particularly at higher risk of exposure to assaultive violence (Perilla et al., 2002).

Greater exposure to trauma certainly predicts higher likelihood of symptoms, but social context factors play a role in symptom development beyond the role of differential exposure (Bonanno, Galea, Bucciarelli, & Vlahov, 2007). Even when controlling for trauma exposure, lack of access to resources predicts higher likelihood of developing

symptoms (Bonanno et al., 2007; Chen et al., 2007; Galea, 2008). Education, financial resources, and availability of social support are all important in predicting resilience following exposure to traumatic events (Adler & Rehkopf, 2008; Galea, 2008; Tarrier & Humphreys, 2003).

Socio-economic status, measured using educational attainment, has been consistently shown to predict posttraumatic symptoms, in that higher educational attainment is associated with fewer symptoms (N. Breslau et al., 1998; Dohrenwend, 2000). Some have suggested that this difference is wholly explained by differential exposure to traumatic events, as individuals with lower educational attainment report greater exposure to violence (Perilla et al., 2002; W. C. Wilson et al., 2007). However, educational attainment may also impact posttraumatic symptoms independently, related to access to resources (Dohrenwend, 2000).

Access to financial resources appears to be an important predictor of symptoms following trauma. In several studies of posttraumatic symptoms following disasters, financial loss and lack of financial resources were among the strongest predictors of symptoms (Bonanno et al., 2007; Chen et al., 2007; Galea, 2008). Some research has found that pre-trauma poverty and financial strain following trauma exposure are more important predictors of mental health outcomes than prior exposure to traumatic events, or other vulnerability factors (Chen et al., 2007). In general, research has suggested that lack of access to financial resources predicts a wide variety of psychiatric and physical health symptoms following all types of traumatic events (Adler & Rehkopf, 2008; Dohrenwend, 2000). In general, women and members of ethnic minority groups have

lower income and less availability of financial support than men and members of dominant groups (Okamura, 2008), which may help account for variability in posttraumatic symptoms.

Availability of social support is another important factor in determining who will develop symptoms following trauma. Lack of social support following disaster, as well as following other types of traumatic events, is associated with greater likelihood of developing both physical and mental health symptoms (Bonanno et al., 2007; Chen et al., 2007; Galea, 2008; Tarrier & Humphreys, 2003). People who sought social support following traffic accidents but rated available support as poor were 8 times more likely to develop PTSD (Tarrier & Humphreys, 2003), and access to psychosocial resources predicts better mental health functioning following trauma (Steury et al., 2004). Social support can include emotional and behavioral resources, as well as informational and tangible support (Tarrier & Humphreys, 2003). Thus social support may be important not only in terms of emotional processing of traumatic events, but also related to receiving needed help and assistance. This may be particularly true for members of more collectivist cultural groups, and those with fewer tangible resources (Pole et al., 2008).

Social support may be less available when a primary member of one's social network is the perpetrator of the traumatic event. For example, family members (e.g., parents, spouses) are often primary sources of social support, and trauma perpetrated within a family can disrupt this social support system (Riggs, 2000). Traumas that are

interpersonal in nature, particularly those perpetrated by family members or close others (i.e., betrayal traumas), tend to lead to worse symptoms, and disrupt functioning in relationships (Banks, 2006, Barker-Collo & Read, 2003, Freyd, Klest, & Allard, 2005).

Most research assessing the effects of traumatic stress on symptoms is correlational in nature. That is, reports of traumatic stress, potential moderating factors such as financial strain and social support, and symptom reports, are all collected at the same time. Thus some have argued that social context and resource theories have an inherent problem in that social causation cannot be disentangled from social selection (Dohrenwend, 2000). That is to say, it cannot be fully determined whether adverse social circumstances (lack of education, financial resources, and social support) predict symptoms following trauma, or whether symptoms following trauma lead to adverse social circumstances (Dohrenwend, 2000). Using quasi-experimental as well as longitudinal methods, researchers have found evidence that both social causation and social selection are at play (Dohrenwend, 2000; J. G. Johnson et al., 1999).

While lack of access to social resources appears to have a causal role in determining both exposure to traumatic events and posttraumatic symptoms, it is also the case that exposure to trauma and subsequent symptoms lead to poor educational attainment (J. G. Johnson et al., 1999). Educational attainment is associated with access to financial resources, as well as social support (Hatch & Dohrenwend, 2007). Thus lack of access to social resources *or* exposure to trauma may begin a cycle in which negative outcomes become more and more likely. Members of socially disadvantaged groups and those with historical traumatization may be at particular risk for entering such a cycle,

and large numbers of group members entering this cycle may create a social context in which other group members are affected. Thus social resource theories may explain why members of ethnic minority groups, particularly those with traumatic historical roots (e..g, indigenous groups experiencing colonization), appear to be at greatest risk for developing posttraumatic symptoms.

The Current Study

Culture, Social Context, and Trauma in Hawaii

Common myths about the social context of Hawaii[1] include the idea that Hawaii is a multiracial paradise, in which different ethnic groups coexist in harmony unfettered by the racism and stereotypes that are so problematic in mainland multiethnic communities (Edles, 2004; Mayeda, Chesney-Lind, & Koo, 2001). Many believe in the fairy tale that Native Hawaiians are a people free from worry, living outside of time in a tropical paradise (Mokuau, 1990). These myths allow Americans to ignore the historical and social realities of Hawaii, instead promoting Hawaii as an ideal place to vacation with clear conscience. However, these myths fail to reflect the truly complex nature of Hawaii's multiethnic social context (Edles, 2004; Mayeda et al., 2001; Okamura, 2008).

[1] Although the preferred local spelling is "Hawai'i" I will be using the federally recognized spelling ("Hawaii") to be consistent with published articles using data from prior waves of the current study.

Hawaiian historical context

Significant tensions between different ethnic groups in Hawaii have been present at least since the middle of the 19th century, by which time American missionaries and entrepreneurs had substantially impacted Hawaiian society (Edles, 2004). During this time, white Americans had taken control of much of the land in Hawaii, and had begun importing plantation workers from Japan, China, the Philippines, and elsewhere. Workers were treated differently and paid differently along racial and gender lines; men and light-skinned workers were paid more and treated better. Among these foreign workers a variety of social conditions existed, where some were voluntary laborers, some indentured servants, and some, particularly Filipino workers, were barred from learning English or becoming literate (Edles, 2004).

At the same time, Native Hawaiians were dying of Western diseases at a rapid rate, with more than three-fourths of the Native Hawaiian population wiped out by disease in a 75-year period. Then in 1896, as an extension of the belief in "manifest destiny," the United States unilaterally "annexed" Hawaii, effectively ending Hawaii's self-governance (Edles, 2004; Mokuau & Matsuoka, 1995). This historical context, in which white Americans controlled most of Hawaii's resources and political power, foreign workers of diverse backgrounds and status were increasing in number, and Hawaiians were becoming an impoverished minority in their own land, sets the stage for current social relations in Hawaii.

Current social context

The cultural landscape of Hawaii is in constant flux due to factors such as in-migration from and out-migration to the continental U.S., immigration, and intermarriage between members of different ethnic groups (Okamura, 2008). However, at least since 1970, the social stratification among ethnic groups represented in Hawaii has remained fairly constant, with the exception of Japanese Americans gaining status over the past two decades (Okamura, 2008, 1990). Currently, when considering occupational status, education, and income, Caucasians, Japanese Americans, and Chinese Americans hold the highest status among ethnic groups in Hawaii. Prior to 1990 Japanese Americans fell into the intermediate status group, and as such have only recently achieved high socioeconomic status in Hawaii. In intermediate positions of status are African Americans and Korean Americans, and at the bottom of the socioeconomic spectrum are Samoans, Filipino Americans, and Native Hawaiians (Okamura, 2008, 1990). Thus over the past 30 years, Caucasians and Chinese Americans have had greatest access to socioeconomic resources in Hawaii, Japanese Americans have recently joined these groups at the top of the socioeconomic ladder, and Samoans, Filipino Americans, and Native Hawaiians consistently have the least access to resources.

Besides socioeconomic evidence of stratification, other social indicators suggest lower status for Native Hawaiians and other Pacific Islanders (such as Samoans) as well. In a study of juvenile court proceedings, it was found that even controlling for numerous possible confounding factors, Samoan and Native Hawaiian youth were treated more severely than Caucasian youth, with treatment of East Asian and Filipino youth falling

somewhere in between (J. M. MacDonald, 2003). In fact, this study found that ethnicity predicted severity of juvenile court outcome, while the severity of the offense for which the youth was brought to court was not a significant predictor of outcome. This study employed stringent tests of ethnic bias, by including many control variables that arguably correlate with bias, thereby potentially diluting the observed effect (J. M. MacDonald, 2003). Thus this study provides strong evidence of ethnic group bias against Samoans and Native Hawaiians in the juvenile justice system in Hawaii.

Ethnic group bias has been observed in other arenas as well. For example, Native Hawaiians and other Pacific Islanders tend to be overrepresented in state psychiatric institutions (Olson & Anders, 2000). In addition, Native Hawaiians in psychiatric care tend to be treated differently from other groups. One study found that Native Hawaiians were more likely than other groups to be given anti-psychotic medication, although they were less likely than any other group to receive a diagnosis of schizophrenia, for which such medication is usually prescribed (Olson & Anders, 2000). This disparity points to potential ethnic bias in either diagnosis or treatment of psychiatric disturbance, or possibly to bias in both domains.

Relations between ethnic groups in Hawaii tend to be quite complex, as might be expected given the social and historical context. A study of youth perceptions of ethnic groups in Hawaii found that many high school students from disadvantaged neighborhoods held negative stereotypes about their own and other ethnic groups (Mayeda et al., 2001). These stereotypes included perceptions about work ethic, intelligence, violence, and sexuality, and the students in the study tended to ascribe traits

to different ethnic groups with an essentialist view—that is, assuming that these traits were inborn, and unchangeable (Mayeda et al., 2001). Bias and stereotyping likely affect relations among ethnic groups in Hawaii, as well as self-perceptions and behaviors of individuals based on ethnic group membership.

Some evidence suggests that these complex relationships between access to resources, stereotypes about one's own ethnic group, and stereotypes about others, may affect exposure to and perpetration of violence. For example, Filipino and Samoan youth are stereotyped as being more likely to be involved in gangs and gang violence than other ethnic groups in Hawaii, and stereotypes exist that members of these groups are violent by virtue of their ethnicity (Mayeda et al., 2001). Research suggests that these stereotypes influence ethnic identity formation within Samoan and Filipino youth, and influence others' expectations of these youths. Mayeda and colleagues (2001) suggest that due partly to expectations and partly to poor access to resources, some youths begin engaging in violent behavior in order to be "the best" at something, when they see themselves as failing in other domains. That is, they see members of their ethnic groups as having poor potential for succeeding in school and occupationally, but view their groups as being superior to others in committing acts of violence (Mayeda et al., 2001). As mentioned earlier, associating violence with identity formation and masculinity increases the probability that young men will be exposed to community violence, and that they will commit acts of violence against others, including sexual violence against women within their own ethnic groups (Mayeda et al., 2001; Próspero, 2008; Stretesky & Pogrebin, 2007).

Native Hawaiians may be at particular risk for trauma exposure and development of symptoms related to their history as a colonized indigenous people (Mokuau & Matsuoka, 1995). Some authors have suggested that in general, a history of colonization and attendant lack of self-determination and self-governance, are important factors in the development of an array of social problems, including exposure to and perpetration of violence, mental health problems, poor education, and poverty (Mokuau, 1990; Mokuau & Matsuoka, 1995). Indeed, greater exposure to trauma has been observed in Native American groups, as well as the indigenous Maori of New Zealand (Flett et al., 2004; Manson et al., 2005). The history of Native Hawaiians has much in common with the history of Native Americans in the U.S., and thus if history and social context are important in determining exposure to trauma and posttraumatic symptoms, it is likely that Native Hawaiians will display a profile of symptoms and exposure similar to that of Native Americans.

One study suggests that Native Hawaiians are at greater risk than other groups for exposure family adversity, such as family discord and household dysfunction (Carlton et al., 2006). Interestingly, Native Hawaiians tend to have greater family support than other groups, which predicts resilience in the face of stress (Carlton et al., 2006). Thus some aspects of Native Hawaiian identity and culture may be protective, though the adversity faced by Native Hawaiians is a risk factor. One study found that Native Hawaiians with a strong ethnic identity and pride had less likelihood of exposure to violence and

perpetration of violence, and less likelihood of engaging in alcohol or drug use (Austin, 2004). Although the above studies are correlational in nature, they suggest that Hawaiian culture and identity relate to trauma exposure and posttraumatic symptoms in a complex way.

Theories related to social resources may be particularly important for explaining differences among groups in trauma exposure and symptoms in Hawaii. One study assessing community perspectives on violence prevention in rural Hawaii found that a major theme in community members' beliefs about causes of violence was lack of access to adequate resources. Community members suggested the need for better educational and healthcare resources, and believed that access to such resources was integral to violence prevention (Affonso, Shibuya, & Frueh, 2007). Indeed, the U.S. Surgeon General advocates integrating education and healthcare as part of youth violence prevention efforts (United States Department of Health and Human Services, 2001).

Thus the social context of Hawaii provides a unique opportunity for studying the relationships between social resources, ethnicity, gender, trauma, and symptoms. Hawaii is ethnically and culturally diverse, and the historical context includes identifiable differences among ethnic groups. Additionally, ethnic group status indicators such as income and education are available for use in testing social resource theories as they relate to trauma exposure and posttraumatic symptoms. The current study begins to explore these complex relations, and describe how trauma, posttraumatic symptoms, and health relate to gender, ethnicity, and social context in Hawaii.

Research Questions and Hypotheses

The current study relies on social context theories to predict exposure to traumatic events, and posttraumatic symptoms. These theories include betrayal trauma theory, which explains symptoms in terms of differential trauma exposure, and social resource theories, which explain symptoms in terms of differential access to education, financial, and social support. These theories are both informed by an understanding of the roles of gender and racial bias, identity formation and role socialization, and cultural influences. Several research questions and hypotheses, summarized in table 1, will be tested under the guidance of these theoretical perspectives.

First, several hypotheses relate to describing trauma exposure and symptoms among different groups within Hawaii. Although a few studies have looked at specific groups, such as veterans, with regard to trauma exposure and symptoms among ethnic groups in Hawaii, to date no research is available that broadly surveys trauma exposure and posttraumatic symptoms in these groups (Friedman et al., 2004; Kulkarni & Pole, 2008). The current study will address whether rates and types of trauma exposure differ for different cultural groups within Hawaii, and for men and women in this sample. It is hypothesized that socially disadvantaged groups (e.g., Native Hawaiians) will report more trauma exposure than dominant groups (e.g., Caucasians). It is also expected that women will report more exposure to interpersonal trauma perpetrated by a close other, and men will report more non-interpersonal trauma, and trauma perpetrated by non-close others. Based on prior research in Native American and other indigenous populations

(Flett et al., 2004; Manson et al., 2005), it is hypothesized that among Native Hawaiians, gender differences in trauma exposure will be attenuated compared with gender differences observed in other groups.

Regarding posttraumatic symptoms, it is predicted that more exposure to trauma will be associated with more physical and mental health symptoms, and traumas high in betrayal will have stronger associations with symptoms, as has been observed in previous research. However, the question remains whether posttraumatic symptoms differ for different ethnic groups in this sample. It is predicted that socially disadvantaged groups will report the most symptoms, intermediate status groups will report moderate symptoms, and advantaged groups will report the fewest symptoms. Additionally, it is hypothesized that the relationship between trauma and symptoms will be strongest within disadvantaged groups. Because social resource access may serve as a protective factor against developing symptoms, it is expected that trauma will be highly predictive of symptoms within groups with the fewest social resources, and less predictive of symptoms within advantaged groups.

Relatedly, it is expected that women will report more symptoms than men, as a function of women's socially disadvantaged status and greater exposure to traumas high in betrayal. However, it is also expected that gender and ethnicity will interact in predicting trauma exposure and symptoms. It is hypothesized that men from socially disadvantaged ethnic groups will report more exposure and symptoms than men in dominant groups, with fewer gender differences in symptoms for disadvantaged groups than dominant groups.

Finally, an examination of social resource theory will be conducted, to explore whether social context factors explain ethnic group and gender variation in symptoms. It is predicted that one's own socioeconomic status as well as the status of one's ethnic group will contribute to predicting symptoms, as will exposure to traumas high in betrayal.

Table 1. Summary of Research Questions and Hypotheses

Research Question	Hypothesis
Do rates/types of trauma exposure differ for men and women in this sample?	Women will report more exposure to interpersonal trauma perpetrated by a close other, and men will report more non-interpersonal trauma, and trauma perpetrated by non-close others.
Do rates/types of trauma exposure differ for different cultural groups within Hawaii?	Socially disadvantaged groups (e.g., Native Hawaiians) will report more trauma exposure than dominant groups (e.g., Caucasians).
Is trauma related to symptoms in this population?	More exposure to trauma will be associated with more physical and mental health symptoms, and traumas high in betrayal will have stronger associations with symptoms.
Do posttraumatic symptoms differ for different ethnic groups in this sample?	Socially disadvantaged groups will report the most symptoms, intermediate status groups will report moderate symptoms, and advantaged groups will report the fewest symptoms. Additionally, the relationship between trauma and symptoms will be strongest within disadvantaged groups.
Do posttraumatic symptoms differ for men and women?	Women will report more symptoms than men, as a function of women's socially disadvantaged status and greater exposure to traumas high in betrayal.
Do gender and ethnicity interact in predicting trauma exposure and symptoms?	Men from socially disadvantaged ethnic groups will report more exposure and symptoms than men in dominant groups, with fewer gender differences in exposure and symptoms for disadvantaged groups than dominant groups. In particular, it is predicted that gender differences in exposure will be smaller among Native Hawaiians than other groups.
Do social context factors explain ethnic group and gender variation in symptoms?	Socioeconomic status of oneself and one's ethnic group will each contribute to predicting symptoms, as will greater exposure to traumas high in betrayal.

CHAPTER II

METHOD

Participants

Participants in this study are members of the Hawaii Personality and Health cohort (Hampson et al., 2001). These participants have been recruited from a population-based cohort of over 2000 people who were rated in a study of personality characteristics of elementary school children between 1959 and 1967. Approximately 60% of people in the original cohort are participating in further research with the Hawaii Personality and Health studies, headed by Sarah Hampson and Lew Goldberg at Oregon Research Institute (ORI), and Joan Dubanoski and colleagues at the University of Hawaii (see Hampson et al., 2001, for a description of the history of this project). Most participants in the cohort are currently 51-60 years old, reside in Hawaii, and have some post-secondary education. Approximately 47% of the sample are women, and the sample is ethnically diverse with about 35% Japanese Americans, 21% Native Hawaiians, 18% Caucasians, and 25% of other Asian and Pacific Island descent.

Members of the Hawaii Personality and Health cohort have been mailed five sets of survey questionnaires since 1999. The current study includes 833 cohort members who participated in the most recent survey, wave five, which was mailed in May 2008. Because some members of the cohort have not participated in all waves of data

collection, some data collected at earlier time points is not available for some participants in the current study. Data for age, gender, cultural group identity, marital status, employment status, and educational attainment are available for 95-98% of the current sample. Data for sexual orientation and military status are available for 71% and 73% of the sample, respectively. The number of participants for whom demographic information is available is presented in table 2.

Table 2. Number of Participants With Valid Data

Measure	*N*	*Source (wave)*
Age	814	1
Gender	813	1
Ethnicity	815	1
Cultural Identity	791	1
Marital Status	805	1
Sexual Orientation	587	3
Employment Status	809	1
Educational Attainment	805	1
Military Status	611	3

In the current study, 47% of participants are men and 53% are women. Participants range in age from 51 to 60 years (M = 55.05, SD = 2.00). At the time they were surveyed, 65.7% of participants were married, 3.9% were living with a partner, 15.2% were divorced, 2.6% were separated, 0.6% had been widowed, and 12% had never been married. Participants in this sample report broad diversity in which cultural groups they identify with most strongly (35.5% Japanese, 20.5% Caucasian, 18.7% Hawaiian, 9.2% Filipino, 5.9% Chinese, 4.2% Okinawan, 2.9% Latino, 0.8% Korean, 0.5% Other Pacific Islander, and 1.8% other primary cultural identification). A majority of

participants (93.9%) identify as heterosexual, 2.9% identify as homosexual, bisexual, or transsexual, 1.7% report that they are nonsexual, and 1.5% endorsed the response category “don’t know.”

When asked about highest level of educational attainment, 2% of participants report not completing high school, 17.1% report having a high-school diploma or GED, 30.8% report some college or technical training, 30.7% report having completed college or technical training, and 19.4% report post-graduate or professional degrees. At some point in their lifetimes, 11.3% of participants in this study report having served in the military. Regarding current employment status, 78.1% of participants reported that they were employed for wages or self-employed, 11.5% were homemakers, 2.6% were students, 1.5% were retired, 3% were disabled and unable to work, and 3.5% were unemployed.

Participants in this sample are representative of the Hawaii personality and health cohort as a whole. This sample is somewhat more educated than the general population of Hawaii, and includes a higher percentage of Native Hawaiians and lower percentage of Caucasians than are currently represented in Hawaii as a whole (“U.S. Census Bureau state & county QuickFacts,” 2009).

Measures

Demographic Information

Demographic information collected from participants includes age, gender, cultural identity, marital status, employment status, educational attainment, sexual orientation, and military experience. Age was assessed by obtaining date of birth, and gender was assessed with a dichotomous choice question (male or female). Cultural identity was assessed with a single question asking “Which group best describes your cultural identity?,” and instructing participants to choose only the one group with which they most identify. In addition a question was included asking about the extent to which participants identified with their primary cultural group.

To assess marital status, participants were instructed to choose one of six response options including married, divorced, widowed, separated, never married, and member of an unmarried couple living together. Sexual orientation was assessed using a single question in which participants were asked to choose which category best characterized their sexual orientation. Categories included heterosexual, homosexual, bisexual, transsexual, nonsexual, and don't know.

Employment status was measured by asking participants to check as many as were applicable of the following options: employed for wages, self-employed, out of work for more than one year, out of work for less than one year, homemaker, student, retired, and permanently disabled/unable to work. A majority of participants endorsed only one response, and those who endorsed more than one were coded into the category

indicating greatest level of employment (usually employed for wages or self-employed). Educational attainment was assessed by asking participants to indicate the highest level of education they had completed. Response options included eighth grade or less, junior high or intermediate school, some high school, high school graduate or GED certificate, some technical school, technical or nursing school graduate, some college or community college, college graduate, and postgraduate or professional degree.

Finally, ethnic group information was obtained from the U.S. census bureau related to median income and educational attainment for different ethnic groups within Hawaii (U.S. Census Bureau, 2000). Educational attainment information included number of individuals within each ethnic group who had reached each of 16 possible categories of highest educational attainment, ranging from "no schooling" to "doctorate degree." Income was measured using median family income, and median individual income by sex for full-time workers. In addition, information about full-time and part-time employment status was obtained. These data were available for individuals identifying as full or part Native Hawaiian/Pacific Islander, Japanese American (including Okinawan), Caucasian, Filipino American, Chinese American, Korean American, Hispanic/Latino, and Other.

Physical Health Measures

Physical health was assessed at all five waves of the study using a single question about self-rated general health. Participants were asked to complete the statement "compared to others of your same age and sex, would you say that in general your health

is...," with one of the following response options: excellent, very good, good, fair, or poor. Previous research has demonstrated that single-question assessments of self-rated health reliably predict health status and mortality across ethnic groups (McGee et al., 1999). In addition, at the first point of data collection participants were asked to indicate how many times they had visited a physician, nurse practitioner, or physician's assistant over the past year, to assess healthcare utilization.

Mental Health Measures

Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977)

The CES-D is a 20-item self-report scale assessing symptoms of depression. In the current study, participants rated how often they experienced each of 20 symptoms over the past month on a 5-point rating scale, ranging from 0 (not at all like me) to 4 (most or all of the time). The measure includes items indicative of depressive symptoms (e.g., "feel depressed), and reversed items inconsistent with depression (e.g., "feel hopeful about the future"). After reverse-scoring appropriate items, all items are summed to obtain a total score ranging from 0 to 80. Higher scores indicate more symptoms of depression, and greater severity of symptoms. The CES-D demonstrates high internal consistency, with Cronbach's alpha coefficients above .85 across a number of studies (Radloff, 1977). Validity has been demonstrated in that CES-D scores are reliably associated with clinical and self-report measures of depression (Radloff, 1977).

Trauma Symptom Checklist - 40 (TSC-40, Elliott & Briere, 1992)

The TSC-40 is a 40-item checklist, assessing symptoms commonly associated with the experience of traumatic events. The TSC-40 is a revision of the TSC-33, which included fewer items. Respondents are asked to indicate how frequently they have experienced each symptom on a scale of 1 (never) to 4 (very often). The TSC-40 is composed of 6 symptom subscales: anxiety, depression, dissociation, sexual abuse trauma index, sexual problems, and sleep disturbances. Sample items include "anxiety attacks" and "trouble getting along with others." The TSC-40 is scored by summing responses, with higher scores indicating greater trauma symptomatology.

In the current study, only 30 items from the TSC-40 were included. Items related to sexual functioning and self-harm were removed from the questionnaire in order to limit the number of sensitive questions included in the survey as a whole. The 30 included items comprise all items required to compute totals for the anxiety, dissociation, and sleep disturbance subscales, and include all but two items from the depression subscale. The total scores on this version of the TSC range from 30 to 120. Participants in the current study were asked to rate how often they have experienced each symptom for three life periods—childhood (before age 12), adolescence (age 12-17), and adulthood (age 18 and older) including current symptoms. Retrospective reports of childhood and adolescent symptoms using the TSC have not been studied for reliability or validity, however the TSC-33 and TSC-40 demonstrate good reliability and validity in samples of adults, and a version of the TSC has been used in child and adolescent samples (Briere & Runtz, 1989; Elliott & Briere, 1992).

PTSD Checklist—Civilian Version (PCL-C, Weathers, Huska, & Keane, 1991)

The PCL-C is a 17-item self-report measure of PTSD symptoms on which each item corresponds to a PTSD diagnostic criterion symptom in the DSM-IV (Weathers, Huska, & Keane, 1991). Respondents rate how often they have experienced each symptom, from 1 (not at all) to 5 (extremely). This measure has been used extensively in PTSD research, and is recommended for research and PTSD screening by the National Center for PTSD. This measure demonstrates good reliability over time, and is highly predictive of meeting criteria for DSM-IV defined PTSD (Norris & Hamblen, 2004). Symptom reports on this measure are highly correlated with trauma exposure and other posttraumatic symptoms (Norris & Hamblen, 2004).

Trauma Exposure Measures

Brief Betrayal Trauma Survey (BBTS; Goldberg & Freyd, 2006)

The BBTS is a self-report measure of trauma exposure. Respondents are asked to indicate whether they have experienced each of 14 types of traumatic events. Several versions of the BBTS have been used in research (see Freyd, 2008), and the current study employed a version asking about experiences of each event before age 12, between ages 12 and 17, and at age 18 and over. Events on the survey range in level of betrayal from natural disasters (no betrayal) to sexual abuse by someone close (very high betrayal). The questions avoid using labels for the events and instead describe them behaviorally. Typically, the BBTS provides respondents a choice of the following options for how

often they had experienced each event: "never," "one or two times," "more than that" for each age range. The current version includes additional response options to the question "Have each of the following events happened to you?," including "yes," "no," "don't know/can't remember," and "decline to respond." These response options are meant to discourage respondents from simply leaving the question blank, or from selecting "no" or "never" when a different response better captures the person's experience or decision-making. This measure has been demonstrated to be relatively reliable over time, and yields rates of trauma exposure similar to other measures (DePrince, 2001; Goldberg & Freyd, 2006).

Neglect and household dysfunction

Several items assessing physical and emotional neglect and other forms of household dysfunction (for example living with a mentally ill household member, or having a household member incarcerated) were included in the current study. These items are modeled after items from the Adverse Childhood Experiences study (Felitti et al., 1998). The three items ask participants to indicate whether they experienced household dysfunction during childhood, adolescence and adulthood, (i.e., "someone in your household was a problem drinker or alcoholic, or used street drugs, or was depressed or mentally ill, or attempted suicide, or went to prison"), and asked about experiences of emotional and physical neglect during childhood and adolescence (i.e., "no one in your family loved you or thought you were important or special, or your family didn't feel close to each other, or support each other," and "you didn't have enough to eat, or had to

wear dirty clothes, or had no one to protect you, or your parents were too drunk or high to take care of you"). Endorsement of similar items has been shown to predict physical and mental health problems in large samples of adult participants (Edwards et al., 2003; Felitti et al., 1998).

Data Collection

This study involves the use of existing data as well as new data collection. Existing data on educational attainment, income, and employment status for different ethnic groups within Hawaii were obtained from the U.S. census bureau website (U.S. Census Bureau, 2000). These data are aggregate reports from the 2000 decennial U.S. census, and include no individual identifying information.

Other existing data used in the current study were collected as part of the Hawaii Personality and Health study, at four different time points between 1999 and 2006. At each wave of data collection, participants were mailed packets of surveys containing a variety of questionnaires covering a broad range of topics, including personality, health behaviors, physical and mental health symptoms, personal characteristics, attitudes and beliefs, and personal experiences such as trauma exposure. Participants were asked some of the same questions at each wave of data collection, but a majority of the questionnaires in each wave were unique to that wave.

New data for the current study were collected as part of the fifth wave of this study, using the same methods as were used in prior survey administrations. Survey packets were constructed by compiling questionnaires on a variety of topics. The survey

packet was evaluated by research team members at Oregon Research Institute and University of Hawaii. Questionnaires were edited to be concise, appropriate to the cohort participants, and balanced in content. The goal was to create a survey packet that would be well-received by cohort participants, to ensure validity of responses and continued willingness of participants to be included in the study.

The survey packet was mailed to participants' home addresses by researchers at Oregon Research Institute, along with a cover letter and a postage-paid return envelope. One month after the initial mailing, a reminder letter was mailed to participants who had not yet responded to the survey request. One month following the dispatch of reminder letters, duplicate packets were mailed to participants who had not yet responded. These packets included the same materials as were included in the initial survey mailing. Participants who returned a completed survey were mailed a "thank you" letter and a $25 check.

Self-rated general health was assessed during all five waves of data collection, and responses to this question from all waves are included in the current study. In addition to self-rated general health, several questions and questionnaires from the first wave of the study are included in the current analyses. These include health-care utilization over the past year, depression symptoms measured by the CESD, age, gender, educational attainment, cultural group membership and identification, and ethnicity. Sexual orientation and military experience were collected during the third wave, and will also be included in the current study. Questionnaires collected during wave five

specifically for use in the current study include trauma exposure measures (the BBTS and questions assessing neglect and household dysfunction), and trauma-related symptom measures (including the PCL-C and TSC).

Questionnaires were formatted for optical scanning, and data were processed and stored at Oregon Research Institute. As primary investigator on the current project, I maintain only coded data files that contain no personally identifying information about participants. The current research has been approved by the institutional review boards at both Oregon Research Institute (ORI) and the University of Oregon.

CHAPTER III

RESULTS

Data Preparation

Data from earlier waves of the study had been processed and prepared by research staff at ORI. I was provided a data file containing only those variables from waves one through four that were to be used in the current research. New questionnaire data from wave five were encoded by researchers at ORI using optical scanning equipment, and I was then sent raw data from the relevant questionnaires collected during wave five.

Data were missing from varying numbers of participants for each questionnaire. Each questionnaire was assessed individually to determine the best method of handling missing data. General health was measured by a single question, and thus imputation of missing values was not possible. Measures of trauma exposure, including the BBTS and household dysfunction questions, ask participants to indicate whether or not they have experienced particular events. It is not expected that these questionnaires measure one underlying construct, as exposure to one traumatic event is not necessarily indicative of exposure to other events. For this reason, using responses from some questions to impute missing values for other questions on trauma exposure questionnaires is inappropriate. Thus for the general health and trauma exposure measures, missing data points were left as missing.

On the other hand, the TSC and PCL-C are questionnaires using multiple questions to assess underlying constructs. The PCL-C includes 17 questions that assess post-traumatic stress disorder symptoms, and the TSC has 30 questions assessing general post-traumatic symptoms; thus imputation of missing values using responses from other questions on each measure was appropriate. Multiple imputation with 5 iterations using a two-way imputation model was used to replace missing values for items on the PCL-C and the TSC. This method uses information about each participant's valid scores on other items on the questionnaire, as well as about other participants' responses to the missing item, to impute missing values (van Ginkel & van der Ark, 2005; Sijtsma & van der Ark, 2003). Prior to replacing missing values for a given questionnaire, individuals with less than 66% valid responses to that questionnaire were excluded. Because the TSC was administered with response sets for three different time periods (i.e., childhood, adolescence, and adulthood), responses for each time period were analyzed separately. Less than 5% of data points for each measure were missing initially, and missing values were spread relatively randomly across items and participants. Due to the relatively complete nature of the data set initially, few iterations were required to impute missing values with maximum effectiveness, and the number of iterations was set to five (van Ginkel & van der Ark, 2005; Schafer & Graham, 2002; Sijtsma & van der Ark, 2003). Missing values imputation was conducted using SPSS with syntax provided by Van Ginkel and van der Ark (2005).

Scoring and Descriptive Statistics

Trauma Exposure

Four response options were provided for each item on the trauma exposure measures, including the BBTS and the questions assessing neglect and household dysfunction. Participants were asked whether they had experienced each event, and could respond with yes, no, don't know/can't remember, or decline to respond. The number of individuals failing to endorse any of the response choices for a given item ranged from 3 (0.4%) to 20 (2.4%), with two exceptions: the item on the BBTS asking participants if, between ages 12 and 17, they had experienced the death of one of their own children (4.3% did not respond to this item), and the last item on the BBTS, asking participants if they had experienced a seriously traumatic event not already covered (3.4 % of participants failed to provide responses to this question for childhood and adolescent time periods, and 12.7% failed to respond to this item for the adulthood time period). A large majority of participants endorsed the "yes" and "no" response choices, with between 1.0% and 4.1% choosing either "don't know/can't remember" or "decline to respond" for any given item. One exception was the item asking about experiencing a natural disaster prior to age 12, for which 7.3% responded with "don't know/can't remember." Due to the small number of participants choosing these responses, "don't know/can't remember" and "decline to respond" were re-coded to be categorized with the "no" responses. Thus for final scoring, all trauma exposure item responses were classified as "yes," "no or other," or missing data.

The BBTS was scored separately for each age period (childhood, adolescence, and adulthood), and in addition a total score was computed for all time periods combined. Scores were computed by summing the number of "yes" responses to the 14 BBTS items, indicating how many different types of traumatic events participants had experienced. For childhood trauma exposure only, the possible range of scores was 0 to 13, and for adolescent trauma exposure only and adult trauma exposure only, the possible range of scores was 0 to 14 (the item asking whether participants had experienced the death of one of their own children was not included for the childhood time period). The actual ranges of scores observed in the data were 0 to 13 for number of types of childhood trauma, 0 to 11 for adolescent traumas, and 0 to 11 for traumas experienced in adulthood. The possible range of scores for total number of types of trauma experienced across all three age periods was 0 to 41, and the actual range of observed scores was 0 to 32.

In addition to computing total scores, subscale scores were computed that divide traumatic events into traumas with a high degree of betrayal (more betrayal or MB traumas) and traumas with no betrayal or lesser degrees of betrayal (less betrayal or LB traumas). These scores were computed by summing the number of yes responses to items on the two subscales. Items included in each subscale are presented in table 3. The possible range of scores for each of the three age periods for MB traumas is 0 to 5, and the possible range of scores for LB traumas for each age period is 0 to 7. For all three age periods, the full range of possible scores was observed in the data. The total possible score for MB traumas across all age periods ranges from 0 to 15, and the total possible score for LB traumas across age periods ranges from 0 to 21. The range of scores

observed in the data for MB traumas was 0 to 13, and the range of scores observed for LB traumas was 0 to 21. Overall, 78.4% of participants reported exposure to at least one traumatic event assessed by the BBTS, with 68.1% reporting at least one LB trauma, and 47.8% reporting at least one MB trauma.

Table 3. Categorization of Traumatic Events into MB and LB

Traumas involving a high degree of betrayal (More betrayal or MB traumas)	Traumas involving a lesser degree of betrayal (Less betrayal or LB traumas)
	Been in a major earthquake, fire, flood, hurricane, or tornado that resulted in significant loss of personal property, serious injury to yourself or a significant other, the death of a significant other, or the fear of your own death.
	Been in a major automobile, boat, motorcycle, plane, train, or industrial accident that resulted in similar consequences.
Witnessed someone with whom you were very close (such as a parent, brother or sister, caretaker, or intimate partner) committing suicide, being killed, or being injured by another person so severely as to result in marks, bruises, burns, blood, or broken bones. This might include a close friend in combat.	Witnessed someone with whom you were not so close undergoing a similar kind of traumatic event.
Witnessed someone with whom you were very close deliberately attack another family member so severely as to result in marks, bruises, blood, broken bones, or broken teeth.	Witnessed someone with whom you were not so close deliberately attack a family member that severely.
You were deliberately attacked that severely by someone with whom you were very close.	You were deliberately attacked that severely by someone with whom you were not close.
You were made to have some form of sexual contact, such as touching or penetration, by someone with whom you were very close (such as a parent or lover).	You were made to have such sexual contact by someone with whom you were not close.
You were emotionally or psychologically mistreated over a significant period of time by someone with whom you were very close (such as a parent or lover).	You were emotionally or psychologically mistreated over a significant period of time by someone with whom you were not close.

The three questions assessing neglect and household dysfunction were scored in the same manner as the BBTS items. The same response choices used for BBTS items were used for these questions. Participants were asked to respond to the two neglect questions only for childhood and adolescence, and were asked to respond to the household dysfunction question for all three time periods assessed (childhood, adolescence, and adulthood). Rates of failure to respond to these questions ranged from 1.0% to 1.9%. As with BBTS items, a large majority of participants endorsed the "yes" and "no" response choices, with between 1.1% and 3.1% choosing either "don't know/can't remember" or "decline to respond" for any given item. These responses were re-coded to be categorized with the "no" responses. The possible ranges of scores for these questions is 0 to 3 for childhood and adolescence, 0 to 1 for adulthood, and 0 to 7 for the items combined across all three time periods. The full range of possible scores was observed in the data for these questions. Overall, 45.3% of participants reported experiencing some form of neglect or household dysfunction during at least one time period.

Additionally, BBTS items and neglect/household dysfunction items were combined into one variable to assess overall rates of trauma exposure. This was accomplished by adding the total BBTS score and neglect/dysfunction score at each time period, as well as creating a variable for lifetime exposure by combining data from all time periods. Overall, 83.1% of participants reported exposure to at least one traumatic event. Rates of exposure to traumatic events, as well as means and standard deviations for number of events reported in each category, are reported in table 4.

Table 4. Rates of Trauma Exposure by Age at Time of Trauma and Type of Trauma

Measure of Trauma Exposure	*Age at time of trauma*	*% reporting at least one event*	*M (SD)*
BBTS (total)	Child	45.4	1.06 (1.78)
	Adolescent	49.5	1.28 (1.96)
	Adult	70.0	2.09 (2.31)
	Lifespan	78.4	4.37 (5.27)
BBTS (MB)	Child	24.8	0.44 (0.93)
	Adolescent	29.5	0.53 (1.00)
	Adult	38.3	0.70 (1.08)
	Lifespan	47.8	1.66 (2.57)
BBTS (LB)	Child	34.2	0.52 (0.92)
	Adolescent	38.2	0.67 (1.10)
	Adult	58.5	1.15 (1.34)
	Lifespan	68.1	2.33 (2.87)
Neglect and Household Dysfunction	Child	25.2	0.32 (0.62)
	Adolescent	28.6	0.37 (0.64)
	Adult	35.3	0.35 (0.48)
	Lifespan	45.3	1.03 (1.46)
Total (all traumas)		83.1	6.40 (7.30)

Physical Health

Physical health was assessed with a single question about general self-rated health, asked at all five waves of data collection. Scoring of the question included coding responses on a 1-5 scale, in which low numbers correspond with worse health ratings (1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent). The full range of the scale was observed in data collected at all five waves. Different numbers of participants responded to this question at each wave of the study, partly related to the number of participants

completing each wave of data collection. A relatively large number of participants failed to respond to this question during wave five data collection (13% of cases have missing data for this question). Overall, of the 833 participants who completed wave five, 370 have complete data for this question for all five waves. Table 5 summarizes the means, standard deviations, and number of participants completing this question for each wave.

Table 5. Self-rated General Health

Wave	*n*	*M (SD)*
1	813	3.43 (0.93)
2	536	3.51 (0.93)
3	616	3.49 (0.90)
4	684	3.47 (0.93)
5	726	3.38 (0.94)

In addition to self-rated general health, at wave one, participants were asked how frequently they had visited a physician, nurse practitioner, or physician's assistant in the past year. Responses ranged from 0 to "9 or more," with the category "9 or more" coded as 9. The full range of the scale was observed in the data. The mean number of visits was 2.89, with a standard deviation of 2.51 visits. Data for this question are available for 690 of the participants in the current study.

Mental Health Symptoms

Mental health symptoms were assessed in the current study using the CESD to measure depression, the PCL-C to measure posttraumatic stress disorder (PTSD)

symptoms, and the TSC to measure general posttraumatic symptoms (including subscales for dissociation, anxiety, depression and sleep disturbance). The CESD, which was collected during wave one, was scored by researchers at ORI. For information related to scoring this measure, see Radloff (1977). Scores for the CESD were available for 538 participants in the current study. Observed scores range from 0 to 41 (M = 6.08, SD = 6.48). Descriptive statistics for the CESD and other mental health symptom measures are summarized in table 6.

Table 6. Means and Standard Deviations for Mental Health Symptom Measures

Symptom Measure	*n*	*M (SD)*	*Min*	*Max*	*Possible Score Range*
CESD	538	6.08 (6.48)	0	41	0 to 60
PCL-C	833	28.12 (10.77)	17	78	17 to 85
TSC (Childhood)	820	38.45 (9.81)	30	103	30 to 120
Dissociation		7.07 (1.85)	6	23	6 to 24
Anxiety		10.80 (2.61)	9	35	9 to 36
Depression		9.38 (2.82)	7	26	7 to 28
Sleep Disturbance		8.01 (2.83)	6	24	6 to 24
TSC (Adolescence)	821	42.20 (11.65)	30	116	30 to 120
Dissociation		7.72 (2.29)	6	23	6 to 24
Anxiety		11.91 (3.26)	9	35	9 to 36
Depression		10.42 (3.27)	7	28	7 to 28
Sleep Disturbance		8.79 (3.18)	6	24	6 to 24
TSC (Adulthood)	833	49.21 (13.07)	30	120	30 to 120
Dissociation		9.12 (2.72)	6	24	6 to 24
Anxiety		13.79 (3.96)	9	36	9 to 36
Depression		12.27 (3.67)	7	28	7 to 28
Sleep Disturbance		12.33 (4.08)	6	24	6 to 24

The PCL-C was scored by summing responses to the 17 questions on the scale. All 833 participants in the current study completed this measure. The possible range of scores on the measure is 17 to 85, and scores ranging from 17 to 78 were observed in the current study (M = 28.12, SD = 10.77). Higher scores indicate more symptoms, and scores above 44 on the PCL-C are indicative of clinically significant PTSD symptoms (see Norris & Hamblen, 2004). In the current sample, 9.4% of participants had PCL-C scores above 44.

The TSC was scored by summing responses to all 30 items on the questionnaire to yield a total symptom score. Scoring was done separately for the 3 time periods participants were asked to report on (childhood, adolescence, and adulthood). The possible range of scores on this measure is 30 to 120, and scores from 30 to 103 were observed for reports on childhood symptoms, scores from 30 to 116 were observed for reports on symptoms in adolescence, and scores from 30 to 120 were observed for symptoms in adulthood. Data from 820, 821, and 833 participants were available for childhood, adolescence, and adulthood symptoms, respectively. Means and standard deviations are reported in table 6.

In addition to total scores, subscale scores were computed for symptoms related to anxiety, depression, dissociation, and sleep disturbance, by summing scores for items on each subscale. The items on each subscale are listed in table 7, and means and standard deviations for subscale scores are provided in table 6.

Table 7. Trauma Symptom Checklist Subscales

TSC Subscale	**Subscale Items**
Dissociation	"Flashbacks" (sudden, vivid, distracting memories)
	"Spacing out" (going away in your mind)
	Dizziness
	Memory problems
	Feeling that things are "unreal"
	Feelings that you are not always in your body
Anxiety	Headaches
	Stomach problems
	Anxiety attacks
	Dizziness
	Fear of men
	Fear of women
	Unnecessary or over-frequent washing
	Feeling tense all the time
	Having trouble breathing
Depression	Insomnia (trouble getting to sleep)
	Weight loss (without dieting)
	Sadness
	Waking up early and can't get back to sleep
	Uncontrollable crying
	Feelings of inferiority
	Feelings of guilt
Sleep Disturbance	Insomnia (trouble getting to sleep)
	Restless sleep
	Nightmares
	Waking up early and can't get back to sleep
	Not feeling rested in the morning
	Waking up in the middle of the night

Demographic Variables

Frequencies for demographic variables are reported above, in the description of participants in the current study. Demographic variables coded for use in further analyses include gender, educational attainment and work status. Gender was coded numerically,

with males coded as 1, and females coded as 2. Educational attainment was scored by ranking each of the 9 response categories from least to highest degree of education, with 1 corresponding to the least education (eighth grade or less) and 9 corresponding to the most education (postgraduate or professional degree). On average, participants reported having some post-secondary education (M = 6.96, SD = 1.77). Work status was scored by categorizing participants as working for pay versus not working, with working coded as 1 and not working coded as 2. Overall, 78.1% of participants were engaged in some form of work for pay.

Demographic variables for ethnic groups within Hawaii include median family income, income for men and women working full-time, full-time work status, and educational attainment. Proportion of workers employed full-time (for men, women, and overall) were calculated by dividing the number of individuals who typically worked 35 or more hours per week by the number of individuals who worked during the year. Income and employment status data are reported in table 8. Educational attainment was scored by finding the proportion of individuals who had completed high school education. This was done by summing the number of individuals in each category of educational attainment including high school diploma or equivalent and higher, and dividing by the total number of individuals. Educational attainment data are reported in table 9.

Table 8. Income and Employment by Ethnic Group

	Median annual income (USD)			Proportion employed full-time		
Ethnic Group	Family	Men	Women	Men	Women	Total
Japanese	69,214	44,034	33,962	0.82	0.74	0.78
Chinese	57,312	39,759	29,255	0.80	0.70	0.75
White	55,543	37,332	30,990	0.84	0.68	0.77
Filipino	53,942	30,213	24,795	0.83	0.74	0.78
Hawaiian/ Pacific Islander	47,111	33,631	26,378	0.81	0.70	0.76
Korean	46,613	39,089	27,605	0.79	0.68	0.73
Latino	39,416	29,126	25,952	0.82	0.67	0.75
Other	41,088	29,761	26,180	0.83	0.70	0.78
Total	56,961	36,808	29,831	0.83	0.72	0.78

Source: 2000 U.S. Census Data

Table 9. Educational Attainment by Ethnic Group

	Proportion completing high school or higher		
Ethnic Group	Men	Women	Total
Japanese	0.89	0.86	0.87
Chinese	0.85	0.83	0.84
White	0.91	0.91	0.91
Filipino	0.75	0.75	0.75
Hawaiian/ Pacific Islander	0.83	0.84	0.84
Korean	0.88	0.78	0.82
Latino	0.80	0.83	0.81
Other	0.80	0.82	0.81
Total	0.86	0.84	0.85

Source: 2000 U.S. Census Data

Because ethnic group categories used in the current study do not match perfectly with data available from the U.S. census, for the purposes of consistent analysis, categories from the current study were re-coded to match U.S. census categories. The 33 participants identifying as Okinawan and 281 identifying as Japanese American were combined into one group to match the Japanese category as used in the U.S. census data. The four participants identifying as Other Pacific Islander were added to the 148 participants in the Native Hawaiian group, to match the Native Hawaiian/Pacific Islander U.S. census category. The number of participants in each ethnic/cultural identity category is listed in table 10.

Table 10. Ethnic Group Frequencies

Ethnic Group	Men	Women	Total
Japanese & Okinawan	152	162	314
Chinese	21	26	47
Caucasian	72	89	161
Filipino	40	33	73
Hawaiian/ Pacific Islander	65	86	151
Korean	3	3	6
Latino	12	11	23
Other	6	8	14
Total	371	418	789

Gender, Ethnicity, and Trauma Exposure

To determine whether overall rates of trauma exposure differ between men and women, an independent samples t-test was run with gender as the grouping factor and total BBTS score as the dependent variable. There were no significant differences observed between men and women in overall rates of trauma exposure, $t(811) = -0.46$, $p = .64$. Two independent samples t-tests comparing rates of exposure to trauma high in betrayal between men and women, and rates of trauma lower in betrayal between men and women, both reveal significant differences. Men in this sample report exposure to more traumas low in betrayal than do women ($t(811) = -3.22$, $p < .01$), and women report exposure to more traumas high in betrayal than do men ($t(811) = 2.12$, $p < .05$). These findings are consistent with prior research examining gender differences in trauma exposure (Goldberg & Freyd, 2006). In addition, an independent samples t-test assessing gender differences in exposure to household dysfunction revealed that women report more household dysfunction exposure than men, $t(780) = 2.88$, $p < .01$. These results are summarized in table 11.

Table 11. Trauma Exposure by Gender and Type of Trauma

Measure of Trauma Exposure	Women *M(SD)*	Men *M (SD)*	*t(df)=*
BBTS (total)	4.33 (4.96)	4.50 (5.68)	$t(811) = -0.46$
BBTS (MB)	1.86 (2.56)	1.48 (2.61)	$t(811) = 2.12$*
BBTS (LB)	2.05 (2.57)	2.70 (3.18)	$t(811) = -3.22$**
Neglect and Household Dysfunction	1.19 (1.56)	0.88 (1.38)	$t(780) = 2.88$**

*$p < .05$, **$p < .01$*

Next, ethnic group differences in trauma exposure were assessed. Because so few participants identified as Korean American (n = 6), this group was excluded from analysis. In addition, very few participants chose the category "other" (n = 14) and it is also unclear whether this category represents a meaningful group distinction. Thus, this group was also excluded from analysis. The remaining groups, including Japanese and Okinawan, Chinese, Caucasian, Filipino, Native Hawaiian and Pacific Islander, and Latino, were compared on total exposure to trauma as assessed by the BBTS, as well as exposure to traumas high in betrayal, traumas lower in betrayal, and neglect and household dysfunction.

Ethnic group differences in exposure to trauma were observed, with similar patterns emerging for all measures. For overall trauma exposure as measured by the BBTS total score, a one-way ANOVA revealed significant ethnic group differences (F (5, 765) = 19.49, p < .001). Similarly, comparing ethnic groups on exposure to traumas high in betrayal, significant group differences exist (F (5, 765) = 20.36, p < .001), and the same was true for exposure to traumas low in betrayal (F (5, 765) = 14.56, p < .001). Post-hoc pairwise comparisons revealed that these effects were completely accounted for by the fact that Native Hawaiians reported significantly more trauma exposure than all other groups, with the exception of Latinos, who did not differ significantly from any group. Thus Native Hawaiians in this sample were significantly more likely than

Japanese Americans, Caucasians, Chinese Americans, and Filipino Americans to be exposed to both high betrayal traumas and traumas lower in betrayal, and no other ethnic group differences in trauma exposure were observed. Means and standard errors are shown in figures 1 and 2.

Figure 1. Exposure to Traumas Lower in Betrayal by Ethnic Group

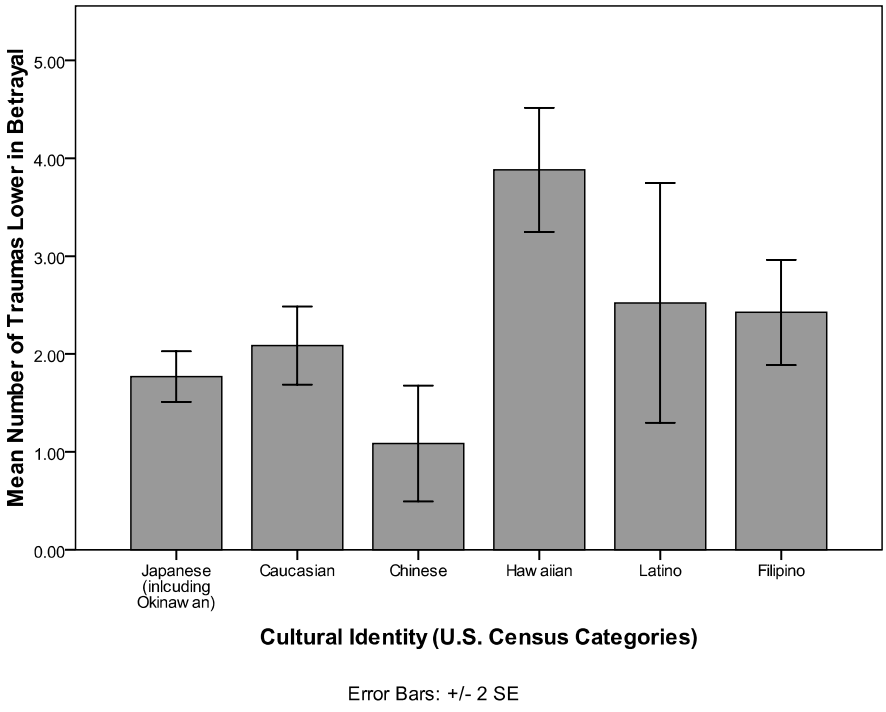
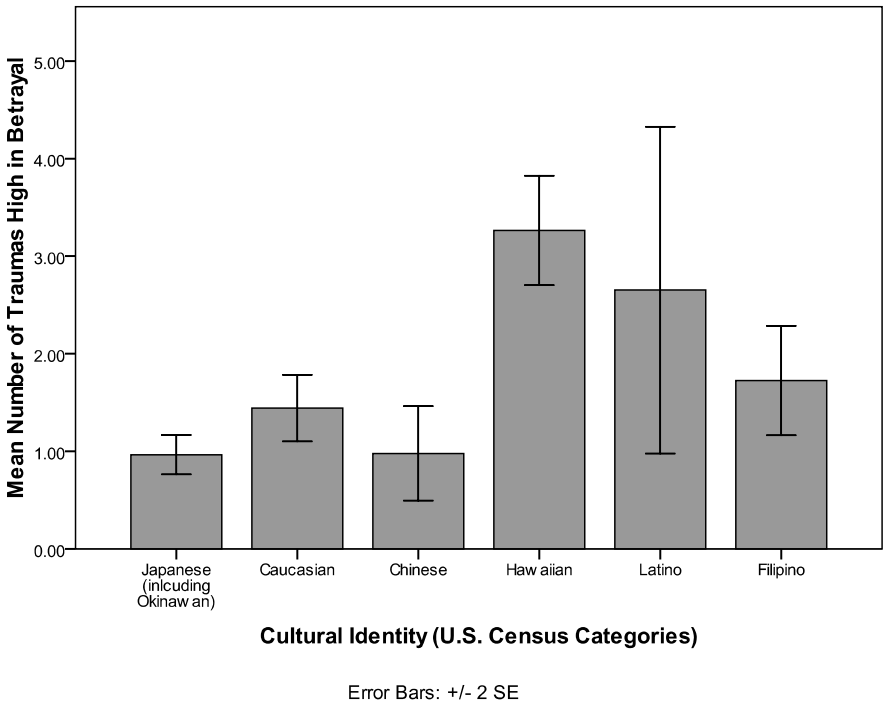
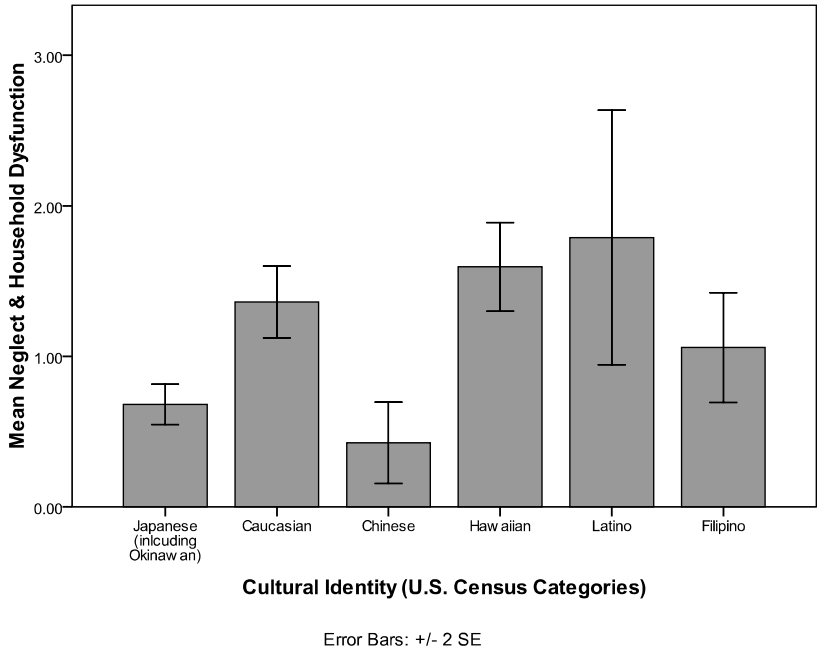


Figure 2. Exposure to Traumas High in Betrayal by Ethnic Group



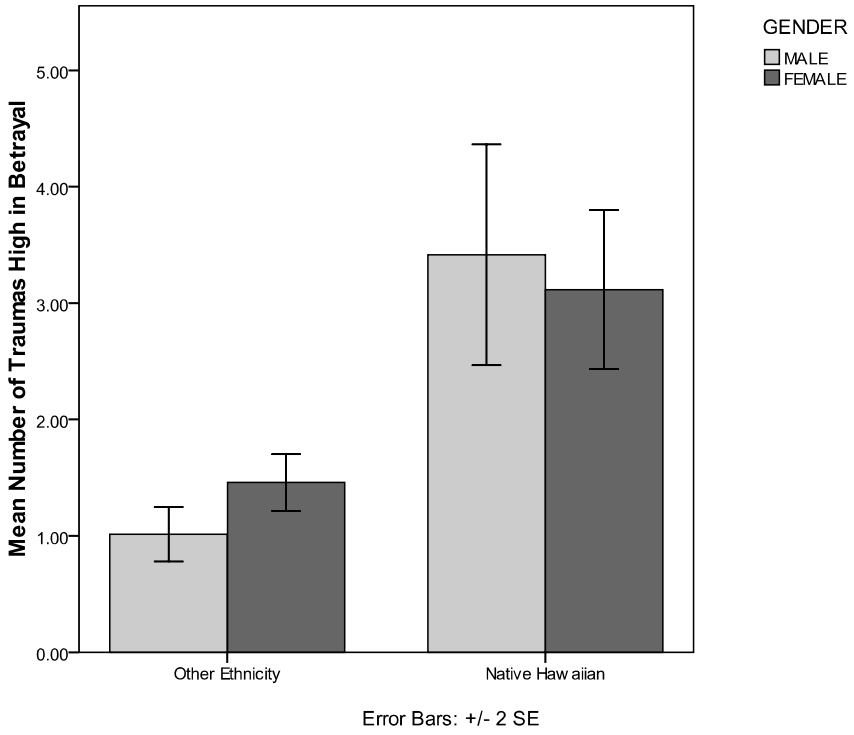
Significant ethnic group differences were also observed in exposure to neglect and household dysfunction (F (5, 738) = 12.92, p < .001). Pairwise post-hoc comparisons revealed a somewhat more complex picture for neglect and household dysfunction than for other types of trauma exposure. Native Hawaiians and Caucasians both reported significantly more exposure than Japanese Americans or Chinese Americans, and Latinos reported significantly more exposure than Chinese Americans. Filipino Americans were not significantly different from any other group in exposure to neglect and household dysfunction. Thus Chinese Americans reported the least exposure to neglect and household dysfunction, followed by Japanese Americans, then Filipino Americans, followed by Caucasians, Native Hawaiians, and Latinos. Means and standard errors are summarized in Figure 3.

Figure 3. Exposure to Neglect and Household Dysfunction by Ethnic Group



Finally, to test the hypothesis that Native Hawaiians have fewer gender differences in trauma exposure than other groups, simple effects tests were run comparing Native Hawaiians and non-Hawaiians on gender differences in exposure to traumas high in betrayal, and traumas lower in betrayal. For traumas lower in betrayal, Native Hawaiian men and women did not differ in exposure ($F(1, 765) = 0.82$, $p = .36$), but among non-Hawaiians men had more exposure than women ($F(1, 765) = 12.09$, $p < .01$). Similarly, for traumas high in betrayal, Native Hawaiian men and women did not differ in exposure ($F(1, 765) = 0.16$, $p = .69$), but among non-Hawaiians women had more exposure than men ($F(1, 765) = 4.47$, $p < .05$). An illustration of this effect for traumas high in betrayal is displayed in figure 4.

Figure 4. Exposure to Traumas High in Betrayal by Gender and Ethnic Group



Associations Between Trauma and Symptoms

Trauma and Mental Health

To test whether trauma exposure predicts mental health symptoms, a series of regression analyses were run. Trauma high in betrayal, trauma lower in betrayal, and neglect and household dysfunction were simultaneously entered as predictors of each measure of mental health symptoms. Mental health symptom measures included PTSD symptoms assessed by the PCL-C, depression symptoms assessed by the CESD, and four subscales of the TSC assessing symptoms of depression, anxiety, dissociation, and sleep disturbance during adulthood, including current symptoms. For all measures, exposure to trauma was a significant predictor of symptoms overall. Traumas high in betrayal and neglect and household dysfunction each predicted unique variance in all measures of mental health symptoms. Exposure to trauma lower in betrayal predicted unique variance in PTSD symptoms, and dissociative symptoms. In all cases, more exposure to trauma was associated with higher symptom levels. The results of these regression analyses are summarized in table 12.

Table 12. Trauma and Mental Health Symptoms

	R	*F*	*Semi-partial r*		
Dependent Measure			Traumas High in Betrayal	Traumas Lower in Betrayal	Neglect & Household Dysfunction
PCL-C PTSD	.42***	57.27	.12***	.13***	.16***
CESD Depression	.31***	17.04	.12**	.04	.13**
TSC Dissociation	.42***	57.82	.15***	.11**	.14***
TSC Depression	.38***	46.06	.18***	-.01	.16***
TSC Anxiety	.38***	45.59	.15***	.05	.15***
TSC Sleep Problems	.34***	35.22	.13***	.02	.16***

*$p < .05$, **$p < .01$, ***$p < .001$, $df = 3, 797$, except CESD where $df = 3, 493$

Trauma and Physical Health

To test whether trauma exposure predicts physical health symptoms, another series of regression analyses were run. Trauma high in betrayal, trauma lower in betrayal, and neglect and household dysfunction were simultaneously entered as predictors of each measure of physical health symptoms. Measures of physical health symptoms included current self-rated general health at wave five of the study, average self-rated health across all five waves, and healthcare utilization, as measured by number of visits to a physician in the past year (which was measured at wave one). For all measures, exposure to trauma was a significant predictor of symptoms overall. Traumas high in betrayal predicted unique variance in self-rated health, with greater exposure predicting poorer health ratings. Exposure to trauma lower in betrayal predicted unique variance in number of

physician visits, such that greater exposure corresponded with more visits. Neglect and household dysfunction did not predict unique variance in any measure of physical health functioning. The results of these regression analyses are summarized in table 13.

Table 13. Trauma and Physical Health

	R	*F(df)*	*Semi-partial r*		
Dependent Measure			Traumas High in Betrayal	Traumas Lower in Betrayal	Neglect & Household Dysfunction
Self-Rated Health (Wave 5)	.15***	5.43(3, 700)	-.10*	.01	-.03
Self-Rated Health (Average)	.20***	10.48(3, 797)	-.11**	-.02	-.02
Physician Visits	.22***	5.72(3, 326)	.03	.15**	.03

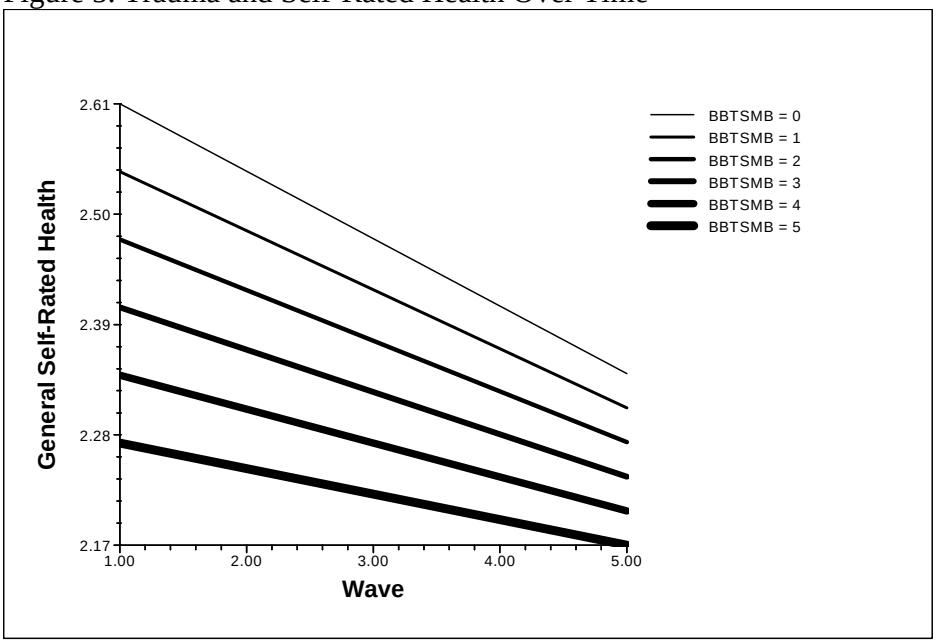
*$p < .05$, **$p < .01$, ***$p < .001$

To test whether trauma exposure was associated with health trajectory over time, a linear growth model was run using the statistical program HLM. The five measurements of self-rated general health from each wave were entered as outcome variables, with wave number functioning as the time variable. Trauma high in betrayal and trauma lower in betrayal were added as predictors. Overall, there was significant variability among participants in average self-rated health status ($\chi^2(702) = 1838.32$, $p < .001$), and in health status trajectory over time ($\chi^2(702) = 1009.26$, $p < .001$). Exposure to trauma lower in betrayal did not significantly predict average health status when controlling for other predictors ($t(702) = 0.13$, $p = .90$), but was marginally predictive of

health trajectory over time ($\chi^2(7) = 13.58$, $p = .06$). Trauma high in betrayal significantly predicted both average health status, ($t(702) = -2.08$, $p < .05$), and health trajectory over time ($\chi^2(7) = 15.74$, $p < .05$).

To examine the nature of the relationship between high betrayal trauma and health trajectory, a graph was created plotting self-rated health over time for the most frequently reported numbers of high betrayal traumas (0, 1, 2, 3, 4, and 5). As shown in figure 5, exposure to more high betrayal trauma was associated with poorer initial self-rated health. In general, all participants reported a decline in health over time. Participants with fewer betrayal traumas reported a faster rate of decline than those reporting the most betrayal traumas. However, although those participants reporting the fewest betrayal traumas reported greater rate of decline, participants with more betrayal traumas consistently reported the poorest self-rated health at all waves.

Figure 5. Trauma and Self-Rated Health Over Time



Associations Between Gender, Ethnicity, and Symptoms

Gender, Ethnicity, and Mental Health

To assess for gender differences in mental health symptoms, independent samples t-tests were run comparing men's and women's scores on all measure of mental health. No significant gender differences were observed in PTSD symptoms. A marginally significant gender difference in depression as measured by the CESD was observed, as were significant gender differences for all TSC subscales (dissociation, depression, anxiety, and sleep disturbance). In all cases where gender differences were detected, women reported more symptoms than men. The results of these t-tests are reported in table 14.

Table 14. Gender and Mental Health Symptoms

Dependent Measure	Women *M(SD)*	Men *M (SD)*	*t*
PCL-C PTSD	28.04 (10.96)	28.18 (10.61)	0.17
CESD Depression	6.53 (6.65)	5.56 (6.24)	1.72^{+}
TSC Dissociation	9.34 (2.79)	8.91 (2.67)	2.28*
TSC Depression	12.84 (3.74)	11.63 (3.45)	4.77***
TSC Anxiety	14.35 (4.04)	13.13 (3.79)	4.43***
TSC Sleep Problems	12.72 (4.20)	11.91 (3.90)	2.85**

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$, ($df = 811$, except for CESD where $df = 536$)

Next, ethnic group differences in mental health symptoms were assessed. Means and standard deviations for each ethnic group for each symptom measure are presented in table 15. One-way ANOVA analyses were run using ethnicity as the grouping factor and each symptom measure as a separate dependent variable. Marginally significant ethnic group differences were observed for PTSD symptoms, and significant ethnic group differences were detected for all other symptom measures. Post-hoc tests using Tukey's HSD revealed a pattern of results suggesting more symptoms in general for Latino and Hawaiian participants, and fewer symptoms for Japanese, Caucasian, and Chinese participants. The Latino group was smaller than other ethnic groups (n = 23), and thus significant differences were harder to detect. Although differences were not significant, Latinos reported more PTSD symptoms than Caucasian and Japanese participants, more Depression symptoms as measured by the CESD than Caucasians, and more sleep problems than Chinese participants in this study. Latino participants reported significantly more dissociation and anxiety symptoms than Japanese, Caucasian, and Chinese participants. Native Hawaiians reported marginally more depression symptoms as measured by the TSC than Japanese participants, and reported significantly more anxiety than Japanese participants and significantly more dissociation than Japanese, Chinese, and Caucasian participants in this study. Filipino participants were not significantly different from any other group on any symptom measure. The results of these analyses are summarized in table 16.

Table 15. Means for Mental Health Symptoms by Ethnic Group

Ethnic Group	PCL-C Total Score	CESD Depression	TSC Dissociation	TSC Anxiety	TSC Depression	TSC Sleep Disturbance
			M(SD)			
Japanese	26.87 (9.53)	5.86 (6.08)	8.80 (2.21)	13.25 (3.21)	11.84 (3.37)	11.86 (3.82)
Caucasian	28.44 (10.35)	5.07 (6.00)	8.94 (2.59)	13.49 (3.63)	12.53 (3.76)	12.65 (4.12)
Chinese	26.23 (8.08)	5.55 (6.03)	8.30 (2.11)	12.91 (3.40)	11.60 (3.07)	11.53 (3.56)
Hawaiian	29.29 (11.62)	6.99 (7.27)	9.78 (2.96)	14.55 (4.38)	12.81 (3.90)	12.69 (4.22)
Latino	31.65 (13.03)	10.29 (11.25)	10.48 (3.99)	16.17 (5.68)	13.48 (4.17)	13.96 (4.59)
Filipino	27.92 (11.37)	7.08 (6.57)	9.19 (2.87)	13.64 (3.83)	12.10 (3.55)	12.19 (4.26)

Table 16. Ethnicity and Mental Health Symptoms

Dependent Measure	*F*	Largest Group Differences	
PCL-C PTSD	2.10^{+}	Latino >	Caucasian (n.s.) Japanese (n.s.)
CESD Depression	2.26*	Latino >	Caucasian^{+}
TSC Dissociation	5.33***	Hawaiian >	Japanese** Caucasian* Chinese**
		Latino >	Japanese* Caucasian^{+} Chinese*
TSC Depression	2.64*	Hawaiian >	Japanese^{+}
TSC Anxiety	5.04***	Hawaiian >	Japanese**
		Latino >	Japanese** Caucasian* Chinese**
TSC Sleep Problems	2.40*	Latino >	Chinese (n.s.)

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$,
$df = (5, 765)$, except for CESD where $df = (5, 506)$

To test for interactions between gender and ethnicity on mental health symptoms, interaction tests were computed using ANOVA. Significant interactions between gender and ethnicity were observed for depression as measured by the CESD, and anxiety symptoms. A marginally significant interaction was detected for sleep problems. There were no significant interactions for other mental health symptom measures. The results of these analyses are reported in table 17. Examining the significant interaction for CESD

depression symptoms, it appears that although women report more symptoms in most ethnic groups, men report more symptoms than women among Latino and Chinese participants. Assessing the interaction for anxiety symptoms, it appears that in general women report more anxiety symptoms, although the size of the gender difference varies among ethnic groups, and no gender difference is evident for Chinese participants. A similar pattern appears to exist for sleep problems, where overall women report more symptoms, but the size of the difference varies among ethnic groups. Means and standard errors for men and women in each ethnic group for each symptom measure are presented in figures 6 – 11.

Table 17. Gender by Ethnicity Interactions for Mental Health Symptoms

Dependent Measure	*df*	*F*
PCL-C PTSD	5, 757	0.89
CESD Depression	5, 500	3.52**
TSC Dissociation	5, 757	1.01
TSC Depression	5, 757	0.70
TSC Anxiety	5, 757	2.57*
TSC Sleep Problems	5, 757	2.11^{+}

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$

Figure 6. Gender, Ethnicity, and Depression Symptoms (CESD)

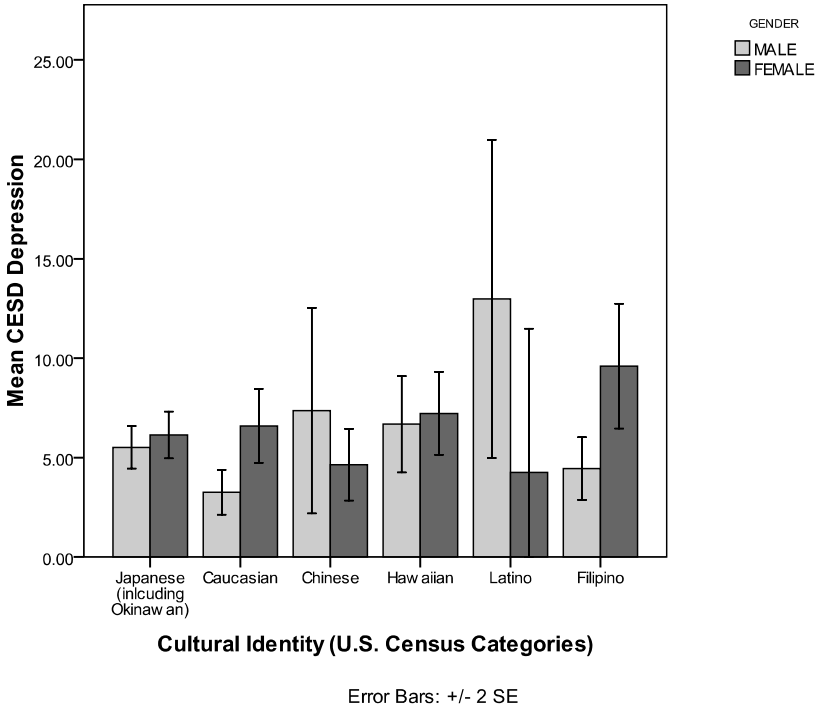


Figure 7. Gender, Ethnicity, and PTSD Symptoms

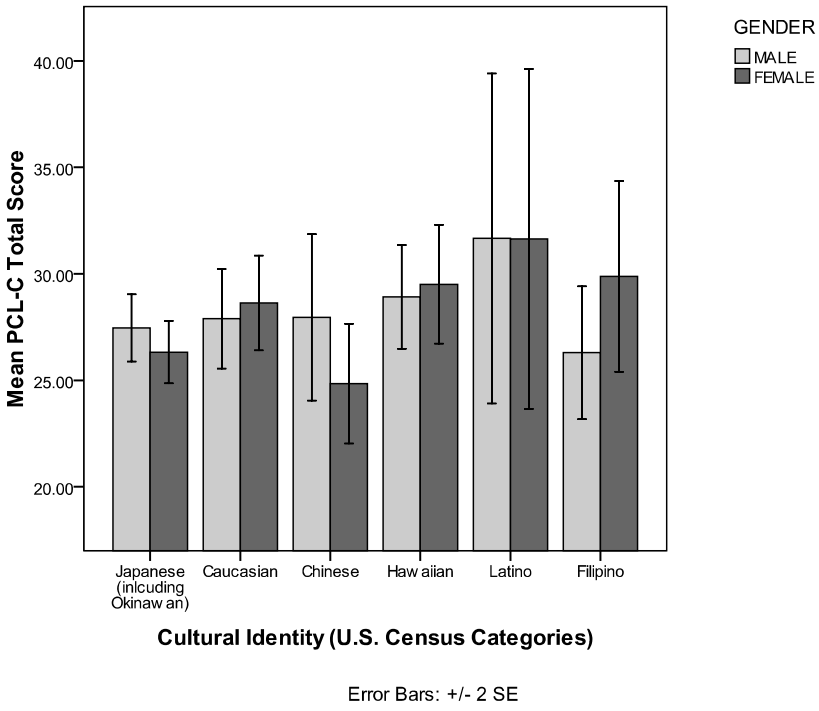


Figure 8. Gender, Ethnicity, and Depression Symptoms (TSC)

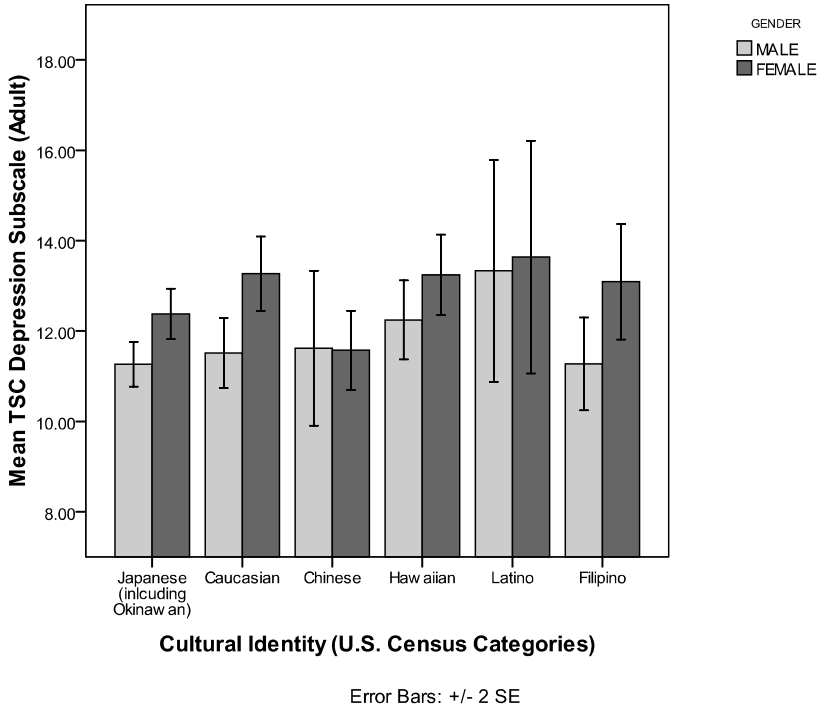


Figure 9. Gender, Ethnicity, and Dissociative Symptoms

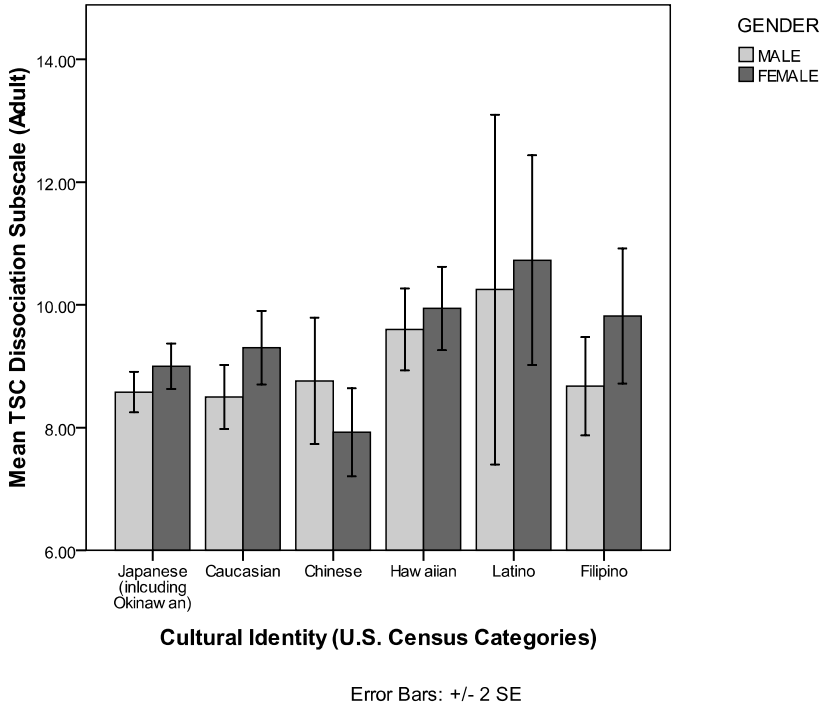


Figure 10. Gender, Ethnicity, and Anxiety Symptoms

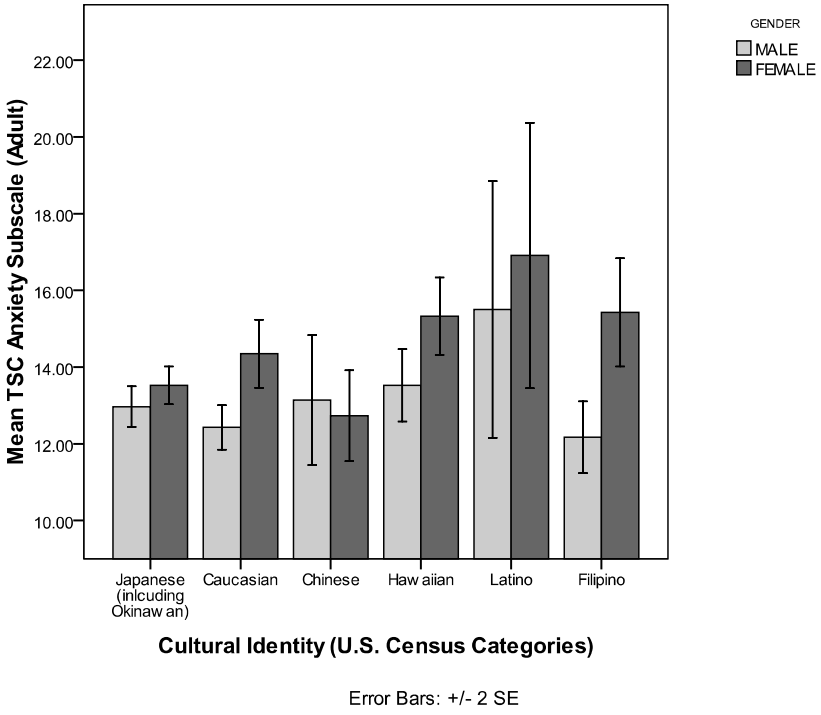
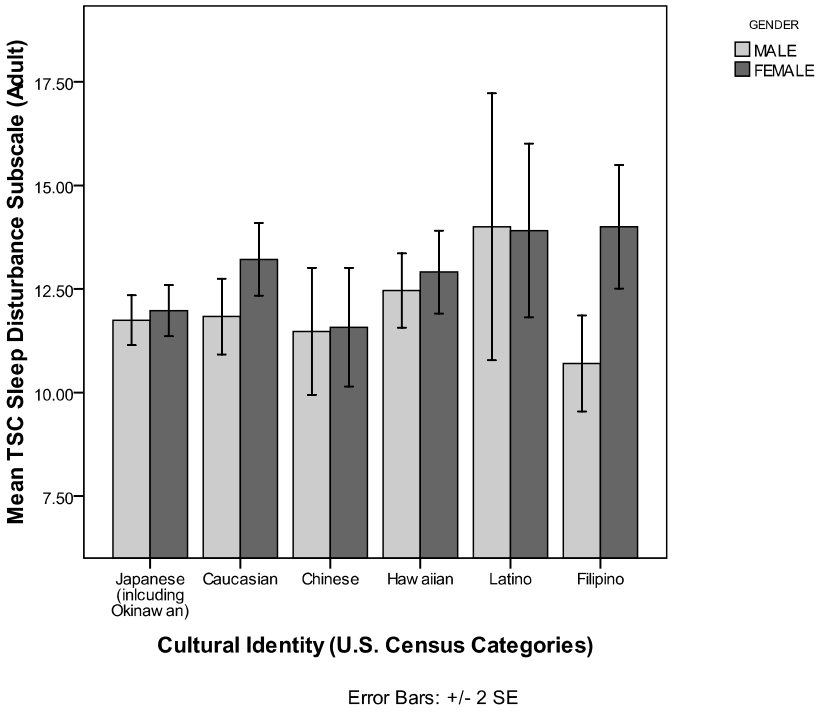


Figure 11. Gender, Ethnicity, and Sleep Disturbance Symptoms



Gender, Ethnicity, and Physical Health

To assess for gender differences in physical health symptoms, independent samples t-tests were run comparing men's and women's scores on all measure of physical health functioning. No significant gender differences were observed in self-rated health for either wave 5 or average ratings. A significant gender difference in healthcare utilization was observed, with women reporting more physician visits than men. The results of these t-tests are reported in table 18.

Table 18. Gender and Physical Health Symptoms

Dependent Measure	Women *M(SD)*	Men *M (SD)*	*df*	*t*
Self-Rated Health (Wave 5)	3.40 (0.93)	3.36 (0.95)	706	0.58
Self-Rated Health (Average)	3.48 (0.81)	3.41 (0.80)	811	1.22
Physician Visits	3.12 (2.47)	2.63 (2.55)	688	2.54*

*$p < .05$, **$p < .01$, ***$p < .001$

Table 19. Means for Physical Health Symptoms by Ethnic Group

	Self-Rated Health (Wave 5)	Self-Rated Health (Average)	Physician Visits
Ethnic Group		*M(SD)*	
Japanese	3.42 (0.89)	3.43 (0.72)	2.75 (2.44)
Caucasian	3.67 (0.91)	3.75 (0.78)	3.05 (2.40)
Chinese	3.52 (1.09)	3.65 (0.86)	2.95 (2.86)
Hawaiian	3.14 (0.94)	3.24 (0.82)	3.16 (2.64)
Latino	3.00 (1.18)	3.05 (1.01)	2.94 (2.91)
Filipino	3.27 (0.84)	3.35 (0.74)	2.94 (2.73)

Ethnic group differences in physical health symptoms were assessed. Means and standard deviations for each ethnic group for each measure of health functioning are presented in table 19. One-way ANOVA analyses were run using ethnicity as the grouping factor and health functioning measures as a separate dependent variables. Significant ethnic group differences were observed for self-rated general health, both at wave 5 and for the average across waves. Post-hoc tests using Tukey's HSD revealed a pattern of results suggesting that Caucasian and Chinese participants reported better health than other groups. Caucasians rated their health as better than Hawaiian, Latino, and Filipino participants at wave 5, and better than Japanese, Hawaiian, Latino, and Filipino participants for the average across all waves. Chinese participants reported their health as better than Hawaiian and Filipino participants for the average across all waves. The results of these analyses are summarized in table 20.

Table 20. Ethnicity and Physical Health Symptoms

Dependent Measure	*df*	*F*	Largest Group Differences	
Self-Rated Health (Wave 5)	5, 666	5.88***	Caucasian >	Hawaiian*** Latino* Filipino*
Self-Rated Health (Average)	5, 765	9.19***	Caucasian >	Japanese*** Hawaiian*** Latino*** Filipino**
			Chinese >	Hawaiian* Latino*
Physician Visits	5, 649	0.54		

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$

To test for interactions between gender and ethnicity on physical health functioning, interaction tests were computed using ANOVA. No significant interactions between gender and ethnicity were observed for physical health measures. The results of these analyses are reported in table 21. Means and standard errors for men and women in each ethnic group for each health functioning measure are presented in figures 12 – 14.

Table 21. Gender by Ethnicity Interactions for Physical Health Symptoms

Dependent Measure	*F*	*df*
Self-Rated Health (Wave 5)	0.34	5, 659
Self-Rated Health (Average)	1.17	5, 757
Physician Visits	0.44	5, 643

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$

Figure 12. Gender, Ethnicity, and Self-Rated Health (Wave 5)

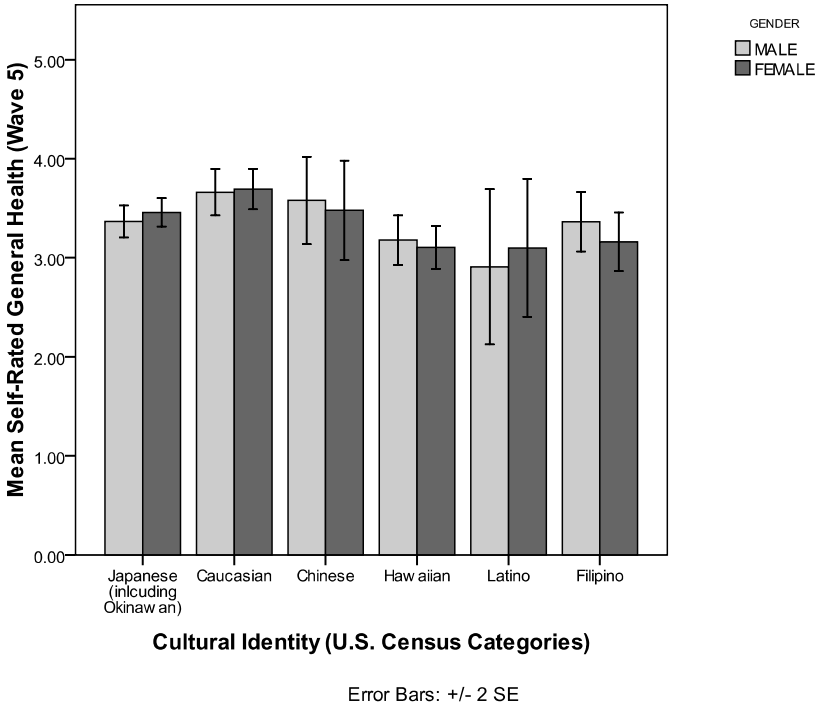


Figure 13. Gender, Ethnicity, and Self-Rated Health (Average)

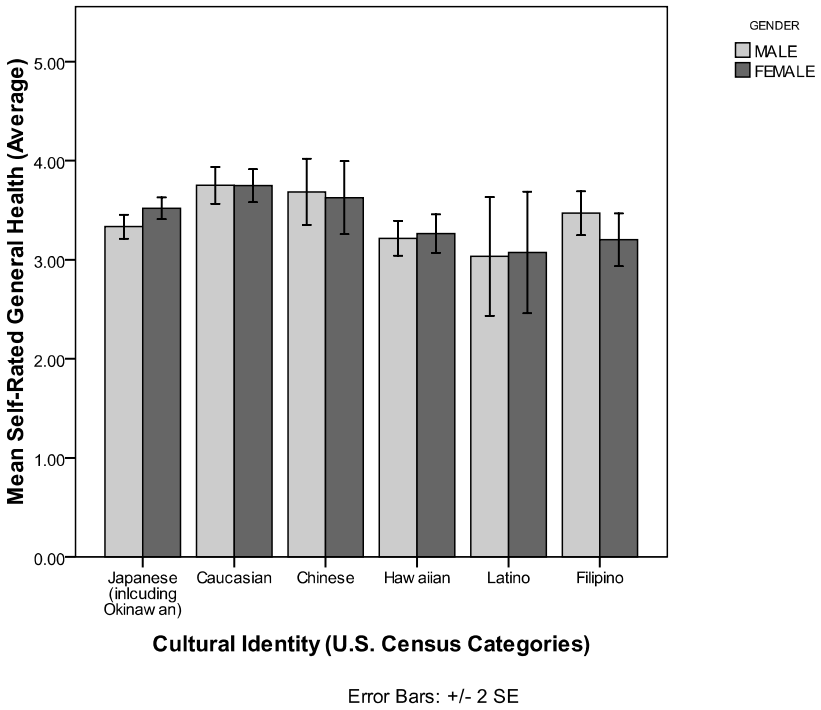
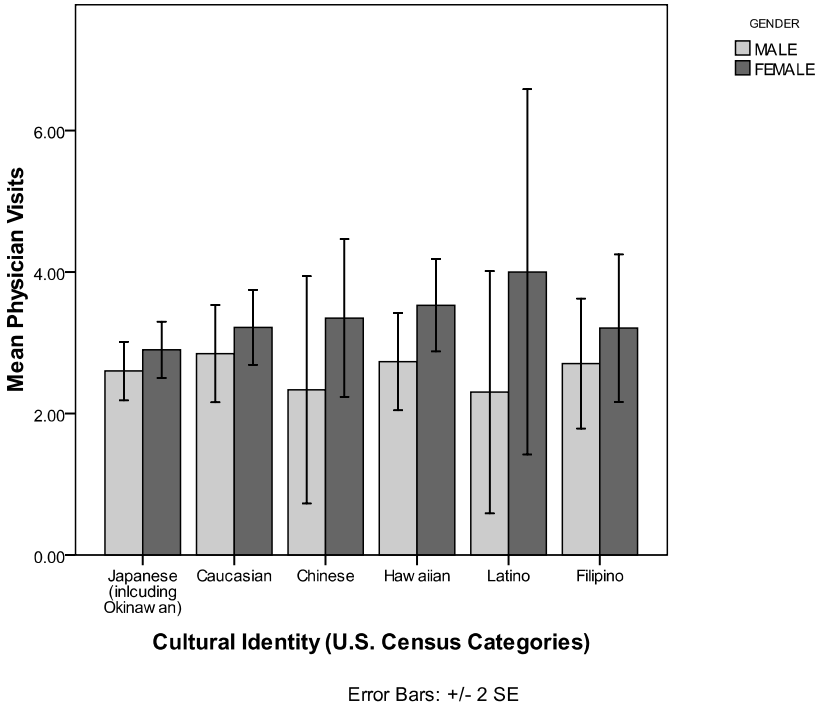


Figure 14. Gender, Ethnicity, and Healthcare Utilization

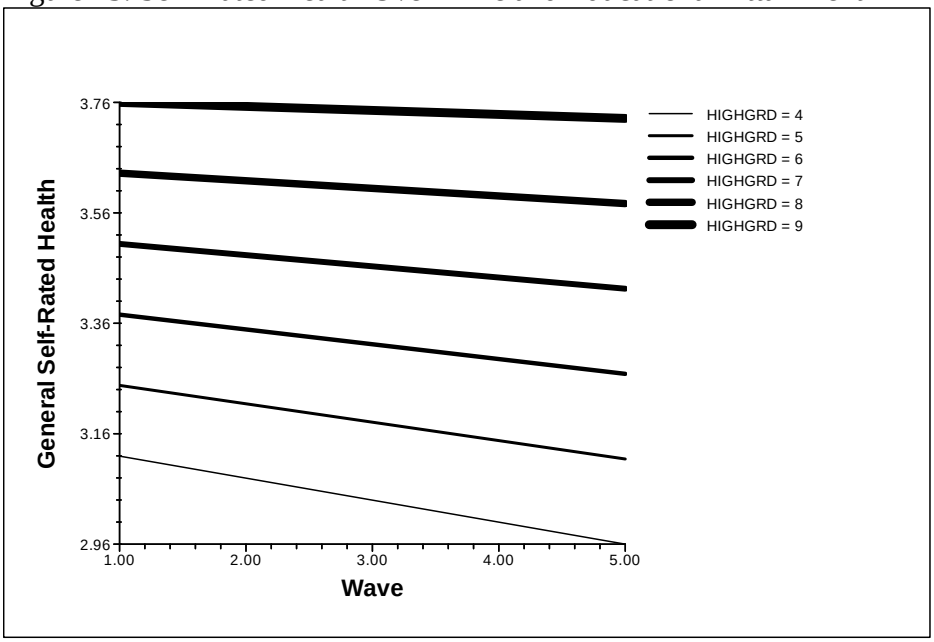


Trauma, Symptoms, and Social Resources

To test whether educational attainment was associated with health trajectory over time, a linear growth model was run using the statistical program HLM. The five measurements of self-rated general health from each wave were entered as outcome variables, with wave number functioning as the time variable. Trauma high in betrayal and trauma lower in betrayal, as well as highest level of educational attainment, were added as predictors. Overall, there was significant variability among participants in average self-rated health status ($\chi^2(702) = 1838.32$, $p < .001$), and in health status trajectory over time ($\chi^2(702) = 1009.26$, $p < .001$). Controlling for other variables, level of educational attainment significantly predicted both average health status, ($t(702) = 4.93$, $p < .001$), and health trajectory over time ($\chi^2(7) = 16.31$, $p < .05$).

To examine the nature of the relationship between educational attainment and health trajectory, a graph was created plotting self-rated health over time for the most frequently reported educational attainment categories (4, 5, 6, 7, 8, and 9), which correspond to educational attainment ranging from high school/GED to graduate or professional degree. As shown in figure 15, less educational attainment was associated with poorer initial self-rated health, and a faster rate of decline in health over time.

Figure 15. Self-Rated Health Over Time and Educational Attainment



Regression analyses were run assessing whether educational attainment and work status predict unique variance in symptoms, when taking into account the impact of trauma exposure and gender on symptoms. Exposure to traumas lower in betrayal, traumas high in betrayal, and neglect and household dysfunction, as well as gender,

educational attainment, and work status, were entered into a series of regression models with mental health symptom measures and average self-rated health as outcomes. Traumas high in betrayal remained a significant predictor of all outcome measures, and traumas lower in betrayal contributed significantly to prediction of PTSD and dissociative symptoms. Neglect and household dysfunction remained a significant predictor of all outcomes except health status. In all cases of significant associations between trauma and symptoms, more exposure to trauma correlated with more symptoms and worse self-rated health.

When controlling for other factors, gender significantly predicted depression and anxiety as measured by the TSC, such that women report more symptoms than men. In addition, men report significantly worse self-rated health than women. Educational attainment was a significant predictor of PTSD symptoms, depression as measured by the CESD, dissociation and anxiety symptoms as measured by the TSC, and self-rated general health. Less education was associated with more symptoms, and poorer self-rated health. Finally, work status was significantly associated with all outcome measures except dissociation. Individuals who reported being engaged in work for pay also reported fewer symptoms and better self-rated health than those not employed for pay. The results of these analyses are summarized in table 22.

Table 22. Trauma, Gender, Social Resources, and Mental Health Symptoms

Dependent Measure			Traumas Lower in Betrayal	Traumas High in Betrayal	Neglect & Household Dysfunction	Gender	Educational Attainment	Work Status
	R	*F*	*Semi-partial r*					
PCL-C PTSD	.44	29.61***	.11**	.11**	.16***	-.05	-.09*	.07*
CESD Depression	.35	11.77***	.02	.11*	.10*	.03	-.12**	.15***
TSC Dissociation	.44	29.54***	.10**	.13***	.12***	.06	-.12***	.06
TSC Depression	.42	27.01***	.01	.16***	.15***	.13***	-.05	.07*
TSC Anxiety	.44	30.45***	.07^{+}	.12***	.14***	.12***	-.13***	.10**
TSC Sleep Problems	.37	19.66***	.02	.12***	.14***	.06	-.06	.09**
Self-Rated Health (Average)	.32	14.64***	.02	-.10**	.00	.09*	.22***	-.11**

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$, $df = 6, 754$, except CESD where $df = 6, 513$

To test the hypothesis that ethnic group social status predicts variance in individual outcomes, social status groupings were computed using U.S. census data for income and educational attainment for each ethnic group. Regardless of method of computation, clear groupings emerged with Japanese Americans, Caucasians, and Chinese Americans having higher socioeconomic status than Native Hawaiians, Filipino Americans, and Latinos. Thus for the next set of analyses, a variable was created where lower status groups were coded as 1 for the status, and higher status groups were coded as 2 for this variable.

Using the statistical modeling program HLM 6.06, student edition, a series of multilevel models were run in which individuals were nested within ethnic groups. Outcome variables included the PCL-C, all four subscales of the TSC, and average self-rated health. The CESD was excluded from analysis, as a large number of participants had not completed this measure, and HLM requires complete data for all variables used in analysis. Cases with missing data for one or more measures were deleted prior to creation of the multilevel data file, and a total of 724 participant were included.

Predictors entered at the level of the individual (level 1) included exposure to trauma high in betrayal (more betrayal or MB trauma), exposure to trauma lower in betrayal (less betrayal or LB trauma), educational attainment, and work status. Socioeconomic status grouping was entered at the ethnic group level (level 2). A series of model comparisons were conducted, comparing the empty model (with no predictors) to models using only level 1 predictors, only level 2 predictors, and both level 1 and level 2 predictors. It was hypothesized that ethnic group level social status (the level 2 predictor)

would contribute significantly to the prediction of symptoms, over and above the contribution of trauma and personal social status (as measured by educational attainment and work status, level 1 predictors).

In general, this hypothesis was not supported. Predictors at the level of the individual, including personal trauma exposure, educational attainment, and work status, were the best predictors of symptoms. For most outcome measures, ethnic group level socioeconomic status did not contribute significantly to the prediction of symptoms. One exception to this pattern was in the prediction of PTSD symptoms, where ethnic group status did predict symptoms above the contribution of the level-1 predictors. However, this effect was in the direction counter to predictions, in that controlling for level-1 factors, members of higher status groups reported more PTSD symptoms than members of lower status groups. The results of these model tests are summarized in table 23.

Table 23. Deviance Tests of Nested Models

Outcome Variable	[a]Level 1 Predictors Only vs. Empty Model	[b]Level 2 Predictors Only vs. Empty Model	[a]Level 1 and [b]Level 2 Predictors vs. [a]Level 1 Predictors Only
	$\chi^2(df = 14)$	$\chi^2(df = 1)$	$\chi^2(df = 1)$
PCL-C PTSD	135.22***	3.88*	4.29*
TSC Dissociation	127.77***	3.67^{+}	n/a[c]
TSC Depression	90.51***	1.31	n/a[c]
TSC Anxiety	119.48***	2.98^{+}	n/a[c]
TSC Sleep Problems	71.93***	1.44	n/a[c]
General Health (Average)	49.52***	1.1	n/a[c]

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$
[a]Level 1 predictors: MB Trauma, LB Trauma, Educational Attainment, Work Status
[b]Level 2 predictors: Ethnic Group Social Status
[c]Unable to calculate χ^2; deviance difference is negative

Coefficients for variance estimates in these models were examined, to determine whether the included variables explained ethnic group differences in symptoms, or whether significant ethnic group variability in symptoms remained after accounting for included variables. In addition, coefficients were examined to test the hypothesis that the relationship between trauma and symptoms would vary for different ethnic groups, such that lower status groups would show stronger relationships between trauma and symptoms.

Intercept coefficients for the empty models indicated marginally significant variability among ethnic groups on the PCL-C, and significant ethnic group level variability for all other symptom measures and self-rated health. Next, coefficients for the best-fitting predictor models were assessed. These included the level-1 only models for the four TSC subscales and self-rate health, and the model with both level-1 and level-2 predictors for the PCL-C. For the dissociation subscale of the PCL-C, marginally significant ethnic group variability in symptoms remained after accounting for predictors. For all other outcomes, there were no significant ethnic group differences in symptoms after accounting for the contribution of predictors.

The hypothesis that the relationship between trauma and mental health symptoms would be stronger in lower status ethnic groups was not generally supported. No ethnic group differences in the relationship between trauma and symptoms were observed for symptoms of PTSD, depression, anxiety, or sleep disturbance. Ethnic group differences in the relationship between traumas lower in betrayal and dissociation were observed. However, a clear pattern did not emerge related to social status—ethnic group differences in how strongly traumas lower in betrayal predict dissociative symptoms did not relate in any way to socioeconomic status. These results are summarized in table 24.

A different pattern emerged for self-rated general health. Marginally significant ethnic group differences in the relationship between traumas lower in betrayal and self-rated health were observed. In addition, significant ethnic group variability in the relationship between traumas high in betrayal and self-rated health was detected. A graph of the regression lines for each group was created, in which the relationship between

exposure to trauma high in betrayal and self-rated health was plotted, holding other level-1 predictors constant. Regression lines for the various ethnic groups were coded by social status (low versus high). It appears that in general the negative relationship between exposure to high betrayal trauma and self-rated health is stronger in two of the three lower status ethnic groups. Examining the regression equations for each ethnic group separately, it appears that controlling for educational attainment, work status, and exposure to trauma lower in betrayal, high betrayal trauma is a significant predictor of poorer health in Filipino Americans and Native Hawaiians, but not in any of the other ethnic groups. The results of this analysis are summarized in table 24, and the regression lines are plotted in figure 16.

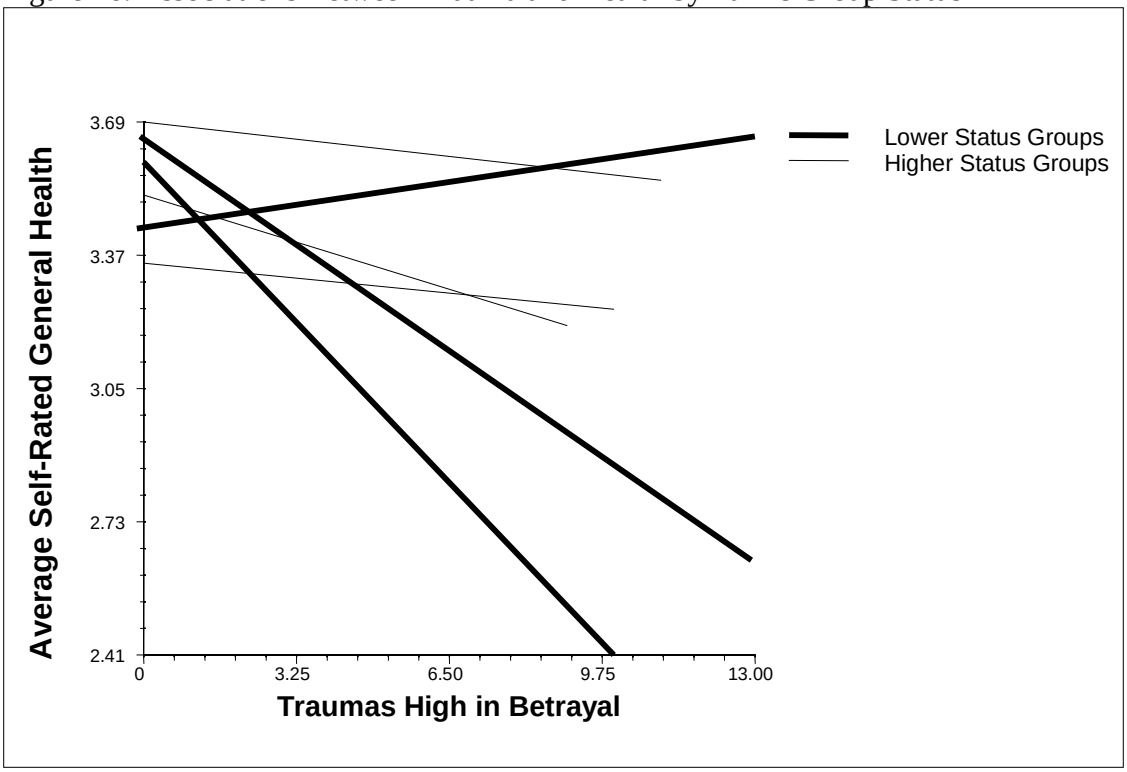
Table 24. Ethnic Group Variability in Symptoms, and in Associations Between Trauma and Symptoms

Outcome Variable		Empty Model	Best-Fitting Predictor Model[a]
		$\chi^2(df = 5)$	
PCL-C			
	Intercept	9.63^{+}	7.22
	LB Trauma		2.64
	MB Trauma		3.10
TSC Dissociation			
	Intercept	31.38***	10.03^{+}
	LB Trauma		19.15**
	MB Trauma		8.39
TSC Depression			
	Intercept	15.10**	6.32
	LB Trauma		3.66
	MB Trauma		3.73
TSC Anxiety			
	Intercept	36.21***	5.44
	LB Trauma		4.04
	MB Trauma		6.35
TSC Sleep Problems			
	Intercept	14.48*	9.06
	LB Trauma		4.59
	MB Trauma		7.27
General Health			
	Intercept	45.27***	8.94
	LB Trauma		10.57^{+}
	MB Trauma		15.78**

$^{+}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$

[a]Level 1 and 2 predictors for PCL-C, level 1 predictors only for all others

Figure 16. Associations Between Trauma and Health by Ethnic Group Status



CHAPTER IV

DISCUSSION

The results of this study indicate that gender, ethnicity, trauma exposure, and social context have some straightforward and some complex relations with one another in predicting physical and mental health. Gender and ethnicity are each related to trauma exposure, and trauma exposure relates to physical and mental health symptoms. Socioeconomic resources and the relational context in which trauma occurs are also reliably related to symptom reporting. While many of the observed outcomes were consistent with predictions, some aspects of the data require more interpretation. In this section, I discuss and interpret each finding, and present general discussion of the limitations, implications, and importance of the current study.

Gender, Ethnicity, and Trauma Exposure

As predicted, women in this sample reported exposure to more traumas high in betrayal than did men, and men reported exposure to more traumas lower in betrayal than did women. There were no statistically significant gender differences in total number of traumas reported. These results are consistent with prior research assessing gender differences in exposure to traumatic events, replicating the findings of Goldberg and Freyd (2006), and extending them to a more ethnically diverse sample.

While some research has found that men report more trauma exposure overall than do women (Tolin & Foa, 2008), such research tends to focus on fear-based rather than betrayal-based traumas. Discrepancies between this prior research and the current research are likely accounted for by the fuller range of traumatic events assessed in this study as compared with some prior studies. Because men are more likely than women to experience traumas lower in betrayal, focusing exclusively on this type of trauma likely results in the appearance that men are exposed to more traumatic stressors than women. However, when including traumas high in betrayal in addition to traumas that are more fear-based, gender differences in overall rates of exposure disappear. These results suggest that the interpersonal context in which trauma occurs tends to differ for men and women, and thus should be taken into account when describing gender differences in trauma exposure. In addition, these results point to the need for inclusion of high betrayal events in definitions of trauma, if such definitions are to be gender equitable.

Women also reported more exposure to neglect and household dysfunction than did men. Although no specific predictions were made regarding neglect and household dysfunction, this result is not surprising. Consistent with these findings, one prior study found that in a community sample, women reported more exposure to household dysfunction and emotional neglect than did men, although the statistical significance of these differences was not reported (Dong, Anda, Dube, Giles, & Felitti, 2003). Exposure to childhood neglect and household dysfunction has also been shown to correlate with exposure to other forms of childhood trauma, including emotional, physical, and sexual abuse (Dong et al., 2004). Childhood abuse is often perpetrated by a family member, and

women report exposure to more traumas perpetrated by close others, such as family members. It appears that neglect and household dysfunction and high-betrayal traumas may occur in similar relational contexts, and that female gender is a risk factor for exposure to trauma in such contexts.

As predicted, Native Hawaiians reported more trauma exposure than higher status groups, including Caucasians, Japanese Americans, and Chinese Americans. However, contrary to prediction, other lower status groups (Latinos, Filipino Americans) did not report more trauma exposure than higher status groups, and Native Hawaiians also reported more exposure than Filipinos, a lower status group. Interpretation of ethnic group differences in trauma exposure is complicated somewhat by unequal sample sizes, and associated larger standard errors in some ethnic groups than others. In particular there were relatively few Latinos in the current study (n = 23). Thus although it appears that Native Hawaiians have more exposure to traumas lower in betrayal than Latinos, due to the small sample size and resultant large standard error, this difference is not significant. Similarly, it seems that Latinos in this sample may have more exposure than most groups but less exposure than Native Hawaiians to traumas high in betrayal, but due to the small sample size, differences were not detected.

Still, this discrepancy between predicted and observed outcomes requires interpretation. Overall, it seems that Native Hawaiians are at greatest risk for exposure to traumas both high and lower in betrayal, which is consistent with predictions. Native Hawaiians have low socioeconomic status compared with other groups in Hawaii, and also have historically been at greater disadvantage related to their status as a colonized

indigenous people. The fact that Native Hawaiians report more trauma exposure than Filipino Americans (who have similar socioeconomic status) points to the potential role of other factors in predicting trauma exposure. Income and educational attainment may not adequately capture the social status of an ethnic group, and other factors such as historical rights of self-governance and historical traumatization may relate to the likelihood of exposure to traumatic events (Mokuau & Matsuoka, 1995). While the current study was not designed to test this particular hypothesis, converging evidence from this and other studies of indigenous groups suggests the need to consider indigenous status when assessing ethnic group variation in exposure to traumatic events (Flett et al., 2004; Manson et al., 2005).

Ethnic group differences in exposure to neglect and household dysfunction showed a somewhat more complicated pattern. Chinese Americans reported the least exposure, followed by Japanese Americans, then Filipino Americans, and Caucasians, Latinos, and Native Hawaiians reported the most exposure to neglect and household dysfunction. It was expected that patterns of exposure to neglect and household dysfunction might mirror patterns for other types of trauma exposure, however this does not appear to be the case. Native Hawaiians did report more exposure than some other ethnic groups, consistent with prior research (Carlton et al., 2006), as well as with other reports of trauma exposure in the current study. However, Caucasian and Latino participants reported levels of exposure similar to Hawaiians. Elevated exposure among Latinos is consistent with the prediction that lower status groups would report more

trauma exposure compared with dominant groups, and may also be consistent with elevated high-betrayal trauma exposure in this study (though the difference between Latinos and other groups was non-significant for high-betrayal trauma exposure).

Inconsistent with general predictions about trauma, as well as patterns for other types of trauma exposure, was the elevated rate of exposure to neglect and household dysfunction among Caucasians. Some might argue that cultural differences in responding impacted results, such that Japanese American and Chinese American participants reported less exposure to neglect and household dysfunction, making it appear that Caucasians reported higher levels of exposure in comparison. However, although cultural differences in labeling experiences as abuse have been observed (Lau et al., 2006), the items assessing neglect and household dysfunction in this study were behaviorally defined, and did not use labels such as “neglect” and “abuse.” Research has shown that when neglect is behaviorally defined, socially desirable responding does not appear to have an impact on reporting either among European- or Asian-ancestry participants (Meston, Heiman, Trapnell, & Carlin, 1999). In fact, some research has found that rates of neglect tend to be lower among Caucasians than other ethnic groups (Meston et al., 1999). Thus the finding that Caucasian participants in this study report higher levels of exposure to neglect and household dysfunction remains puzzling.

Finally, consistent with predictions, gender differences in high-betrayal and lower-betrayal traumas were not observed among Native Hawaiians, while they were observed for non-Hawaiian participants. This does not appear to be an artifact of the smaller sample size for Hawaiians compared with non-Hawaiians, as sample size in the

Hawaiian group was still large enough (n = 151) to detect small to moderate gender differences had they existed. This result is consistent with prior research that finds no gender differences, or smaller gender differences compared with Caucasians, in trauma exposure in indigenous populations (Flett et al., 2004; Manson et al., 2005). General findings for trauma exposure by gender and ethnic group are summarized in table 25.

Table 25. Groups Reporting More (+) and Less (-) Exposure than Other Groups

	Lower Betrayal Traumas	High Betrayal Traumas	Neglect and Household Dysfunction
Gender			
Men	+	-	-
Women	-	+	+
Ethnic Group			
Japanese	-	-	-
Chinese	-	-	-
Caucasian	-	-	+
Native Hawaiian	+	+	+
Latino			+
Filipino	-	-	

Associations Between Trauma Exposure and Physical and Mental Health Symptoms

Exposure to trauma was significantly associated with more mental health symptoms on all symptom measures used in this study. Traumas high in betrayal and neglect and household dysfunction each uniquely predicted variance in symptoms of anxiety, depression, and sleep disturbance, while traumas lower in betrayal did not. However, for symptoms of dissociation and PTSD, all three types of exposure (high

betrayal, lower betrayal, neglect and household dysfunction) predicted unique variance when controlling for the other types. This pattern remained when controlling for gender, educational attainment, and employment status.

This pattern of results suggests that neglect and household dysfunction as measured in the current study are similar to trauma high in betrayal in terms of symptom prediction. Neglect and household dysfunction, by definition, involve family members or other household members, and thus are likely to occur in the context of close interpersonal relationships. Given this, it is not surprising that such events would function similarly to high betrayal traumas. However, because each is uniquely predictive of symptoms, it also suggests that measurement of these two types of exposure is not redundant. These results are consistent with the speculation that neglect and household dysfunction are indeed traumatic, and points to the utility of understanding these events as betrayal-based, rather than fear-based, traumatic stressors.

The fact that traumas lower in betrayal were predictive of some but not all mental health symptoms supports the distinction between fear-based and betrayal-based traumatic stressors. While traumas high in betrayal and neglect and household dysfunction seem to be general risk factors for the development of mental health symptoms, traumas lower in betrayal appear to be predictive of more specific symptom presentations including PTSD and dissociation. Symptoms specifically associated with both PTSD and dissociation include intrusive symptoms, such as flashbacks, and symptoms of emotional numbing. These are among the hallmark symptoms of PTSD, and have been hypothesized to occur due to fear-based psychological disturbances following

trauma (Riggs et al., 2006). Research related to PTSD has primarily focused on combat trauma, motor vehicle accidents, and stranger sexual assault (Tolin & Foa, 2008), which all fall into the category of traumas lower in betrayal. Importantly, high betrayal traumas also predicted unique variance in PTSD and dissociation, suggesting that while fear-related traumas are more specifically related to these symptoms, these symptoms are not specific to fear-related traumas.

Associations between trauma and physical health functioning also differed for different types of trauma exposure. Exposure to traumas high in betrayal was predictive of poorer self-rated health, while exposure to lower betrayal traumas was associated with greater healthcare utilization, and neglect and household dysfunction did not predict variance in either measure of health functioning when controlling for other types of trauma exposure. The association between high betrayal trauma and poorer health was consistent with predictions. However, it was also hypothesized that trauma high in betrayal would be more predictive of healthcare utilization than lower betrayal traumas, but the opposite effect was observed.

It is not surprising that traumas lower in betrayal would be associated with increased healthcare utilization. A number of studies have documented that exposure to trauma such as combat and physical assault is associated with increased visits to healthcare providers (Green & Kimerling, 2004; Grubaugh et al., 2005). However, it is somewhat surprising that traumas high in betrayal were not predictive of healthcare utilization. Prior research has found that a history of childhood sexual abuse, which is most often perpetrated by family members and is thus usually a trauma high in betrayal,

is associated with increased healthcare utilization (Sickel, Noll, Moore, Putnam, & Trickett, 2002; Suris, Lind, Kashner, Borman, & F. Petty, 2004). However, these prior studies did not specifically report on the perpetrator-victim relationship, and thus it is possible that the current results are not inconsistent with findings in other samples.

In addition, prior studies have often been limited to female participants. Overall, women report more healthcare utilization than men, and women report more trauma high in betrayal. It is possible that the relationship between trauma and healthcare use differs for men and women. However, post-hoc analyses revealed that in the current sample, the patterns of association between trauma exposure and healthcare utilization were the same for men and women. More research specifically assessing closeness of relationship between victim and perpetrator is necessary to determine whether traumas high in betrayal are generally associated with healthcare utilization.

It was also somewhat surprising that exposure to neglect and household dysfunction was unrelated to measures of physical health functioning in this study. In particular, given that mental health symptoms were consistently predicted by neglect and household dysfunction, it is surprising that physical health outcomes were not. There is very little if any research assessing the independent contribution of neglect and household dysfunction to symptoms (either mental or physical), and thus more research is needed on this topic to draw definitive conclusions.

Health trajectories were measured by assessing changes in self-rated health over the course of the five waves of data collection in this study. In general, participants in this study rated themselves as becoming less healthy over time. This finding is expected,

given that participants are now in their fifties, a time in life when health problems begin to surface for many people. It is expected that past middle age, for most people health declines over time. As predicted, exposure to traumas high in betrayal predicted poorer self-rated health. Contrary to predictions, greater exposure to trauma predicted a slower decline in health status over time, as compared with no exposure or less exposure. At first glance, this appears to suggest that trauma exposure is protective against declining health; however closer examination contradicts this claim. Participants with the least trauma exposure still report better health at wave five than participants with the most trauma exposure report at wave one. Thus even considering slower rate of health decline, participants with more trauma exposure rate their health as poorer overall than those with less exposure. The apparent slower rate of decline may be an artifact of disparate initial ratings—that is, if a participant has poor health to begin with, there is less room to get worse, whereas when beginning in relatively good health, there may be more room for aging to impact health. Overall, exposure to traumas high in betrayal has a negative impact on self-rated general health.

Associations Between Gender, Ethnicity, and Symptoms

Women reported more symptoms of depression, anxiety, dissociation, and sleep disturbance than did men in this sample. These gender differences are consistent with differences observed in other samples, and with higher rates of diagnosis for mood and anxiety disorders in women than men (Harvard School of Medicine, 2007). Counter to predictions, no gender differences were observed in PTSD symptoms. This is surprising

given that one meta-analysis found that across 52 studies, regardless of methodology women were consistently more likely than men to meet criteria for a diagnosis of PTSD (Tolin & Foa, 2008). The current study did not assess diagnostic status, but did use a measure of PTSD symptoms based directly on diagnostic criteria. Scores on this measure are highly predictive of meeting criteria for diagnosable PTSD (Norris & Hamblen, 2004). Thus a lack of gender difference is surprising, particularly when gender differences in other symptoms were observed in the expected direction. This lack of difference does not appear to be accounted for by ethnic group variation in symptoms, as gender differences were not observed even in ethnic groups where they have been seen in the past (e.g., Caucasians).

Variation in symptoms among ethnic groups was observed, and these differences were mostly consistent with predictions. In general, it was expected that Native Hawaiians and other lower status ethnic groups would report more symptoms than higher status ethnic groups. Slightly different patterns of results were observed for each symptom measure, but Native Hawaiians and Latinos generally reported more symptoms than Japanese Americans, Caucasians, and Chinese Americans, and Filipino American participants fell somewhere in between. In no cases did higher status groups report more symptoms than lower status groups, and in all cases of significant differences, lower status groups reported more symptoms.

While these results are mostly consistent with predictions, there are some discrepancies between predictions and findings. Marginally significant ethnic group differences in PTSD symptoms were observed, with Latino participants reporting more

symptoms than Caucasian and Japanese American participants. This is consistent with prior research in the mainland U.S., where Latinos consistently report higher rates of PTSD (Pole et al., 2008). However, prior research in Hawaii assessing PTSD in Vietnam veterans found that Caucasians reported higher rates of PTSD than Japanese Americans (Friedman et al., 2004), but this finding was not replicated in the current study. This may point to differences between community samples and veteran samples in the ethnic distribution of PTSD in Hawaii.

In addition, it was hypothesized that Filipino Americans, as a lower status group, would report more symptoms than higher status groups. However, Filipino Americans did not differ significantly from any other ethnic group on any measure of mental health symptoms. This lack of difference may relate partially to pronounced gender differences in symptoms between Filipino American men and women. While men in this ethnic group report relatively low levels of symptoms (as low as or lower than men in higher status groups in most cases), women generally report far higher symptom levels. The gender differences in symptoms for Filipino Americans were more consistent and larger than gender differences in any other ethnic group. It may be the case that gender relations play an important part in determining symptoms, or that the social status of Filipino American men differs from that of Filipino American women. As an example, Filipino women report lower income than any other group, while Filipino men have income levels similar to other lower status men, and higher than women from nearly all ethnic groups. Thus ethnicity and gender may need to be considered simultaneously to fully interpret patterns of differences in symptoms and their associations with socioeconomic status.

Several gender by ethnicity interactions in the prediction of symptoms were observed. There was a marginally significant interaction for sleep disturbance symptoms, and significant interactions for anxiety and depression symptoms. For other symptom measures there were no significant interactions, but gender differences in symptom patterns did appear to differ among ethnic groups. Looking at depression symptoms measured by the CESD, an interesting pattern emerged in which men reported more symptoms than women among Chinese American and Latino participants, while women reported more symptoms than men for other ethnic groups, though gender differences were quite small for Native Hawaiian and Japanese American participants. Upon closer examination of the data, it appears that this gender reversal in symptoms may be partially explained by small samples and unequal cell sizes in the Latino group. The CESD was completed by fewer participants than were other symptom measures, and data were available for only 4 Latino women and 9 Latino men. Thus the contribution of Latino participants to this observed interaction cannot be treated as reliable in this case.

However, the reversed gender difference (men reporting more symptoms than women) in the Chinese American participants is also present for PTSD symptoms and dissociative symptoms, and there are no large gender differences for Chinese American participants on any other measure. It appears that Chinese American participants show a different pattern of gender differences in symptoms than other ethnic groups in this sample. This pattern was not expected, and is inconsistent with findings from other studies of mental health in Chinese American populations, which tend to find that women have more symptoms and risk factors for symptoms than men (Tsai, Ying, & P. A. Lee,

2001). However, it was the case that Chinese American men reported more exposure to neglect and household dysfunction than Chinese American women in the current study. Chinese Americans were the only ethnic group with this pattern of exposure, as women reported more exposure in all other ethnic groups. Since neglect and household dysfunction were predictive of symptoms, this may explain the observed gender differences in symptoms. It is unclear why this pattern emerged in this sample, and further research is needed to determine whether this is a spurious finding.

In examining the gender by ethnicity interactions for anxiety and sleep disturbance symptoms, it appears that differences relate to the magnitude rather than direction of gender differences. For anxiety symptoms, women report more symptoms than men for nearly all ethnic groups, though the size of the difference is largest among Filipino Americans, with Caucasians and Native Hawaiians also showing large gender differences compared with other groups. For sleep problems, most ethnic groups show no gender differences in symptoms, while gender differences are present for Caucasians and Filipino Americans.

Gender by ethnicity interactions in predicting mental health symptoms were not consistent with predictions in any case. While it was predicted that lower status ethnic groups would report fewer gender differences in symptoms, ethnic group social status did not appear to relate to the size or direction of observed gender differences. Ethnic group variation in gender differences in mental health symptoms may be predicted by other

factors such as cultural differences in gender role socialization. The current study was not designed to examine such factors, and further research is needed to untangle the relations between gender, ethnicity, culture, and symptoms.

Gender differences in healthcare utilization were observed, and were in the predicted direction, with women reporting more physician visits than men. Contrary to predictions, gender was not associated with self-rated health in direct comparisons. While it was predicted that women would report poorer health than men, this lack of difference is not entirely inconsistent with prior research. Although many previous studies have found that women report worse self-rated health than men, others find no overall gender differences in health ratings (Gorman & Jen'nan Ghazal Read, 2006; Muhajarine & Janzen, 2006). However, gender differences did appear when controlling for trauma exposure, work status, and educational attainment, such that men had poorer self-rated health on average than did women. This finding is consistent with prior research in which women reported poorer health on average, but when men and women had similar access to socioeconomic resources men reported worse health than women (Gorman & Jen'nan Ghazal Read, 2006).

In partial support of predictions, Caucasian participants reported better average self-rated health than Native Hawaiian, Latino, and Filipino participants, and Chinese Americans also reported better health than Native Hawaiian and Latino participants. However, contrary to prediction, Caucasian participants reported better health than Japanese Americans (another higher status group). Prior research finds that Asian Americans report better self-rated health than Caucasians, however these studies

frequently do not distinguish among different groups within the large category “Asian American,” (McGee et al., 1999). Thus although this finding is contrary to predictions, it is unclear whether it is inconsistent with previous research. Additionally, Japanese Americans did not report significantly better health than lower status groups. However, although health differences between Japanese Americans and lower status groups did not reach statistical significance, mean differences were in the expected direction. Thus while these results do not add statistical support to expected findings, they also are not contrary to predictions.

No significant gender by ethnicity interactions were observed in the prediction of self-rated health or healthcare utilization. Not controlling for other factors, gender differences in self-rated health were consistently small across ethnic groups. Gender differences in healthcare utilization were consistently in the direction of women reporting more physician visits, and were relatively similar in size across ethnic groups.

Trauma, Symptoms, and Social Resources

Educational attainment was significantly associated with self-rated health over time, such that controlling for trauma exposure, self-rated health started lower and declined more rapidly for participants with less education. This is consistent with predictions and previous research, demonstrating that access to social resources (in this case education) is a significant predictor of poorer health (Adler & Rehkopf, 2008; Gorman & Jen'nan Ghazal Read, 2006).

When controlling for trauma exposure (traumas high and lower in betrayal, and neglect and household dysfunction) and gender, lower educational attainment predicted more symptoms of PTSD, depression, dissociation, and anxiety, and worse average self-rated health. Similarly, being employed for pay predicted fewer symptoms of PTSD, depression, anxiety, and sleep disturbance, and better self-rated health. Importantly, educational attainment and employment status are each uniquely predictive of symptoms, above and beyond the predictive power of gender and trauma exposure. These results are consistent with predictions, and suggest that access to socioeconomic resources is significantly associated with better physical and mental health.

Contrary to predictions, it was found that ethnic group social status was not associated with symptoms when controlling for trauma exposure, gender, and personal socioeconomic variables. One exception to these findings was in the prediction of PTSD symptoms, but this difference was opposite the expected direction—higher status groups had more PTSD symptoms than lower status groups controlling for person-level variables. The finding that higher status groups report more PTSD symptoms controlling for other factors may suggest that additional factors, unassociated with socioeconomic status, contribute to PTSD symptoms in this sample. For example, prior research has suggested that age at time of trauma (young or elderly), and less functional coping styles predict likelihood of developing PTSD (Briere & Scott, 2006).

In general, these results suggest that there is no direct effect of ethnic group status on symptoms in most cases, and that personal access to resources better predicts symptoms than ethnic group status. In most cases, ethnic group variation in symptoms

was observed initially, but when controlling for person-level variables (trauma exposure, educational attainment, employment status) there no longer remained significant ethnic group variation in symptoms. This suggests that these person-level factors explain most observed ethnic group variability in symptoms.

Finally, the prediction that relationships between trauma and symptoms would be strongest in lower status groups was generally not supported for measures of mental health symptoms. There did not appear to be significant variation between ethnic groups in the relationship between trauma and mental health symptoms. In general, exposure to trauma predicted symptoms equally across ethnic groups.

However, this was not the case for average self-rated health. Trauma exposure was more strongly associated with poorer health among Filipino Americans and Native Hawaiians. Controlling for educational attainment and employment status, trauma exposure was not a significant predictor of self-rated health for Caucasian, Japanese American, Chinese American, and Latino participants, but was significantly predictive of poorer health ratings for Native Hawaiians and Filipino Americans. This result is generally in the predicted direction, however given that Latinos are a lower status group it would have been expected that they also would report stronger associations between trauma exposure and health status. The relatively smaller sample size and greater variability in responding for self-rated health among Latino participants complicates the interpretation of this finding. However, it appears that Native Hawaiian and Filipino

Americans may be at increased risk of poor self-rated health following trauma exposure, particularly for traumas high in betrayal. General results for all predictors of physical and mental health measures are summarized in table 26.

Table 26. Direction of Significant Associations Between Predictors and Outcomes

	PTSD (PCL-C)	Depression (CESD)	Depression (TSC)	Anxiety (TSC)	Dissociation (TSC)	Sleep Problems (TSC)	Self-Rated Health
Lower Betrayal Traumas	+				+		
High Betrayal Traumas	+	+	+	+	+	+	-
Neglect and Household Dysfunction	+	+	+	+	+	+	
Educational Attainment	-	-		-	-		+
Employment for Pay	-	-	-	-		-	+
Ethnic Group Status	+						
Gender							
Male			-	-			-
Female			+	+			+
Ethnic Group							
Japanese	-[a]		-	-	-		-
Chinese				-	-	-	+
Caucasian	-[a]	-		-	-		+
Native Hawaiian			+	+	+		-
Latino	+[a]	+		+	+	+	-
Filipino							-

[a]Association is moderate but not statistically significant

Implications

Findings in this study have implications for prevention, intervention, and research in the area of trauma and posttraumatic symptoms with diverse samples. The relevance of these results can be summarized with three main arguments. First, definitions of trauma must include events that occur across relational contexts if they are to be gender equitable and most predictive of symptoms. Second, gender and ethnic group differences in symptoms are best explained by differential trauma exposure and differential access to educational and economic resources. And third, prevention and intervention efforts must address both trauma exposure and social context, as each is implicated in the presentation of symptoms.

The inclusion of high betrayal events in definitions of trauma gains support from the current findings. Exposure to traumas high in betrayal reliably predicts a variety of posttraumatic symptoms, and in most cases does so more strongly than traumas lower in betrayal. Current criteria used in the DSM to define traumatic events, as part of the PTSD diagnostic criteria, focus on fear-based traumas and fail to include betrayal-based events. The current findings are consistent with suggestions that these criteria need to be revised (L. S. Brown & Freyd, 2008). Because women report more high betrayal traumas whereas men report more lower betrayal traumas, the inclusion of high betrayal events in definitions of trauma serves to legitimize women's posttraumatic symptoms. Excluding high betrayal events, it may appear that women report more symptoms in the face of less trauma. This has the effect of pathologizing women's symptoms, as important causal

information is hidden. Thus it is important for future work on the relationship between trauma exposure and symptoms to use more inclusive definitions of trauma, such as were used in the current study.

Related to this, neglect and household dysfunction serve as predictors of posttraumatic symptoms, and thus the inclusion of such chronic acts of omission in definitions of traumatic stress is also supported. These events function similarly to high betrayal traumas in the prediction of mental health symptoms, and thus it seems that these events may be best classified along with high betrayal traumas. However, more research is needed to tease apart which aspects of neglect and household dysfunction can best be classified as traumatic. The current study used only a few questions to assess many potentially traumatic events in this category, making it impossible to distinguish the impact of individual types of events. In general though, it is noteworthy that reporting exposure to neglect and household dysfunction was consistently predictive of mental health symptoms, even given the limitations of the questions used. It seems important to continue to assess these events, and include them in future trauma research.

This research supports differential trauma exposure and social context theories in the explanation of gender and ethnic group differences in posttraumatic symptoms. For nearly all symptom measures, trauma exposure and personal socioeconomic resources best explained ethnic group variation in symptoms. If cultural differences better explained symptom differences, it would be expected that significant between-group variance would remain when controlling for trauma exposure and socioeconomic resources, and this was not the case in the current study.

The current research also does not support essentialist views of ethnic group variation in symptoms. Essentialism refers to the idea that characteristics of individuals are natural and immutable, and that category distinctions and observed differences among categories are inherently real rather than socially constructed (Hollander & Howard, 2000; Jayaratne et al., 2009). From the essentialist viewpoint, it is assumed that characteristics differ based on genetics, or that "essential" and unchangeable qualities of cultural groups lead to variation. In the current study, it seems that adverse experiences and the contexts in which they occur are more important to understanding physical and mental health symptoms than are supposed deeply ingrained characteristics of individuals of different cultural backgrounds.

This is highly important for prevention and intervention efforts. Essentialist views of ethnic group variation tend to lead researchers to ignore social context and social inequality, which may have important implications for the treatment of psychological distress (Hollander & Howard, 2000). For example, the assumption that one is at greater risk of symptoms due to genetic vulnerability in one's ethnic group, or due to deficits in the culture of that group, would likely lead to different prevention/intervention strategies than would working from the assumption that social inequality is the greater risk factor. The first approach would more likely lead to pathologizing symptoms in the individual or cultural group, while the second locates the problem in larger social structures. With the understanding that social context and access to resources are important, change strategies can be directed toward personal and social activism, as opposed to passive acceptance.

Prevention of trauma and symptoms, as well as interventions following exposure and development of symptoms, must incorporate information about the social contexts in which these events occur. While therapeutic interventions to address trauma may lessen symptoms, such interventions are likely less effective if lack of access to resources is not addressed, and the reverse is likely also true. Similarly, efforts at preventing trauma exposure must take into consideration the role that lack of access to resources plays in violence perpetration, potential for accidental injury, neglect, and other traumatic events.

Limitations and Future Directions

The current study has several limitations that support cautious interpretation of some results. First, unequal sample sizes for different ethnic groups at times made interpretation of results difficult. It is unclear, for example, whether findings for Latinos in this study were as reliable as findings for other groups with more participants, and some differences in comparisons between Latinos and other ethnic groups may not have been detected. Ethnic group and social stratification in Hawaii differs from that of the mainland U.S., and thus findings about specific ethnic groups in this study may not generalize to the same groups in other populations. Similarly, a specific age cohort was used in the current study, and thus results may not generalize to other age groups.

The classification of some events as high betrayal versus lower betrayal on the BBTS poses challenges due to relatively vague wording of some items. Specifically, items that ask about witnessing attacks leave open to interpretation the identity of the perpetrator of the attack and the victim of the attack, as well as the motivation for the

attack. The item is worded, “Witnessed someone with whom you were very close deliberately attack another family member so severely as to result in marks, bruises, blood, broken bones, or broken teeth.” This item is meant to probe for family violence, but it is possible that in this scenario that the “attacker” is acting in protection of the respondent, or in self-defense, and thus it may be problematic to classify this as a high betrayal event. However, such protective attacks are likely uncommon relative to the common occurrence of family violence (Kendall-Tackett, 2004). Given probable base rates of each type of attack, it seems more likely that a person would endorse witnessing this type of attack as a result of witnessing family violence. Even if the attack was protective or in self-defense, the way the question is worded it implies that violence occurred between family members, which in most cases involves events high in betrayal.

This study relied entirely on self-report measures, and in such cases biased responding cannot be ruled out. Some participants may have been more likely to respond affirmatively to questions than others, and reports from some participants may have been biased by patterns of socially desirable responding. Biased responding is unlikely to have affected some results however. For example, it is unlikely that observed gender differences in trauma reporting are related to biased responding, as men and women reported similar rates of trauma exposure overall. While types of trauma exposure differed for men and women, neither group was more likely to endorse exposure to events in general. Past research has found that while research participants are generally

prone to underreporting exposure to traumatic events (L. M. Williams, 1994), socially desirable responding does not appear to affect reports of trauma exposure when traumatic events are behaviorally defined, as was the case in the current study (Meston et al., 1999).

Finally, the design of the current study was entirely correlational in nature. Thus it is not possible to determine causality in the associations among trauma exposure, socioeconomic resources, and symptoms. While the analyses in this study treated symptoms as dependent variables, under the hypothesis that exposure to trauma and fewer resources cause symptoms to develop, it is entirely possible that causality is far more complicated. For example, mental and physical health symptoms may lead to problems completing education and obtaining work, and may lead to poor decisions which put an individual at risk for exposure to trauma. Similarly, lack of education and few financial resources are likely to lead to living conditions that increase risk for trauma exposure, and living in such conditions may create difficulties with completing future education and finding work. Indeed, it is likely that all these pathways are bidirectional. While causality cannot be determined, this does not change the general implications of this research—trauma, social resources, and symptoms all relate, and to fully understand one of these topics it is important to address the others.

The results of this study suggest several directions for future research. First, examination of neglect and household dysfunction as traumatic stressors may prove important to fully understanding the role of trauma in predicting symptoms and healthcare utilization. Future studies will help to determine whether certain events and types of neglect and household dysfunction are best classified as traumatic, and whether

such events can be considered high in betrayal. Future research should also continue to examine the role of victim-perpetrator relationship in predicting posttraumatic symptoms, and to do so across a variety of ethnic groups. If patterns of exposure observed in this study are replicated by future research, it will be worth examining why some results were counter to predictions in some cases.

The inclusion of additional cultural information in future research may help explain puzzling findings in the current study. For example, information about gender relations within different cultures may help to explain some of the variation in how gender relates to exposure and symptoms across ethnic groups. In addition, cultural risk and protective factors may explain why some lower status groups reported fewer symptoms than other lower status groups, and why, for example, Caucasian participants reported higher rates of neglect and household dysfunctions compared with other higher status groups.

Similarly, collecting more detailed information about access to social resources would strengthen claims regarding the role of resources in predicting symptoms. While educational attainment and employment status were predictive of symptoms, so might be other factors such as actual income, other tangible resources, and availability of social support. In addition, personal factors such as coping styles and health behaviors might also add to prediction of symptoms. It would be interesting to examine the relative contribution of each of these variables in determining outcomes, and the degree to which they are interrelated.

Multiple methods of data collection would be useful in determining whether findings from the self-report data in this study are reliable. Interviews and structured examinations might corroborate findings from self-report measures. Obtaining qualitative data related to participants' perspectives on how access to social resources impacts trauma exposure and symptoms might also yield insights into these questions. Finally, prospective longitudinal analyses of large numbers of participants might help untangle the directionality (or bidirectionality) of causal relationships between trauma exposure, access to social resources, and symptoms.

Conclusion

This study adds new information about the prevalence of traumatic stress and mental health symptoms across ethnic groups in Hawaii. In addition, this study provides preliminary information on the independent contribution of neglect and household dysfunction to the prediction of symptoms, and begins to examine how such events might be classified with other forms of trauma. Results suggest that gender and ethnic group variation in symptoms is mostly accounted for by trauma exposure and access to socioeconomic resources. Prevention and intervention efforts should incorporate social context factors when considering the impact of traumatic stress.

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