RELATING TRAUMATIC STRESS TO HOPELESSNESS AND RISK BEHAVIORS AMONG AFRICAN AMERICAN ADOLESCENTS LIVING WITHIN HIGH POVERTY COMMUNITIES

by

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A THESIS

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While most are familiar with PTSD due to combat, few realize individuals growing up in communities with high poverty and high crime often experience tragedy to the degree which PTSD occurs. Although adolescents are often not the perpetrators of violent acts, adolescents still bear the strain of living in an environment where there is a constant threat of serious injury to themselves and/or to people they hold dear. By probing the relationship between traumatic stress and risk behavior such as drug abuse, fighting, weapon use, and risky sexual behaviors, policy makers and community leaders will have a better understanding of the beliefs and attitudes behind negative behaviors in traumatized adolescents and therefore be able to identify appropriate tools to combat deviant adolescent behavior.

The purpose of this study is to relate traumatic stress to risk behaviors and hopelessness among African American children adolescents in high poverty communities in Mobile, AL. It uses data collected between 1998 and 2005 as part of the Mobile Youth Survey (MYS), a community-based, multiple cohort longitudinal study of mainly African American adolescents growing up in extremely impoverished neighborhoods in the Mobile Alabama.

The linear mixed model analysis revealed that traumatic stress was a statistically significant predictor of the development variables hopelessness (p<0.001) and self worth (p<0.001), and the psychosocial variable worry (p<0.001). For violent risky behaviors,
traumatic stress was a statistically significant predictor for carrying a gun or knife 
(p<0.01), weapon brandishment (p<0.01), and fighting (p<0.01), but did not predict 
weapon usage. No statistically significant differences were found for sexual activity, 
marijuana, tobacco, cocaine, or alcohol usage. Surprisingly, being the victim of violence 
did not predict traumatic stress, but instead was predicted by witnessing violence 
(p<0.05). The study findings underscore the importance of intervention programs arming 
participants with skills to understand their cognitive response to trauma, and how these 
responses can be internalized in the form of hopelessness, lack of self worth, and worry, 
and be externalized in the form of increased engagement in violent behavior.

Key words: traumatic stress, risk behaviors, high poverty communities, African 
Americans, adolescents
ACKNOWLEDGMENTS

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INTRODUCTION

Post traumatic stress disorder (PTSD) is often associated with war veterans who have firsthand experience with tragic events, such as violence, death, roadside bombs, improvised explosive devices (IEDs), and the handling of human remains. Diagnostic symptoms for PTSD include re-experience in the form of flashbacks or nightmares, avoidance of stimuli associated with the trauma, as well as trouble sleeping, hyper vigilance and anger (DSM). While most are familiar with PTSD due to combat, few realize individuals growing up in communities with high poverty and high crime often experience tragedy to the degree which PTSD occurs (Alim, Charney & Mellman, 2006). Many African Americans living in high crime, high poverty communities chronically experience trauma at the level that causes PTSD (Alim, Charney & Mellman, 2006). Instead of the threat of injury or death during a routine patrol through a neighborhood in a foreign county, the threat may be getting killed or injured by a stray bullet while walking home from school (Thompson & Massat, 2005). Although children are often not the perpetrators of violent acts, children still bear the strain of living in an environment where there is a constant threat of serious injury to themselves and/or to people they hold dear (Bolland, Lian & Formichealla, 2005).

While the literature on combat-related PTSD is fairly extensive (Elhai et al., 2007; Koenen, Stellman, Dohrenwend, Sommer, & Stellman, 2007), the literature concerning non-combat related PTSD is limited. Thompson and Massat (2005) found that children
with symptoms of PTSD had lower levels of academic achievement than children without PTSD. While a few researchers have investigated the link between PTSD and risk behaviors, only a couple of researchers have examined the link between risk behavior and hopelessness. Hopelessness according to Bolland (2003) is a pervasive feeling of not being able to change your current and future circumstances. Bolland (2003) found that youths with high levels of hopelessness were more likely to engage in risky behaviors.

Below is a brief review of the current literature covering traumatic stress, hopelessness, and adolescent risk behavior.

**Traumatic Stress and Posttraumatic Stress Disorder**

*Racial Differences in Posttraumatic Stress Disorder*

Before looking at PTSD and hopelessness among adolescents, we will investigate if researchers have found racial differences in posttraumatic stress. Adams and Boscarino (2005) found no significant relationship between race and prevalence of PTSD, PTSD severity, or physical health among whites, African Americans, Dominicans, Puerto Ricans and other Hispanic groups following the terrorist attacks in New York City. Langley and Jones (2005) researched adolescents after a wildfire in Central Florida and also found no significant relationship between race and prevalence or severity of PTSD symptoms.

Several researchers have found contradictory results about the association between race and PTSD. Perila, Norris and Lavizo (2005) found that ethnic groups differed strongly in the prevalence of PTSD following Hurricane Andrew, and acculturation factors did not account for observed ethnic differences in coping effectiveness. The sample was equally distributed by racial and gender categories. The
authors found that 38% of Latinos, 23% of African Americans and 15% of whites displayed symptoms of PTSD. Therefore, using this example, minorities may experience PTSD at a higher prevalence than their white counterparts.

Lincoln, Chatter and Taylor (2003) considered if social support could predict which racial group is more susceptible to PTSD. The authors focused on social relationships because of the widespread recognition that social relationships are consequential for health, although not much is know about how social support impacts mental health during traumatic events. Structural equation modeling revealed that social support did not mediate the effects of traumatic events and financial strain on psychological distress in either racial group.

Seng, Kohn-Wood and Odera (2005) investigate if the inconclusive results concerning PTSD differences in racial groups could be due to under or over diagnosis. Using logistic regression analysis, the authors found that African American women were under diagnosed with PTSD. These results could help explain why researchers have found contradictory results about racial differences in PTSD. The results of statistical test can only be as valid as the input data.

**PTSD Among Adolescents**

After looking at the major studies discussing racial differences in PTSD prevalence, we will turn our focus specifically on PTSD prevalence and coping strategies among African American adolescents. Okaundaye (2004) investigated how drug trafficking and the violence and traumatic events surrounding the drug trade impacted PTSD symptomatology among adolescents living in drug infested inner-city communities. The purpose of this qualitative study was to explore post-traumatic stress
outcomes, prevention and intervention needs of 20 African American youths between the ages of 11 and 17 from three housing projects with heavy concentrates of drug trafficking. Okundaye (2004) found that most of the study participants were readily able to describe several incidents of drug related violence. Participants also could recall several incidences of the tragic deaths of neighborhood friends and family members caught in middle of drug trafficking activities and how these traumatic events caused chronic fear and despair in daily activities. The author’s findings highlight the need for strategies for managing and alleviating PTSD.

**Strategies for PTSD Management**

Several researchers consider possible strategies for PTSD management and minimization. Overstreet, Dempsey and Graham (1999) examine how adolescents exposed to chronic community violence, either through witnessing or victimization, are at increased risk for developing a number of internalizing symptoms, including, PTSD, generalized anxiety, depression, and suicidal ideation. The purpose of this study was to determine whether availability of family support moderates the negative impact of exposure to chronic community violence on internalizing symptoms among African American adolescents. Regression analysis found that family support moderated the relationship between violence and depressive symptoms, but not the relationship between violence and PTSD symptoms.

A study by Paxton, Robinson, Shah and Schoeny (2004) also looked at the role of family support in moderating the relationship between violence victimization and PTSD symptoms by examining the relationship between exposure to violence and psychological distress (PTSD and depressive symptoms) within a sample of African American male
adolescents in an inner-city Midwestern public high school. The authors found that exposure to violence was significantly associated with depression and PTSD symptoms, however, social support did not moderate the relationship between exposure to community violence and psychological distress.

Although family support was not found to be a feasible moderator in the pathway between exposure to community violence and PTSD, other authors analyzed other potential protective factors. Richard et al (2004) found that more time in unstructured and unmonitored environments and less time in monitored family contexts was related to more exposure to violence, delinquent behavior, and symptoms of PTSD. Another group of authors look at whether personal coping style impacted the probability of displaying PTSD symptoms. Dempsey, Overstreet, and Moely (2000) examined the role of coping in the link between exposure to violence and post-traumatic stress disorder symptoms in African American children living in an urban environment. The authors found that avoidant coping strategies functioned as a protective mechanism from displaying PTSD symptoms.

**PTSD and Risk Behavior**

Although the preceding studies discuss potential strategies for managing PTSD, they do not directly consider how adolescents display their PTSD symptoms. Thompson and Massat (2005) utilized a descriptive-correlation cross-sectional research design to examine violence, PTSD, academic achievement and behavior of a group of urban, African-American school children. The authors found that the level of exposure to family violence was significantly related to levels of behavior problems and negatively related to school achievement, but not significantly related to PTSD.
Hopelessness

Hopelessness and Risk Behaviors

Several authors find that hopelessness is also a predictor for engagement in risk behaviors. Bolland (2003) investigates how hopelessness is displayed in adolescents’ lives. Using descriptive statistics and logistic regression in order to calculate odds ratio, the author found feelings of hopelessness were associated with most aspects of risk behavior, including violence, substance use, and risky sexual behavior. The odds ratios for risk behaviors differed significant between adolescents with low vs. high levels of hopelessness. These results suggest that health interventions must target hopelessness when designing effective prevention and intervention programs for inner-city adolescences in order to effectively target risky behaviors of those living within these types of neighborhoods.

Strategies for Hopelessness Management

Several authors consider potential moderators or mediators for alleviating hopelessness. Landis et. al. (2007) investigated the role of coping strategies between stressful life experiences and hopelessness among a sample of low-income urban youth. The authors found that coping strategies served as effective moderator among males, although the relationship was not significant for females. Bolland, Lian, and Formichella (2005) examined the role of neighborhood connectedness in the relationship between neighborhood poverty and feelings of hopelessness. The authors found that protective factors such as connectedness to neighborhood, mother figure, and religious beliefs led to decreases in hopelessness.
Research Questions and Approach

While a few studies have investigated the relationship between PTSD and risk behavior or the relationship between hopelessness and risk behaviors, no studies have considered the association between traumatic stress, hopelessness and risk behaviors. This study will use a longitudinal survey design to examine if the presence of traumatic stress in the previous year (time one – $T_1$) predicts engagement in risk behaviors or elevated levels of hopelessness in the following year (time two – $T_2$). We will investigate if traumatic stress is associated with the self worth, hope, and level of anger of the adolescent affected. Since the survey instrument does not diagnose PTSD, but gives a measure of anxiety and trauma, the findings will be discussed in terms of the non-medical term, traumatic stress. By probing the relationship between traumatic stress and risk behavior such as drug abuse, fighting, weapon use, and risky sexual behaviors, policy makers and community leaders will have a better understanding of the beliefs and attitudes behind negative behaviors in traumatized adolescents and therefore be able to identify appropriate tools to combat deviant adolescent behavior.

The purpose of this study is to relate traumatic stress to risk behaviors and hopelessness among African American children adolescents in high poverty communities in Mobile, AL. It uses data collected between 1998 and 2005 as part of the Mobile Youth Survey (MYS), a community-based, multiple cohort longitudinal study of mainly African American adolescents growing up in extremely impoverished neighborhoods in the Mobile Alabama metropolitan statistical area (MSA), although it also follows those youths as they move to other neighborhoods outside of the MSA. It was begun in 1998, with 1,774 participants. Since then, over 8,500 different adolescents
have participated in the MYS, although the results presented here are based on 7,095 adolescents interviewed between 1998 and 2005. Several questions will guide our research including:

- **Question 1.** How prevalent is traumatic stress among African American adolescence in high poverty neighborhoods?
  - 1A. How does traumatic stress relate to hopelessness among this study population?
  - 1B. How does traumatic stress relate to risk behaviors among this study population?

- **Question 2.** How does traumatic stress relate to violence exposure and victimization?
METHODS

Field Site Location, Procedures and Target Population

The statistics stated for the Mobile Metropolitan Statistical Area (MSA), census data, sampling method, and general study information can be found in Mobile Youth Survey Overview (Bolland, 2007). The MYS is conducted in Mobile and Prichard, Alabama. Mobile is a city of approximately 200,000 located on the Gulf coast and is the major city in the Mobile MSA, which has a population of nearly 540,258 people. In 2000, 46.1% of Mobile’s population was African American and 22.4% lived in poverty. Median household income was $31,445. Prichard, a city of nearly 30,000, borders Mobile on its north side; in 2000, 83.3% of the population was African American, and 44.1% lived in poverty. Median household income was $19,544.

The MYS was started in 1998 by sampling adolescents from 13 neighborhoods representing 23 block groups in 14 census tracts. The 2000 population in this area was approximately 23,500. Seven of the neighborhoods are public housing developments and the other six are non-public housing developments. Five of the neighborhoods are located in Prichard, and eight are located in Mobile. The targeted neighborhoods are overwhelmingly African American (95%), and over 98% of MYS participants are African Americans. The 2000 poverty rate in the 13 neighborhoods ranged between 31.5% and 81.4%, with a median poverty rate of 57.2%. The median rate of extreme poverty (i.e., <50% of the poverty rate) is 30.5%.

Recruitment of participants for the 13 MYS target neighborhoods was conducted using a combination of active and passive recruitment strategies. To accomplish this, half of the public housing units with adolescents, based on housing authority data, and half of
the residential units in non-public housing neighborhoods were selected from a census of addresses developed while walking through the neighborhoods. Field research interns knocked on doors of these active recruitment households, explained the MYS and invited 10-18 year old adolescents living in the household to participate, obtained parental consent, and scheduled a time for the participants to come to a community center (typically a school, a church, or a Boys and Girls Club) to be surveyed as part of a group survey administration. For the other, passive recruitment households, interns posted flyers about the survey around the neighborhood, inviting 10-18 year old adolescents from the neighborhood to participate (and providing a phone number to call for more information). If a resident of a passive recruitment household contacted an intern, either in the field or by phone, the intern went to their home and engaged them in the procedure used for the active recruitment households. If an eligible adolescent from a passive recruitment household came to the survey administration site, interns obtained parental consent then scheduled the adolescent for a time to be surveyed.

Each year after 1998, survey participants were actively and passively recruited to a new cohort of MYS participants in each of the MYS target neighborhoods. Previously MYS participants were also actively recruited, even if they had moved to a new addresses in Mobile County. By 2005, a total of 7,095 youths had been surveyed. Table 1 shows the initial size of each cohort, the number of respondents from each cohort who contributed one, two, three, four, five, six, seven, and eight data points. During the first eight years of the MYS, 4,304 (60.6%) respondents have been surveyed more than one time, with the mean number of annual waves of data for each study participant in 2003 equal to 2.28. Since 1998 the active recruitment response rate each year has hovered around 90%,
reflecting an increased awareness of and trust in the survey and the research team. Each participating youth received $15 per year for the hour that was required to complete the survey.

**Table 1. Mobile youth survey multiple cohort design**

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>New Cohort</th>
<th>Eight</th>
<th>Seven</th>
<th>Six</th>
<th>Five</th>
<th>Four</th>
<th>Three</th>
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<td>1,774</td>
<td>83</td>
<td>98</td>
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<td>173</td>
<td>238</td>
<td>259</td>
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<tr>
<td>1998</td>
<td>2,461</td>
<td>1,213</td>
<td>110</td>
<td>94</td>
<td>130</td>
<td>138</td>
<td>154</td>
<td>202</td>
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<tr>
<td>2000</td>
<td>2,191</td>
<td>616</td>
<td>77</td>
<td>81</td>
<td>75</td>
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<td>2001</td>
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<td>134</td>
<td>156</td>
<td>292</td>
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<td>2002</td>
<td>2,258</td>
<td>687</td>
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<td>140</td>
<td>126</td>
<td>150</td>
<td>271</td>
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<td>2003</td>
<td>2,273</td>
<td>651</td>
<td></td>
<td>179</td>
<td>190</td>
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<td>307</td>
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<td>2005</td>
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<td>Total</td>
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<td>83</td>
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<td>539</td>
<td>723</td>
<td>932</td>
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Table 2 displays basic demographic characteristics of study participants. Each year, the sample was split evenly between males (49.4-53.3%) and females, and the mean age ranged between 12.6 years and 13.6 years. The vast majority (between 89.0% and 94.1% each year) of the youths self-identified as African-American, with an additional 4.4%-6.2% self-identifying as mixed-race or Creole and the remainder self-identifying as Caucasian. Each year, between 44.8% and 62.3% of respondents reported living in public housing, and between 87.3% and 93.0% reported receiving free or reduced-cost lunches.
Measures

The first seven waves of the MYS consisted of 294 questions about risk behaviors and attitudes associated with violence, substance use, sex, family structure, feelings about neighborhood and experiences in school. In 2005, 112 questions were added which related to identity style, ego strengths, intimate relationships, and connectedness to school and to friends. MYS questions and scales used to address the research questions are described below. For each, the original source for the questions is specified (when one exists), although it should be noted that in most cases questions were adapted to address the situations and reading levels of the respondents.

Independent Variables

The independent variable, traumatic stress, used in our analysis was measured using seven questions concerning ones feelings, behavior and emotional response, when bad things happen to a family member or friend. The traumatic stress scale ranges from 0 to 14, with the higher values indicating higher levels of traumatic stress; the internal reliability (Cronbach’s alpha) ranges from 0.697 to 0.763. Respondents were asked how often they had bad dreams, trouble sleeping, worried or thought about the negative events experienced by family members or friends. Table 3 below list the traumatic scale.
correlations across different years of data collection. The individual questions included in the scale are listed in appendix two.

**Table 3. Correlations across waves for traumatic stress scale**

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<td>.24**</td>
<td>.21**</td>
<td>.17**</td>
<td>.07</td>
<td>.12*</td>
<td>.15*</td>
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<td>.27**</td>
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</table>

**Dependent and Control Variables**

Gender and age, which have a demonstrated relationship to adolescent response to traumatic stress, were controlled for during the data analysis. Gender and age are demographic variables measured during each survey administration by the respondents self reports. By including gender and age in our models, any potential moderator affects are eliminated.

Several dependent variables are considered in the analysis, including risk behaviors (violence, substance use, and sexual activity), developmental factors, and psychological processes. Risk behaviors were assessed using questions developed by a group of researchers (Brown et al. 2001) funded by the National Institute for Child Health and Human Development, and measured by an additive scale. Violence risk
behaviors considered in this paper included carrying a gun or knife, weapon
brandishment, weapon usage, and fighting. Marijuana, alcohol, tobacco, and cocaine
usage make up the scales used to measure substance use. These scales along with sexual
activity were adapted from Browne et al. (2001) by changing the wording of the
questions to make them understandable to younger adolescents and eliminating items
from longer scales.

Developmental variables included in our dependent variables are hopelessness
and self worth. Hopelessness is based on six questions, adapted from the Hopelessness
Scale for Children (Kazdin, et al., 1983). The scale ranges from 0 (low hopelessness) to 6
(high hopelessness) and has an internal reliability that ranges from .71 to .74. Self worth
is measured through a nine-question scale adapted from Harter (1984), with an internal
reliability between .62 and .65 across eight waves of data collection. Measurement scores
range from 0 (low self worth) to 9 (high self worth). Worry, the psychological factor
measured in our analysis, is a scale based on nine questions, adapted from Small and
Rodgers (1995), concerning a variety of potential worries adolescents face. The scale
ranges from 0-18, with higher scores indicating higher levels of worry. The internal
reliability of the scale ranges between .72 and .77

Exposure and victimization variables were measured using additive scales, and all
range from 0 to 3, except for sexual victimization, which ranges from 0 to 2. Higher
scores indicate the event has occurred recently or frequently. The exposure variable for
measuring violence experienced by a family member or friend is based on two questions,
asking respondents if family members or friends had ever been shot or stabbed. The
variable created to investigate adolescent witnessing of violence consist of two questions
asking respondents if they had ever seen someone being cut, stabbed, or shot and if that event had occurred once or multiple times in the past three months. The victimization variable is based on four questions in the MYS concerning if the respondent had ever had a knife or gun pulled on them and if they had to seek medical attention due to cut or gun wound. The sexual victimization variable is measured by survey questions asking respondents if anyone their age had ever made them have sexual intercourse when they did not want to, and the recentness of that event.

A variety of statistical test are used in this analysis to determine the relationship between traumatic stress and the various dependent variables, as well as the relationship between the dependent variables. Frequency analysis was used to measure the prevalence of traumatic stress among survey respondents throughout the eight waves of data collection (1998 to 2005). Correlation analysis was completed for the various dependent variables to gauge the strength of the relationships between the different risk behaviors, psychosocial and development variables. Our main analysis utilized the PROC MIXED procedure in SAS to model if traumatic stress predicted respondent’s engagement in risk behaviors. PROC MIXED can be used for linear mixed models, where due to the longitudinal nature of the data collection, experimental units (survey respondents) have repeated observations, which are likely to be correlated between years of data collection. A general linear model is not appropriate when observations are correlated. When using data with longitudinal observations that are correlated across years, a statistical test that includes maximum likelihood estimation is more appropriate.
RESULTS

Prevalence of Traumatic Stress

The mean level of traumatic stress across eight waves of data collection ranges from 6.04 (SD = 3.18) to 6.87 (SD = 2.90). The traumatic stress scale ranges from zero (no traumatic stress) to 14 (high levels of traumatic stress), so the median scores across waves indicate moderate levels of traumatic stress for most survey participants. Respondents with a zero score for traumatic stress range from 2.0% to 6.1% of survey participants, with the mean score for zero levels of traumatic stress around 3.3% across all eight waves of data collection. The range of respondents with extreme traumatic stress ranges from 1.4% to 2.0%. The low percentage of survey respondents with low and high levels of traumatic stress indicates the variability between scores for traumatic stress among this population. In each of the waves, there are a few outliers with low or high levels of traumatic stress, but the majority of respondents have moderate to low levels of traumatic stress.

Relating Traumatic Stress to Dependent Variables

Descriptive Statistics for Dependent Variables

In this study population, we found low median levels of hopelessness; weapon usage and brandishment; marijuana, tobacco, and cocaine usage across eight waves of data collection (Table 3). The median level of hopelessness, ranges from 1.13 (SD=1.54) to 1.77 (SD=1.73) across eight waves of data. The scale for measuring cocaine usage varied from 0 for no usage to 3 for high usage. The median level of respondents engaging in cocaine usage ranged from 0.33 (SD=0.77) to 0.67 (SD=1.39). The median levels for tobacco, which also has a three point scale, were slightly higher and ranged from 0.49 to
0.79. Median marijuana usage ranged from 0.85 (SD=1.65) to 1.11 (SD=1.78). Although median levels for cocaine, marijuana and tobacco usage were low, the median level of alcohol usage was moderate. On the five point alcohol usage scale, the median level of usage across all waves of data was 1.27 (SD=1.70), indicating greater propensity, acceptance, or access to alcohol compared to other substances. Descriptive statistic analysis also revealed moderate median levels of fighting and sexual activity.

Table 4. Descriptive statistics for traumatic stress and related variables by wave

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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<th></th>
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</thead>
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<td>1.77</td>
<td>1.57</td>
<td>1.26</td>
<td>1.42</td>
<td>1.65</td>
<td>1.54</td>
<td>1.13</td>
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<td>Self worth</td>
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<td>6.03</td>
<td>6.18</td>
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<td>6.33</td>
<td>6.31</td>
<td>6.34</td>
<td>6.47</td>
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<td>Worry</td>
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<td>7.57</td>
<td>7.29</td>
<td>7.11</td>
<td>7.33</td>
<td>7.11</td>
<td>6.77</td>
<td>6.84</td>
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<tr>
<td>Carried a gun or knife</td>
<td>1.93</td>
<td>2.15</td>
<td>1.91</td>
<td>1.78</td>
<td>1.84</td>
<td>1.93</td>
<td>1.68</td>
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<tr>
<td>Engaged in fighting</td>
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<td>2.05</td>
<td>1.97</td>
<td>1.94</td>
<td>2.11</td>
<td>1.96</td>
<td>2.05</td>
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<td>0.53</td>
<td>0.41</td>
<td>0.33</td>
<td>0.67</td>
<td>0.40</td>
<td>0.36</td>
<td>0.35</td>
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<tr>
<td>Weapon brandishment</td>
<td>0.65</td>
<td>0.94</td>
<td>0.73</td>
<td>0.64</td>
<td>0.36</td>
<td>0.75</td>
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<td>Had sexual intercourse</td>
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<td>2.25</td>
<td>2.11</td>
<td>2.08</td>
<td>2.11</td>
<td>1.01</td>
<td>2.05</td>
<td>2.19</td>
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<tr>
<td>Marijuana use</td>
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<td>1.11</td>
<td>1.04</td>
<td>0.99</td>
<td>0.94</td>
<td>1.01</td>
<td>0.85</td>
<td>0.88</td>
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<td>Tobacco use</td>
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<td>0.69</td>
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<td>Alcohol usage</td>
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<td>1.31</td>
<td>1.34</td>
<td>1.26</td>
<td>1.29</td>
<td>1.06</td>
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<td>0.15</td>
<td>0.11</td>
<td>0.06</td>
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<td>Violent victimization</td>
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<td>0.45</td>
<td>0.50</td>
<td>0.43</td>
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<td>Sexual victimization</td>
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<td>0.18</td>
<td>0.14</td>
<td>0.17</td>
<td>0.20</td>
<td>2.05</td>
<td>0.11</td>
</tr>
<tr>
<td>Witnessing violence</td>
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<td>0.93</td>
<td>1.03</td>
<td>0.88</td>
<td>0.80</td>
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<td>0.81</td>
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<td>Family victimization</td>
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<td>1.11</td>
<td>1.05</td>
<td>1.17</td>
<td>1.06</td>
<td>0.93</td>
<td>0.89</td>
<td>0.98</td>
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</table>
Correlations for Dependent, Victimization and Exposure Variables

Aside for analysis of the median levels of risk behaviors, exposure, and victimization within this population, we also considered correlations among those variables (Table 4). Hopelessness is negatively correlated with self worth ($r=-0.33$) and positively correlated with worry ($r=0.25$), fighting ($r=0.19$), weapon usage ($r=0.21$), and violent victimization ($r=0.24$) and sexual victimization ($r=0.20$). As expected, marijuana, tobacco and alcohol usage are positively correlated. The highest level of correlation among the risk behaviors and exposure variables is between weapon usage and violent victimization ($r=0.61$) across all years.

Table 5 Correlations among risk behaviors

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<th>1</th>
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<td>.07</td>
<td>.09</td>
<td>.08</td>
<td>.24</td>
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<td>.12</td>
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<td>1.67</td>
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<td>8. Tobacco use</td>
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<td>.56</td>
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<td>9. Alcohol use</td>
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<td>13. Family Victimization</td>
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<td>.36</td>
<td>1.05</td>
<td>1.01</td>
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</table>
Traumatic Stress Regressed on Dependent Variables

This portion of the paper seeks to address research questions 1A and 2B, “How does traumatic stress relate to hopelessness?” and “How does traumatic stress relate to risk behaviors?” The mixed model analysis revealed (Table 5) that traumatic stress was a statistically significant predictor of the development variables hopelessness ($p<0.001$) and self worth ($p<0.001$), and the psychosocial variable worry ($p<0.001$). The interaction term of gender and traumatic stress was also a statistically significant for predictor of hopelessness ($p<0.001$). For violent risky behaviors, traumatic stress was a statistically significant predictor for carrying a gun or knife ($p<0.01$), weapon brandishment ($p<0.01$), and fighting ($p<0.01$), but did not predict weapon usage. No statistically significant differences were found for sexual activity, marijuana, tobacco, cocaine, or alcohol usage.

Table 6. Lagged linear mixed model results

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Age</th>
<th>Gender</th>
<th>Traumatic $t-1$</th>
<th>Dependent $t-1$</th>
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<tr>
<td></td>
<td>Est.</td>
<td>Std error</td>
<td>Est.</td>
<td>Std error</td>
</tr>
<tr>
<td>Hopelessness</td>
<td>-.03</td>
<td>.01*</td>
<td>-.29</td>
<td>.03*</td>
</tr>
<tr>
<td>Self Worth</td>
<td>.06</td>
<td>.01*</td>
<td>.15</td>
<td>.04*</td>
</tr>
<tr>
<td>Violate Attitudes</td>
<td>-.07</td>
<td>.01*</td>
<td>-.42</td>
<td>.05*</td>
</tr>
<tr>
<td>Worry</td>
<td>-.27</td>
<td>.02*</td>
<td>-.13</td>
<td>.07</td>
</tr>
<tr>
<td>Carried a gun or knife</td>
<td>.08</td>
<td>.01*</td>
<td>-.39</td>
<td>.05*</td>
</tr>
<tr>
<td>Weapon use</td>
<td>.02</td>
<td>.00*</td>
<td>-.13</td>
<td>.02*</td>
</tr>
<tr>
<td>Fighting</td>
<td>-.06</td>
<td>.01*</td>
<td>-.33</td>
<td>.03*</td>
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<tr>
<td>Sexual Activity</td>
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<td>.01*</td>
<td>-.72</td>
<td>.05*</td>
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<tr>
<td>Weapon brandishment</td>
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<td>.01*</td>
<td>.01</td>
<td>1.00</td>
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<td>Marijuana</td>
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<td>.01*</td>
<td>-.25</td>
<td>.03*</td>
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<td>Tobacco</td>
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<td>.00*</td>
<td>-.11</td>
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<td>Alcohol</td>
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<td>-.19</td>
<td>.03*</td>
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<td>Crack usage</td>
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<td>.00</td>
<td>-.03</td>
<td>.01*</td>
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</tbody>
</table>
In Table 5, values with an asterisk (*) indicate p-value <0.001, two asterisk (**) indicate p-value <0.01 and three asterisk (***) indicates p-value <0.05. Lagged dependent variables and include into the model to increase the potential for causal inference.

**Relating Violence Exposure to Traumatic Stress**

*Descriptive Statistics for Violence Exposure and Victimization*

In this study population, we found low median levels of violent victimization, which has a scale from 0 to 3, and sexual victimization, which has a scale from 0 to 2, across eight waves of data collection (Table 3). Descriptive statistic analysis also revealed moderate median levels of family victimization and witnessing violence. The median level of witnessing violence pooled across all waves was 0.89 (SD=0.98), while the median level of family victimization across all waves was 1.05 (SD=1.01). These statistics, along with the violent victimization ($m=0.48$, SD=0.89) and sexual victimization ($m=0.18$, SD=0.53) measures, indicate that although survey respondents aren’t normally the victims themselves of violence, they are exposed to violence through the experience of a family member or seeing violence on the street, in school, etc.

*Violence Exposure and Victimization Regressed on Traumatic Stress*

So far the analysis has revealed that traumatic stress is one of the variables which can predict some violent behaviors such as carrying a gun, fighting, and weapon brandishment, but does violence exposure, either through witnessing or having a close relationship with someone who is the victim of violence, lead to traumatic stress? The linear mixed model revealed very interesting results. Two separate variables measuring violent victimization were not significant for predicting traumatic stress. The first, having someone cut or shot at you, had a very large F value, 0.86. The second measure, having
someone pulled a gun or knife on you, was also insignificant and had an even larger F value of 3.01. Sexual victimization was significant at the five percent level. Being exposed to violence through witnessing someone being cut or shot was also statistically significant for predicting traumatic stress (p <0.05).

**Table 7.** Does violence exposure and victimization predict traumatic stress?

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>F Value</th>
<th>P Value</th>
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<td>Intercept</td>
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<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.15</td>
<td>0.02</td>
<td>9.45</td>
<td>0.002</td>
</tr>
<tr>
<td>Gender</td>
<td>0.21</td>
<td>0.07</td>
<td>0.86</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Violent victimization (cut or shot) ( t_{-1} )</td>
<td>-0.048</td>
<td>0.052</td>
<td>0.86</td>
<td>0.353</td>
</tr>
<tr>
<td>Violent victimization (gun or knife pulled) ( t_{-1} )</td>
<td>0.096</td>
<td>0.055</td>
<td>3.01</td>
<td>0.082</td>
</tr>
<tr>
<td>Sexual victimization ( t_{-1} )</td>
<td>0.187</td>
<td>0.083</td>
<td>5.10</td>
<td>0.024</td>
</tr>
<tr>
<td>Witness violence ( t_{-1} )</td>
<td>0.086</td>
<td>0.039</td>
<td>4.77</td>
<td>0.029</td>
</tr>
<tr>
<td>Family victimized ( t_{-1} )</td>
<td>0.066</td>
<td>0.036</td>
<td>3.34</td>
<td>0.067</td>
</tr>
<tr>
<td>Traumatic Stress ( t_{-1} )</td>
<td>0.289</td>
<td>0.011</td>
<td>669.32</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
DISCUSSION

The analysis focused on determining developmental, psychosocial, and risk behaviors associated with traumatic stress among 9-19 year old adolescents in Mobile and Prichard Alabama over an eight year period. Moderate levels of traumatic stress were found, and this traumatic stress predicted hopelessness, self worth, worry and some violent risk behaviors. Several risk behaviors, including substance use, sexual activity and weapon usage, were not predicted by traumatic stress.

Several researchers have documented a strong relationship between exposure to community violence and traumatic stress symptomatology (Thompson et al, 2005), but have focused exclusively on witnessing violence (Overstreet et al., 1999), or combine witnessing and victimization together (Karyn & Wein, 1995). For the study analysis, being the victim of violence and witnessing violence were analyzed separately. Surprisingly, being the victim of violence did not predict traumatic stress, but instead was predicted by sexual victimization and witnessing violence. The study findings corroborate what others that have found that youths are seemingly better able to handle assault on themselves as opposed to observing assaults on other (Bolland et al., 2005). Although, Muller, Goebel-Fabbri, Diamond and Dinklage (2002) did not observe a relationship between community violence and psychopathy, but this could be due to the researchers lumping witnessing violence and being the victim of violence into the same category.

The finding that witnessing violence predicts traumatic stress has important implications for interventions geared towards youths in high poverty communities. Interventions which aid youths in processing community violence are needed while social
and economic policies are developed and implemented to modify social determinants of health for urban youths. It is pivotal that prevention and intervention programs arm participants with skills to understand their cognitive response to trauma, and how these responses can be internalized in the form of hopelessness, lack of self worth, and worry, and be externalize in the form of increased engagement in violent behavior.

An ecological perspective has been identified as appropriate for studying and designing interventions for exposure to community violence and the resulting psychological trauma (Rosenthal & Wilson, 2003). The social ecological model (figure 1) proposes that human behavior and the modification of that behavior can best be understood and influenced by the interaction of interpersonal, intrapersonal, organizational, community and policy factors (McLeroy, Bibeau, Steckler & Glanz, 1988). Effective programs and policies will have to be planned, implemented, and evaluated from these five spheres of influence. Existing interventions have focused on one or two targets of intervention, most notably the interpersonal level through individual psychotherapy (Berman, Silverman & Kurtines, 2000) and the intrapersonal level through family or group counseling (Glodich & Allen, 1998), but effective programs to decrease the levels of traumatic stress in this community will have to focus on multiple levels and the interaction among those levels. Many of the challenges associated with traumatic stress among African American adolescents may be ameliorated or overcome on their own due to strong familial ties, spirituality, or church affiliation, but successful programs should build on these factors to reinforce sustainable change.
Although this study has overcome many limitations inherent in examining risk behavior and traumatic stress, there remain some limitations worth noting. The first and main limitation is that the results of this study have limited generalizability to other study populations due to the homogeneity of the MYS study population. Conclusions from this study cannot, and should not, be applied to other socioeconomic contexts and geographic areas. By limiting external validity, the internal validity is greatly strengthened. The
homogeneity of the study population enables the study to control for variety of factors, which are great confounder in other studies focused on inner city youths. Factors controlled for by homogeneity of the study population include household income, level of neighborhood poverty, and degree of community violence. This allows the assessment of the relationship between the risk behaviors, traumatic stress, and hopelessness to be determined without concern for the unmeasured effects of socioeconomic status.

Another limitation is that measures for sexual victimization, witnessing violence, and violent victimization are limited and may not fully represent these concepts. For example, sexual victimization is not limited to intercourse, but could include unwanted touching, being forced to touch someone else, being forced to watch pornography, etc. Witnessing violence is not limited to seeing someone cut or shot, but could include seeing the wound from a gun or knife, hearing gun shots, etc.

The third limitation is that any causation found in this study analysis is not absolute. The nature of cross-sectional surveys makes it hard to determine absolute causation, but due to the longitudinal data collection for the MYS, this study attempts to limit this limitation by utilizing lagged variables. The use of lagged variables aids the strength of the regression analysis results.

The recent proliferation of research based on childhood traumatic stress started with efforts to develop psychologically and clinically sound approaches for interviewing exposed children, followed by the development of assessment instruments that facilitate clinical, community and population-based studies, and ends with the movement towards investigating the complex developmental psychopathology model of traumatic stress (Goenjian, Karayan & Pynoos, 1997). In order to understand the interaction across time
of many critical factors in the pathway from traumatic exposure to pathology, further research is needed to investigate possible moderators and mediators intertwined in the causal pathway between community violence exposure and victimization, traumatic stress symptomology, and risk behaviors. A possible research question to explore is if traumatic stress is a mediator between witnessing violence and negative risk behaviors.

Research is needed to define community violence in more specific terms and differentiate between exposure and actually being the victim of violence. Researchers should investigate how different sources of violence relate to psychological and behavioral response. A method for operationalizing community violence with greater precision should be developed to distinguish between exposure, victimization, trauma severity and trauma frequency. By identifying and fully understanding the causal pathway between all types of community violence and the resulting health outcomes, effective prevention and treatment interventions can be developed, implemented and evaluated.
LIST OF REFERENCES


APPENDIX A

IRB APPROVAL FORMS
UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federally Assured Assurance with the Office for Human Research Protections (OHRP). The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines. The Assurance became effective on November 24, 2003 and expires on October 26, 2010. The Assurance number is FWA0005960.

Principal Investigator: MULLINS, MONIQUE S
Co-Investigator(s):
Protocol Number: X081126010
Protocol Title: Relating Post-traumatic Stress Disorder (PTSD) to helplessness and risk behavior among African American adolescents living within high poverty neighborhoods in Mobile, AL

The IRB reviewed and approved the above named project on 1/5/08. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

Project received EXPEDITED review.

IRB Approval Date: 1/21/08
Date IRB Approval Issued: 1/21/08

Marilyn Doss, M.A.
Vice Chair of the Institutional Review Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.
UAB Project Revision/Amendment Form

(Please type: In MS Word, highlight the shaded, underlined box and replace with your text; double-click checkboxes to check/Unchecked.)

- Federal regulations require IRB approval before implementing proposed changes.
- Change means any change, in content or form, to the protocol, consent form, or any supportive materials (such as the investigator's brochure, questionnaires, surveys, advertisements, etc.).
- Complete this form and attach the changed research documents.

Today's Date: 5/12/2009

1. Contact Information
   - Principal Investigator's Name: Monique Mullins BlazerID: mmullins E-mail: mmullins@uab.edu
   - Contact Person's Name: Monique Mullins BlazerID: mmullins E-mail: mmullins@uab.edu
   - Telephone: 205-238-3456 Fax:
   - Campus Address: 2133 10th Ave, South Birmingham, AL 35205

2. Protocol Identification
   - Protocol Title: Relating traumatic stress to hopelessness and risk behaviors among African American adolescents living within high poverty communities
   - IRB Protocol Number: X08112010
   - Current Status of Project (check only one):
     - Study has not yet begun (No participants entered)
     - Closed to participant enrollment (remains active)
       - Number of participants on therapy/intervention: ______
     - Number of participants in long-term follow-up only: ______
     - Total number of participants enrolled: 8,000
   - This submission changes the status of this study in the following manner (check all that apply):
     - Protocol Revision
     - Protocol Amendment
     - Study Closed to participant entry
     - Study Closure
     - Other, (specify) Changed protocol title

3. Reason for Change
   - Briefly describe, and explain the reason for the change. If normal, healthy controls are included, describe in detail how this change will affect those participants.
   - Include a copy of the protocol and any other documents affected by this change (e.g., consent form, questionnaire) with all the changes highlighted.
   - The survey instrument does not measure or diagnose PTSD, but does indicate levels of traumatic stress.
   - Therefore it is more appropriate to title the protocol "Relating traumatic stress to risk behaviors and hopelessness among African American adolescents living in high poverty communities."

4. Does this change revise or add a genetic or storage of samples component?
   - Yes No

5. Does the change affect subject participation (e.g., procedures, risks, costs, location of services, etc.)?
   - Yes No

6. Does the change affect the consent document(s)?
   - Yes No

Include the revised consent document with the changes highlighted.
Will any participants need to be reconsented as a result of the changes? □ Yes □ No
If yes, when will participants be reconsented?
Signature of Principal Investigator: [Signature]
Date: 5-13-09

APPROVED
Marilyn Dobb, M.A.
Vice Chair – IRB
APPENDIX B

MOBILE YOUTH SURVEY QUESTIONS
Traumatic Stress

1. I have bad dreams about the bad things that have happened to a family member of friend.
   a. Almost never
   b. Sometimes
   c. Very often

2. I have trouble sleeping at night when bad things happened to a family member or friend.
   a. Almost never
   b. Sometimes
   c. Very often

3. I think I would feel better if I could talk to someone about the bad things that happen to a family member or friend.
   a. Almost never
   b. Sometimes
   c. Very often

4. When bad things happen to a family member or friend, it feels like they are happening to me.
   a. Almost never
   b. Sometimes
   c. Very often

5. I think about bad things that have happened to a family member or friend, even when I don’t want to.
   a. Almost never
   b. Sometimes
   c. Very often

6. After bad things happen to a family member or friend, I feel uncomfortable being with them because it reminds of the bad things that happened.
   a. Almost never
   b. Sometimes
   c. Very often

7. I worry that bad things might happen to a family member or friend.
   a. Almost never
   b. Sometimes
   c. Very often
Hopelessness

1. All I see ahead of me are bad things, not good things.
   a. Agree
   b. Disagree

2. There’s no use in really trying to get something I want because I probably won’t get it.
   a. Agree
   b. Disagree

3. I might as well give up because I can’t make things better for myself.
   a. Agree
   b. Disagree

4. I don’t have good luck now and there’s no reason to think I will when I get older.
   a. Agree
   b. Disagree

5. I never get what I want, so it’s dumb to want anything.
   a. Agree
   b. Disagree

6. I don’t expect to live a very long life.
   a. Agree
   b. Disagree
Self worth
1. There are people in my neighborhood, other than my family, who really care about me.
   a. Agree
   b. Disagree
2. I have friends in my neighborhood I can depend on.
   a. Agree
   b. Disagree
3. If you don’t out for yourself in my neighborhood, no one else will.
   a. Agree
   b. Disagree
4. No one in my neighborhood takes any interest in what their neighbors are doing.
   a. Agree
   b. Disagree
5. It is hard to make good friends in my neighborhood.
   a. Agree
   b. Disagree
6. If I am upset about a personal problem, there are people in my neighborhood I can turn to.
   a. Agree
   b. Disagree
7. How much does it bother you if your friends think you area punk?
   a. It bothers me a lot
   b. It bothers me some
   c. It bothers me a little
   d. It doesn’t bother me at all
8. How important is it to do things your friends think are cool?
   a. It is very important
   b. It is somewhat important
   c. It is only a little important
   d. It is not important at all
9. How many of your friends think you are a punk if you don’t drink alcohol?
   a. Most of them
   b. Some of them
   c. Almost none of them
Worry
1. How much do you worry about getting good grades?
   a. I am not in school
   b. Not at all
   c. Some
   d. Very much
2. How much do you worry about being pressured into doing something dangerous by your friends?
   a. Not at all
   b. Some
   c. Very much
3. How much do you worry about not fitting in with other kids in the neighborhood or at school?
   a. Not at all
   b. Some
   c. Very much
4. How much do you worry that your family has enough money to get by?
   a. Not at all
   b. Some
   c. Very much
5. How much do you worry that you might not get a good job when you get older?
   a. Not at all
   b. Some
   c. Very much
6. How much do you worry about getting along with people of other races?
   a. Not at all
   b. Some
   c. Very much
7. I worry that bad things might happen to a family member or friend.
   a. Almost never
   b. Sometimes
   c. Very often
8. How much do you worry about gangs in your neighborhood?
   a. Not at all
   b. Some
   c. Very much
9. How much do you worry about whether you are ‘straight’ or ‘gay’?
   a. Not at all
   b. Some
   c. Very much
10. How much do you worry that you might get AIDS?
    a. Not at all
    b. Some
    c. Very much
Carried a gun or knife
1. Have you ever carried a knife or razor?
   a. No
   b. Yes
2. In the past 3 months (90 days), did you carry a knife or razor?
   a. No
   b. Yes, just once
   c. Yes, more than once
3. In the past month (30 days), did you carry a knife or razor?
   a. No
   b. Yes, just once
   c. Yes, more than once
4. In the past week (7 days), did you carry a knife or razor?
   a. No
   b. Yes, just once
   c. Yes, more than once
5. Have you ever carried a gun?
   a. No
   b. Yes
6. In the past 3 months (90 days), did you carry a gun?
   a. No
   b. Yes, just once
   c. Yes, more than once
7. In the past month (30 days), did you carry a gun?
   a. No
   b. Yes, just once
   c. Yes, more than once
8. In the past week (7 days), did you carry a gun?
   a. No
   b. Yes, just once
   c. Yes, more than once

Weapon Brandishment
1. Have you ever pulled a knife or a gun on someone else?
   a. No
   b. Yes
2. In the past 3 months (90 days), did you pull a knife or a gun on someone else?
   a. No
   b. Yes, just once
   c. Yes, more than once
3. In the past month (30 days), did you pull a knife or a gun on someone else?
   a. No
   b. Yes, just once
   c. Yes, more than once
Weapon usage
1. Have you ever cut or stabbed someone else?
   a. No
   b. Yes
2. In the past year (12 months), did you cut or stab someone else?
   a. No
   b. Yes, just once
   c. Yes, more than once
3. Have you ever shot a gun at someone else?
   a. No
   b. Yes
4. In the past year (12 months), did you shoot a gun at someone else?
   a. No
   b. Yes, just once
   c. Yes, more than once

Fighting
1. Have you ever been in a physical fight (a fight with hitting, kicking, or pushing)?
   a. No
   b. Yes
2. In the past 3 months (90 days), were you in a physical fight?
   a. No
   b. Yes, just once
   c. Yes, more than once
3. In the past month (30 days), were you in a physical fight?
   a. No
   b. Yes, just once
   c. Yes, more than once
Substance Use

Tobacco
1. Have you ever smoked a cigarette?
   a. No
   b. Yes
2. In the past month, did you smoke cigarettes?
   a. No
   b. Yes, just once
   c. Yes, more than once
d.

Alcohol
1. Have you ever drunk alcohol?
   a. No
   b. Yes
2. In the past month, did you drink alcohol?
   a. No
   b. Yes, just once
   c. Yes, more than once
3. In the past week, did you drink alcohol?
   a. No
   b. Yes, just once
   c. Yes, more than once

Marijuana
1. Have you ever used marijuana (chronic, blunts, grass, herb, reefer)?
   a. No
   b. Yes
2. In the past year, did you use marijuana?
   a. No
   b. Yes, just once
   c. Yes, more than once
3. In the past month, did you use marijuana?
   a. No
   b. Yes, just once
   c. Yes, more than once

Cocaine
1. Have you ever used crack or cocaine (rock)?
   a. No
   b. Yes
2. In the past year, did you use crack or cocaine?
   a. No
   b. Yes, just once
   c. Yes, more than once