Stress and Support in the Lives of Kenyan Youth: Stress, Psychological Symptoms, and the Role of Peer and School Community Relationships

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BOSTON COLLEGE
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Counseling, Developmental and Educational Psychology

Counseling Psychology

STRESS AND SUPPORT IN THE LIVES OF KENYAN YOUTH:
STRESS, PSYCHOLOGICAL SYMPTOMS, AND THE ROLE OF PEER AND
SCHOOL COMMUNITY RELATIONSHIPS

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by

NICOLE M. DUFFY

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Stress and Support in the Lives of Kenyan Youth:
Stress, Psychological Symptoms, and the Role of
Peer and School Community Relationships

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Social scientists are increasingly interested in the life experiences of youth in developing countries. Moreover, positive youth developmentalists posit the need to understand wellbeing, strengths, and resiliency in addition to maladjustment, pathology, and deficits. Guided by relational cultural theory (Jordan, 2001; Miller & Stiver, 1997) and models linking stress to psychopathology (Bowman & Yehuda, 2004), the current study examines the associations between stress, psychological symptoms, and relational health in a sample of Kenyan youth ($N = 254$) using cross-sectional data from an ongoing preventative intervention. Multiple regression analyses were used to examine how well stress and relational health predicted psychological symptoms and MANOVA were used to test the hypotheses that gender differences exist in youth reports of psychological symptoms and exposure to stress.

Findings indicated that exposure to certain types of stress were associated with psychological symptoms. Specifically, exposure to violence was correlated with depression. Number of stressful events, which captured exposure to many different types of stressors, was also correlated with depression. Although boys and girls did not report differences in exposure to stressors, small effects were found for differences in depression scores, with boys reporting greater levels of depression than their female
peers. Gender moderated the relationship between stress and depression, with stress impacting female youth more than male youth. Although quality relationships with a peer and with the school community did not moderate the relationship between stress and depression in the present sample, main effects were found such that relational health was negatively correlated with depression. No significant effects were found for PTSD in any of the analyses. These results suggest implications for theory, research, clinical and community-based practice, and educational policy. Suggestions for improving validity and reliability in cross-cultural research are also included, with particular attention to measurement issues that arise when applying existing instruments among diverse populations.
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Chapter 1 (Introduction)

Problem Statement

According to a 2009 report by the U.S. Department of State, 80,000 Kenyan children drop out of school yearly due to economic circumstances that lead to premature entry into marriage and the labor force. In particular, poor and rural children are disproportionately affected by financial insecurity. Although universal education is held as a national priority, boys and girls in rural Kenya face many barriers and stressors that limit their access to education and impede their academic performance. Despite such stressors, many boys and girls persist in their studies and are able to complete primary and secondary education with a small percentage continuing on to university.

The current study seeks to document exposure to stress, psychological functioning, and relational qualities in a sample of youth enrolled in grades six and seven in rural, West Pokot, Kenya. Specifically, this study uses quantitative methodology to explore the primary association between life stress and psychological symptoms, while also observing the effects of relational health and gender (see Figure 1). The specific variables of interest in the present study include exposure to stress and trauma as assessed by both the type of stressor as well as the total number of stressful events experienced by youth; psychological functioning as measured by symptoms of depression and symptoms of post-traumatic stress disorder (PTSD); resiliency factors as assessed by relational health in two contexts (dyadic friendship and sense of belonging to the school community); and gender.

Although counseling psychologists have become increasingly focused on issues
faced by youth in the global context, there continues to be a lack of research that captures the life experiences and psychological functioning of youth in developing countries. When research on stress does occur, it frequently pertains to a particular event and/or is conducted in large cities. For example, one study, in the aftermath of the 1998 bombing of the U.S. Embassy in Nairobi, found PTSD symptoms in Kenyan children with 55% of the sample reporting difficulty at home and/or school one year later (Pfefferbaum et al., 2003). However, studies such as this, that focus on a terrorist event or natural disaster, may not capture chronic, day-to-day experiences, or commonplace stressors endured by youth. Moreover, it is not clear whether data collected with urban youth can be generalized to youth in rural areas as encounters with stressors and access to resources is often context dependent.

Furthermore, the relationship between stressors, well-being, and maladjustment remains unclear. Bowman and Yehuda (2004) suggested there is strong evidence to support both the sensitization model, whereby increased stressors lead to greater risk for maladjustment, and the adaptation model, whereby compounded stressors have an immunization effect, leading to increased coping skills and better outcomes. Carr and Vitaliano (1985) offered a model of distress “defined as a complex of biobehavioral responses to antecedent stressors (perceived as well as real) mediated by vulnerability to stress (demographic factors; genetic, physiologic, and psychologic predisposition), and psychological and social resources (coping strategies, social supports)” (as cited in Kleinman & Good, 1985, p. 246). Research in the U.S. has consistently linked stressors to symptoms of mental illness and maladjustment in adolescents (e.g., Garber, 2006;
Grant, 2004). Similarly, global, epidemiological studies emerging from Turkey and Switzerland have found that symptoms of anxiety and depression are common, although not inevitable for youth, in response to stress, trauma, and adversity (e.g., Basoglu, Kihc, Salcioglu & Livanou, 2004; Steinhausen & Metzke, 2000). Few researchers, however, have examined these factors in Kenyan youth. Thus, in this study, I examine whether exposure to stress and psychological symptoms are associated for rural, Kenyan youth, as is suggested by research on other youth around the globe.

Researchers using a strength-based approach have been able to identify resiliency factors in individuals and environments that may buffer youth in Europe and in the U.S. against illness and maladjustment in the face of adversity and stress (e.g., Hjemdal, Aune, Reinfjell, Stiles, & Friborg, 2007; Masten & Coatsworth, 1998; Masten, 2001). In particular, social support, broadly defined as interpersonal connection to individuals and groups, has consistently been shown to moderate the effects of stressors on the mental health outcomes of youth. Although less attention has been paid to qualitative aspects of relationships in this population, a growing body of literature suggests that relationships characterized by authenticity, empathy, and engagement, may be particularly important in adolescent populations and may be seen as a source of social resiliency (e.g., Kerr, Stattin, Biesecker, & Ferrer-Wreder, 2003; Miller & Stiver, 1997; Regan, 2011). As such, this study explores the buffering effects of such relationships on the association between stress and psychological symptoms in Kenyan youth.

Political, Economic, and Social Factors Impacting Kenyan Youth
Arthur Kleinman (1988) defined *sickness* as a disorder “in relation to macrosocial (economic, political, institutional) forces” and suggested that symptoms may reflect not merely biological processes but “political oppression, economic deprivation, and other social sources of human misery” (p. 6). Understanding how the political landscape, social and economic climate impacts Kenyan youth contextualizes their experience of stress, psychological symptoms, and resilience. While not intended to be exhaustive, a brief description of the political, economic, and social factors impacting Kenyan youth follows.

The Republic of Kenya was established independently of the British Empire in 1963. Although independence has led to self-determination, the post-colonial landscape in Kenya has been characterized by political instability, violence, and ethnic strife (Branch, 2011). In 2010, the year the data were collected for the present study, a new constitution was adopted in an attempt to decentralize power, adopt a bill of rights, initiate land reform, and increase accountability for crimes committed (Branch, 2011; Gettleman, 2010).

Kenya is bordered by South Sudan and Ethiopia in the north, Somalia in the east, Tanzania in the south, and Uganda in the west. Many people in these bordering territories have experienced extreme poverty, conflict, and violence that have led to increased migration into Kenya and increased strain on Kenyan resources. In addition, political elections in Kenya have often been associated with an upsurge in community and ethnic violence, from early colonial times through the most recent post-election violence following the presidential election in 2008. Political violence, largely perpetrated by male
youth, has led to displacement of men, women, and children, further straining and burdening affected communities. Although not explicitly measured in the present study, it is likely that this population of youth has been impacted by some exposure to poverty, conflict, and violence.

With regard to their economic reality, youth in the present study live on a continent whereby half of the population exists on less than $1USD per day. When contrasted with other countries, however, Kenya boasts one of the strongest economies in Eastern and Central Africa. Agriculture continues to be a mainstay of the Kenyan economy despite the fact that only 20% of the land is arable and the population has surged over the last few decades (Meredith, 2005). Consistent with this, agriculture accounts for the majority of the subsistence economy in the rural area where the present study is located. According to a report from a nongovernmental organization (NGO) working in the region, some of the major challenges faced in the region include “unsupportive cultural practices, environmental degradation, poor terrain, and food insecurity due to recurrent drought” (World Vision Kenya, 2012). Many of the economic issues relevant to youth in the present study are closely tied to cultural practices such as female genital mutilation/cutting (FGM/C), early marriage, and a history of discouraging education of female youth. Additional economic issues impacting youth and their families include food insecurity and a reliance on child labor.

Poverty can affect youth in many ways including, but not limited to, decreased access to medicine, inability to pay school fees or school uniforms and materials, and restricted nutrition. Closely tied to the overall poverty in the region, perhaps one of the
greatest stressors on Kenyan youth continues to be food insecurity. Proper nutrition is vital for healthy cognitive development and physical growth, and has been linked to number of grades of school completed in a sample of youth in rural Zimbabwe (Alderman, Hoddinott, & Kinsey, 2006). Furthermore, malnutrition has been cited as a risk factor for mental illness (Patel, Fisher, Hetrick, & McGorry, 2007). Even in rural areas with strong horticultural practices, droughts and blights may limit access to nutrition for youth, thus impacting their health and well-being as well as their educational attainment.

Also related to the issue of poverty, is lack of access to clean water and proper sanitation. This impacts all students, but especially female students who require proper sanitation measures and facilities during menstruation. Lack of clean and safe sanitation is problematic for girls in schools throughout the developing world, and Kenya is no exception. Ineffective and unhealthy menstrual hygiene often leads to absenteeism in school and may increase stress for female students. While Kenya is making strides in the education of young girls, it is against the backdrop of a continent where half of all African women are illiterate (Meredith, 2005).

As in many developing nations, swift changes in policy and programming often occur. For example, the Ministry of Education may make changes to academic standards, or the academic calendar mid-year, which may cause increased stress for students. Education of Pokot youth was originally provided only for boys and was focused on farming (Jónsson, 2006). Later, colonialists promoted girls’ education, and Christian communities from the West worked with the Kenyan government to rapidly expand
access to schools. Presently, primary education is compulsory and open to both girls and boys. However, access to schooling differs by gender and location. According to Branch (2011), female students in the Rift Valley, where the West Pokot district is located, are half as likely to attend secondary school as female students in the Central Province.

As in other parts of the developing world, school enrollment is often tied to the local economy and legislative efforts. For example, in 1999, as farm cooperatives became self-governing and land disputes ensued, revenues from coffee declined, leading to a drop in household income and reduced school enrollment in some regions (Branch, 2011). However, in 2002, Kenyan government officials removed fees for state-run primary schools, leading to 1.3 million newly enrolled students seeking access to free education (Branch, 2011).

**Ethnicity and Kenyan Youth**

The vast majority of youth in the present study identify as Pokot. These youth, as well as most of the other ethnic groups identified by youth in this study, are part of the broader Kalenjin ethnic group. This grouping of ethnic identities occurred around World War II to unite the various groups politically (Branch, 2011). Kalenjin make up 10-15% of the population of Kenya and are the predominant ethnic group in the West Pokot area where this study is located. In Kenya, ethnic identity is largely tied to politics, particularly regarding the redistribution of resources including land, jobs, and funding for development projects (Branch, 2011). Violence throughout the 1990s was closely linked to ethnic ties to land. Although spurred by politicians, much of the violence was carried out by youth (Branch, 2011). The fighting between ethnic groups ceased temporarily for
the most part when the country was united in 1998 following the bombing of the U.S. embassy in Nairobi that killed 213 people including 201 Kenyans (Branch, 2011, p. 230). Most recently, in 2007 and 2008, ethnic violence erupted in the Rift Valley province, and elsewhere in Kenya, between the Kalenjin and Kikuyu following a disputed election that left nearly 1,300 people dead (Rice, 2010). Although the present study does not include specific questions about youths’ experience with post-election violence, it is entirely possible that youth in this sample were impacted by this collective experience in the events of 2007-2008.

While ethnicity is tied to power and access to resources, it is also tied to belief systems and worldview. Beliefs regarding this study’s constructs of health and illness, resilience, and relationships are likely informed by culture. For example, the worldview of the Pokot suggests that mental disturbances are influenced by guardian spirits (Jónsson, 2006) while sickness, misfortune, and death, are influenced by evil spirits (Jónsson, 2006). Developing in the context of such a worldview may impact the extent to which youth endorse psychological symptoms. In addition, Pokot participating in the present study have limited access to medical health services and instead may rely upon herbalists and prophets (Jónsson, 2006).

**Gender and Kenyan Youth**

According to a 2007 report from the World Bank, Kenya remains ‘a highly unequal society, with exclusion and disadvantage reflecting stratification by class, gender, and region’ (as cited in Branch, 2011, p. 264.) For example, at the time of the study, female youth remained underrepresented as compared with their male peers in
secondary school and university. In addition, the Kenyan education system is heavily reliant on national exam scores that determine placement into secondary and post-secondary educational opportunities. Conversations with current and former Kenyan educators, administrators, and researchers suggested that while female students were historically reported to underperform on standardized testing, as compared with their male peers, they were starting to outperform their male counterparts in language subtests (i.e., English and Kiswahili; personal communications July, 2012). These informants cited an increased interest in the education of girls to explain the improved language performances, and provided a variety of reasons girls have traditionally underperformed in testing, including required domestic duties, danger in traveling to and from school (particularly in the early morning or late evening), missing school during menstruation, dropping out of school due to pregnancy, and a preference of some parents for daughters to leave school to get married or generate income to support the family (personal communications July, 2012). Specific to the region, it is expected that sons and daughters provide different social and economic advantages to the larger family group, with sons continuing lineage and daughters acquiring bride wealth (Meyerhoff, 1981).

Although these stereotyped ideas are changing, there continues to be different ideas about the roles of male and female youth. Given the number of hypotheses in the current study that are related to the social construction of gender, this section provides a gendered portrait of Pokot youth. Illuminating how gender is conceptualized, enacted, and reproduced in this population of youth has implications for the rationale of gender impacting number and type of stressors and for the rationale of gender impacting
symptom expression and relational health in the present study. As there is little published research on this topic and in this population, the following information on gender in the Pokot community is largely derived from two anthropological dissertations, one on Pokot masculinity (2006) and the other on Pokot women (1981).

Jónsson (2006) offers an extensive account of contemporary Pokot masculinity in his dissertation on rituals in male formation. This historical anthropology suggests that rituals are critically important in the development of a masculine identity that upholds masculine ideals including bravery, power, knowledge, and subordination of women (Jónsson, 2006). Jónsson’s work suggests that close relationships often develop between sex segregated age cohorts. Boys develop close bonds with each other in the circumcision group such that members of the same cohort become friends and confidants for years into the future. It is believed that through their simultaneous preparation the boys become “brothers” and their “fate is intertwined” (Jónsson, 2006, p. 154). Undergoing ritual formation enhances relationships between groups of boys (and later men) and may impact, relational health, one of the constructs of the present study. Throughout the process of circumcision and related rituals of masculinity, boys are shamed and punished if they show emotion, cannot tolerate physical pain, or appear weak. A cultural preference for stifling emotion, disregarding and sublimating pain may impact report of stressful experiences or psychological functioning, the two primary constructs in the present study, via influencing youths’ report of experiences or symptoms related to pain.

Similar to their male counterparts, female youth are shamed if they show fear or untoward emotion during FGM/C. In contrast, however, while boys undergo ritual
circumcision and preparation to become leaders of their communities, women undergo FGM/C to prepare them for marriage. Marriage is seen as necessary for the economic survival of the girl and, at times, of her family.

Marriageability is the primary reason women give for wanting their daughters to be clitoridectomized: without the operation, they believe, their daughters will not find husbands, and without husbands, they believe, their daughters’ and their own life chances are diminished (Shaw, 1995, p. 80).

Currently, there is tension both within the community and between the community and outsiders regarding the practice of traditional rituals such as FGM/C. NGOs operating in communities such as the site of the present study, are providing “rescue centres” and programs aimed at educating girls about the potential risks of FGM/C and early marriage, and the potential rewards of continued education. Furthermore, both identity and relationships may be impacted through participation (or lack of participation) in these rituals. As stated by Kleinman (1988),

Meaning of a social kind is stamped into bodily processes and experiences, sometimes literally so, as, for example, when ritual circumcision and other forms of mutilation (subincision, tattooing, clitoridectomy, amputation of finger joints, scarification) mark life transitions and group and personal identity (p. 12).

Similar to their male counterparts, female youth are expected to develop close bonds with their age mates. In addition to sex segregated initiation rituals, Pokot society is also sex segregated with regard to roles in the home and in the community, and interactions between the sexes are restricted. In her dissertation on Pokot women, Meyerhoff (1981)
describes the importance placed upon ritual in the initiation of both sexes, emphasizes women’s pride in, and control of their sexuality, and describes culturally informed negotiations between the sexes. Close relationships are often maintained within sex and age cohorts as result of these separate spheres for Pokot men and women. In addition to providing social support, age cohorts also leverage social pressure in order to regulate the behavior of members from a particular ethnic group.

Anthropological accounts provide additional context for the differing experiences of male and female youth; these accounts illuminate how youth raised in this culture may encounter different life stressors, engage in different types of relationships with their age cohorts and their communities, and manifest and report psychological symptoms differently than youth in the U.S. and previously studied contexts. It is from this gender profile that differences between boys and girls may be hypothesized regarding youth reports of exposure to stressors and psychological symptoms. Data collection in the present study did not include report of youth participation in ritual circumcision. However, given the historical prevalence of these practices in the region, and the subsequent age-cohort relationships that emerge, it is likely that cultural practices influence conceptualizations of relational health via their relationships with peers and the larger community.

Age and Developmental Status

The intersection of gender and age is relevant to domestic and community activities for Pokot youth. Child labor is not sex specific for young children and often includes caretaking for younger siblings. Around age eight, children begin to engage in
sex-specific work with boys participating in agricultural or pastoral tasks and girls focusing on domestic chores (Meyerhoff, 1981). Young boys may herd livestock and hunt small animals, while girls make beads and gather vegetables (Meyerhoff, 1981). Similarly, tasks largely remain sex-segregated for adults. Men are responsible for digging and clearing in the fields, making irrigation canals, fishing, hunting, bee-keeping, and raising cattle. Women are responsible for socializing children, and domestic tasks related to the production of food including collecting firewood and water, digging and planting, and watching over the fields during the daytime (Meyerhoff, 1981).

According to Meyerhoff (1981), marriage negotiations begin with the early signs of puberty and before initiation, between the ages of 10 and 15. However, colleagues and co-researchers collaborating on the present study have suggested that parents begin negotiations when their girls are as young as seven or eight years old. Developmentally, the initiation period is perhaps the most critical juncture in Pokot life, providing physical markings and social rituals that distinguish children from adults. Meyerhoff (1981) suggested the distinction between children and adults is more important than the distinction between the sexes. Given that expectations, roles, and rituals for Pokot youth are largely impacted by gender and developmental status, gender and age are examined as covariates in the present study.

**Rationale for Studying Adolescence**

Given the cultural significance surrounding initiation, labor, and marriage for Pokot youth, studying the period of adolescence in this community may be particularly salient. Furthermore, adolescence is typically a developmental time period marked by increased
emotional vulnerability to stress (Larson & Ham, 1993) and increased risk of psychopathology (Hankin, Abramson, Moffitt, Silva, McGee, & Angell, 1998; Lewinsohn, Streigel-Moore, & Seeley, 2000) for youth in New Zealand and the U.S. Although there is no research on stress and mental health in Pokot youth, it is reasonable to suggest that these youth, much like youth elsewhere, may be affected by changes in biology and social roles that contribute to increases in psychopathology and stress. Additionally, gender differences in depressive symptoms typically begin to emerge during this period of development (e.g., Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993). Findings indicate depression symptoms in seventh grade can often predict depressive levels in secondary school for youth in the U.S. (Ge, Conger, & Elder, 2001) lending further support to studying the adolescent period. Furthermore, it is well documented that healthy developmental trajectories may be impacted by the developmental period in which stress and trauma occur. For example, childhood trauma has been linked to an increased risk of comorbid post-traumatic stress disorder (PTSD) and depression, while trauma in adolescence has been linked to PTSD in a study of German females (Maercker, Michael, Fehm, Becker, & Margraf, 2004). Studying this critical period of development in a sample of Kenyan youth is particularly salient as 42% of the population in Kenya is under the age of 15 (United Nations Data, 2011).

**Theoretical Framework**

Theoretical frameworks guiding this line of inquiry include theories of resilience and competence in children at risk (Masten & Coatsworth, 1998), an ecological perspective of resilience in trauma survivors (Harvey, 2007), and indices of relational
health in the context of peers and school communities (Liang et al., 2002) as derived from relational cultural theory (Jordan, 2001; Miller & Stiver, 1997).

**Resilience.** According to Masten (2001), “resilience refers to a class of phenomena characterized by good outcomes in spite of serious threats to adaptation or development” (p. 228). In addition to Masten’s definition, the framework of resilience in the present study is also guided by the work of Rutter (1987) and Werner (1989) who studied adaptation of youth exposed to adverse and hostile environments. Based upon two criteria, (1) exceptional, good, or adequate development in the context of (2) exposure to risk and adversity, the overarching framework of resilience was used to understand those students who display healthy adjustment in spite of exposure to stress and adversity. Furthermore, this framework guided the sampling of students in the present study. Researchers intentionally sought to recruit youth attending school instead of those youth who had already dropped out. In this context, school attendance can be considered a proxy for internal (child-based) and/or external (family or community-based) resilience.

**An ecological perspective of resilience in trauma survivors.** Working from a community psychology framework, Harvey (2007) suggested five tenets of an ecological view of recovery and resilience in trauma survivors. These included: (1) understanding resilience as transactional and contextual, (2) viewing resilience as multidimensional and co-existing with symptoms of pathology, (3) designing interventions at the level of individual, community and society that enhance the relationship between the person and the environment, (4) believing that cultural context determines intervention efficacy and that challenging culture may be a point of intervention, and (5) sustaining interventions
that are embedded in existing settings and community contexts. In the present study, the ecological perspective of resilience in trauma survivors is relevant to understanding the experience of untreated survivors and working in a culturally informed manner. Given that resilience is a multi-faceted and culturally laden construct, it is necessary to consider what resilience might look like for a student in rural Kenya.

Resilience at the individual student level may include competence, health, and well-being. In addition, resilience is not showing emotion during rites of passage (e.g., circumcision) that mark culture on the body. Resilience at the family level may include access to food and sanitation, requisite school fees, and minimal family burdens. At the community level, resilience may be fostered by a shared connection to an age-cohort or an ethnic group. With regard to educational settings, individual, family, or community level resilience may be operationalized as student completion of coursework, graduating from primary school, and access to secondary school, future training, or higher education.

Relational-cultural theory. Relational-cultural theory posits that psychological growth occurs in the context of mutually authentic, engaged, and empathic relationships. It is theorized that such relationships foster particular positive outcomes (i.e., “Five Good Things”): increases in sense of worth, self-knowledge, connection, as well as the promotion of action, and zest. Furthermore, a person’s sense of meaning and well-being is anchored in such relationships throughout the lifespan (Jordan, 2001). Conversely, unhealthy development occurs when youth disconnect from their experiences, blame themselves, and cease to act authentically in relationships. Health in interpersonal relationships can also be associated with individuals’ sense of connection within broader
social systems such as school communities (Jordan, 2001). Conversely, individuals who have been oppressed in interpersonal relationships only bring parts of themselves into future interpersonal and societal connections. Engaging with only part of one’s self in turn leads to increased marginalization and disconnection within the larger social context (Jordan, 2001). In turn, prejudice, bias, and power structures further silence people and damage their sense of connection, worsening relational health. Understanding youth adjustment with regard to dyadic peer relationships and sense of belonging to the larger school community may have implications for understanding youths’ sense of belonging in their broader societal contexts (such as neighborhood or ethnic group). Additionally, understanding youth relationships may reveal intermediaries in the pathway between experienced adversity and psychological functioning.

**Research Questions**

Informed by these theoretical frameworks and the existing empirical literature, the present study identifies youth exposure to specific stressors, documents psychological symptoms, and explores the role of healthy relationships as a potential resiliency factor in a sample of Kenyan youth. Specifically, the following research questions are addressed:

1. **Are certain types of stress stronger predictors of psychological symptoms than other types of stress?**

   It is hypothesized that certain types of stress (i.e., exposure to violence) will be a stronger predictor of depression and PTSD symptoms as compared with other types of stress.

2. **Does the total number of stressful events predict psychological symptoms?**
As exposure to stress increases, depression and PTSD symptoms are also expected to increase.

3. Are there gender differences in the type of stress or total number of stressful events?

Gender differences will emerge across type of stress and total number of stressful events.

4. Are there gender differences in the report of psychological symptoms?

It is hypothesized that female youth are expected to report greater levels of depression and PTSD symptoms as compared to male youth.

5. Does gender moderate the relationship between total number of stressful events and psychological symptoms?

It is hypothesized that female youth, compared to males, will evidence stronger associations between total number of stressful events and symptoms of depression and PTSD.

6. Does relational health have direct or stress-buffering effects on psychological functioning?

a) It is hypothesized that a quality connection to a friend will be negatively correlated with depression and PTSD.

b) It is hypothesized that a quality connection to a school community will be negatively correlated with depression and PTSD.
c) It is hypothesized that a strong connection to a friend will moderate the relationship between total number of stressful events and psychological symptoms such that greater levels of relational health will predict lower levels of depression and PTSD.

d) It is hypothesized that a strong connection to a school community will moderate the relationship between total number of stressful events and psychological symptoms such that greater levels of relational health will predict lower levels of depression and PTSD.
Chapter 2 (Review of the Literature)

Although concepts of resiliency and relational health have been found to be important factors in the healthy development of youth in the United States, there is a lack of research on how such concepts may or may not apply to youth globally. While numerous studies on youth in North America, Europe, and Asia have suggested links between stress and psychological functioning, few have addressed the types of stressors and subsequent psychological symptoms facing African youth broadly, and Kenyan youth specifically.

Existing studies have demonstrated somewhat mixed findings. For example, one study that examined the connection between traumatic stressors and psychological symptoms in urban youth in Nairobi and Cape Town suggested that Kenyan youth have higher rates of exposure to traumatic stressors (75% of the sample) and violence than their South African peers (Seedat, Nyamai, Njenga, Vythilingum, & Stein, 2004). Yet, in the same study, PTSD symptoms were lower in the Kenyan sample (5%) than in the South African sample. In an effort to explain their findings, the authors speculated that perhaps Kenyan youth experience a buffer against PTSD (Seedat et al., 2004). Gender differences in this study were similarly mixed. While no gender difference was found in exposure to violence, a gender difference was found in the report of mental health outcomes among Kenyan youth; girls, compared to boys, reported both a higher frequency of depression symptoms and higher rate of depression overall as measured by their scores on the Beck Depression Inventory (Seedat et al., 2004). Similarly, researchers documenting psychological functioning of Kenyan youth living and working on the
streets in Nairobi found that developmental problems and psychological disturbance were greater for girls than for boys (Aptekar & Ciano-Federoff, 1999). Given the sparse research described above, more work must be done to elucidate the levels and impact of stressors among Kenyan boys and girls. Moreover, little or no research to date has examined these variables of interest in a rural population of Kenyan youth.

**Type of Stress and Psychological Functioning in Youth**

Existing literature in the field of developmental psychopathology suggests that adverse experiences in childhood lead to increases in depression (Rutter & Sroufe, 2000). The relationship between stressful life events and psychopathology in adolescence was first addressed in a sample of college freshmen in which the data supported evidence of a “direct stress and illness model” (Hotaling, Atwell, & Linsky, 1978). Since that time, several contemporary studies have linked exposure to stressors with declines in mental health for youth in the United States, Europe, and China. In a study of youth in Hong Kong, stressful life events explained 22% of the variance in psychological symptoms for mainland Chinese immigrant youth while stressful life events explained 32% of the variance in symptoms for local youth in Hong Kong (Wong, 2008). Similarly, a study of Mexican youth ages 6-13 found a significant association between self-reported stressful events and physical and psychological symptoms (Reyes & Acuña, 2008).

Specifically, links have been made between stress and increases in internalizing and externalizing behaviors in the U.S. (McLaughlin & Hatzenbuehler, 2009; Roosa et al., 2009) and in Dutch youth (Willemen, Koot, Ferdinand, Goossens, & Schuenge, 2008) and more specifically to symptoms of depression (Cuffe, McKeown, Addy, & Garrison,
2005; Ge et al., 2001; Grant, Compas, Thurm, McMahon, & Gipson, 2004; Unger et al., 2001) and PTSD (Davidson & Baum, 1990; Davidson, Inslicht, & Baum, 2000).

Furthermore, researchers in the United States, Europe, and Asia have found evidence that the type of stressors experienced by youth play a role in predicting their psychological symptoms (e.g., Garber, 2006; Sund, Larsson, & Wichstrøm, 2003; Wong, 2008). For example, a study of Norwegian adolescents 12-14 found that specific stressors (e.g., school-related stress, daily hassles) were predictive of depressive symptoms (Sund, et al., 2003). For youth in China, depression was correlated with negative school related events (Unger et al., 2001), while immigrant youth in Hong Kong were particularly impacted by changing schools and parental discord (Wong, 2008). Other stressors have been linked to depression including “personal disappointments, failures and loses, child abuse/maltreatment… poverty, and interpersonal problems…” (Garber, 2006, s112).

A dissertation exploring independent and dependent stressors on positive and negative outcomes in adolescence (Dudeck, 2007) suggested that dependent stressors, or those more closely tied to the individual (e.g., fighting with parents), are more highly correlated with depression as compared with independent stressors, or those that are seen as beyond one’s control (e.g., parent getting sick; Dudeck, 2007). Li and Zhang (2007) found that different types of stressors (e.g., interpersonal problems, family poverty, family accident) lead to different mental health problems for middle school students in China. Furthermore, it is likely that stressors involving peers may be particularly disruptive for youth. In a study of Dutch youth, 10-12 years old, Bakker, Ormel, Verhulst, and Oldehinkel (2010) found that boys and girls were likely to develop both
internalizing and externalizing symptoms in the context of peer victimization at school and peer relationship losses. Youngstrom, Weiss, and Albus (2003) found that experiencing violence, witnessing violence, and knowing a victim of violence were related to poorer mental health outcomes in a sample of 320 urban high school students in the U.S.

The types of stress experienced by youth around the world range from mundane, daily hassles, to significant loss, to egregious forms of chronic violence. In a study of youth in China, the most frequently rated stressful events included receiving bad grades and punishment at school; the most severe events experienced by these youth included death, divorce, and disability of parents (Unger et al., 2001). It stands to reason that the type of events that are experienced as more intense or chronic may be related to higher levels of maladjustment and symptomatology.

Although these studies provide initial evidence of an association between types of stressors and psychological functioning in populations of youth globally, research has yet to examine the relationship between stressors and psychological symptoms in Kenyan youth. Collaboration with key informants in Kenya (e.g., research assistants, heads of school, teachers) suggested that Kenyan youth may be particularly troubled by issues pertaining to school performance and violence (personal communication, January 2010).

The present study hypothesizes that certain types of stressors (e.g., witnessing violence, death of a family member or friend) will predict higher levels of depression and PTSD symptoms as compared with potentially positive or neutral stressors (e.g., a new baby coming into the family, someone moving out of the home).
Total Number of Stressful Events and Psychological Functioning in Youth

In addition to type of stress predicting psychological functioning, empirical findings have also suggested that the total number of stressful events may also be a predictor. In a sample of 11-18 year olds in the U.S., a link between exposure to violent stressors and level of trauma symptoms suggested that poly-victimization, or exposure to many types of violence (e.g., bullying, physical violence, sexual assault), had greater deleterious effects on youth than repeated exposure to the same stressor (Turner, Finkelhor, & Ormrod, 2010). Additionally, in the aforementioned study of Norwegian adolescents, researchers found that the number of stressful events experienced by youth predicted depressive symptoms (Sund et al., 2003). In a cross-sectional study of 110 Kenyan secondary school students ages 12-26 researchers found that the number of traumatic events experienced by the students was positively correlated with symptoms of PTSD (Ndetei et al., 2007). This is consistent with the findings of Seedat et al. (2004) in that youth from Nairobi and Cape Town who met full criteria for PTSD endorsed exposure to more traumatic events than youth who did not meet the diagnostic threshold. Furthermore, a meta-analysis of risk factors for PTSD suggested that additional life stress during or after the trauma was related to PTSD (Brewin, Andrews, & Valentine, 2000). Given the consistency of these findings, the present study hypothesizes that the total number of stressful events will be associated with psychological symptoms such that greater numbers of stressful events will be positively associated with greater levels of depression and PTSD symptoms.

Gender and Type of Stressors
Available research presents mixed findings regarding gender differences across different types of stress. Moreover, specific stressors may affect persons differently by gender (Davidson & Baum, 1990; Davidson et al., 2000). For example, gender differences in type of stressors were found in a survey of Chinese adolescents with boys reporting stress related to school, family, health, and romantic relationships and girls reporting higher levels of peer stress (Sun, Tao, Hao, & Wan, 2010). Among U.S. youth ages 11, 13, and 15, girls reported a greater number of independent stressors and dependent interpersonal stressors (e.g., lack of friends, breakup, family conflict) over time as compared with boys, however there was no gender difference regarding non-interpersonal dependent stressors (e.g., getting bad grades; Mezulis et al., 2010). In a small sample (N = 124) of seventh and eighth graders in the U.S., boys were more likely to experience violence at home and in the community than were girls (Allwood & Bell, 2008). Consistent with this finding, Seedat et al. (2004) found that boys in Nairobi, Kenya were more likely to report having witnessed community violence, having been robbed, and having been physically and sexually assaulted than their female peers.

Of note, the literature does not report consistent use of one validated measure of stress for youth. Instead, studies of stress in youth report using a wide range of scales. Of the studies mentioned thus far, the following scales have been used to capture constructs of stress: College Student Life Events Scale (CSLES), War Trauma Screening Scale, Screen for Adolescent Violence Exposure (SAVE), Life Events Questionnaire – Adolescent (LEQ-A), Trauma Checklist (adapted from the Schedule for Affective Disorders and Schizophrenia for School-age Children), self-report stress list generated
from semi-structured interviews, and Adolescent Perceived Events Scale (APES). Because there was no universally reported measure, the current study utilized a measure (Stressful Urban Life Events; SULE) that was chosen for its attention to both school stress and exposure to violence, two categories of stress which school personnel and community workers from a collaborating NGO independently deemed salient to youth in the present sample. Although it is plausible that there are gender differences in the type of stressors experienced by students, given the limited findings on the type of stress by gender, and lack of research on rural Kenyan youth, the current study does not provide a specific hypothesis for which types of stressors male youth may be more likely to report as compared with their female peers.

**Gender and Total Number of Stressful Events**

Research on Spanish youth has also suggested that boys and girls experience different rates of exposure to stressors (Jiménez García, Menéndez Álvarez-Dardet, & Hidalgo García, 2008). Although, there have been some contradictory findings on stressors by gender, with initial reports suggesting that girls experience more life stress during early adolescence (e.g., Rutter, 1986), recent research typically suggests that boys encounter a greater number of stressors than do girls, particularly with regard to violence (e.g., Ruchkin, Henrich, Jones, Vermeiren, & Schwab-Stone, 2007). For example, Seedat, et al. (2004) found that boys in Nairobi and Cape Town reported a greater number of trauma exposures per youth than did their female peers. A study of violence exposure, PTSD, and depression in immigrant schoolchildren in the U.S. found that immigrant boys experienced more violence than immigrant girls (Jaycox et al., 2002). Differences in total
amount of stressors were also found in a survey of Chinese adolescents with boys reporting more stressors as compared with girls (Sun et al., 2010). A large sample (N = 20,745) of adolescents (grades 7-12) in the U.S. reported male adolescents encountered a greater number of stressful events as compared with their female peers (Meadows, Brown, & Elder, 2006). However, the authors attributed this finding to a bias in the stress events measure and not to a true representation of gender differences in stressful life experiences (Meadows et al., 2006).

In contrast to these studies, researchers found that stressful life events did not differ by gender among 5th grade Mexican Americans (Roosa et al., 2009). However, the researchers hypothesized that differences might be found among slightly older adolescents. Indeed, in a longitudinal study examining youth ages 11, 13, and 15, gender differences in exposure to stressors emerged only at age 15 with girls reporting more stressors than boys (Mezulis, Funasaki, Charbonneau, & Hyde, 2010). Gender differences were also found in a study by Ge, Lorenz, Conger, Elder, and Simons (1994); boys reported more stressful life events until age 13 when girls reported more stressors than their male peers.

Overall, gender differences are modest and do not typically emerge until mid-to-late adolescence (Mezulis et al., 2010). Taken together, these findings suggest that it may be particularly important to look at gender differences in stressors during adolescence. Given mixed findings in previous studies, the current study of Kenyan youth will not specify whether boys or girls report a greater number of stressors.

**Gender and Depression**
Depression, the leading cause of disability and the fourth leading contributor to disease burden (World Health Organization, 2000), may also vary across gender. Gender effects have been observed in internalizing psychopathology (Costello et al., 2002), and lifetime prevalence rates suggest that women are at significantly greater risk for developing depression than are men with estimates in a ratio of 2:1 (American Psychiatric Association, 2000). Furthermore, epidemiological studies of youth in the U.S. note differences in depression emerge between boys and girls around the time of adolescence (e.g., Roberts, Andrews, Lewinsohn, & Hops, 1991) and suggest that girls are twice as likely as boys to be depressed after the age of 15 (Nolen-Hoeksema & Girgus, 1994). Interestingly, researchers found that boys in the U.S. had slightly higher levels of depression until age 13 when girls reported higher levels of depression (Ge, Lorenz, Conger, Elder, & Simons, 1994).

A study looking at the cognitive-vulnerability stress model (Abramson et al., 2002) in youth in the United States found that gender moderated several components of the model (Mezulis, Funasaki, Charbonneau, & Hyde, 2010). For example, girls showed stronger associations between stress and depression over time as compared with boys. Additionally, the cognitive vulnerability-stress interaction significantly predicted girls’ depression trajectories over time although it did not do so for boys (Mezulis et al., 2010). Although girls and boys were likely to experience the same levels of depressive symptoms at age 11, girls had significantly higher levels of depression at ages 13 and 15. Furthermore, girls experienced a greater increase in depression symptoms from age 11 to 15 as compared with boys (Mezulis et al., 2010).
Although most research has found evidence for greater levels of depression in adolescent girls, there have been some null and contradictory findings as well. Researchers found no direct nor indirect relationship between gender and depression in a sample of \((N = 287)\) seventh and eighth graders in the U.S. (Yarcheski & Mahon, 2000). Standing in stark contrast to what is typically reported in North American and European samples, a survey of more than 17,000 Chinese adolescents ages 11-22 found higher rates of depression in boys as compared with girls (Sun et al., 2010).

Research on depression in Kenya has been limited and has shown both similarities to and differences from findings in other samples. For example, similar to findings among Western adolescents, Mitchell and Abbott (1987) found that adolescent girls reported greater depressive symptoms than their male peers in a survey of Kikuyu secondary school students (mean age = 17.7 years) in Kenya. A review of global findings on gender differences in depression also cited research by Jenkins, Kleinman and Good (1991) that found greater depression among Kikuyu females as compared with their male counterparts (as cited in Norman, 2004). Anthropological research (Harness, 1987) reported that, unlike their Western counterparts, Kipsigis women in Kenya do not report symptoms of post-partum depression (as cited in Norman, 2004). This later finding may suggest that Kenyan girls and women may not exhibit the same trends toward depression as do Western women, that depression findings in Kenyan women and girls may vary by ethnicity, or that symptoms of depression may vary by cultural expression.

The present inquiry seeks to elaborate on the aforementioned findings by using a validated measure of depression and by utilizing a sample of youth in the age range
where differences in psychological functioning have typically emerged. Despite some discrepancy in the literature on gender effects in adolescent depression, the vast majority of research suggests that girls tend to have higher rates of depression than boys. As such, it is hypothesized that Kenyan girls are expected to report higher levels of depression as compared with their male counterparts in the present study.

**Gender and Post-traumatic Stress Disorder**

The aforementioned study with Kenyan and South African youth found that boys and girls were equally likely to meet criteria for full PTSD, partial PTSD, and PTSD symptom clusters (Seedat et al., 2004). Many studies, however, suggest that women and girls report higher levels of PTSD than boys and men. For example, community samples in the United States have suggested that women have twice the lifetime prevalence for PTSD as compared with men (Vogt, 2007) and girls are more likely to report PTSD symptoms than their male peers (Singer, Anglin, Song, & Lunghofer, 1995). In addition, existing literature has drawn connections between stress and symptoms of post-traumatic stress in youth with potential differences by gender. Specifically, a growing body of studies (Dawes et al. 1989; Green et al., 1991; Lonigan et al., 1991; Pynoos et al., 1993; Vernberg & Varela, 2001), including a review paper on etiologic factors in PTSD in children and adolescents (Foy, Madvig, Pynoos, & Camilleri, 1996), suggested girls tend to report greater PTSD symptoms than boys. While little research has examined this gender difference in diverse populations of youth, limited evidence supports its generalizability to youth in Kenya, including studies on urban adolescents (Ruchkin, Henrich, Jones, Vermeiren, & Schwab-Stone, 2007) and immigrant schoolchildren
(Jaycox et al., 2002) in the United States which found that girls reported more PTSD symptoms than did boys.

Nevertheless, such studies are inconclusive given that gender differences are generally small (Vernberg & Varela, 2001), and sometimes contradictory (Foy et al., 1996). In a review of nine studies that looked at the significance of gender in predicting PTSD symptoms, four studies found gender to be significantly related to PTSD, while five did not find gender to be significant (Foy et al., 1996).

Taken together, the findings seem to suggest that girls report greater levels of PTSD symptoms as compared with boys and that such gender differences tend to be modest if present at all. It is thus hypothesized that girls will report greater levels of PTSD symptoms as compared with boys in the present study.

**Gender, Stress, and Psychological Functioning**

Addressing the connection between gender and stress has particular relevance for determining risk and resilience, and promoting mental health. Female gender, sub-clinical depressive symptoms, anxiety, and exposure to stressful life events have all been found to be risk factors for depression in children and adolescents (Garber, 2006). In addition, research has suggested that the relationship between stress and depression may be particularly salient for adolescent girls (Garber, 2006; Ge et al., 1994). Ge et al. (1994) found that rates of exposure to stressors might lead to different depressive symptoms by gender (as cited in Meadows, Brown & Elder, 2006). Using a longitudinal design across three time points, Meadows et al. (2006) found that stressful life events were more strongly related to depressive symptoms in female adolescents as compared to males.
Moderation analyses have found that gender moderated the relationship between witnessing community violence, and anxiety and depression scores (Foster, Kuperminc, & Price, 2004) and that gender moderated the relationship between academic stress and depression in Chinese youth (Liu & Lu, 2012). Guay, Billette, and Marchand (2006) call for future research to examine gender as a moderator of the relationship between PTSD and social support as well as a focus on comorbidity, especially including depression.

In addition, there is evidence to suggest that types of stressors may differently impact youth by gender. In their sample of Norwegian youth, Sund et al. (2003) found school-related stress was correlated with depressive symptoms for boys, whereas for girls, daily hassles were more highly associated with depressive symptoms. It is hypothesized that girls, compared to boys, will evidence a stronger association between total number of stressful events and symptoms of depression and PTSD.

**Relational Health, Stress, and Psychological Functioning**

Research suggests evidence for both direct effects between relational health and psychological functioning (e.g., Colorassi & Eccles, 2003; Liang et al., 2002) and buffering effects of relational health mitigating the effects of stress on psychological outcomes (e.g., Park, 2004). The relationship between specific stressors and specific psychopathology is moderated by other factors (e.g., Garber, 2006; Grant, Compas, Thurm, McMahon, & Gipson, 2004; Masten & Coatsworth, 1998). For example, research and theory using models of diathesis-stress suggest that certain individual vulnerabilities interact with environmental stress to produce a multitude of possible outcomes reflecting
both adaptive functioning and maladjustment. For youth, important relationships can be both a source of stress and a source of support in their lives. Several U.S. studies have suggested that social support, particularly support offered in close personal relationships, may have a profound effect on youth (e.g., Hotaling et al., 1978; Stice, Ragan, & Randall, 2004). Specifically, Windle’s (1992) stress-buffering model posits that perceived social support may provide a buffer between stressful life events and depressive symptoms. In studies of positive youth development, Park (2004) found that among other factors, high-quality relationships may lead to the development of life satisfaction which may mitigate effects of stressful life events and decrease psychological symptoms. In research on stress and youth, social support often serves as a moderator between stressful life events and behavioral outcomes with greater social support buffering the effects of stress on children (e.g., Jackson & Warren, 2000).

While relationships may moderate the negative effects of stressful life events for both boys and girls, there is reason to suggest that girls may tend toward coping styles that involve disclosure to others; and thus relational health may be particularly important for adolescent girls. Gelhaar et al. (2007) found differences in how youth cope (i.e., active, internal, withdrawal) with stressors in a multinational sample of European adolescents. Across all ages and countries of origin, youth were found to employ more active coping styles when dealing with peer related stress than with other stressors. Girls were more likely to exhibit active coping styles compared with their male peers, particularly in the domains of trying to talk to the person, ask for help from others in similar situations and seeking guidance from peers (Gelhaar et al., 2007). With regard to
internal coping strategies, boys were more likely to report not worrying about the problem while girls were more likely to endorse accepting one’s limits, thinking about potential solutions and accepting that problems will always exist. With regard to age, active coping was most likely employed in early adolescence, withdrawal was employed during mid-adolescence and internal coping was most often endorsed by those youth in late adolescence suggesting developmental changes over time (Gelhaar et al., 2007). Furthermore, evidence suggests that relationship losses may be more problematic for girls than for boys in a study of Dutch youth (Bakker et al., 2010).

Conversely, research has suggested that unhealthy relationships may lead to additional stressors and psychological symptoms and boys may be more likely than girls to engage in these maladaptive relationships. For example, researchers found significant, positive correlations between relationships with delinquent peers and externalizing and internalizing symptoms and that boys reported more relationships with delinquent peers and greater externalizing symptoms as compared with girls in a sample of Mexican-American youth (Roosa et al., 2009). In a survey of both immigrant and local Chinese youth in Hong Kong, peer support, conceptualized as a protective factor, influenced the mental health of immigrant Chinese youth (Wong, 2008). Local youth who experienced stress in peer relationships had poorer mental health while immigrant youth benefited from a stress-buffering effect by which strong peer relationships lead to better mental health outcomes (Wong, 2008).

Using indices of relational health explicitly developed for youth, Liang et al. (2010) found an inverse relationship between relational health and depressive symptoms
in a sample of sixth and ninth grade youth in the United States, such that students who reported healthy friendships and group relationships reported lower levels of depression. In addition, the authors found that students with a healthy peer relationship scored lower on a measure of perceived stress (Liang et al., 2010). Of note, the study found gender differences in overall levels of relational health such that girls reported higher levels of connection with a significant peer than did boys, while boys reported higher relational health in the community group than did girls (Liang et al., 2010).

The present study seeks to build upon the findings of Liang and colleagues (2010) by examining stress-buffering effects of relational health in rural Kenyan youth. Moreover, because peer relationships are often embedded within other social contexts such as school and neighborhood (Brown, 2004), the present study also seeks to examine whether a quality connection with peers and with the school community as a whole will moderate the relationship between stress and psychological symptoms. Although there is limited research on the stress-buffering effects of community relational health, Frey and colleagues (i.e., Frey, Beesley, & Miller, 2004; Frey, Tobin, & Beesley, 2006) have found some direct effects between community relational health and psychological distress. Specifically, the researchers found that higher levels of psychological distress were significantly predicted by lower levels of community relational health in both college men and women in the U.S. (Frey, Tobin, & Beesley, 2004; Frey, Beesley, & Miller, 2006). In addition, there have been some direct effects between psychological functioning and school connectedness, a concept closely related to relational health with a school community. For example, Bond et al. (2007) suggested that school
connectedness in early adolescence is an important predictor of depression in later years for Australian youth, while Resnick et al. (1997) found that perceived school connectedness was a consistent factor in protecting against emotional distress and suicidal thoughts and gestures in a large study (N = 12,118) of adolescents in grades seven through twelve in the United States. In their study of Somali youth in the U.S., Kia-Keating and Ellis (2007) found evidence of direct effects between school belonging and depression but did not find effects between school belonging and PTSD.

With regard to stress-buffering and moderation analyses, one often cited study found that a measure of social support (that included a belonging component) moderated the effects of stress on depression (measured by the CES-D) in a study of college students in the U.S. (Cohen & Hoberman, 1983). However, the previously mentioned study of Somali youth did not find stress-buffering effects; that is, school belonging did not buffer the impact of adversity on psychological symptoms (Kia-Keating & Ellis, 2007). Also, lack of social support was one of the strongest predictors of PTSD in trauma-exposed adults (Brewin et al., 2000). As the literature suggests both direct and indirect effects of social support on psychological adjustment, the present study looks at both main effects and moderating effects of relational health. It is hypothesized that students who show greater levels of school community relational health will exhibit fewer symptoms of depression and PTSD. It is also hypothesized that students with greater levels of school community relational health will be buffered by the effects of stress and will report fewer symptoms of depression and PTSD through this interaction.
Chapter 3 (Method)

The following chapter outlines the research design and methodology for this study. Included is a description of the sampling and recruitment strategy, data collection procedures, quantitative measures and their psychometric properties, and analytic plan. Also included are missing data strategies and preliminary analyses.

Research Design

The research design employed in the present study is quantitative description as relatively little is known about exposure to stress, psychological symptoms, and relational health in this population of Kenyan youth. Quantitative description is particularly useful when gaining an initial understanding about a phenomenon of interest (Heppner, Wampold, & Kivlighan, 2008). Specifically, the study utilizes a correlational design as variables are not being manipulated as they would in an experiment but rather are cross-sectional observations that are assessed in relation to one another.

Sampling

The target population, youth attending primary school in West Pokot district, Kenya, was chosen because of the psychosocial and educational needs perceived by a collaborating non-governmental organization. This sample of students is part of an ongoing educational, health, and needs assessment in partnership with a U.S. based university, that seeks to understand the unique aspects of educating youth whose communities practice female genital mutilation (FGM/C) and early marriage. In addition to physical and psychological health issues that may arise, such practices typically end girls’ school attendance prematurely. Data were collected from 255 youth. However, after
employing missing data techniques (described in detail below) the present study is based on 254 participants in grades six and seven. The sample included 151 girls and 103 boys ranging in age from 10 to 19 ($M = 14, SD = 1.5$). Although a total of nine ethnic groups were represented, 96% of the sample identified as Pokot. The remaining 4% of youth identified as Abagusii, Cheranga [sic], Karamoyong [sic], Luhy, Maasai, Marakwet, Nandi, and Sabaot (see Table 1). According to Jónsson (2006), the Pokot, Cherangany, and Marakwet are all considered part of a larger ethnic group called Kalenjin that share many similar aspects of culture including beliefs, traditions, and elements of language. These groups also share similar traditions with the Karamojong (Jónsson, 2006). Regarding ethnicity, youth typically identify with their father’s tribe, regardless of their mother’s ethnic identity (Jónsson, 2006).

Furthermore, all of the youth in the sample come from communities that have historically practiced FGM/C, and a few of the girls in the sample have undergone this procedure. The majority of the participants are English Language Learners. While English is the language of primary instruction within their school, most of the students speak Kipokot, Kiswahili, or another local dialect. As such, researchers provided uniform translation of survey items when necessary.

**Recruitment**

This is a secondary analysis of an existing cross-sectional data set based upon self-report surveys from 254 youth. Participants were recruited as part of a larger study of the Postcards for Peace intervention, a collaboration of a primary school in West Pokot, an NGO operating in that district, and a U.S. based university. Informed consent was
garnered in accordance to the policies set forth by the Institutional Review Board at Boston College (see Appendix A for a copy of the consent form). Consent was granted by the school administration for all willing student participants. Students were given the opportunity to ask questions after reviewing the assent form and were told that participation was voluntary and that they would be allowed to engage in another activity if they declined participation (see Appendix B for a copy of the student assent form). However, all youths chose to participate in the study.

**Data Collection Procedure**

Data were collected by volunteer research assistants comprised of Kenyan primary school staff and NGO affiliates who were trained via Skype by this author and Dr. Liang. Volunteer research assistants were given the opportunity to ask questions of the researchers regarding methods for attaining the best data possible in a cross-cultural situation. For example, as part of the initial training, the research assistants discussed ways to clarify questions for youths to ensure they would be addressed in a uniform manner. Through this process of training and trouble-shooting, consensus was reached.

The survey was first pilot tested on a sample of Kenyan youth from the target population in accordance with best practices in cross-cultural measurement (Tran, 2009). Survey items were then reworded, added, and discarded as necessary. After consent was obtained from the school and assent was obtained from the students, participants were divided into groups of approximately 30 students with each group monitored by a trained research assistant. Signed assent forms were removed from the survey packets. Identification numbers were assigned to students and written on the survey form. The
students were given surveys and the research assistants read the items aloud verbatim. They provided additional translation and assistance to students who were unclear about the meaning of a particular item. Students were reminded that they could skip any questions that they did not feel comfortable answering. Consent forms and surveys were then mailed to the U.S. where they were kept separate and in a locked filing cabinet to ensure confidentiality and fidelity of data. Preliminary findings were then shared with research assistants and participants including the primary school teachers, administrators, and student participants, NGO staff, local government officials, and members of the Kenyan Ministry of Education. This sharing of findings resulted in a discussion between researchers and participants that improved ecological validity by connecting the research findings to the lived experience of participants and volunteers within the community.

Measures

A detailed description of the measures used in the present study follows. The variables used to test proposed hypotheses are visually depicted in Figure 2 and the items are located in Appendices C-G.

Relational health. The Relational Health Indices for Youth (RHI-Y) are a compilation of six-item scales assessing relational health in three different relationship domains: a peer friendship, a mentoring relationship, and a relationship with a community (Liang et al., 2010). The friendship and community subscales were used in the present study. The items for each subscale were derived from relational-cultural theory, which posits that positive development, health, and wellbeing are fostered by relationships that are authentic, engaged, empathic, and empowering. The RHI-Y items
were tailored from the original RHI scale (Liang et al., 2002) in an effort to be more accessible and developmentally appropriate for youth. The responses were scored on a 5-point Likert scale (1 = never to 5 = always). This measure has been used with culturally diverse student populations in the United States and has been used with youth populations in Uganda and Kenya. Cronbach’s alpha coefficients for RHI-Y-Friend and RHI-Y-Community were found to be .83 and .81 respectively for a sample of sixth and ninth grade boys and girls in the United States (Liang et al., 2010). In the present study “community” was defined as youth in the student’s primary homeroom class—which was the setting in which they spent the majority of their school day.

Psychological symptoms. Depression symptoms were measured using the Center for Epidemiological Studies Depression scale that has been validated for use in non-clinical populations (CES-D; Radloff, 1977). A total score (possible range from 0 to 60) is generated by summing all regularly scored and reverse scored items. Although a score of 16 or higher is frequently used as the cutoff point for high depressive symptoms, false positives lead some researchers to suggest that a higher score be employed when using the scale for diagnostic screening purposes (Boyd, Weissman, Thompson, & Myers, 1982; Zich, Attkisson, & Greenfield, 1990). Scoring for items (except reverse scored items) is as follows: 0 = rarely or none of the time, < 1 day; 1 = some or a little of the time, 1-2 days; 2 = occasionally or a moderate amount of the time, 3-4 days; 3 = most or all of the time, 5-7 days. A sample item is: “I felt hopeful about the future” (Radloff, 1977). Of note, a degree of variability has been found in certain CES-D items (e.g., “I felt lonely”) in cross-cultural studies suggesting cultural differences in the relevance of this
item in assessing depression (Tran, 2009). The CES-D has been used widely in international and cross-cultural research on depression (e.g., Naughton & Wiklund, 1993). Cronbach’s alpha coefficients for CES-D reach upwards of .90, demonstrating good internal consistency in the United States (Radloff, 1977) and more recently have been reported at .84 in a primary care setting in Zambia (Chisginga, Kinyanda, Weiss, Patel, Ayles, & Seedat, 2011).

Symptoms of PTSD were rated using the Posttraumatic Stress Disorder Checklist-Civilian Version (PCL; Weathers, Huska, & Keane, 1991). A total symptom severity score (range from 17 to 85) can be obtained by summing the scores from each of the 17 items. A cutoff score between 30-38 is often used as a marker of significant PTSD within civilian populations accessing primary care settings in the United States. A sample item is: “I am bothered when I have repeated disturbing memories, thoughts or images of the stressful experience” (Weathers et al., 1991). Youth rated their behaviors on a 5-point Likert scale (ranging from 1 = Not at all to 5 = Extremely). The PCL was used in the present study because it has strong psychometric properties and the items directly correspond to DSM-IV symptoms of PTSD. In addition, the PCL has been used with diverse populations including Chinese and Spanish-speaking populations (e.g., Marshall, 2004; Wu, Chan, & Yu, 2008) and with Sudanese refugees in Chad (Rasmussen, Katoni, Keller, & Wilkinson, 2011). Cronbach’s alpha coefficients are reported as high as .97 in the U.S. (Weathers et al., 1991) and .88 in Sudan (Rasmussen et al., 2011).

Exposure to stress. Positive, neutral, and negative stressors (e.g., starting a new school, birth of a new family member, death of a friend) were measured using a modified
version (12-items) of the original 15-item self-report Stressful Urban Life Events Scale (SULE) as produced in the compendium of assessment tools published by the Centers for Disease Control and Prevention (Dahlberg, Toal, Swahn, & Behrens, 2005). The SULE measures youth exposure to stress in the past 12 months and consists of five subscales: Hassles, Life Transitions, Circumscribed Events, Violence, and School Problems. Some of these items were taken from the original 16-item self-report Stress Index that is comprised of three subscales including Life Transitions, Circumscribed Events, and Exposure to Violence (Attar, Guerra, & Tolan, 1994). Items for Life Transitions and Circumscribed Events originated in the Social Stress Measure designed by Tolan, Miller, and Thomas (1998), while items for the Exposure to Violence subscale were created by Attar et al. (1994). The Stress Index was initially used with 384 African-American and Hispanic (predominantly Mexican-American) youth (Attar et al., 1994). The authors reported good construct validity. The Stress Index continues to be used with diverse student populations in the U.S. (e.g., Cowell, 2009; Kiser et al., 2010). Both subscales and total scores can be calculated using this measure. The SULE has most recently been used as a total score in studies of health with youth (e.g., Belgrave et al., 2010) and adults (e.g., Almeida, Savoy, & Boxer, 2010) in the U.S. Belgrave and colleagues (2010) reported using an adapted seven-item version of the SULE for which they reported a Cronbach’s alpha of .76. For the present study, three items were removed from the SULE that included reference to shootings, guns, gangs, and drugs, to increase cultural relevance and cohesion. The Hassles subscale was not reported, as three of the five items were not included in the present study. The SULE consists of a dichotomous
yes/no response format with point values assigned (1 = yes, 0 = no). The measure is used to indicate stress experienced by youth in the past 12 months. In the present study, six stress scales are reported including four subscales and two composite scales (see Figure 3). The subscales include: Life Transitions (T), Circumscribed Events (C), Violence (V), and School Problems (S). Additionally, two composite scales were created for the present study: Bad Stress and Total Stress. Bad Stress, is a composite of the items in the Circumscribed Events and Violence subscales and was created to capture exposure to traumatic stress including illness, injury, death, and violence. Total Stress is a composite of the four subscales (12 items total) and refers to the total number of stressful events.

**Preliminary Analyses**

Prior to conducting the main analyses, multiple preliminary analyses were conducted using IBM SPSS Statistics 20. Data were examined for missing values, influence and outliers, distribution and skew patterns.

**Missing values**

Missing data were located, analyzed, and addressed using the Missing Values Analysis procedure for IBM SPSS Statistics. Of the 255 students who participated in the study, 31 students (12%) had missing data, however the vast majority of the data were intact for the variables of interest in the present study. Twenty-five students were missing one data point, five students were missing two data points, and one student was missing eight data points as that student’s survey instrument was missing an entire page. No more than one or two data points were missing for any given variable with the exception of the CES-D depression measure. Notable exceptions included six missing data points for
CES-D item “I felt fearful” and four missing data points for CES-D item “I enjoyed life”. Missing data were again evaluated after items were removed from the CES-D and PCL scales (explanation detailed below) yielding 23 participants (9%) with missing data. A closer examination revealed that the participants who had missing data did not differ significantly with regard to sex, age, grade, or intervention group.

In the initial analyses, a missing data strategy of listwise deletion was used to provide the most conservative estimates for the exploratory factor analyses that follow. Listwise deletion, a technique that removes an entire case from the dataset, can impact the sample size, thus jeopardizing statistical power and threatening to increase the risk of Type I error and statistical conclusion validity (Roth, 1994). Despite the potential risks to validity, listwise deletion, as recommended by Chen and Astebro (2003), was the procedure chosen because less than 1% of the sample would be impacted and thus would not bias parameter estimates or decrease power. This technique was used to remove the single case that was missing eight data points.

Alternative strategies (e.g., mean substitution, regression imputation, maximum likelihood) for dealing with the remaining missing data were considered (Roth, 1994). First, a multivariate test statistic was run to determine if data were missing completely at random (MCAR; Little, 1998). Little’s test statistic was not statistically significant, meaning the chi-square test did not detect mean differences between students who responded to a particular survey item and those who did not respond to the same item, and therefore had missing data ($\chi^2 = 687.75, df = 670, p = .309$). The findings from this test suggested that the missing data were MCAR, that there were no differences detected
among subgroups (i.e., sex, age, grade) between students with intact data and those with missing data. Given that the data were MCAR, unconditional mean substitution was determined to be an adequately robust technique to address the remaining missing values. Unconditional mean substitution replaced missing values based on the mean score of the item as derived from the actual data. Although this technique is preferred to less sophisticated methods (e.g., listwise deletion), mean substitution can introduce statistical bias (i.e., biased estimated for parameters, reduced variance, distorted covariance; Schafer & Graham, 2002; Schlomer, Bauman, & Card, 2010). Still, it was deemed an appropriate technique to address the missing data for continuous variables including the CES-D, PCL, and RHI-Y.

For imputation of incomplete binary data, suggested techniques include simple rounding, “coin flip”, or adaptive rounding (Bernaards, Belin, & Schafer, 2007). Although each technique has strengths and weaknesses, all are preferred to reliance on complete-case analysis (Bernaards et al., 2007). Two missing data points were identified in the dichotomous (yes/no) SULE scale item “During the last year, has a family member become seriously ill, injured badly, and/or had to stay at the hospital?” A coin-flip was used to complete the missing data points. When the coin flip resulted in “heads,” or an answer of “yes,” “1” was imputed. When the coin flip resulted in “tails,” or an answer of “no,” “0” was imputed.

**Outliers and influential data**

Outliers and influential data were located using studentized residuals, Cook’s D, histograms and partial plots as recommended by Fox (1991). A histogram with normal
curve confirmed the RHI-Y-F and RHI-Y-C were negatively skewed. Similarly, the CES-D was found to have a slight positive skew however, the histogram coupled with the skew and kurtosis statistics reported below suggested that a transformation was not necessary. The PCL and stress scales approximated the normal curve in the histogram.

Scatterplots were generated for different combinations of the variables of interest. Predictor variables, including the stress measures, gender, and relational health indices were plotted with both outcome variables, CES-D and PCL. For example, a basic scatterplot of Total Stress predicting CES-D scores showed the majority of respondents located within the 95% confidence intervals, with eight cases falling outside of the 95% confidence interval. Furthermore, an upward slope was observed between the minimum (min = 0) and maximum (max = 10) stressful events encountered in the past year. This suggested that depression, as captured by CES-D scores, tended to be greater as total number of stressful events increased. Of note, there was a wide range of depression scores (z-scores ranged from -1.29 to 2.36) for students reporting none of the events captured by the stress measure. In addition, the plots of relational health were beginning to show a fan-like shape indicating possible homoscedasticity. To account for this potentially problematic data distribution, a log transformation was indicated to stabilize the variance and enhance variability. (The log transformation is described below in the Transformation of relational health scores section.) All other plots appeared to fit a linear equation with the vast majority of points lying within the 95% confidence intervals. For any given plot, no more than eight participants (3% of total participants) reported scores outside of the 95% confidence intervals.
Next, Cook’s Distance (Cook’s d) was calculated to identify influential observations. This diagnostic underscored the potential influence of five participants on the regression equation. This was similarly supported by the SDFBETA calculations used to assess the effect of specific observations on the model fit. SDFBETA measures the “change in a regression coefficient when an observation is omitted from the regression analysis” and is suggested at $\pm 3/\sqrt{n}$ (Pedhauzer, 1997). For the present study ($N = 254$), SDFBETA was estimated ($\pm .188$) such that observations greater than .188 and less than -.188 were considered influential. In addition to the participants of interest identified by Cook’s d, the SDFBETA analysis identified two of the five research participants previously identified by Cook’s d. Analyses were subsequently run with and without data from these participants. Ultimately, the results did not differ. Closer examination of these participants did not suggest any clear reason why they were exhibiting influence on the regression. Therefore, data for these participants were retained for subsequent analyses.

Cross-Cultural Validation of Measures

The CES-D, PCL, and RHI-Y are measures that have been validated in U.S. samples. They have been found to be empirically and psychometrically sound, and have been increasingly utilized with culturally diverse populations internationally. Although psychometric properties are not readily available in published studies for the SULE in its entirety, it has been used with diverse populations (e.g., Almeida, Savoy, & Boxer, 2010; Belgrave et al., 2010). Additionally, the core SULE items, derived from the Stress Index, have also been used with diverse populations (Attar et al., 1994; Cowell et al., 2009; Kiser et al., 2010). In the present study, the 12-item stress instrument was verified by
Kenyan research collaborators as a reasonable tool to capture the presence of stressful events in students’ lives in a structured format, particularly given the emphasis on school and violence related stressors.

The measures used in the present study have undergone rigorous preparation to improve cultural relevance and construct validity. For example, during a similar intervention in Uganda, research assistants from Uganda and the U.S. formed focus groups to improve the validity of the aforementioned measures. Through this process, each item of a measure was carefully considered, reworded, or deleted for cultural validity and then pilot tested in a study of Ugandan youth enrolled in an intervention. Items found to be consistently unclear or of questionable relevance to Ugandan youth were further refined, reworded and deleted as necessary. Similarly, this author and Dr. Liang jointly conducted several training sessions and focus groups via Skype where Kenyan research assistants were able to ask questions, clarify item meanings, and consult with one another about how to best translate the items into the local Kiswahili and Kipokot languages as necessary. During the training calls, research assistants worked to reach consensus on uniform interpretations of each item. These measures were further pilot tested with Kenyan youth, and items were reworded or discarded as necessary.

Tran (2009) suggested three approaches to developing cross-cultural measurement including adoption, adaptation, and development. The present study used an adaptation approach whereby some of the survey items are reworded or discarded. Of note, no new items were added to the measures. Additionally, Tran (2009) recommended using both qualitative and quantitative checks to improve the validity of measures used cross-
culturally. The qualitative checks utilized in the present study included formulating research aims, defining the boundaries and population, generating hypotheses, and building a cross-cultural research support team. The quantitative checks included pilot studies in Uganda and Kenya, measurement adaptation, data collection strategy, and assessment of instrument validity and reliability that follows.

**Assessing measurement validity and reliability**

Preliminary analyses were conducted to determine the cross-cultural validity of the measures used in this study. The purpose of assessing measurement equivalence was to verify reliability and validity of the scales and to determine if the psychometric properties initially described in U.S. samples were retained for this sample of Kenyan youth. Adequate reliability and validity is important in increasing the confidence that the scales are accurately capturing the constructs (e.g., depression, PTSD, stress, relational health) assessed in the current study. Preliminary analyses included descriptive analysis (i.e., means, standard deviations, range, skew and kurtosis), reliability analysis to determine internal consistency (i.e., Cronbach’s alpha), exploratory factor analysis (i.e., structure and factor loadings) to determine cross-cultural equivalence, and confirmatory factor analysis (i.e., measurement errors and goodness-of-fit) to assess measurement equivalence as recommended for cross-cultural studies (Chan, Tran, & Nguyen, 2012; Tran, 2009).

**Descriptive analysis: means, standard deviations, range, skew, and kurtosis**

A descriptive analysis was completed to identify any issues with the data distribution (i.e., non-normality) and response patterns. Means, standard deviations, and
observed ranges were calculated for the total raw scores of each variable and reported in Table 2. Skewness (the asymmetry of the data distribution) and kurtosis (the peakedness of the data distribution) were also calculated.

Total RHI-Y-F scores ranged from 10 to 30 with a mean score of 27.4 ($SD = 3.58$), skew of -2.02, and kurtosis of 4.70. Total RHI-Y-C scores ranged from 13 to 30 with a mean score of 27.3 ($SD = 3.37$), skew of -1.77 and kurtosis of 3.25. Dividing the total raw score by number of items resulted in an average item score that could be used to compare to the sample described by Liang et al., (2010). This sample of Kenyan youth exhibited slightly greater relational health scores (RHI-Y-F: $M = 4.6$; RHI-Y-C: $M = 4.6$) as compared to youth in the United States (RHI-Y-F: $M = 3.8$; RHI-Y-C: $M = 4.2$).

Scores on the Total Stress scale ranged from 0 to 10 with a mean score of 3.15 ($SD = 2.00$), skew of .396, and kurtosis of -.258. (Descriptive information for additional stress subscales is located in Table 2.)

For the CES-D, scores ranged from 3 to 52 with skew of .457 and kurtosis of -.869. The mean score of the present sample ($M = 21.0$, $SD = 11.9$) is slightly higher than the median score of 19 reported by Chishinga et al. (2011) in a study of Zambian adults in a primary care setting. (Chishinga et al. (2011) did not report the mean or standard deviation for their sample.) The mean for Kenyan youth is also higher than scores reported by Radloff (1991) for youth in the United States (Junior high: $N = 355$, $M = 16.60$, $SD = 9.19$; High school: $N = 282$, $M = 17.88$, $SD = 10.31$).

Scores on the PCL ranged from 17 to 85 with a mean score of 52.2 ($SD = 13.7$), skew of -.352, and kurtosis of -.188. The mean is considerably higher than the 30-38
generally cited as cutoff scores for clinically significant PTSD. Dividing the mean by the total number of items resulted in a score of 3.07, which was higher than the mean item score for Sudanese adults ($M = 2.58$, $SD = .74$) reported by Rasmussen et al. (2011). However, the mean item score for the present sample of Kenyan youth was within one standard deviation of the Sudanese sample.

Overall, the present sample of Kenyan youth reported greater scores on indices of relational health and psychological symptoms than other populations.

In a normal distribution, skew and kurtosis equal zero. Although skew and kurtosis were close to zero for the psychological symptoms and the stress measures, they were higher for the relational health measures. A closer look at skew and kurtosis for individual items revealed, for the RHI-Y-F measure, the individual items were negatively skewed and ranged from -1.66 to -3.16. Kurtosis values ranged from 2.50 to 10.96, with the largest kurtosis value for the item, “My friend and I think it is important to keep making our friendship better.” Individual items were also negatively skewed from -1.51 to -2.66 for the RHI-Y-C measure. Kurtosis for RHI-Y-C items ranged from 2.23 to 7.19. Such issues with skew and kurtosis suggested that the assumption of normal distribution was not been met for the relational health indices and provided further evidence for transformation (as described below in Transformation of relational health scores).

The individual items from the SULE were negatively skewed with the exception of “During the last year, has a new baby come into the family?” which was positively skewed. For the individual stress items, skew ranged from -.159 to 2.38 and kurtosis
ranged from -.161 to 3.70. The Total Stress composite had an acceptable skew (.396) as did the stress subscales (T = .355, V = .687, C = .545, S = 1.203).

Individual CES-D items ranged in skew from -1.34 to 1.91 and most of the items were positively skewed. However, three items were negatively skewed including: “I had trouble keeping my mind on what I was doing”; “I felt that everything I did was an effort”; and “I talked less than usual.” Also of note, the four reverse coded items had larger skew values than most of the other items suggesting there may have been additional issues with the administration or interpretation of reverse coded items. Total CES-D scores, however, were within the acceptable range for skew.

Skew and kurtosis ranged from .673 to -.841 and from -.760 to -1.71 respectively for individual items of the PCL, and eleven of the 17 items were negatively skewed. Positively skewed items included: “I suddenly act or feel as if the stressful experience is happening again (as if I am reliving it)”; “I feel distant or cut off from other people”; “I feel like I am unable to have loving feelings for those close to me”; “I feel as if my future will somehow be cut short,” “I have trouble falling or staying asleep”; and “I have difficulty concentrating.” Despite the negatively skewed items, total PCL scores reported skew within the acceptable range (-.352).

**Transformation of relational health scores**

Transformations were performed on skewed relational health data in order to better approximate the normal distribution, one of the underlying assumptions of linear regression. This was particularly salient for the negatively skewed RHI-Y subscales, as measures of relational health have been reported as negatively skewed in other
populations (e.g., U.S. middle school students). To account for the skew, RHI-Y data underwent a log transformation. As suggested by Tabachnick and Fidell (2001), first, each RHI-Y score was subtracted from the greatest score plus one, to reverse the direction of the data distribution, thus moving from a negative skew to a positive skew. Changing the direction of the distribution allowed for the possibility of a log transformation as it would not have been possible to take a log of a negative number. Lastly, the log score for each data point was subtracted from the greatest log score plus one, to return the data back to its original negative skew for consistency and ease of data interpretation. By re-running the descriptive statistics, it was determined that this transformation reduced the skew in the data from -2.019 to -.543 for the RHI-Y-F and from -1.772 to -.331 for the RHI-Y-C such that the skew more closely approximated the desired value of zero, thus indicating a more normal distribution.

**Reliability analyses: correlations**

Consistent with the guidelines put forth by Tran (2009), psychometric equivalence was determined by observing the correlation of each item in the scale with the overall scale. Correlation of the items in a scale should all be positive (Tran, 2009). While this was the case for the RHI-Y-F and RHI-Y-C, there were negative inter-item correlations in the CES-D and PCL measures. One item in the CES-D, “I had trouble keeping my mind on what I was doing,” was negatively correlated with the remaining CES-D items. As such, this item was considered for removal from the scale, but was ultimately retained after careful consideration following the exploratory and confirmatory analyses below. Additionally, six PCL items had negative correlations. Again, these
items were considered for removal from the scale. Following additional consideration and data from the exploratory and confirmatory factor analyses, two of these items, “I have difficulty concentrating” and “I feel jumpy or easily startled” were removed from the PCL measure.

**Reliability analysis: Cronbach’s alpha coefficients**

Psychometric equivalence was further confirmed through observation of the internal consistency coefficient, Cronbach’s alpha (Tran, 2009). Reliability analyses were conducted for the RHI-Y-Friend, RHI-Y-Community, CES-D, PCL, and SULE to determine internal consistency (Table 2). Cronbach’s alpha coefficients for RHI-Y-Friend and RHI-Y-Community were found to be .806 and .804 respectively and consistent with the U.S. sample (Liang et al., 2001). The CES-D and PCL demonstrated acceptable internal consistency with Cronbach’s alpha coefficients of .859 and .808 respectively. Internal consistency for the 12-item Total Stress variable was .488. Although this alpha is considerably lower than the .76 reported by Belgrave et al., (2010) in their use of an adapted 7-item version of the SULE, this statistic should be examined with caution. Unlike the aforementioned measures, it was not expected that this stress measure demonstrate internal consistency, as it is a questionnaire that elicits a wide variety of stressful life events that would not be expected to relate to one another. For example, items such as “Has a new baby come into the family?” and “Have you seen anyone beaten, shot or really hurt by someone?” may both induce stress, but one should not be related to the other. Unlike the CES-D, which is meant to capture the construct depression via items that are closely related to one another, and to the larger depression...
construct, the stress measure used in the present study does not capture a singular construct of stress but rather, seeks to capture youth exposure to specific types of stressors that may be positive, negative, or neutral. While a new baby coming into the home may indicate positive, negative, or neutral stress, witnessing violence is likely to be negative stress. While both are potentially stressful events captured by the SULE measure, these mutually exclusive events would not be expected to demonstrate internal consistency.

Of note, Cronbach’s alphas increased for the psychological symptom measures following the data reduction analyses reported in the Exploratory Factor Analysis and Confirmatory Factor Analysis sections. Specifically, reducing the CES-D measure from 20 to 13 items led to a Cronbach’s alpha coefficient change from .859 to .893. Cronbach’s alpha coefficient for the PCL changed from .808 to .812 when the measure was likewise reduced from 17 to 14 items.

**Exploratory factor analysis**

Exploratory factor analyses were run for the following variables: RHI-Y-F, RHI-Y-C CES-D, and PCL. This was done to determine statistical validity for measures that have not previously been used with Kenyan youth. Factor analysis was not conducted for the stress scales as they did not have a defined factor structure or available normative psychometric properties for comparison.

*Kaiser-Meyer-Olkin test and Bartlett test of sphericity.* Before the exploratory factor analysis (EFA) were conducted, tests were run to determine if psychometric requirements were met as measured by the Kaiser-Meyer-Olkin (KMO) test of sampling
adequacy and the Bartlett Test of Sphericity (BS; Ferguson & Cox, 1993). The KMO statistic suggested that the RHI-Y (.90), CES-D (.88), and PCL (.85) all exhibited sampling adequacy as the statistic was larger than the required minimum value (.50; Dzubian & Shirkey, 1974). Furthermore, all scales exhibited significance ($p < .001$) on Bartlett’s Test of Sphericity suggesting that the items were significantly different from one another. Therefore, the measures met the requirements for KMO and BS in this sample of Kenyan youth.

**Exploratory factor analysis with varimax rotation.** Next, EFA was used to explore the factor structure of the scales and to determine item performance in the sample of Kenyan youth. A principal component EFA was carried out in order to determine the factor structure of the following scales: RHI-Y (Friend and Community subscales), CES-D, and PCL. Because their psychometric properties have not yet been demonstrated on a sample of rural Kenyan youth, it was necessary to first conduct an EFA before attempting a Confirmatory Factor Analyses (CFA) based upon theoretical underpinnings.

**RHI-Y factor structure**

The KMO coefficient was .900 and the $\chi^2$ from the Bartlett test was 1123.2 ($df = 66, p < .001$), for the RHI-Y scale. The principal component analysis concluded that the RHI-Y had a two-factor structure accounting for 44.3% of the total variance in the rotated model. Factor 1 included nine items with factor loadings ranging from .422 to .729, and accounted for 27.6% of the total variance in Factor 1. Factor 2 included three items ranging from .545 to .689, and accounted for 16.7% of the total variance in the factor.
The factor loadings of the individual items in both scales are presented in Table 3. The relational health measure utilized in the present study differs somewhat from the original scale. In the present sample, items from the Friend and Community subscale loaded onto both Factor 1 and Factor 2. This was most pronounced for the Community subscale items. Despite this finding, all 12 items (six items in each subscale) were retained for the subsequent CFA analysis. This determination was made as items in both subscales were driven by relational cultural theory and should be closely related to one another, and were all positively correlated with one another in the reliability analysis.

**CES-D factor structure**

For the CES-D, the KMO coefficient was .88 and the \( \chi^2 \) from the Bartlett test was 1765.9 (\( df = 190, p < .001 \)). This result suggested that the data were suitable for the principal component factor analysis. The principal component analysis concluded that the CES-D had a three-factor structure accounting for 41.9% of the total variance in the rotated model. One of these factors consisted of 13 items. Factor loadings of the items included in this factor ranged between .548 and .770, accounting for 29.6% of the total variance in the scale, this factor was termed “Depression Symptoms.” The second factor consisted of four items. Items loadings in this factor, “Reverse Coded Items” ranged between .535 and .586 and accounted for an additional 9.6% of the total variance in the scale. The third factor, “Focusing,” consisted of one item that loaded onto the factor (.461) and accounted for an additional 2.7% of the total variance in the scale. Per best practices by Tabachnick and Fidell (2001) only those items greater than .32 were retained.
in the present study (as cited in Tran, 2009). The factor loadings of the items in the CES-D are presented in Table 4. The factor structure described herein differs considerably from the established factor structure of the CES-D derived from a sample of youth in the United States as reported by Radloff (1991). Radloff’s structure included four factors: Depressed Affect, Happy, Somatic and Retardation, and Interpersonal.

Given the findings, it was decided that six items should be removed from the depression scale. All four items in the “Reverse Coded Items” factor were removed (i.e., Good, Hopeful, Happy, Enjoyed). It was hypothesized that the students, who are unaccustomed to Likert scale surveys, misinterpreted the wording or scale direction for these items. This finding was consistent with Carlson et al. (2011) who observed similar issues in the psychometric properties of the CES-D when administered to ethnically diverse older adults. Researchers found that reverse scored items were less internally consistent, had lower item-scale correlations, more atypical responses, and were negatively correlated with non reversed items (Carlson et al., 2011). Items removed included the following: “I felt that I was just as good as other people.” “I felt hopeful about the future.” “I was happy.” “I enjoyed life.” In addition, two other items were removed including: “I felt that everything I did was an effort.” and “I talked less than usual.” It was likely that these two items were not indicative of depression in this cultural context and therefore the items would not be expected to cluster together with other depression items in the factor analysis. In sum, six of the original twenty items were removed from the CES-D scale, and the remaining fourteen were retained in the measure and used in subsequent analyses.
Lastly, the PCL scale KMO coefficient was .85 and the $\chi^2$ from the Bartlett test was 1350.9 ($df = 136, p < .001$). This suggested that the data were suitable for the principal component factor analysis. The principal component analysis concluded that the PCL had a four-factor structure accounting for 45.9% of the total variance. One of these factors consisted of nine items. Factor loadings of the items included in this factor ranged between .507 and .713, accounting for 21.3% of the total variance in the scale, this factor was termed “Factor 1.” The second factor consisted of six items. Factor loadings of the items included in this factor ranged between .462 and .758. Accounting for 15.2% of the total variance in the scale, this factor was termed “Factor 2.” The third factor consisted of two items with loadings of .497 and .677 and accounting for 6.2% of the total variance in the scale. This factor was termed “Factor 3.” The fourth factor consisted of partial loadings of items that loaded onto the other three factors. Accounting for 3.2% of the total variance in the scale, this factor was termed “Factor 4.” The findings are inconsistent with previous research that suggested a hierarchical four-factor model: Re-experiencing, avoidance, numbing, and hyperarousal factors (Asmundson et al., 2000). The factor loads of the items in the PCL scale are presented in Table 5.

Discussions with collaborating researchers led to the removal of one of the 17 items in the PCL: “Being super alert or watchful on guard.” This item was identified by Kenyan research assistants as likely to have been considered a positive attribute by the youth rather than a symptom of PTSD. The remaining sixteen items were retained in the scale and used in subsequent analyses.
Confirmatory factor analysis

Confirmatory factor analyses (CFA) were used to test the factor structures identified by the prior EFA. CFA is guided by theory and previous research findings and it is assumed that items will only load on to factors to which they are assigned. Goodness-of-fit statistics confirmed the CFA accurately captured the data in the present study (see Table 6). The CFA reported below was computed using the AMOS (Version 7.0; Arbuckle, 2006) statistical software package.

The CFA was run according to the EFA findings, relational-cultural theory, and previous research on the RHI-Y scale that specified two factors; one factor for the RHI-Y-F subscale, and one factor for the RHI-Y-C subscale. In the two-factor model, the CFA yielded satisfactory goodness-of-fit statistics ($X^2 = 152.0, df = 52, p < .001$, RMSEA = .080, CFI = .922). The RMSEA value indicated a “reasonable fit” according to Kline (2005) who designated .05 as “good”, .08 as “reasonable”, and .10 as “poor” fit statistics. The CFI value was similarly deemed “reasonable” using Kline’s (2005) criteria of .90 to .95. Factor loadings were moderate and ranged from .48 to .72 for RHI-Y-F and ranged from .54 to .70 for RHI-Y-C (see Table 7). Although some of the items demonstrated relatively weak factor loadings, ultimately, all six items for each scale (12 items total) were retained in an effort to better approximate the original, theory-driven scale that has been previously reported in the literature.

A series of CFA were run with the CES-D items. In the final model, factor loadings ranged from .52 to .79 (see Table 8) and fit statistics were satisfactory ($X^2 = 129.2, df = 65, p < .001$, RMSEA = .062, CFI = .953). A covariance line was added to
account for large covariance (12.8) between two of the error terms and this improved factor loadings. The final model included one factor consisting of 13 items. Although the CFA was originally specified with 14 items (given the removal of six items following the EFA), an additional item, “I had trouble keeping my mind on what I was doing” was removed. This item exhibited a low factor loading (.11) in the CFA and was previously identified as being negatively correlated with other depression items. It was ultimately removed in an effort to improve parsimony and goodness of fit for the final model.

As mentioned, the original PCL was comprised of 17 items. Following the removal of one item during the EFA, 16 remaining items were used in the CFA. Four factors emerged from the EFA, with 16 of the 17 items loading onto Factor 1 or Factor 2, two items loading onto Factor 3, and Factor 4 comprised of partial loadings from all items. Guided by the EFA within this study as well as the EFA conducted by Taylor et al. (1998), a two-factor scale was specified for the CFA. Taylor and colleagues specified one factor for Intrusions and Avoidance, and a second factor for Hyperarousal and Numbing. In the CFA, data began to approximate the factor structure described by Taylor et al. (1998), but ultimately was not identical. In the present study, the first factor contained 10 items with loadings ranging from .43 to .71. These items included four of five intrusion items, both avoidance items, two of five numbing items, and two hypervigilance items. The second factor consisted of six items with loadings ranging from .45 to .74. Large covariances were noted between four of the error terms. Adding covariance lines between the error terms however, did not alter the loadings in a meaningful way. The two items with the weakest loadings (.43 and .45 respectively) were “I feel jumpy or easily startled”
and “I have difficulty concentrating.” These items were previously identified as being negatively correlated with other PCL items. Given these items both had negative inter-item correlations, and the weakest factor loadings, both items were subsequently removed from the final model. The final model included two factors with 14 items from the original PCL and demonstrated improved goodness of fit ($X^2 = 173.96, df = 76, p < .001$, RMSEA = .071, CFI = .913). Factor loadings ranged from .55 to .76 for Factor 1 and from .59 to .74 for Factor 2 and are located in Table 9.

**Transformation of CES-D and PCL scores**

Because the CES-D and PCL measures were trimmed from their original compositions following EFA and CFA analyses, total raw scores were no longer interpretable and could not be compared to clinically useful cut-off scores indicating levels of symptomatology for depression or PTSD. Nor could they be compared with findings from previous studies that used the full measures with all of the items. Instead, standard scores were calculated for CES-D and PCL, and are reported for ease of comparison among boys and girls. The transformation of raw scores to standard scores provided improved interpretation of the findings as the $z$-scores could be compared to a standard mean ($M = 0, SD = 1$).

**Descriptive Analysis: Means, Standard Deviations, and Correlations**

Recalculated descriptive data including means, standard deviations, ranges, skew and kurtosis for the transformed data are located in Table 10. Log transformed RHI-Y-F scores ranged from .01 to 2.95, with a mean of 2.13 ($SD = .839$), skew of -.543, and kurtosis of -.892; while log transformed RHI-Y-C scores ranged from .01 to 2.90, with a
mean of 1.95 ($SD = .830$), skew of -0.331, and kurtosis of -1.013. Greater RHI-Y scores indicated healthy relationships with a close friend and with the school community. The Total Stress variable ranged from -1.59 to 3.43 (skew = 0.396, kurtosis = -0.258) with greater scores indicating exposure to greater numbers of stressful events. (Descriptive statistics for additional stress scales located in Table 10.) Scores of psychological symptoms and stress were all standardized ($M = 0, SD = 1$). For the psychological symptom measures, total CES-D scores ranged from -1.29 to 2.36 (skew = 0.363, kurtosis = -0.982) and total PCL scores ranged from -2.37 to 2.27 (skew = -0.389, kurtosis = -0.296).

Correlations were also derived for the variables of interest in order to further confirm the validity of the measures, and to determine the subsequent appropriate statistical techniques based upon relationships between variables (see Table 11). Because the current sample differs from U.S. samples on which the measures were originally derived, correlations were run to determine whether measures were working in expected directions. In addition, correlations between the six stress subscales, and correlations between the CES-D and PCL scales were considered in order to confirm that the proposed MANOVA would be the appropriate statistical technique for the current study. Correlation results showed the four stress subscales (i.e., Life Transitions, Circumscribed Events, Violence, School Problems) were significantly associated with each other, and with the two composite scales (i.e., Bad Stress, Total Stress). Relational health predictors (i.e., RHI-Y-F, RHI-Y-C) were positively correlated with one another, and negatively correlated with the stress scales and the depression measure. Similarly, the two measures of psychological symptoms (i.e., CES-D, PCL) were positively correlated with each
other. In addition, the CES-D was positively correlated with the stress scales. These correlations were in the expected direction and consistent with hypotheses in the current study, previous findings, and relevant theory. The only remarkable exception was that the PCL was not significantly correlated with the stress scales or the predictors of relational health. However, given that the PCL was correlated with the CES-D, is a widely used measure with strong psychometric properties and a robust theoretical and diagnostic basis, and that it is a key variable in the proposed study, it was retained for subsequent analyses.

**Summary of Preliminary Analyses**

The analyses described in this chapter provided additional statistical evidence for the proposed measures in the current study. Analyzing missing data, outliers and influence improved confidence in the reliability of the data. Descriptive analyses (i.e., means and standard deviations) were calculated in an effort to provide descriptive information about stress, psychological symptoms, and relational health in this sample of Kenyan youth. Equivalence in data distribution is important in assessing measurement equivalence (Tran, 2009), and was evaluated via skew and kurtosis of the RHI-Y scales, the CES-D, and PCL. Exploratory factor analysis and confirmatory factor analysis were used to evaluate the factorial equivalence of measures of relational health and psychological symptoms for a cultural group that has not been previously studied using these measures. Correlations provided additional evidence to support the use of all the measures of interest in the current sample with the possible exception of the PCL. However, the PCL was retained given its correlation with the CES-D and relevance to the
study hypotheses. Correlations also provided support for the use of MANOVA over ANOVA given correlations between stress variables and between psychological symptoms.

**Primary Analyses**

Following the preliminary analyses, the primary analyses including testing for gender differences and moderation analyses were conducted. The overarching purpose of this empirical study was to test the hypothesis that depression and PTSD symptoms among youth were associated with their stressful life experiences and that this association would vary as a function of relational health and gender. Data analyses were guided by best practices for multiple regression and correlation techniques (Hoyt, Imel, & Chan, 2008) for purposes of explanation and prediction (Pedhauzer, 1997) as well as tests of moderation where appropriate (Frazier, Tix, & Barron, 2004; Holmbeck, 1997). In addition, two multivariate analyses of variance (MANOVA) were employed to assess gender differences in exposure to stressors as well as depression and PTSD symptoms. The specific research questions, hypotheses, and analyses are detailed in Chapter 4 (and are located in Table 12).
Chapter 4 (Results)

This chapter discusses the analytic strategy and subsequent results for each question in the present study. Also included are the diagnostic procedures used to test whether assumptions for regression analyses and analyses of variance were met in addition to a detailed explanation of primary analyses. Analyses were run to ensure that requisite assumptions about the data and the residuals were met for linear regression and MANOVA. Results from the diagnostic fit analysis highlighted potential issues with the predictor and outcome variables, led to data corrections of violated assumptions where possible, and decreased the risk that a violation would compromise the integrity of the regression analyses.

Diagnostics

Regression and analysis of variance are interpreted with increased confidence when the underlying assumptions for these procedures have been met. Assumptions for linear regression analyses include independence, normality, homoscedasticity, and linearity (Shavelson, 1996). For multiple regression, the same assumptions must be met, as well as the assumption that there is little or no multicollinearity. Assumptions for multivariate analysis of variance include independence, multivariate normality, and homogeneity of covariance matrices (Field, 2009). Although some of these procedures are carried out before the primary analyses are run (e.g., linearity), and some during the regression analyses (e.g., homoscedasticity), diagnostics are reported together in this section for cohesion.

Independence
Independence in the data refers to the notion that a score for a particular youth participant is independent of the scores for all other youth in the sample. The threat to independence was reduced through the data collection procedure by utilizing a cross-section of independent observations. To further confirm independence, a plot was constructed of the residuals, and patterns were not observed.

**Normality**

As reported in Chapter 3, the descriptive analyses (skew) revealed that the RHI-Y subscales and CES-D were not normally distributed. In addition to measuring skew, issues with normality of the residual distribution were confirmed through plots and histograms fitted with a normal curve. Plotting the studentized residuals (SRESID) against the unstandardized predicted values identified eight participants that were under predicted. There were no participants that were over predicted. Next, the normal curve was fit to the SRESID histogram. This revealed a slight positive skew and suggested that the assumption of unconditional normality may not have been met. However, the normal probability plots confirmed the residuals appeared normally distributed for the outcome variables.

To account for skew, as mentioned in Chapter 3, RHI-Y data were transformed using log transformations which reduced skew and led to a closer approximation of normality. Skew was also reduced in the CES-D following the removal of items from the scale. These transformations improved normality.

**Homoscedasticity**
Hoscedasticity refers to the assumption of constant error variances (Fox, 1991). After the regression models were run, studentized residuals (SRESID) were plotted against predicted values so the assumption of equal variance in the residuals throughout the range of the predictors could be determined. With the added fit line, the residuals appeared scattered. The error variance was therefore constant with varying values in the predicted variables. The residuals were not correlated with the predictor variables. This was confirmed with the normal distribution of errors throughout the range of the predictors. Given the plot of residuals against predicted values demonstrated homoscedasticity, or constant variance of the residuals, this assumption was met.

**Linearity**

It is assumed that the relationship between the predictor variable and outcome variable is linear. If the relationship between the variables is not linear, it is likely that the regression model has been miss-specified. Miss-specification may occur when: (1) predictor variables are missing from the equation, (2) the data are unreliable, or (3) there are specific observations exerting undue influence on the model. Partial regression plots, previously utilized to identify influential data (see Chapter 3), were also used to confirm linearity (Fox, 1991). To confirm linear relationships between the predictors and outcomes, psychological symptom outcome variables (i.e., CES-D and PCL z-scores) were plotted against the six stress variables. Plots confirmed the assumption of linearity was met for the data in the present study.

**Multicollinearity**
Testing for multicollinearity was necessary to meet the additional requisite assumption for the multiple regression analyses and MANOVA. Collinearity, refers to the relationship between predictor variables based upon their correlation coefficients (Pedhauzer, 1997). When two or more predictor variables are highly correlated with each other, this can affect standard errors of regression coefficients, magnitude of regression coefficients, and variance (Fox, 1991; Pedhauzer, 1997). To minimize the threat of multicollinearity on the interpretation of the regression analyses, diagnostics including observation of correlation coefficients, variance inflation factor (VIF), and tolerance were employed for all predictor variables used in multiple regression models (i.e., Life Transitions, Violence, Circumstantial Events, School, RHI-Y-F, RHI-Y-C).

Results from the correlation analyses reveal that all of the predictor variables related to stress were correlated with one another. In addition, the RHI-Y subscales were correlated with one another, and with the stress variables. Findings from the correlation matrix suggested some multicollinearity among the data. However, the greatest correlations, between Bad Stress and Circumscribed events (.788), Bad Stress and Total Stress (.772), and RHI-Y-C and RHI-Y-F (.710) are all smaller than the .8 or .9 suggested as problematic levels of multicollinearity (Field, 2009). While correlation coefficients are useful, VIF and tolerance were also examined in an effort to identify subtle forms of multicollinearity. Relatively small values for VIF are considered desirable, as larger VIF may indicate collinearity that could impact the regression coefficients (Pedhauzer, 1997). Researchers suggest a diagnostic threshold of 10 for VIF but note this threshold is not sufficient in determining which variables are discarded (O’Brien, 2007). In addition to
VIF, tolerance is another measure of collinearity that accounts for inaccurate computations due to rounding errors (Pedhauzer, 1997). Although there is no consensus regarding tolerance values, Menard (1995) indicated values less than .2 may be problematic. The VIF for the four stress subscales were close to desirable levels, ranging from 1.06 to 1.98, as was tolerance, ranging from .93 to .94. However, while attempting to enter the two composite scales in the model (i.e., Bad Stress and Total Stress), the composites incurred complete collinearity, and reached minimum tolerance scores (.000), which led to a forced removal from the multiple regression equation. Complete collinearity of the composites was expected, as they include all of the items from the subscales without contributing any unique items. Therefore the composite scales were run in separate models from the subscales in the analyses.

Although the correlation matrix revealed potential threats regarding multicollinearity, the VIF and tolerance diagnostics confirmed that while the stress subscales are correlated, they remained separate predictors as their shared variance was relatively small. Similarly, for the relational health scales, both VIF (.496) and tolerance (2.02) were adequate. Although some multicollinearity existed as suggested by the correlation matrix, favorable VIF and tolerance values confirmed multiple regression analyses could be interpreted with confidence. The only exception to this was with regard to the composite stress scales and it was determined that the composite stress scales would be run individually, in separate regression analyses from the subscales.

**Summary of diagnostics**
Diagnostics were employed to test whether assumptions about the observed data and the residuals were met for regression and MANOVA. Attending to these assumptions included diagnosing problems that could influence the analyses, transforming data to improve robustness of the analyses, and generalizability of the findings. By utilizing a rigorous diagnostic fit analysis, it was determined that the assumptions of independence, homoscedasticity, and linearity, were reasonably upheld. The assumption of multicollinearity was also upheld. Although some of the variables were correlated with one another, they did not meet the threshold for problematic levels of collinearity. Data transformations were conducted to address the issue of non-normality. Data transformations increased the confidence with which the subsequent regression analyses and analyses of variance could be interpreted and generalized.

**Primary Analyses: MANOVA, Linear Regression, and Moderation**

Primary analyses were run to answer the overarching research questions about stress predicting psychological symptoms, gender differences emerging in the report of stress and psychological symptoms, and potential moderating effects of gender and relational health. The following analyses tested a variety of specific hypotheses under the general hypothesis that psychological symptoms are related to youth encounters with stressful life events, and that this association may vary as a function of healthy relationships with friends, connection to the school community, and gender.

**Question 1: Are certain types of stress stronger predictors of psychological symptoms than other types of stress?**
Analytic strategy #1: To test whether stress is related to depression and PTSD, four analyses were specified including two multiple regressions and two simple linear regressions. It was necessary to run separate regression models instead of one model because when the six stress variables (including the four subscales and two composite scales) were entered together, the composites incurred complete collinearity, and unfavorable variance inflation factor (VIF) and tolerance scores, which led to a forced removal from the multiple regression equation.

Stress was operationalized using subscales and composite scales of the SULE instrument (see Figure 3). The stress subscales including Life Transitions, Circumscribed Events, School Problems, and Violence, as well as the composite scale, Bad Stress, captured the concept of type of stress. Bad Stress was the sum of the Circumscribed Events and Violence subscales and consisted of a total of five items regarding illness, death, and violent acts. Regarding the criterion variables, depression was captured by the CES-D, and PTSD was operationalized using the PCL.

It was hypothesized that certain types of stress would predict greater CES-D and PCL scores in a multiple linear regression analysis. Specifically, it was hypothesized that the Violence subscale would be the strongest predictor of psychological symptoms as compared with the other types of stress.

In the multiple linear regressions, the four stress subscales were entered simultaneously into the same step in the model. Observing the standardized betas enabled a comparison of the relative strength of each stress variable in predicting psychological
symptoms with the largest $\beta$ indicating the type of stress that most strongly predicted depression and PTSD.

In the simple linear regressions, the composite Bad Stress was entered as the predictor variable and CES-D and PCL as the outcome variables. It was predicted that Bad Stress, a composite of Violence and Circumscribed Events, would also predict depression and PTSD symptoms.

Finding #1: To test whether type of stress predicted depression and PTSD, a multiple linear regression was run to determine which stress subscales predicted CES-D and PCL scores. Inclusion of all four stress subscales in the model forced the subscales to “compete” for variance thereby making it possible to see which type of stress accounted for the most variance in depression and PTSD scores. This analytic strategy also decreased the risk of Type I error, which increases in likelihood when multiple models are run separately and used to predict the same criterion variables.

As this was a confirmatory model based upon theoretical underpinnings and previous research findings, variables were entered into the regression analysis in blocks. Student demographics (e.g., age, ethnicity) were entered into the first block as potential covariates so that the effects of these variables would be partialled prior to testing the main effects of the stress variables. Although the overall model was significant, the unique contributions of age and ethnicity were not statistically significant; the means for depression and PTSD scores did not differ for the study participants as a function of their age or ethnicity. This result was not surprising given the lack of variability in the age and
ethnicity of study participants. The age and ethnicity variables were thus removed from the final model for increased parsimony.

The overall model accounting for the four stress subscales was statistically significant ($R^2 = .087, F(4, 249) = 5.965, p < .001$). Interpreting the $R^2$ term, 8.7% of the variance in the predicted CES-D scores was accounted for by the model. Of the four subscales entered as predictors, the Violence subscale was the only variable that was statistically significant ($\beta = .182, t(249) = 2.895, p < .01$). Since the predictor and outcome variables were previously standardized to z-scores, results for unstandardized coefficients (b) were the same as those for the standardized coefficients ($\beta$). Additionally, due to standardization, a one-unit increase referred to one-standard deviation increase and not one unit from the original scale. The slope for the violence subscale ($\beta = .182$) suggested a one-standard deviation increase in exposure to violent stress predicted an increase in depression scores of .182 magnitude using the standardized CES-D scores. This finding indicated that stress predicted depression scores, and that exposure to violent stress was the strongest predictor of depression scores as compared with other types of stress, providing support for the first hypothesis. The type of stress was indeed positively associated with psychological functioning as measured by depression symptoms.

In order to provide additional support for the hypothesis in Question 1, a second multiple regression analysis was run using the Bad Stress composite as the predictor variable, to determine if this type of stress would predict psychological symptom outcomes. In this regression analysis, Bad Stress accounted for approximately 7% of the variance in CES-D depression scores ($R^2 = .069, F(1, 252) = 18.619, p < .001$). The
slope for Bad Stress ($\beta = .262, p < .001$) suggested every one-standard deviation increase in Bad Stress predicted an increase in depression scores of the magnitude .262 using the standardized CES-D scores. This finding suggested that depression scores were elevated for youth reporting exposure to Bad Stress, the composite variable of items related to violence, death, and injury.

Consistent with the hypothesis that certain types of stress are stronger predictors of depressive symptoms, findings revealed that the Violence subscale and Bad Stress composite were significantly correlated with depression.

In contrast, evidence was not found to support the hypothesis that certain types of stress would predict greater scores on the PCL. Consistent with the correlations that failed to indicate any statistically significant relationship between the stress variables and the PCL, the corresponding regression analyses were similarly insignificant. That is, results for the first, multiple regression model specifying the four stress subscales ($R^2 = .034, F = .989, p = .414$) and the second linear regression model specifying the Bad Stress composite ($R^2 = .020, F = .276, p = .600$), confirmed that stress did not predict PTSD in the current sample. The type of stressors were not found to be positively associated with PTSD symptoms as assessed by the PCL. Possible explanations for this unexpected finding are offered in Chapter 5.

**Question 2: Does the total number of stressful events predict psychological symptoms?**

*Analytic strategy #2:* To test the impact of total number of stressful events on psychological functioning, a simple linear regression was modeled. The number of
stressful events encountered in the previous year was captured by the Total Stress variable. Recall that Total Stress was a composite of the four aforementioned subscales (i.e., Life Transitions, Circumscribed Events, School Problems, Violence) and included a possible 12 items indicating exposure to stressful life events in the past year. It was hypothesized that as total stress scores increased, scores on the CES-D and PCL would also increase.

Finding #2: In this analysis, Total Stress was entered into the model as the predictor variable. The finding suggested that the Total Stress variable accounted for 7.4% of the variance in CES-D depression scores ($R^2 = .074, F(1, 252) = 20.230, p < .001$). The slope for Total Stress ($\beta = .273, t(252) = 4.498, p < .001$) suggested every one-standard deviation increase in the total amount of stress, irrespective of type, predicted a .273 increase in depression scores using the standardized CES-D.

In contrast, stress did not predict PCL scores ($R^2 = .020, F = .267, p = .606$). Total number of stressful events was not associated with PTSD symptoms. Possible explanations for this unexpected finding are offered in Chapter 5.

Question 3: Are there gender differences in the type of stress or total number of stressful events?

Analytic Strategy #3: The idea that gender differences will emerge for type of stressor and total number of stressors was suggested by the extant literature. Generally, ANOVA is used to test for significant differences between means when comparing groups with two distinctions (i.e., male and female youth). However, if the variables are highly correlated, MANOVA is the preferred statistical technique. Because the stress
scales were correlated with one another (see Table 11), MANOVA was deemed more appropriate than an ANOVA, and was utilized in the subsequent analyses to minimize statistical bias. By utilizing MANOVA, the aforementioned correlation between the outcome variables could be accounted for.

To test for gender differences in type of stress and total number of stressful events, a multivariate analysis of variance (MANOVA) was conducted to determine if the variability between boys and girls was greater than the variability within these groups at a statistically significant margin. Recall that types of stress were indicated by the four stress subscales (i.e., Life Transitions, Circumscribed Events, Violence, and School Problems) and by the composite scale Bad Stress. The variable Total Stress was the proxy for total number of stressful events encountered by students in the past twelve months. All six-stress variables (i.e., Life Transitions, Circumscribed Events, Violence, School Problems, Bad Stress, and Total Stress) were entered into the model as outcome variables, and the gender variable (dummy coded as 0 = female and 1 = male) was entered as the factor.

Finding #3: Results from this MANOVA suggested there was no statistical significance in mean differences for types of stress or total stressors reported by boys compared with girls $F(4, 249) = 1.069, p = .373$, partial $\eta^2 = .017)$. In sum, contrary to the hypothesis that gender differences would emerge regarding exposure to stressors, the findings suggested there were no statistically significant gender differences in the self-report of stress by this sample of Kenyan youth.
Question 4: Are there gender differences in the report of psychological symptoms?

Analytic Strategy #4: With regard to psychological adjustment in Kenyan youth, it was hypothesized there would be differences in the mean scores between boys and girls. Because depression and PTSD symptoms are often co-occurring (American Psychiatric Association, 2000; O’Donnell, Creamer, & Pattison, 2004), a preliminary correlation analysis was run to determine if ANOVA or MANOVA should be utilized. As expected, CES-D and PCL scores for this sample of Kenyan youth were correlated (see Table 11), suggesting a MANOVA be utilized for the subsequent analysis to account for the correlation between the outcome variables. A MANOVA was used to test for gender differences in psychological functioning (as measured by standardized, mean CES-D and PCL scores) of Kenyan youth. The stated hypothesis was that girls compared to boys were expected to report greater scores on both depression (CES-D) and PTSD (PCL) measures.

Finding #4: Results from the MANOVA confirmed a statistically significant difference in psychological symptoms between boys and girls, $F(1, 251) = 4.05, p < .05$, partial $\eta^2 = .031$. Box’s Test of Equality of Covariance Matrices ($p = .692$) confirmed the assumption of homogeneity of covariances was not violated. Subsequent tests of between-subjects effects revealed that boys and girls exhibited statistically significant mean differences in CES-D depression scores, $F(1, 254) = 7.93; p < .01$. Comparing means and standard deviations, boys exhibited higher depression scores (.211, $SD = .99$) than did their female peers (.144, $SD = .98$). Given the statistical significance of this
finding, the effect size for depression was estimated by Cohen’s d by subtracting the mean CES-D score for girls from the mean CES-D score for boys and dividing it by the pooled standard deviation, resulting in a small to medium effect size (.355; Cohen, 1988).

It can be concluded that there are gender differences in the self-report of symptoms in this sample of youth with respect to depression. Interestingly, although this result is consistent with the hypothesis that boys and girls would differ on CES-D scores, it is not in the expected direction. Boys reported greater levels of depression than did girls in the present sample.

In addition, tests of between-subjects effects did not detect statistically significant mean differences between boys and girls for PCL scores, $F(1, 254) = .127; p = .722$. This finding is contrary to the proposed hypothesis that girls compared to boys would report greater levels of PTSD. (Means, standard deviations, and ANOVA by gender for each stress variable and psychological symptom variable are located in Table 13.)

The findings that boys reported greater levels of depression than girls, and that there were no gender differences in the report of PTSD symptoms, ran contrary to the original hypotheses that girls would report greater levels of depression and PTSD symptoms as compared with their male peers. Potential reasons for these findings are discussed in detail in Chapter 5.

**Question 5: Does gender moderate the relationship between total number of stressful events and psychological symptoms?**

**Analytic Strategy #5:** Hierarchical linear regression was used to test whether gender moderated the relationship between stress (i.e., Total Stress) and depression in the
present sample. (The original analytic plan included tests of moderation for both the depression and PTSD outcomes. However, because the correlation between the Total Stress predictor variable and the PCL criterion variable was not statistically significant, moderation analyses were not conducted for PTSD.)

First, a statistically significant relationship between total number of stressful events and CES-D was determined. Second, the continuous predictor variable, Total Stress, was standardized according to the method outlined by Frazier, Tix, and Barron (2004). That is, each Total Stress raw score (actual range 0 to 10) was subtracted from the mean ($M = 3.16$), gender was dummy coded (1 = male, 0 = female), and a product term was created by multiplying the standardized (Total Stress) variable by the dummy coded (Gender) variable. Third, terms were then entered into the regression equation in a hierarchical procedure. The predictor (Total Stress) and moderator (Gender) were entered in the first step. The resulting $R^2$ term, thus represented the amount of variance in the depression scores that was explained by both exposure to stress, and by gender. The interaction term (Total Stress x Gender) was entered into the equation in the second step. The $R^2$ term represented the amount of variance in CES-D scores that was explained by stress, gender, and the interaction of stress and gender. If significant, the difference in variance in Step 1 and Step 2 would confirm the moderating effect of gender.

Finding #5: Results from the hierarchical linear regression indicated that the specified main effects regression model accounted for 10% of the variation in the outcome variable for depression ($R^2 = .104, F(2, 251) = 14.56, p < .001$). With the cross product, or moderator term added to the model, the variation in the outcome variable for
depression increased to 12% ($R^2 = .121, F(1, 250) = 11.48, p < .001$). The stepwise change that included the moderator term was statistically significant in the overall model $F(3, 250) = 11.48, p < .001$ and the percentage change is considered a small effect size. This suggested the rate of increase in depression scores differs for male and female students as stress scores increase. For example, a female student reporting no stressful life events (Total Stress = 0), was predicted to have a standardized CES-D depression score of -.144. For each standard deviation increase in stressful life events, the average depression score increased .191 for female students. However, for a male student reporting no stressful life events, the standardized CES-D depression score was predicted to be .210, and the average increase in depression score was .058. (The graphed regression equations are located in Figure 4). These results suggested that there is a stronger relationship between stress and depression for girls compared to boys in this sample. Specifically, although their baseline depression scores are lower than their male peers, girls’ depression scores are more strongly impacted by their incremental exposure to stress.

In sum, a hierarchical linear regression model tested for potential main effects and interaction effects of stress and gender on psychological symptoms. The regression model predicting CES-D depression scores from Total Stress, Gender, and the Total Stress x Gender interaction, resulted in statistically significant main effects and interaction effects.

**Question 6: Does relational health have direct or stress-buffering effects on psychological functioning?**

**Analytic Strategy #6:** To answer this question, eight analyses were proposed (and six analyses were ultimately run). First, to test for direct effects, four simple linear
regressions were specified to determine the impact of relational health (RHI-Y-F; RHI-Y-C) on psychological adjustment (CES-D; PCL).

Next, two hierarchical linear regressions were specified to test for potential stress-buffering effects of relational health. Bivariate correlations (located in Table 11) showed relationships between the predictor (Total Stress), outcome (CES-D), and moderating variables (RHI-Y-F, RHI-Y-C). Because of the lack of significant associations found between the stress variables and the PCL in earlier regression analyses, moderation analyses were not conducted for PTSD as originally planned.

In the first hierarchical linear regression, the predictor (Total Stress) and moderator variable (RHI-Y-F) were entered in Step 1. The resulting $R^2$ term was the amount of variance in youths’ CES-D scores explained by stress and relational health. In Step 2, the interaction term (Total Stress x RHI-Y-F) was entered into the equation. The $R^2$ term represented the amount of variance in depression scores explained by stress, relational health, and the interaction of stress and relational health. If the difference in the variance in Step 1 and Step 2 was significant, the moderating effect of relational health with a close friend would be confirmed. A second hierarchical linear regression was specified with RHI-Y-C as the moderator variable and the same procedure was utilized. If the difference in the variance in Step 1 and Step 2 was significant, the moderating effect of relational health from a school community would be confirmed.

*Finding #6:* Findings from the four simple linear regressions and two hierarchical regressions follow: In the first simple linear regression, RHI-Y-F scores accounted for 14% of the variance in depression scores ($R^2 = .140, F(1, 252) = 40.98, p < .001; b = -$
.446, \( t(252) = -6.402, p < .001 \). This result indicated that for every one-unit decrease in log transformed RHI-Y-F scores, standardized CES-D scores increased at a magnitude of .446. That is, a strong relationship with a friend predicted lower levels of depression.

Similarly, a second regression determined RHI-Y-C scores accounted for 6% of the variance in CES-D scores (\( R^2 = .063, F(1, 252) = 16.95, p < .001 \); \( b = -.303, t(252) = -4.117, p < .001 \)). As the log transformed version of RHI-Y-C scores decreased one-unit, depression scores increased at a magnitude of .303. This finding revealed that youths’ positive relationships with their school community predicted lower levels of depression. Put simply, both analyses revealed that increased relational health is associated with increased psychological functioning.

Two simple linear regressions were also run to discern the relationship between relational health and PTSD. However, there was no statistically significant connection between RHI-Y-F or RHI-Y-C and PCL scores.

Findings from the two hierarchical linear regressions with moderator tests follow:

The first hierarchical linear regression model suggested Total Stress and RHI-Y-F accounted for 13% of the variation in the outcome variable for depression (\( R^2 = .133, F(2, 251) = 19.234, p < .001 \)). With the moderator term added, the model was no longer significant (\( R^2 = .140, F(1, 250) = 2.015, p = .157 \)). This finding suggested that RHI-Y-F did not moderate the relationship between Total Stress and CES-D. In this sample of Kenyan youth, a strong connection to a friend did not impact the relationship between stress and depression.
In the second model, Total Stress and RHI-Y-C accounted for 9% of the variation in the depression outcome ($R^2 = .090$, $F(2, 251) = 12.408$, $p < .001$). However the model was no longer statistically significant with the moderator term added ($R^2 = .094$, $F(1, 250) = .974$, $p = .325$) suggesting RHI-Y-C did not moderate the relationship between total number of stressful events and depression in the present sample. For Kenyan youth, a strong connection to the school community did not impact the relationship between stress and depression.
Chapter 5 (Discussion)

Although psychological research has become increasingly inclusive of diverse populations in the U.S., studies of youth mental health in developing countries continue to be sparse. In particular, little empirical research has focused on Kenyan youth. In a rare study of the latter, Kenyan youth reported relatively low levels of PTSD despite relatively high rates of exposure to traumatic stress (Seedat et al., 2004). One potential reason for these findings is that Kenyan youth may have sources of support and resiliency that buffer the impact of stress. Guided by theories of resilience (Harvey, 2007; Masten & Coatsworth, 1998) and relational cultural theory (Jordan, 2001; Miller & Stiver, 1997), the present study examined the relationship between stress, psychological functioning, and the direct and stress-buffering effects of healthy relationships with a close friend and with the larger school community. In this chapter, study findings will be summarized and interpreted by research question. In addition, study limitations, practical and theoretical implications, and other concluding points are discussed.

Summary of Findings

In this study of stress and support in the lives of Kenyan youth, the major findings are as follows:

1. Type of stress predicted depression, but did not predict PTSD. Specifically, the Violence subscale and Bad Stress composite scale provided evidence that type of stress is related to depression symptoms.

2. Total number of stressful events experienced by youth also predicted depression, but did not predict PTSD.
(3) There were no differences between boys and girls regarding the type of stress or the total number of stressful events reported.

(4) A small to medium effect was found regarding differences in depression scores with boys reporting slightly greater amounts of depression than girls. No differences were found between boys and girls with regard to PTSD.

(5) Gender moderated the relationship between total number of stressful events and depression scores such that there was a stronger interaction between stress and depression for girls than there was for boys. Incremental amounts of stress negatively impacted the psychological adjustment of girls at a greater intensity than it did for boys. Gender did not moderate the relationship between stress and PTSD.

(6) Relational health was related to psychological functioning (RHI-Y scores predicted CES-D scores), such that report of healthy relationships with a friend and with the school community was negatively correlated with depression scores. This relationship was not replicated for PTSD. Relational health did not provide a stress-buffering effect, as RHI-Y did not moderate the relationship between stress and psychological symptoms.

To study the relationship between stress, gender, relational health, and psychological functioning in a sample of Kenyan youth, the following questions and hypotheses were addressed:

**Question 1: Are certain types of stress stronger predictors of psychological symptoms than other types of stress?**

It was hypothesized that certain types of stress would be stronger predictors of depression and PTSD symptoms as compared with other types of stress. Regression
analyses revealed that the Violence subscale was the strongest predictor of depression of the four subscales, such that greater levels of exposure to violent stress predicted greater levels of depression. Similarly, Bad Stress (the composite of the Violence and Circumscribed Events subscales) also predicted depression. These findings are consistent with those reported by Foster et al. (2004) who found that youth exposure to violence predicted depression outcomes. This suggests similarities in reactions to exposure to violence between Pokot youth and youth in other cultures, and underscores the notion that certain reactions or symptoms may be natural responses to exposure to stress and violence.

In contrast to the literature (i.e., Sund et al., 2003; Unger et al., 2001), school related stress did not predict depression in this sample of Kenyan youth. This finding may suggest that certain types of stress are expressed in other ways, do not cause distress, or are considered aspects of life to be coped with accordingly.

Type of stress did not predict PTSD for any of the stress scales. Potential reasons for this unexpected finding as related to theory, measurement, and culture are discussed below.

**Question 2: Does the total number of stressful events predict psychological symptoms?**

The Total Stress variable also predicted CES-D scores in the expected direction, such that the total number of stressful events predicted depression. As the number of stressors increased so did the levels of depression. These findings provide empirical evidence for a theoretical paradigm called the *sensitization model* (Bowman & Yehuda,
2004) whereby increased stress leads to increased maladjustment. Moreover, the current findings are consistent with other empirical research that demonstrated stress may render individuals more vulnerable to depression (i.e., Cuffe et al., 2005; Ge et al., 2001; Grant et al., 2004; Unger et al., 2001).

It was also hypothesized that the total number of stressful events would predict PTSD. However, in contrast to the depression findings, analyses revealed that none of the stress variables utilized in the present study had statistically meaningful relationships with the construct of PTSD as measured by PCL scores. These findings do not support the dominant theoretical and empirical literature linking stress and violence to posttraumatic stress disorder. Three plausible explanations for this unexpected finding are: (1) The stress measure may have had poor content validity, such that the stress scales may not have adequately captured the events that would be considered stressful or traumatic to Kenyan youth. (2) The PCL may not have been adequately or consistently translated or interpreted to adequately capture the construct of PTSD. (3) The methodology utilized in the present study may not have adequately captured construct validity.

More specifically, although efforts were taken to make measures culturally relevant, the stress measure may not have adequately captured stress and trauma relevant to Kenyan youth. The stress measures, adapted from the SULE, were originally designed to capture stress and hassles experienced by youth in urban areas of the United States, and were not a comprehensive measure of hassles, stress, or trauma faced by youth in rural Kenya. Although the lack of significance between the six stress scales and PTSD
measure ran contrary to expectations, the finding is consistent with a study which also reported a lack of correlation between a similar stress measure and measures of anxiety for African-American and Hispanic youth (Attar et al., 1994). Taken together, these findings suggest that the stress scales may not appropriately capture the stressful life experiences of culturally diverse youth, or that there are other, more salient factors that contribute to the report of PTSD symptoms for certain groups of youth.

Despite attempts to make the measures relevant for the current sample, the PTSD measure may not have been adequately or consistently translated or interpreted. Although the PCL is a well-validated and oft-used measure in research on stress and psychological trauma in the U.S., it may not have been appropriate for use with Kenyan youth. Despite researchers’ efforts to make the PCL culturally and linguistically viable before data collection, the PCL may require greater measurement development for use with this population.

Finally, the lack of significant findings regarding PTSD may be related to inadequate construct validity. Despite efforts to address measurement issues before data were collected, as well as during data cleaning and analysis, it is not clear if the construct, posttraumatic stress disorder, is actually being captured. For both cultural and developmental reasons, PTSD may look very different in a population of Kenyan youth than it does in the sample of European and American adults it was first described for. For example, Kleinman (1995) suggested that persons in communities with regular exposure to violence, may exhibit physical and emotional reactions, and that these reactions should be understood in the larger social and political context and not pathologized or
medicalized. Through this lens, what might be seen as a natural reaction to the impact of political or cultural violence, has been rendered pathology (Kleinman, 1995). As such, the tool used to capture PTSD, the PCL, may not have adequately captured symptoms of PTSD, as it exists, if it exists, among this sample of Kenyan youth.

**Question 3: Are there gender differences in the type of stress or total number of stressful events?**

The hypothesis that there would be significant gender differences in type of stress and total number of stressful events was not supported by the data. Unlike studies of Chinese youth (Sun et al., 2010) that found boys reported greater stress with regard to school and family than their female peers, and studies of Kenyan youth (Seedat et al., 2004) that found boys were more likely to have been exposed to violence than their female peers, the present sample did not find gender differences across these domains. Furthermore, the present sample did not express differing amounts of stress exposure by gender. This suggests violence, school problems, and other stressors equally impact boys and girls in this context. This finding contrasts previous studies that have found gender differences with respect to stress with girls reporting more stressors than boys (e.g., Mezulis et al., 2010; Rutter, 1986) and still other studies that found the converse, with boys reporting more stressors than girls (e.g., Jaycox et al., 2002; Meadows et al., 2006). Additionally, the present study differs from a prior study of Kenyan youth that found boys reported greater number of trauma exposures than girls (Seedat et al., 2004). This may suggest theoretical underpinnings that suggest gender differences may be tenuous or,
in the case of the latter study, that gender differences in stressors for Kenyan youth are context dependent and differ for youth in rural versus urban areas.

Overall, this finding provides further evidence for the ambiguity surrounding gender differences and stress. For example, researchers (i.e., Mezulis et al., 2010) caution that findings supporting gender differences in stress are generally modest, and often represent a bias in stress measures (e.g., Meadows et al., 2006) as opposed to a true difference between males and females. Findings in the current study are likewise consistent with studies that have reported no gender differences with regard to exposure to certain types of stress (e.g., Mezulis et al., 2010; Roosa et al., 2009).

Furthermore, gender differences may have emerged had the stressors in the survey instrument been gender specific. For example, the SULE inventory did not include items about forced or early marriage, FGM/C, rape, unplanned pregnancy, or sanitation that might disproportionately affect girls; nor did it include items about tribal violence, drugs and alcohol, providing for and protecting one’s family, or managing livestock that might disproportionately affect boys.

It is reasonable to assume that had the measures been more sensitive to the ways in which gender is enacted among and between Kenyan youth, and had been more attuned to the differential impact of certain stressors for boys and girls in this cultural context, gender differences may have emerged. However, the null finding supports the need for a creation of a more nuanced stress scale that is increasingly gender and culture specific, and also questions the utility of research questions that presume gender
differences when there may not be sufficient or clear theoretical or empirical justification to do so.

**Question 4: Are there gender differences in the report of psychological symptoms?**

There were significant group differences between boys and girls with regard to depression scores but not to PTSD scores. However, contrary to the hypothesis, boys reported greater depression symptoms than girls in the present sample. Although this finding is not consistent with the majority of studies linking gender with depression outcomes, it is consistent with the Sun et al. (2010) study of Chinese youth in which males endorsed greater levels of depression than their female counterparts.

Although the finding was statistically significant, the effect size was small, suggesting the clinical or educational impact of depression differences by gender may be slight and should not be overstated. To understand why this contradictory finding may exist for the current population, it may be helpful to consider the specific context when considering possible explanations:

1. Although it was not a primary research question, a supplemental analysis revealed that girls reported stronger relational health with a close friend than boys did. This finding was consistent with samples of youth in the U.S. (Liang et al., 2010). Given that relational health was found to impact depression scores, it is possible that there exists an interaction between gender, relational health, and depression that is related to boys reporting greater levels of depression than girls. Future studies may continue exploration into a possible path analysis that may clarify this relationship.
(2) Boys may be more depressed than girls because of biological and cultural implications of puberty. Although this study did not gather biological data, given that girls go through puberty earlier than boys, it is possible that hormonal changes could be impacting boys differently than girls or that expectations for boys have changed given their age or pubertal status at the time of the study, particularly related to circumcision, work, and marriage.

(3) It is possible that boys in this sample are more depressed because they have less access to secondary school. Youth in the present sample are part of a wider Kenyan culture that holds education in high esteem. Education for youth in poverty, and for rural youth in particular, can symbolize unparalleled hope for the future, increased opportunity, and a chance at economic sustainability. Due to support from the local government, a collaborating NGO, and foreign donors, a secondary school for girls was constructed within view of the primary school where the data were collected. While secondary school was likely available to the majority of female students in this study, it was not available for the majority of male students. Because concerns about getting into secondary school are so salient in this cultural context, their lack of access may have contributed to boys reporting greater levels of depression compared to girls.

(4) Related to lack of access to additional education and thus economic opportunity, it is possible that boys are more depressed given the combined pressure of providing for their families in a context where there is little prospect of attaining work.

(5) Related to this, it is possible that reliance upon and conformity to traditional, cultural manifestations of masculinity norms, which include subordination of women
(Jónsson, 2006), may lead boys to experience a sort of cognitive dissonance given the discrepancy between traditional values and a strong regional emphasis on equality of women and preference for their education. Boys may feel increasingly depressed if their ideas of masculinity are dismantled and they do not feel valued.

The lack of gender differences in level of PTSD symptoms is consistent with a previous study of Kenyan youth (Seedat et al., 2004). Furthermore, the lack of gender differences could also be related to the validity issues that arose when using the PCL with this sample. Because of questionable construct and content validity, it is not clear if Kenyan boys and girls truly do not exhibit different levels of PTSD symptoms, or if the absence of a significant finding is instead related to issues with the measure and how it was interpreted by the participants in this study.

**Question 5: Does gender moderate the relationship between total number of stressful events and psychological symptoms?**

It was hypothesized that gender would moderate the relationship between the Total Stress variable and psychological symptoms as measured by the CES-D and PCL. Using hierarchical linear regression analyses with tests of moderation, gender was found to moderate the relationship between stress and depression. Recall that in the present study, boys had higher CES-D scores at baseline than girls. However, the positive association between stress and depression scores was stronger for girls than for boys such that the psychological functioning of girls was more strongly impacted by added stressors than was the psychological functioning of boys. Both the nature of the moderation, and the direction of the finding, is consistent with existing empirical research that suggests (1)
gender moderates the relationship between stress and depression symptoms in youth and (2) that this relationship is stronger for girls than for boys (e.g., Foster et al., 2004; Liu & Lu, 2012; Meadows et al., 2006; Mezulis et al., 2010). For example, Foster et al. (2004) found that exposure to community violence was positively associated with depression symptoms and that this association was stronger for girls than boys. Similarly, Liu and Lu (2012) found that depression symptoms were more strongly influenced by stressors for girls than for boys. The present study provides further support for the concept that girls’ psychological symptoms are impacted by stress more intensely than boys’ psychological symptoms.

**Question 6: Does relational health have direct or stress-buffering effects on psychological functioning?**

This study confirmed that relational health had a direct effect on depression. Participant reports of healthy relationships with a close friend, and with their larger school community, were significantly associated with depression. As predicted, higher scores of relational health were related to lower scores of depression. These findings are consistent with aforementioned research that demonstrated direct effects between relational health and psychological functioning (Colorassi & Eccles, 2003; Liang et al., 2002) and are also consistent with the cultural emphasis on age and gender specific cohorts and the importance of relationships between members of these groups.

Relational health was not significantly associated with PTSD, however. This lack of significance is likely explained through exploration of additional theory and potential measurement issues. First, this is further evidence of the complex relationship between
exposure to stress and trauma, reactions or symptoms, and interpersonal and community-wide relationships. Kleinman (1995) posited that exposure to violence and stress was inherently social, and that the medical professions have instead reduced this social experience to the individual expression of illness. Given the importance of youth relationships, and the necessity of connection and interdependence of those in rural communities, it may be more important to understand the community impact of certain stressors or violence. Second, this unexpected finding may also be explained by the threats to validity posed by the cross-cultural measurement issues previously described.

With regard to stress-buffering, it was hypothesized that a quality connection to both a friend (RHI-Y-F) and to the school community (RHI-Y-C) would moderate the relationship between stress and psychological functioning (as measured by CES-D). However, neither a healthy relationship with a friend nor a healthy relationship with the school community moderated the relationship between stress and depression. Findings do not support the proposed hypothesis, Windle’s (1992) stress-buffering model, or existing research (Park, 2004) that has demonstrated buffering effects of relational health mitigating the effects of stress on outcomes of psychopathology. This unexpected finding may be explained, in part, by the fact that research on stress-buffering effects of relational health in youth is still in its early stages. For example, relational health indices have never before been used with a sample of Kenyan youth. It is possible that (1) the way in which relational health constructs are understood for youth in the United States differ from how they are understood for Kenyan youth or, (2) these constructs were not adequately measured for these study participants. Additionally, (3) the relationship
between stress and psychopathology may be moderated by many other factors. For example, quality relationships may foster resilience by enabling students to access internal (e.g., self-esteem, perception of control) or external resources (e.g., social capital, pro-social behavior) that are not captured in the present that may, in turn, moderate the relationship between stress and mental health.

**Implications of Research Findings**

The unique contributions of this study can be examined with regard to the topic, sample, and implications for future interventions and future research. The current study represents a foray into an important topic with an understudied population within an understudied region. Although the body of research on youth in diverse cultural contexts continues to emerge, the present study is unique in that it seeks to understand the experiences of a minority group in a remote region. The study uses a rigorous examination of validated measures on a population to further the conversation about the universality (or lack thereof) of psychological symptoms, and suggests the utility of designing and tailoring measures to adequately capture psychological phenomena in a culturally relevant manner. Additionally, this pilot study sets the groundwork for future qualitative research on exposure to stressors, social support and relationships, and psychological symptoms with this population. Furthermore, the findings have relevant implications for theory, applied policy, school-based interventions, and clinical applications as elaborated below.

**Theory**
The present study informs existing theories about the relationship between stress and psychopathology, resilience, and relationships. Findings from the current study provide additional support for Bowman and Yehuda’s (2004) sensitization model whereby increases in stress lead to a greater risk for maladjustment. With regard to theories of resilience (i.e., Masten, 2001; Rutter, 1987; Werner, 1989), this study supports the notion that many youth continue to persevere despite exposure to risk and adversity. Similarly, in support of Harvey’s (2007) ecological perspective of resilience whereby resilience is viewed as contextual, multidimensional, and co-existing with pathology, even those students who express symptoms of depression and PTSD show signs of resilience through their connections to friends and the larger community, and to their continued school attendance despite contextual pressures that lead their peers to drop out of school. The finding that relational health predicted depression scores in the current sample provides further evidence for direct effects between relational health and psychological functioning and is consistent with findings reported by Colorassi and Eccles (2003), and by Liang et al. (2002). This study provides additional cross-cultural support for the utility of a theory of relational health (Jordan, 2001) as manifested by a sense of connection to a peer and to the larger school community.

**Future research**

The present study provided an opportunity to document symptoms in a non-clinical population of Kenyan youth attending primary school. Collecting data on symptoms adds to the growing literature of epidemiology of mood and anxiety disorders such as depression and post-traumatic stress disorder. Documenting symptoms allows
mental health researchers the opportunity to explore the potential universality and uniqueness of psychological symptoms across highly varied and differently socialized populations and cultural groups.

Another strength of this study is that it addresses suggestions articulated in existing research on social support and psychological functioning. Specifically, this study (1) looked at the potential moderating effects of gender on PTSD and social support as suggested by Guay et al. (2006), and (2) specified a defined construct (i.e., relational health) related to functional social support as suggested by Wills and Feegan (2001) as the quality of support and an individual’s perception of that support. In this study, the relational health indices served as such an index of functional social support.

Directions for future research may include (1) continued exploration of the constructs of depression and PTSD across cultures and their related symptoms, (2) the comorbidity of depression and PTSD symptoms in the aftermath of exposure to stress and trauma, (3) path analysis that may clarify the relationship between gender, relational health, and depression, (4) cross-cultural validation of existing measures, (5) creation of new, culturally relevant measures with an explicit focus on psychopathology, resilience, and supportive relationships, and (6) the use of flexible research methodologies that invoke the epistemologies of psychology, psychiatry, anthropology, and epidemiology.

Future research on youth psychopathology may continue to examine the utility of the constructs of depression and PTSD with diverse populations, and may continue to seek convergence and divergence in cross-cultural symptom report for depression and PTSD, as well as the comorbidity between these two disorders following exposure to
stress and trauma. Studies that seek to understand cultural nuances in the expression of mood and anxiety disorders are particularly relevant and timely, as advances in neuroscience continue to shift the focus of psychological functioning to biological explanations of illness (Insel, 2013), it is important that such advances do not occur at the expense of understanding the potential contribution of cultural pathways to mental health and illness.

Future studies might explore, in greater depth, relational health and the direct and buffering effects it may have on psychological functioning. Specifically, future studies may explore a path analysis that may clarify the relationship between gender, relational health, and depression. While constructs of relational health may continue to be examined for evidence of cross-cultural utility, future research may also examine other forms of health, resilience, and well-being. Given the focus on individual characteristics in the current study, one particular area of future exploration may be the study of community resilience to stress and trauma.

Relevant research may also expand upon the current findings about types of stress that impact youth, and would do well to utilize surveys of stress that include items identified by the youth studied to provide an increasingly valid measure and participatory experience for youth in research. This work may lead to revision of current scales and development of new scales for use by clinical researchers. In addition to an adolescent stress scale for Kenyan youth, new scales may include common mental symptoms as expressed in language and idioms indigenous to the local Pokot or Kalenjin culture.
With regard to methodology, qualitative and mixed-method approaches may be utilized to study similar research questions in similar populations to very different ends. For example, Kleinman suggests cultural meanings of symptoms are best understood through *illness narratives*.

Illness narratives edify us about how life problems are created, controlled, made meaningful. They also tell us about the way cultural values and social relations shape how we perceive and monitor our bodies, label and categorize bodily symptoms, interpret complaints in the particular context of our life situation…

(Kleinman, 1988, xiii).

Drawing from the strengths of various methodologies and disciplines and using such illness narratives as a central form of data collection may improve future inquiries.

**Applied policy**

Findings from this study have additional applications to applied policy. Applied policy may exist at the governmental and non-governmental level and include the intersection of education, social, and health sectors. For example, documentation of depressive symptoms in this sample may have implications for policy that enable primary schools to create partnerships with existing community-based health organizations to provide information on mental health as part of a larger health curriculum. Such a partnership would represent an effort to increase awareness and reduce stigma for youth who may be struggling. In addition, given that boys and girls often drop out of school to work or to marry in an attempt to alleviate their families’ economic insecurity,
governments and NGOs may continue to collaborate on ways to improve families’ access to food and income without disrupting youths’ access to continued education.

Although free primary education was introduced in Kenya in 2003, there remains differential access by gender, region, and economic status (Onyango, 2013) with girls, children in rural areas, and economically disadvantaged students experiencing greater challenges to sustained school attendance compared with their peers. In addition, because the initiation and rituals begin at an earlier age for girls, they are at risk for dropping out of school earlier than boys, which may ultimately reduce future educational and economic opportunities for girls. Gender-specific stressors, such as FGM/C, unplanned pregnancy, or sanitation might further impact school attendance for girls in the sample, while tribal violence, managing livestock, and pressure to provide for one’s family might impact boys’ ability to attend school. Given the priority of the Kenyan government to provide universal education to youth thereby improving both access to school, and retention of students, policies that account for gender and ethno-cultural stressors may benefit those students at greatest risk. For example, there may not be adequate support for youth who are married, or expected to become married, or youth who have children.

While the education of women and girls has traditionally fallen short compared to their male counterparts, emerging research has suggested a myriad of economic, social, and health benefits aligned with education of female youth (e.g., Kristof & WuDunn, 2009). Indeed, such findings underlie initiatives set forth by the United Nations Millennium Development Goals to improve the education of girls throughout the
developing world. Specifically in Kenya there has been an effort by the government and NGOs on the educational attainment of female youth.

However, in the interest in promoting social and economic justice between genders, parity in education is paramount. Improvement in access to education for girls need not come at the expense of access to education for boys. The speculation that girls reported fewer depression symptoms than boys was, in part, due to their access to secondary school, and thus perhaps greater psychological peace about their present and future prospects, suggests a continued need for government policy to improve access to education for all Kenyan youth. Given that youth in the present study were living in a rural, economically disadvantaged area, continued access to primary and secondary school in this population is relevant for both girls and boys.

Programs and interventions

It is perhaps most important to understand the application of the present findings in contexts where formal interventions and therapies do not readily exist. Harvey’s (2007) ecological theory suggests the importance of environmental interventions given that most survivors of trauma and adversity in the global community do not have access to specialized psychological services. Indeed, the present study seeks to inform community and school-based interventions for Kenyan youth who lack access to formalized services compared to youth in more developed parts of the country and world. Moreover, the study has implications for underserved youth in the global community in general, and youth in developing nations in particular.
Providers looking to improve access to mental health services have begun implementing such services in primary care settings. While this is true globally, this may be particularly important in rural communities in Africa (Petersen et al., 2009). Petersen and colleagues (2009) call for additional mental health promotion and prevention both through primary care facilities and via community-based workers. In areas that lack even rudimentary healthcare infrastructure, interventions could similarly be provided through existing social structures, including schools, communities, and faith-based settings.

Specifically, the present findings that relational health is negatively associated with depression suggests that relationships characterized by disconnection, violation of others, decreased energy, and powerlessness (Miller & Stiver, 1997) are likely to be related to report of psychological symptoms and illness. In contrast, healthy relationships with friends and school communities are related to better psychological functioning, suggests that fostering healthy dyadic and community relationships in the context of school or faith-based settings may be particularly helpful to youth. This may include designing and implementing programs that foster opportunities for social connection, sharing, and peer mentoring, and creating an overall healthy school climate where youth can engage in close, authentic, and empowering relationships. Schools may provide additional skills training to teachers to help them foster connections with and between youth. Given that boys reported more depressive symptoms than did girls, schools and NGOs working with youth may tailor programs and supports in a way that could better meet the needs of boys. Similarly, given that girls in the current sample were more
impacted by stress, programs and interventions around coping with stress may be salient for girls.

Lastly, the findings may have implications for educational curriculum and extracurricular activities. For example, schools may consider incorporating a health module into their curriculum that provides education on recognizing symptoms and promoting health and wellbeing and reducing stigma. Furthermore, although empirical evidence linking microfinance to mental health is newly emerging, one recent study with Ugandan youth provided evidence to support the idea that school-based poverty reduction strategies can be incorporated with psychosocial interventions to successfully reduce depression (Ssewamala, Neilands, Waldfogel, & Ismayilova, 2012). This suggests the potential mental health benefits of educational curricula that include modules related to personal finance, microfinance, and entrepreneurship.

Schools may also partner with NGOs to incorporate extracurricular activities such as yoga or soccer that may promote community connection, access to mentors, and encouragement of overall health and wellbeing. For example, the Africa Yoga Project delivers low and no-cost yoga interventions throughout schools in both urban and rural areas in Kenya in an effort to improve health and foster wellbeing. Although the empirical evidence supporting yoga as a complimentary service to improve mental health is still building, engaging youth in school-based yoga classes is a relatively convenient and low-cost intervention that can reach a large number of students. Similarly, Grassroot Soccer, an NGO serving youth in Sub-Saharan Africa, uses soccer as a medium to deliver education about HIV prevention, provide mentors, and foster community connection.
Although this organization’s mission is focused on preventing the spread of HIV, it could provide a blueprint for a soccer-based model of mental health promotion through the combination of education, mentorship, and connection via a sport played by youth globally, including youth in rural Kenya.

Given the mental health of boys and girls in the sample was impacted by exposure to violent stress, violence prevention programs, including bystander prevention training, and support for victims and families may be considered. Additionally, school and NGO staff might seek creative ways to engage families, schools, and the larger community in response to violence.

**Clinical practice**

Because clinical practice is essentially non-existent in the region where this study was conducted, the implications for clinical practice are limited. However, increased access to education has led to an increase in participation in the labor force, and movement to larger urban areas where medical treatment, including psychological services is increasingly available. Clinicians working in Nairobi, Kenya and Kampala, Uganda and other large cities in Eastern Africa may do well to attend to the particular stressors and gender socialization of youth raised in rural areas, and consider how their life experience, gender, and ethnic identities have influenced their development, and in particular, their health as well as pathology.

Given stress predicted depression but not PTSD in the present study, clinicians should not assume that exposure to certain stressful or violent experiences will necessarily traumatize youth, particularly given their relational health and other resiliency
factors. Although gender differences were not found regarding exposure to stress in the current study, clinicians may need to attend to gender-specific stressors and the ways in which stress may be differently experienced by youth, particularly regarding relationships, family, and culture. Although it was not anticipated that boys would report greater levels of depression symptoms than girls, there are many potential reasons for this finding. As mentioned earlier, it is possible that access to future schooling may contribute to hope and thus buffer girls against feelings of hopelessness and depression. Additionally, as the region becomes increasingly globalized and technologized, it is possible that changes in culture may lead to a devaluation of traditional roles for boys and men, and changes in the valuing of aspects of masculinity. Understanding depressive symptoms in the context of a changing culture and emerging youth identity may be important for clinicians to attend to. Similarly, the present study reported girls were more strongly impacted by the effects of stress than boys. This suggests there may be different ways boys and girls express distress in this culture. Given that relational health did not buffer the relationship between stress and depression, it is possible that connection to family, cultural group, religious group, or mentors may provide a stronger stress-buffering effect than a dyadic or group relationship with friends or classmates. That is, youth in this culture may be more reticent to seek help from peers compared to other sources of support. This is clinically relevant as mental health workers may seek to better understand what sources of support may be most beneficial for youth during times of stress.
While formal clinical interventions are limited, particularly in the rural areas, some places, like the Africa Mental Health Center and Samaritans provide low or no-cost clinical services to Kenyans in need. Service providers in these settings could be trained to recognize and address the impact of stress and violence on youth in ways that attend to gender and cultural considerations.

Furthermore, existing groups of community health workers may be leveraged to raise awareness and provide education to youth regarding psychological health and the recognition, prevention, and treatment of psychological symptoms and problems. For example, in the region of West Pokot, the location of the present study, Chaptiagwa traditional dancers travel to villages and town centers performing songs and dances that educate people about critical health topics such as HIV/AIDS and FGM/C. Such groups could similarly communicate information about psychological health in an effort to educate people about recognizing symptoms, de-stigmatize mental illness, and to provide support to those suffering.

In addition, as globalization continues, it is likely that clinicians working in North America and other Western contexts where access to mental health care is readily available, will come into contact with clients from far-reaching regions of the world and should also be increasingly sensitized to the great diversity of life experiences and symptom presentations that exist within and across cultures.

**Study Limitations**

The present study is designed to inform researchers, clinicians, and educators about a population on which little academic research has been conducted. However,
methodological and epistemological (i.e., discipline specific assumptions) limitations exist and should be considered. Methodologically, there are potential limitations of the current study that pertain to sampling and instrumentation that may impact internal, external, and ecological validity. Furthermore, the study may be influenced by the limitations imposed by the epistemological assumptions of counseling psychology research. For example, both the chosen methodology and the validity of the conclusions are inherently tied to the epistemological assumptions of counseling psychology or social science more broadly and therefore may introduce a particular bias (e.g., Scott & Usher, 1996). To counteract this, future research could benefit from a multidisciplinary approach that accounts for the conflicting and complimentary assumptions of psychology, psychiatry, anthropology, and epidemiology. These potential limitations and possible ways to address them in future research will be elaborated below.

**Sample**

The present sample was identified by a NGO for having limited access to education and high levels of academic truancy. The sample is fairly homogenous with regard to ethnicity and socioeconomic status, a factor that may contribute to limited external validity. Also, the present study did not capture substantive information about the religious and spiritual beliefs and practices of the participants. Religion and spirituality can influence individual and community understanding of pathology and resilience (e.g., Fadiman, 1997) and, as such, may likely impact participants’ report of psychopathology, stress, and adversity. Although the present study does not capture the extent of religious diversity within the group, it is likely that the sample of youth are
influenced by traditional Kalenjin beliefs and rituals as well as beliefs from the Christian missionaries working in the local schools and communities. A limitation of the present study is that it does not account for the ways in which ritual and religion intersect with conceptualizations of illness and resilience, gender role socialization, and youths’ relationships with their friends and their community.

**Instrumentation**

Belief systems likely contribute to the gender role socialization of Kenyan youth, and ideas about health and well-being. Future studies may consider including survey items that capture the extent to which traditional religious beliefs, Christian beliefs, and other belief systems are held by youth. Understanding how these beliefs impact gender, relationships, and health may have added additional depth to the interpretation of study findings.

Given the ways in which gender expression is influenced by region and culture, using a culturally informed and locally derived scale of masculinity and femininity norms (similar to the Conformity to Masculine Norms Inventory derived on a sample in the United States; Mahalik et al., 2003), would have allowed for a more nuanced exploration of the relationship between gender and the outcome variables including relational health, depression, and PTSD symptoms in a way that using a simple gender binary (male/female) could not.

Although great efforts were taken at the outset of the study to create valid survey items, symptom checklists that are not defined by the population are necessarily constrained in their ability to accurately capture the realities of the population. Kleinman
and Good (1985) suggest that by focusing on quantifying symptoms, measures do not adequately account for the interrelationships of symptoms, stressors, and their cultural meanings. Instrumentation in the present study may have been improved by utilizing a methodology that included a grounded theory approach to document, in their own words, symptoms identified by Kenyan youth that could then be operationalized into statistically and culturally validated survey items. An example of this approach, to understand the overlap of indigenous symptom reports with validated depression and PTSD symptoms, was used with a group of Darfur refugees living in Chad (Rasmussen, Katoni, Keller, & Wilkinson, 2011) and has implications for future scale development for researchers working cross-culturally. For example, these researchers used a combined etic-emic approach to validate existing concepts of depression and PTSD while also gaining evidence for indigenous symptoms that were conceptually related. This was done through an integration of quick ethnography and survey methodology with factor analysis to understand the relationship between specific cultural idioms and concepts of depression and PTSD (Rasmussen et al., 2011). Internal validity might have been improved through efforts to enhance the cultural relevance of constructs of psychological functioning, relational health, and stress, and also by capturing additional constructs including religious beliefs and gender norms.

Although the measures of relational health demonstrated adequate psychometric properties in the current sample of youth and were helpful in answering the proposed research questions, future studies may consider using a measure with more variability in responses. In addition to capturing relationships with peers and the school community,
future measures of relational health may include an assessment of youth relationships with teachers, mentors, and family members. Moreover, other sources of health and resilience could be considered in addition to assessing healthy relationships.

Given the cultural influence on symptom manifestation, and the alteration of the depression measure in the present study following the item correlations and factor analyses, it is not clear if “depression” in the present study is equivalent to “depression” characterized by other studies utilizing complete measures or diagnostic interviews. Furthermore, it is not clear if depression symptoms are experienced by Kenyan youth in the same way that they are experienced by youth in the United States and in other regions. As stated eloquently by Kleinman and Good (1985),

Because such differences are found in the symptoms associated with depressive illness, determination of whether one is studying the same illness across societies is essentially problematic. […] Since symptoms serve as the criteria for depressive illness, and since symptoms vary significantly across cultures, the difficulty of establishing the cross-cultural validity of the category “depression” must be faced (p. 4).

Another potential threat to construct validity is the use of self-report measures. Collecting data solely from youth, and not from their caregivers or teachers, may introduce additional reporting bias and does not allow for triangulation of data from multiple sources that may have provided additional insight and information on the experiences of Kenyan youth. Self-report may also limit findings should students have underreported or misreported symptoms. For example, the previously described cultural
tendency to stifle emotion and disregard or sublimate pain might influence the self-report of psychological and physical symptoms such as depression and PTSD. Moreover, youth who are conditioned to devalue their experience and distance themselves from their feeling states may also under-report or deny difficult or painful life events.

Although the SULE measure was confirmed by Kenyan research collaborators as an instrument that captured stressful life events common to Kenyan youth, there are many types of stressful events, particularly those related to personal victimization, that are unaccounted for in the present study. As previously mentioned, the measure did not account for gender-specific stressors, nor did it account for stressors common to the region including food security and access to clean water. Additionally, the inventory asked about stressors endured in the “past year” and did not account for lifetime exposure to stress. In addition, including The Trauma Checklist (derived from the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime version; K-SADS-PL; Kaufman, 1997) would have provided additional information about the degree to which youth in this sample experienced personal victimization beyond what was captured in the SULE subscales and composite scales. The K-SADS-PL scale was used in previous studies of Kenyan youth (e.g., Ndetei et al., 2007; Seedat et al., 2004) and could be considered in future studies on trauma sequelae.

Furthermore, the present study does not capture the meaning of stressful events in the lives of Kenyan youth. By accounting for the meaning of stressful events, researchers can better approximate the participants’ reality, while clinicians and interventionists can more accurately predict individuals at risk for illness onset (Kleinman & Good, 1985).
Some researchers have suggested that a person’s appraisal of events (or how they make meaning of what occurred) is what mediates the relationship between stress and symptoms (e.g., Carr & Vitriano, 1985; Jackson & Warren, 2000). In future studies, youths’ interpretations of events in their lives, and the role social support plays in how youth interpret such events, could be tested as mediators, or mechanisms that more directly link stressful events to the development of depression and PTSD. Asking youth to generate a list of stressful life events and then report if they experienced the event as positive or negative may be one way to improve external validity in future studies (e.g., Jackson, Kim, & Delap, 2007).

The challenges with instrumentation in the present study point to the need for a bottom-up approach that may more adequately detect culturally specific symptoms. That said, although potential limitations of the current instrumentation exist, statistical analyses were employed to decrease threats to construct validity. Furthermore, great care was taken to consult collaborating school officials and the NGO partner agency at the outset of the research project to confirm the survey instrument was relevant to participating students.

**Epistemology**

Kleinman and Good (1985) suggested that mental health research would be vastly improved if methodology were informed by a true integration of the disciplines of psychology, psychiatry, anthropology, and epidemiology. The authors caution that without this integration, research may become a relic of the discipline from which it emerges. Kleinman and Good state, “… cultural orientations implicit in psychiatric
models produce findings that are artifacts of those models and the methodologies they subsume at least as much as they are aspects of the illness phenomenon under study” (1985, p. 29). For example, the methodology employed by this author, a researcher in the field of counseling psychology, may serve to reify assumptions that exist in the field, and thus may limit the possibility of new findings and insights.

Instead, a quasi-anthropological approach that incorporates field research may improve the validity of cross-cultural research. By including observation and qualitative methods (e.g., gathering life stories and ethnographies) or utilizing an epidemiological approach (i.e., collecting a vast amount of health data in a short amount of time to better understand the prevalence of disease burden) could improve our understanding of the relevance of established psychological symptoms across cultures. Additionally, such an approach would better enable researchers to validate existing measures cross-culturally while also unearthing culturally laden expressions of illness. For example, future research may utilize rapid ethnographic assessment (REA; Bentley, et al., 1988) techniques that combine elements of participatory action research, critical ethnography, and grounded theory to enhance validity of instrumentation. REA has been used in health research to aid scientists in identifying symptom clusters and local treatment strategies. Furthermore, combining an ethnographic approach with a clinical approach and collaborating with Kenyan clinicians and researchers (in addition to educators and NGO social and health service providers) may improve accountability for indigenous meanings of symptoms and stressors and may thus improve internal validity of future studies.

Summary and Conclusions
The present study adds to the growing literature on the experiences of youth in developing countries and on the relationship between stress, relational health, and psychological functioning through the study of youth participants in the West Pokot district in Kenya. One of the strengths of the present study is that it contributes to the field of cross-cultural psychology by suggesting there are generalizable psychological phenomena regarding stress, depression, and relational health happening in this context. The study also contributes ideas about the utility of psychological measurement in cross-cultural contexts, adds to theoretical conceptions of mental health and relational health, and attempts to fill previously identified gaps in existing knowledge.

Through exploratory analyses including linear regression and mean comparisons, the present findings offer additional insight into the symptomatology and common stressors that may be impacting rural Kenyan youth. Specifically, results indicated that depression scores were predicted by (1) exposure to violent stress, (2) total number of stressful events encountered, and (3) healthy relationships with a friend and school community. In addition, (4) boys reported greater levels of depression than girls, and (5) gender moderated the relationship between stress and depression, such that female students were more negatively impacted by stress than were male students. These findings may be used to inform future school-based and community-based interventions with this sample and similar youth populations.

Validity and reliability in future cross-cultural research could be enhanced by designing studies that truly integrate epidemiological, clinical, and anthropological theories and methods in an effort to address cross-cultural universals and differences
(Kleinman & Good, 1985). This study provides additional insight into implications for theory, research, applied policy, programs and interventions, and clinical settings.
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doi:10.1177/0272431609338177


doi:10.1192/bjp.184.2.169


Table 1
Participant Characteristics as a Frequency and a Percentage of the Sample (N=254)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>103</td>
<td>40.6</td>
</tr>
<tr>
<td>Female</td>
<td>151</td>
<td>59.4</td>
</tr>
<tr>
<td>Age in Years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>12</td>
<td>28</td>
<td>11.0</td>
</tr>
<tr>
<td>13</td>
<td>51</td>
<td>20.1</td>
</tr>
<tr>
<td>14</td>
<td>55</td>
<td>21.7</td>
</tr>
<tr>
<td>15</td>
<td>65</td>
<td>25.6</td>
</tr>
<tr>
<td>16</td>
<td>30</td>
<td>11.8</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>7.1</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Ethnicity/Tribe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abagusii</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Cheranga [sic], Cherangany</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Karamoyong [sic]</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Luhya</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Maasai</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Marakwet</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Nandi</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Pokot</td>
<td>244</td>
<td>96.1</td>
</tr>
<tr>
<td>Sabaot</td>
<td>1</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Table 2

Psychometric Properties of the Predictor and Criterion Variables using Raw Scores (N=254)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Items</th>
<th>$M$</th>
<th>SD</th>
<th>$\alpha$</th>
<th>Potential</th>
<th>Actual</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RHIY-F</td>
<td>6</td>
<td>27.4</td>
<td>3.58</td>
<td>.806</td>
<td>6-30</td>
<td>10-30</td>
<td>-2.02</td>
<td>4.70</td>
</tr>
<tr>
<td>RHIY-C</td>
<td>6</td>
<td>27.3</td>
<td>3.37</td>
<td>.804</td>
<td>6-30</td>
<td>13-30</td>
<td>-1.77</td>
<td>3.25</td>
</tr>
<tr>
<td>Exposure to Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Transitions</td>
<td>4</td>
<td>1.35</td>
<td>1.02</td>
<td>.251</td>
<td>0-4</td>
<td>0-4</td>
<td>.355</td>
<td>-.610</td>
</tr>
<tr>
<td>Violence</td>
<td>2</td>
<td>.618</td>
<td>.700</td>
<td>.251</td>
<td>0-2</td>
<td>0-2</td>
<td>.687</td>
<td>-.718</td>
</tr>
<tr>
<td>Circumscribed</td>
<td>3</td>
<td>.665</td>
<td>.797</td>
<td>.309</td>
<td>0-3</td>
<td>0-3</td>
<td>.959</td>
<td>.108</td>
</tr>
<tr>
<td>School Problems</td>
<td>3</td>
<td>.524</td>
<td>.737</td>
<td>.322</td>
<td>0-3</td>
<td>0-3</td>
<td>1.20</td>
<td>.548</td>
</tr>
<tr>
<td>Bad Stress</td>
<td>5</td>
<td>1.28</td>
<td>1.13</td>
<td>.333</td>
<td>0-5</td>
<td>0-5</td>
<td>.575</td>
<td>-.423</td>
</tr>
<tr>
<td>Total Stress</td>
<td>12</td>
<td>3.15</td>
<td>2.00</td>
<td>.488</td>
<td>0-12</td>
<td>0-10</td>
<td>.396</td>
<td>-.258</td>
</tr>
<tr>
<td>Psychological Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-D</td>
<td>20</td>
<td>21.0</td>
<td>11.9</td>
<td>.859</td>
<td>0-60</td>
<td>3-52</td>
<td>.457</td>
<td>-.869</td>
</tr>
<tr>
<td>PCL</td>
<td>17</td>
<td>52.2</td>
<td>13.7</td>
<td>.808</td>
<td>17-85</td>
<td>17-85</td>
<td>-.352</td>
<td>-.188</td>
</tr>
</tbody>
</table>

Note. CES-D = Center for Epidemiological Studies Depression Scale; PCL = Posttraumatic Stress Disorder Checklist; RHI-Y-F = Relational Health Indices for Youth, Friend; RHI-Y-C = Relational Health Indices for Youth, Community.
Table 3

Relational Health Indices for Youth (RHI-Y) Factor Loadings

<table>
<thead>
<tr>
<th>RHI-Y Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RHI-Y Friend</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excited</td>
<td>.422</td>
<td>.242</td>
</tr>
<tr>
<td>Closer</td>
<td>.524</td>
<td>.262</td>
</tr>
<tr>
<td>Improve friendship</td>
<td>.729</td>
<td>.143</td>
</tr>
<tr>
<td>Feel good</td>
<td>.649</td>
<td>.262</td>
</tr>
<tr>
<td>Change</td>
<td>.584</td>
<td>.358</td>
</tr>
<tr>
<td>Grow</td>
<td>.613</td>
<td>.286</td>
</tr>
<tr>
<td><strong>RHI-Y Community</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belong</td>
<td>.639</td>
<td>.248</td>
</tr>
<tr>
<td>Better</td>
<td>.149</td>
<td>.689</td>
</tr>
<tr>
<td>Understood</td>
<td>.471</td>
<td>.368</td>
</tr>
<tr>
<td>Like</td>
<td>.347</td>
<td>.545</td>
</tr>
<tr>
<td>Feel good</td>
<td>.546</td>
<td>.399</td>
</tr>
<tr>
<td>Support</td>
<td>.350</td>
<td>.669</td>
</tr>
</tbody>
</table>

*Note.* High loadings are bold, denoting the factor to which each symptom was assigned.
Table 4

Center for Epidemiological Studies-Depression Scale (CES-D) Factor Loadings

<table>
<thead>
<tr>
<th>CES-D Items</th>
<th>Depression</th>
<th>Reverse</th>
<th>Focusing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bothered</td>
<td>0.548</td>
<td>0.072</td>
<td>-0.087</td>
</tr>
<tr>
<td>Appetite</td>
<td>0.589</td>
<td>0.014</td>
<td>-0.020</td>
</tr>
<tr>
<td>Unhappy</td>
<td>0.599</td>
<td>0.015</td>
<td>-0.251</td>
</tr>
<tr>
<td>*R: Good</td>
<td>-0.10</td>
<td>0.586</td>
<td>-0.066</td>
</tr>
<tr>
<td>Focusing</td>
<td>0.091</td>
<td>-0.202</td>
<td>0.461</td>
</tr>
<tr>
<td>Hopeless</td>
<td>0.634</td>
<td>0.150</td>
<td>0.021</td>
</tr>
<tr>
<td>*R: Effort</td>
<td>-0.061</td>
<td>-0.673</td>
<td>0.267</td>
</tr>
<tr>
<td>*R: Hopeful</td>
<td>0.147</td>
<td>0.561</td>
<td>-0.184</td>
</tr>
<tr>
<td>Failure</td>
<td>0.671</td>
<td>0.078</td>
<td>0.073</td>
</tr>
<tr>
<td>Fearful</td>
<td>0.663</td>
<td>0.038</td>
<td>0.059</td>
</tr>
<tr>
<td>Restless</td>
<td>0.731</td>
<td>0.192</td>
<td>0.084</td>
</tr>
<tr>
<td>*R: Happy</td>
<td>0.114</td>
<td>0.562</td>
<td>0.224</td>
</tr>
<tr>
<td>*Talked</td>
<td>0.299</td>
<td>-0.101</td>
<td>-0.069</td>
</tr>
<tr>
<td>Lonely</td>
<td>0.645</td>
<td>0.000</td>
<td>0.136</td>
</tr>
<tr>
<td>Unfriendly</td>
<td>0.656</td>
<td>0.101</td>
<td>0.064</td>
</tr>
<tr>
<td>*R: Enjoyed</td>
<td>0.073</td>
<td>0.535</td>
<td>-0.003</td>
</tr>
<tr>
<td>Crying</td>
<td>0.732</td>
<td>0.107</td>
<td>0.042</td>
</tr>
<tr>
<td>Sad</td>
<td>0.670</td>
<td>0.096</td>
<td>0.050</td>
</tr>
<tr>
<td>Disliked</td>
<td>0.770</td>
<td>0.123</td>
<td>0.055</td>
</tr>
<tr>
<td>Get going</td>
<td>0.727</td>
<td>0.170</td>
<td>0.212</td>
</tr>
</tbody>
</table>

Note. High loadings are bold, denoting the factor to which each symptom was assigned. * Denotes items that were removed from the scale.
Table 5

Post-traumatic Stress Disorder Check List (PCL) Factor Loadings

<table>
<thead>
<tr>
<th>PCL Items</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memories</td>
<td>.558</td>
<td>-.064</td>
<td>.025</td>
<td>.005</td>
</tr>
<tr>
<td>Dreams</td>
<td>.647</td>
<td>.079</td>
<td>.200</td>
<td>.270</td>
</tr>
<tr>
<td>Reliving</td>
<td>.093</td>
<td>.689</td>
<td>-.039</td>
<td>.117</td>
</tr>
<tr>
<td>Reminds me</td>
<td>.713</td>
<td>.008</td>
<td>.047</td>
<td>.068</td>
</tr>
<tr>
<td>Physiological</td>
<td>.655</td>
<td>.090</td>
<td>.183</td>
<td>.253</td>
</tr>
<tr>
<td>Avoid thoughts</td>
<td>.580</td>
<td>.065</td>
<td>.131</td>
<td>-.357</td>
</tr>
<tr>
<td>Avoid activities</td>
<td>.635</td>
<td>.116</td>
<td>.168</td>
<td>-.284</td>
</tr>
<tr>
<td>Remembering</td>
<td>.622</td>
<td>.008</td>
<td>.215</td>
<td>-.058</td>
</tr>
<tr>
<td>Lost interest</td>
<td>.660</td>
<td>.229</td>
<td>-.037</td>
<td>-.080</td>
</tr>
<tr>
<td>Distant</td>
<td>.007</td>
<td>.758</td>
<td>-.107</td>
<td>-.118</td>
</tr>
<tr>
<td>Loving feelings</td>
<td>.020</td>
<td>.669</td>
<td>-.131</td>
<td>-.081</td>
</tr>
<tr>
<td>No future</td>
<td>.049</td>
<td>.593</td>
<td>-.002</td>
<td>-.088</td>
</tr>
<tr>
<td>Sleep</td>
<td>.034</td>
<td>.641</td>
<td>.050</td>
<td>.150</td>
</tr>
<tr>
<td>Angry</td>
<td>.507</td>
<td>-.077</td>
<td>.386</td>
<td>-.074</td>
</tr>
<tr>
<td>Concentrating</td>
<td>.022</td>
<td>.462</td>
<td>.065</td>
<td>.343</td>
</tr>
<tr>
<td>*On guard</td>
<td>.095</td>
<td>-.109</td>
<td>.677</td>
<td>-.008</td>
</tr>
<tr>
<td>Easily startled</td>
<td>.321</td>
<td>.000</td>
<td>.497</td>
<td>.048</td>
</tr>
</tbody>
</table>

*Note. High loadings are bold, denoting the factor to which each symptom was assigned. *Denotes item removed from the scale.*
Table 6

Fit Indices for CFA Models of RHI-Y, CES-D, and PCL

<table>
<thead>
<tr>
<th></th>
<th>RHI-Y</th>
<th>CES-D</th>
<th>PCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>$X^2$</td>
<td>152.0</td>
<td>129.2</td>
<td>174.0</td>
</tr>
<tr>
<td>df</td>
<td>52</td>
<td>65</td>
<td>76</td>
</tr>
<tr>
<td>$p$</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.080</td>
<td>.062</td>
<td>.071</td>
</tr>
<tr>
<td>90% CI for RMSEA</td>
<td>.064; .096</td>
<td>.047; .078</td>
<td>.057; .085</td>
</tr>
<tr>
<td>CFI</td>
<td>.922</td>
<td>.953</td>
<td>.913</td>
</tr>
</tbody>
</table>

*Note.* Items: Number of items in scale for current study; RMSEA: Root mean square error of approximation; CFI: Comparative fit index.
Table 7

Factor Loadings for the RHI-Y Two-Factor Model

<table>
<thead>
<tr>
<th>RHI-Y Item</th>
<th>Maximum likelihood estimates</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Excited</td>
<td>.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Closer</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Better</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Good</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Change</td>
<td>.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Grow</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Belong</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Better</td>
<td>.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Understood</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Like</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Good</td>
<td>.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Support</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 8

Factor Loadings for the CES-D One-Factor Model

<table>
<thead>
<tr>
<th>CES-D</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bothered</td>
<td>.52</td>
</tr>
<tr>
<td>Appetite</td>
<td>.58</td>
</tr>
<tr>
<td>Unhappy</td>
<td>.58</td>
</tr>
<tr>
<td>Hopeless</td>
<td>.64</td>
</tr>
<tr>
<td>Failure</td>
<td>.68</td>
</tr>
<tr>
<td>Fearful</td>
<td>.64</td>
</tr>
<tr>
<td>Restless</td>
<td>.73</td>
</tr>
<tr>
<td>Lonely</td>
<td>.66</td>
</tr>
<tr>
<td>Unfriendly</td>
<td>.66</td>
</tr>
<tr>
<td>Crying</td>
<td>.72</td>
</tr>
<tr>
<td>Sad</td>
<td>.65</td>
</tr>
<tr>
<td>Disliked</td>
<td>.79</td>
</tr>
<tr>
<td>Get going</td>
<td>.74</td>
</tr>
</tbody>
</table>
Table 9

Factor Loadings for the PCL Two-Factor Model

<table>
<thead>
<tr>
<th>Item/DSM IV Symptom</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memories</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>Dreams</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>Reminds</td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>Physiological</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>Avoid thoughts</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>Avoid activities</td>
<td>.66</td>
<td></td>
</tr>
<tr>
<td>Remembering</td>
<td>.66</td>
<td></td>
</tr>
<tr>
<td>Lost interest</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>Angry</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>Reliving</td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td>Distant</td>
<td>.74</td>
<td></td>
</tr>
<tr>
<td>Loving feelings</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>No future</td>
<td>.63</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>.59</td>
<td></td>
</tr>
</tbody>
</table>
Table 10

Psychometric Properties of the Predictor and Criterion Variables Using Transformed and Standardized Scores (N = 254)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Items</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RHIY-F</td>
<td>6</td>
<td>2.13</td>
<td>.839</td>
<td>.01 – 2.95</td>
<td>-.543</td>
<td>-.892</td>
</tr>
<tr>
<td>RHIY-C</td>
<td>6</td>
<td>1.95</td>
<td>.830</td>
<td>.01 – 2.90</td>
<td>-.331</td>
<td>-1.013</td>
</tr>
<tr>
<td>Exposure to Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Transitions</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>-1.33 – 2.60</td>
<td>.355</td>
<td>-.610</td>
</tr>
<tr>
<td>Violence</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>-.883 – 1.97</td>
<td>.687</td>
<td>-.718</td>
</tr>
<tr>
<td>Circumscribed</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>-.835 – 2.93</td>
<td>.959</td>
<td>.108</td>
</tr>
<tr>
<td>School Problems</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>-.711 – 3.36</td>
<td>1.20</td>
<td>.548</td>
</tr>
<tr>
<td>Bad Stress</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>-1.14 – 3.30</td>
<td>.575</td>
<td>-.423</td>
</tr>
<tr>
<td>Total Stress</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>-1.59 – 3.43</td>
<td>.396</td>
<td>-.258</td>
</tr>
<tr>
<td>Psychological Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-D</td>
<td>13</td>
<td>0</td>
<td>1</td>
<td>-1.29 – 2.36</td>
<td>.363</td>
<td>-.982</td>
</tr>
<tr>
<td>PCL</td>
<td>14</td>
<td>0</td>
<td>1</td>
<td>-2.37 – 2.27</td>
<td>.389</td>
<td>-.296</td>
</tr>
</tbody>
</table>

Note. Log transformations are reported for Relational Health Indices and standardized z scores are reported for Exposure to Stress variables and Psychological Symptoms. *p<.05, **p<.01.
Table 11

Descriptive Correlation Coefficients for the Relationship Between Variables Using Transformed Scores (N = 254)

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
<th>10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stress-T</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Stress-V</td>
<td>.196**</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Stress-C</td>
<td>.147*</td>
<td>.131*</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Stress-S</td>
<td>.131*</td>
<td>.182*</td>
<td>.192**</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Bad Stress</td>
<td>.226**</td>
<td>.714**</td>
<td>.788**</td>
<td>.249**</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Total Stress</td>
<td>.686**</td>
<td>.571**</td>
<td>.591**</td>
<td>.577**</td>
<td>.772**</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. CES-D</td>
<td>.115</td>
<td>.227**</td>
<td>.171**</td>
<td>.177**</td>
<td>.262**</td>
<td>.273**</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. PCL</td>
<td>-.056</td>
<td>-.101</td>
<td>.028</td>
<td>.027</td>
<td>-.043</td>
<td>-.043</td>
<td>.279**</td>
<td>----</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. RHI-Y-F</td>
<td>-.263**</td>
<td>-.249**</td>
<td>-.201**</td>
<td>-.346**</td>
<td>-.296**</td>
<td>-.430**</td>
<td>-.374**</td>
<td>-.096</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>10. RHI-Y-C</td>
<td>-.232**</td>
<td>-.265**</td>
<td>-.234**</td>
<td>-.330**</td>
<td>-.330**</td>
<td>-.427**</td>
<td>-.251**</td>
<td>.041</td>
<td>.710**</td>
<td>----</td>
</tr>
</tbody>
</table>

*Note. T = Life Transitions, V = Violence, C = Circumscribed Events, S = School Problems; Bad Stress, a composite of Violence and Circumscribed Events; Total Stress, a composite of Life Transitions, Violence, Circumscribed Events, and School Problems; CES-D = Center for Epidemiological Studies Depression Scale; PCL = Post-traumatic Stress Disorder Checklist; RHI-Y-F = Relational Health Indices for Youth, Friend Subscale; RHI-Y-C = Relational Health Indices for Youth, Community Subscales. *p<.05, **p<.01
Table 12
Mapping Plan Linking Research Questions to Proposed Hypotheses, Study Variables, and Analytic Technique

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>HYPOTHESES</th>
<th>VARIABLES</th>
<th>ANALYSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are certain <em>types</em> of stress stronger predictors of psychological symptoms than other types of stress?</td>
<td>Exposure to violent stress will be the strongest predictor of PTSD and depressive symptoms as compared with other types of stress.</td>
<td>CES-D, PCL, Life Transitions, Violence, Circumscribed Events, School Problems</td>
<td>1.1 Multiple linear regression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CES-D, PCL, Bad Stress</td>
<td>1.2 Linear regression</td>
</tr>
<tr>
<td>2. Does the total number of stressful events predict psychological symptoms?</td>
<td>As exposure to stress increases, PTSD and depressive symptoms are also expected to increase.</td>
<td>CES-D, PCL, Total Stress</td>
<td>2. Linear regression</td>
</tr>
<tr>
<td>3. Are there gender differences in the type of stress or total number of stressful events?</td>
<td>Gender differences will emerge across type of stress and total number of stressful events.</td>
<td>Gender, Life Transitions, Violence, Circumscribed Events, School Problems, Bad Stress, Total Stress</td>
<td>3. Multivariate Analysis of Variance (MANOVA)</td>
</tr>
<tr>
<td>4. Are there gender differences in the report of psychological symptoms?</td>
<td>Girls compared to boys are expected to report greater levels of depression. Girls compared to boys are expected to report greater levels of PTSD.</td>
<td>Gender, CES-D, PCL</td>
<td>4. Multivariate Analysis of Variance (MANOVA)</td>
</tr>
<tr>
<td>QUESTIONS</td>
<td>HYPOTHESIS</td>
<td>VARIABLES</td>
<td>ANALYSES</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>-----------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| 5. Does gender moderate the relationship between *total* number of stressful events and psychological symptoms? | Gender will moderate the relationship between stress and psychological symptoms. | Gender
*Total Stress*
*CES-D*
*PCL* | 5. Hierarchical linear regression with moderator tests |
| 6. Does relational health have *direct* or *stress-buffering* effects on psychological functioning? | A quality connection to a friend will be negatively correlated with depression and PTSD.  
A quality connection to the school community will be negatively correlated with depression and PTSD.  
A quality connection to a friend will moderate the relationship between stress and psychological symptoms.  
A quality connection to the school community will moderate the relationship between stress and psychological symptoms. | *RHI-Y-F*
*CES-D*
*PCL*  
*RHI-Y-C*
*CES-D*
*PCL*  
*Total Stress*
*RHI-Y-F*
*CES-D*
*PCL*  
*Total Stress*
*RHI-Y-C*
*CES-D*
*PCL* | 6.1 Hierarchical linear regression with moderator tests  
6.2 Hierarchical linear regression with moderator tests  
6.3 Multiple linear regression  
6.4 Multiple linear regression |
Table 13

Means, Standard Deviations, and Analysis of Variance Summary for Study Variables by Gender

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Univariate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female (N=151)</td>
<td>Male (N=103)</td>
<td>$F(1, 253)$</td>
</tr>
<tr>
<td><strong>Exposure to Stress</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Transitions</td>
<td>-.049 (.104)</td>
<td>.072 (.94)</td>
<td>.887</td>
</tr>
<tr>
<td>Violence</td>
<td>-.050 (.97)</td>
<td>.074 (1.05)</td>
<td>.948</td>
</tr>
<tr>
<td>Circumscribed</td>
<td>.071 (1.0)</td>
<td>-.104 (1.0)</td>
<td>1.88</td>
</tr>
<tr>
<td>School Problems</td>
<td>.017 (.98)</td>
<td>-.025 (1.04)</td>
<td>.112</td>
</tr>
<tr>
<td>Bad Stress</td>
<td>.018 (.99)</td>
<td>-.028 (1.01)</td>
<td>.131</td>
</tr>
<tr>
<td>Total Stress</td>
<td>-.008 (.99)</td>
<td>.012 (1.02)</td>
<td>.023</td>
</tr>
<tr>
<td><strong>Psychological Symptoms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-D</td>
<td>-.144 (.98)</td>
<td>.211 (.99)</td>
<td>7.31**</td>
</tr>
<tr>
<td>PCL</td>
<td>-.018 (.96)</td>
<td>.027 (1.07)</td>
<td>.172</td>
</tr>
</tbody>
</table>

*Note. (M = 0, SD = 1 for total sample).  **p < .01*
Figure 1.
Hypothesized Relationship of Stress Predicting Psychological Symptoms as Moderated by Relational Health and Gender
Figure 2.
Variables Used to Test Proposed Relationships Between Stress, Psychological Symptoms, Relational Health, and Gender
Figure 3.
Six Stressful Life Events Variables (Including Subscales and Composites) Used to Measure Stress
Figure 4.
Gender Moderates the Relationship Between Stress (Total Stress) and Depression (CES-D)
Appendix A

Consent Form for Minors to Participate in Postcards for Peace Project in Kenya

BOSTON COLLEGE
CONSENT TO PARTICIPATE IN GENERATIONPULSE (www.generationpulse.org) AND A RESEARCH STUDY

Dear [World Vision Director],

We would like to ask your permission for the students you have selected from [Marich Pass] to take part in a project supported by [World Vision] and Boston College in Boston, Massachusetts, U.S. My name is Belle Liang; I am a professor at Boston College. My students and I are working with [World Vision] in a project called Postcards for Peace that connects classrooms in the U.S. and Kenya through the exchange of writing and art (i.e., postcards). This project is intended to facilitate international classroom collaboration, including expressing ideas and feelings through creating means such as writing and art. Appropriate postcards will be selected for display on our youth web outreach site, www.generationpulse.org. Only first names and last initials will be included to protect confidentiality and anonymity. This educational site for raising awareness about global youth issues is carefully monitored and maintained by me and my staff at Boston College.

As part of the project, students are also invited to participate in our research study. The study examines the impact of participation in this project on one’s psychosocial health and positive youth development. This research evaluation study has been approved by students’ school administration, and these students have been selected by [World Vision] staff as being a part of a [World Vision Area of Development] Project.

Participation in the research evaluation is completely voluntary and you are free to withdraw your consent and discontinue participation at any time. Your decision whether or not to allow students to participate will have no effect on the students’ grades, academic standing, or any services students might receive at school. Students can still participate in the Postcards for Peace [World Vision] project, even if they do not participate in the research evaluation.

Purpose:
The purpose of participating in research evaluation is to assess the impact of the Postcards for Peace project as a safe and constructive outlet for sharing stories through writing, art, and connection with youth around the world. The research study seeks to inform improvements on this psychosocial and educational intervention for youth.

Procedures:
Student participation will take place in their classrooms, during the regular school day. If you give permission and the students’ agree, they will complete a survey including questions such as “This project makes a difference in how I see myself.” This survey will
be administered at two points, once at the beginning of their participation in the program (i.e., when they first start exchanging Postcards with youth from the U.S. or Kenya) and again at the end of the academic year. Each session would take approximately 30 minutes to complete.

Immediately following the first survey, participating students will be invited to participate in exchanging postcards with other participating youth approximately once a month for six months (this aspect of the project would take as little or as much time as the participant would like to dedicate to the postcards), at which time they will be given a second survey to assess whether there have been educational and psychosocial benefits due to participation in this project. Teachers will provide alternative activities for those students who do not participate in the study.

Benefits:
Participants may directly benefit from taking this part in the study through having an outlet for sharing their feelings and experiences. We expect that their participation in the research study will inform the Postcards for Peace project which is designed to give hope and support to youth in Kenya and inspire participants in other parts of the world to reach out and support the work of World Vision in Kenya.

Risks:
To the best of our knowledge, this project involves no more risk of harm to participating students than what they would experience in everyday life. As an additional protection, Salome Ong’ele (Salome_Ong’ele@wvi.org or 020-883652 ext214), National Educational Coordinator for World Vision Kenya can help provide referrals as needed if anyone becomes distressed in the process of participating in this project.

Costs:
There is no cost for students to participate in this study.

Withdrawal from the study:
You may withdraw any student from participating in this project at any point in time. Your decision will have no effect on his or her grades, academic standing, or any services he or she might receive at school or from World Vision.

A participant may be withdrawn from the study in very few instances, such as using offensive language or images on the postcards.

Anonymity and confidentiality:
All responses to the research evaluation will be kept confidential and anonymous. Identifying information (such as participants’ full names and others mentioned in their stories) will be either deleted or changed. Furthermore, this informed consent document, students’ individual written consent documents, and any other documents linking students’ names with the project
will be kept in a locked cabinet in Dr. Liang’s office at Boston College or in password protected files to which only she and her research assistants will have access.

Though we will treat the information students’ give us as confidential, there are some circumstances in which we will have to show their information to other people, such as the Boston College IRB. These circumstances include evidence that a student is a threat to him- or herself or others, if abuse has occurred, or if we are required to by a court of law.

Questions:
Please feel free to contact [redacted] if you have any further questions about this research evaluation.

Certification:
- I have read and I believe I understand this Informed Consent document. I believe I understand the purpose of this research evaluation and what the students in [redacted] will be asked to do. I have been given the opportunity to ask questions and they have been answered satisfactorily.
- I understand that I may withdraw my permission for the students’ participation in this project at any time.
- I understand that the project staff will work to keep the research responses anonymous.
- I hereby give my informed and free consent for the students in [redacted], who are under my supervision, to be participants in this project.

Please check the appropriate box to indicate wither you grant the students in [redacted] under your supervision permission to participate in the research evaluation:

☐ I give these students permission to participate in the research study.

☐ I do NOT give these students permission to participate in the study.

Signatures:

Date __________________________ Signature of [redacted] official

______________________________
Printed Name of [redacted] official & title
Appendix B
Assent to Participate in a Project

ASSENT TO PARTICIPATE IN A PROJECT

Dear Student:
Thank you for your interest in the Postcards for Peace Project. Postcards for Peace is a project that connects classrooms in Kenya with classrooms in the U.S. through postcards with writing and artwork. All appropriate postcards are displayed on a website called www.generationpulse.org.

Your school has given you permission to participate in this project if you want to. If you do, you will be one of the three hundred students selected to participate in this project from your school in Kenya.

Here’s what to do if you want to participate:

- **Turn in your permission slip to be part of Postcards for Peace and the research study.**

The purpose of this questionnaire is to see how students feel about school, themselves, and their relationships. We will not reveal your name and your answers will be kept private. They will not be shown to your teachers or parents. So please answer as openly and honestly as possible.

If you want to work with us and participate, then please check the box below that says how you would like to participate and then write your name and the date below.

☐ I would like to participate in the pilot phase of this research study
☐ I would NOT like to participate in the pilot phase of this research study

_________________________  ______________________________
Date  Signature of Participant

_________________________
Printed Name of Participant

_________________________
Person providing information and witness to assent
Appendix C
Postcards for Peace Student Questionnaire-Kenya

Postcards for Peace Student Questionnaire-Kenya

Please read each question carefully, and choose the option that is your best answer based on the directions for each section.

DIRECTIONS: Please mark your response with an X on the line.

1. I am a _____ Male      _____ Female

2. Mark your age with an X below.
   _____ Under 10 years old  _____ 11 year old  _____ 12 year old  _____ 13 years old
   _____ 14 years old  _____ 15 years old  _____ 16 years old  _____ 17 years old
   _____ 18 year old  _____ 19 years old  _____ 20 years old  _____ 21 years or older

3. Mark your educational level with an X below.
   _____ 5th grade or younger  _____ 6th grade  _____ 7th grade  _____ 8th grade
   _____ 9th grade (secondary year 1)  _____ 10th grade (secondary year 2)
   _____ 11th grade (secondary year 3)  _____ 12th grade (secondary year 4)
   _____ other (please specify):________________________

4. Ethnicity: (please write down your ethnic background)


5. How religious or spiritual would you say you are?
   _____ not at all  _____ not very much  _____ I don’t know
   _____ somewhat  _____ extremely
6. To what extent does your religion or spirituality give your life meaning, value, and purpose?

_____ not at all  _____ not very much  _____ I don’t know  _____ sometimes  _____ very much
### Appendix D
**Relational Health Index – Youth (RHI-Y)**

**RHI-F**

**DIRECTIONS:** When answering the next questions, think of your closest friend. Please circle the response that best describes your friendship.

Use the following scale. 1=Never  2=Hardly  3=Sometimes  4=Most of the Time  5=Always

<table>
<thead>
<tr>
<th>Question</th>
<th>Never (0%)</th>
<th>Hardly (20%)</th>
<th>Sometimes (50%)</th>
<th>Most of the Time (80%)</th>
<th>Always (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. After being with this friend, I feel excited and happy.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. The more time we spend together, the closer we get to each other.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. My friend and I think it is important to keep making our friendship better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. This friendship makes me feel good about myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. This friend helps me change for the better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. This friendship helps me grow in important ways.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**RHI-C**

**DIRECTIONS:** Next to each statement below, please circle the letter that best applies to your relationship with your classmates. Please circle the response that best describes YOUR CLASS and group of classmates.

Use the following scale: 1=Never  2=Hardly  3=Sometimes  4=Most of the Time  5=Always

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never (0%)</th>
<th>Hardly (20%)</th>
<th>Sometimes (50%)</th>
<th>Most of the Time (80%)</th>
<th>Always (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel like I belong in this group.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I feel better about myself after being together with this group.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I feel like people in this group understand me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I feel like people in this group really like me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Being a part of this group makes me feel good about myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. People in this group support and believe in me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**Appendix E**  
Center for Epidemiological Studies Depression Scale (CES-D)

**Directions:** The following questions ask about how YOU have felt or behaved during the PAST WEEK.

<table>
<thead>
<tr>
<th>Question</th>
<th>Rarely less than 1 day</th>
<th>Some 1 to 2 days</th>
<th>Occasionally 3 to 4 days</th>
<th>Most of the time 5 to 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that usually don’t bother me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I did not feel like eating; my appetite was poor.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I felt that I could not stop feeling unhappy even with help from my family or friends.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I felt that I was just as good as other people.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I had trouble keeping my mind on what I was doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I felt hopeless and sad all week long.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I felt that everything I did was an effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I felt hopeful about the future.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I thought my life had been a failure.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I felt fearful.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. My sleep was restless.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. I was happy.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. I talked less than usual.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14. I felt lonely.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15. People were unfriendly.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16. I enjoyed life.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17. I had crying spells.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18. I felt sad.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. I felt that people disliked me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20. I could not “get going”.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix F
Post-traumatic Stress Disorder Checklist (PCL)

DIRECTIONS: Below is a list of problems and experiences that people sometimes have in response to stressful life experiences. Please read each one carefully, and choose the option that indicates how much you have been bothered by that problem in the LAST MONTH.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all (0%)</th>
<th>A little bit (20%)</th>
<th>Occasionally (50%)</th>
<th>Quite a bit (80%)</th>
<th>Extremely (90-100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am bothered when I have repeated, disturbing memories, thoughts or images of the stressful experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I have repeated, disturbing dreams of the stressful experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I suddenly act or feel as if the stressful experience is happening again (as if I am reliving it).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I feel very upset when something reminds me of the stressful experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. When something reminds me of the stressful experience I feel my heart pounding, I have trouble breathing, or begin to sweat.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I avoid thinking about or talking about the stressful experience or avoid having feelings related to it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I avoid activities or situations because they remind me of the stressful experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I have trouble remembering important parts of the stressful experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I have a loss of interest in things that I used to enjoy.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I feel distant or cut off from other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I feel like I am unable to have loving feelings for those close to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I feel as if my future will somehow be cut short.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I have trouble falling or staying asleep.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Statement</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>14. I feel bothered about things or act in an angry way.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I have difficulty concentrating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I am “super alert”, watchful, or on guard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I feel jumpy or easily startled.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix G
### Stressful Life Events Scale

**DIRECTIONS:** For all questions listed below please respond with either **Yes** or **No** to respond to each question or statement when thinking about the PAST YEAR.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. During the last year, I got poor grades on my report card?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. During the last year, I have gotten into trouble with a teacher or principal at school.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8. During the last year, I was required to not attend school because I did something wrong.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9. During the last year, I moved to a new home.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10. During the last year, has a new baby come into the family?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11. During the last year, has anyone moved out of your home?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12. During the last year, did a family member die?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13. During the last year, did another close relative or friend die?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14. During the last year, has a family member become seriously ill, injured badly, and/or had to stay at the hospital?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15. During the last year, has someone else you know, other than a member of your family, gotten beaten, attacked or really hurt by others?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>16. During the last year, have you seen anyone beaten, shot or really hurt by someone?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>17. In the past year, did you change where you went to school?</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>