A structural equation model of conflict-affected youth coping and resilience

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ABSTRACT
This study tested a theoretical relationship between trauma exposure, youth coping strategies and peer, family and community level factors on psychological distress and well-being among 399 trauma-affected youth in the Democratic Republic of Congo. Structural equation modeling (SEM) was used to analyze paths and to assess differences in relationships by gender. Psychological distress was measured by self-reports of internalizing problems (depression and anxiety), externalizing problems (aggression and behavioral problems) and somatic complaints (pain without medical cause). Self-reports of happiness, hope and self-esteem were measures of well-being. Findings from this study suggest gender differences in how individual coping strategies and external factors explain mental health resilience in trauma-affected youth. Problem-focused coping strategies were associated with higher psychological distress in both boys and girls. Use of avoidance was associated with better well-being in girls and boys and use of faith-based coping strategies was associated with better well-being in boys. Use of both problem-focused and emotion-focused coping strategies (coping flexibility) resulted in lower psychological distress in boys and girls. The home environment including closeness to family, caregiver post traumatic stress disorder and violence in the home was associated with psychological distress and well-being. Having close peer relationships, village safety and enrollment in school benefited well-being. Results from these SEM of resilience suggest that interventions should (1) work to build the coping repertoire of youth, (2) support reduction in psychological distress through improved family relationships and caregiver mental health and (3) target improved well-being through support of positive peer and community relationships and school enrollment.

Background
The field of resilience research was pioneered in the early 1970s with research focusing on positive adaptation for children at risk for psychopathology (Garmezy, 1971; Kolar, 2011).
Subsequent research has focused on identifying factors that allowed some individuals to cope better than others when faced with adversity (Garmezy, 1971; Masten, 2013; Masten, Neemann, & Andenas, 1994; Rutter, 1987; Werner, 1997). Some scholars have argued that contexts of conflict are the “ultimate challenge to resilience” where serious life adversities and exposure to potentially traumatic events affect whole populations and are risk factors for mental health (Barber, 2013). While resilience can be measured by a variety of indicators such as economic indicators (wealth and occupational achievement) or physiological (nutrition and food security), a considerable amount of research has focused on resilience in mental health and well-being outcomes. Resilience in mental health and well-being has been defined as “the attainment of desirable social outcomes and emotional adjustment, despite exposure to considerable risk” (Betancourt & Khan, 2008, p. 2). Mental health resilience is conceptualized as not only the absence of psychological distress, but also the fulfillment of well-being, “where human needs are met, where individuals and groups can act meaningful to pursue their goals and where they are satisfied with their way of life” (Armitage, Béné, Charles, Johnson, & Allison, 2012, p. 3). Research argues that in order to fully understand paths to mental health resilience, there is a need to identify both protective and promotive factors; protective factors decrease the likelihood of mental health problems and promotive factors increase psychological well-being (Patel & Goodman, 2007).

The focus of resilience research is to better understand variations in human adaptation to stressful events. Successful coping has been measured in many ways including the absence of psychopathology or functional impairment, achievement of developmental milestones, as well as the presence of prosocial behavior and involvement in cultural/community norms (Tol, Song, & Jordans, 2013). Contemporary research on resilience emphasizes its fluid and contextual nature, as opposed to earlier views of resilience as intrinsic static traits. For example, resilience has been defined as “a dynamic process involving an interaction between both risk and protective processes, internal and external to the individual, that act to modify the effects of an adverse life event” (Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003, p. 2; Rutter, 1987). Individual level coping strategies are part of resilience, but resilience encompasses a wider set of social and environmental factors that influence the relationship between exposure to stress and mental health outcomes. Thus, coping specifically refers to the processes within an individual, whereas resilience includes processes and relationships at multiple levels of an individual’s social ecology.

**Coping strategies**

The concept of coping, which describes responses to stress, emerged from Lazarus and Folkman’s stress theory which describes stress in terms of individual personal appraisal whereby individuals use primary appraisal to assess the significance or meaning of an event and secondary appraisal to assess the ability to cope with the consequences of the event (Lazarus & Folkman, 1984). Coping refers to “the set of cognitive and behavioral strategies used by an individual to manage the demands of stressful situations” (Campbell-Sills, Cohan, & Stein, 2006, p. 588). Coping is effective if stress is accurately appraised and specific behavioral and cognitive strategies are used to manage, reduce or tolerate stressful events (Folkman & Moskowitz, 2004). Coping strategies influence psychosocial, emotional and behavioral functioning leading to greater risk or protection of
psychopathology on the one hand and harm or promotion to well-being and quality of life on the other.

Stress and coping exist within an individual’s unique cultural context with social, cultural, economic and historical processes influencing the types of stress experienced in past, present and future and influencing the coping strategies utilized. Defining favorable adaptation requires a set of assumptions about perceived desirability of that adaptation (Masten, 2001). Coping strategy effectiveness can vary over time or developmental stage and location so that, what is adaptive in one context, situation or developmental period may be perceived as maladaptive under different circumstances (Theron, Theron, & Malindi, 2013; Ungar, Ghazinour, & Richter, 2013). Despite the noted importance of viewing coping as a developmentally, context and culturally determined process, much research on coping has been aimed at delineating a priori which coping strategies may be perceived as more helpful. Some research suggests that emotion-focused coping is associated with poorer mental health, whereas task or problem-focused coping is associated with better mental health outcomes (Campbell-Sills et al., 2006; McMahon et al., 2013). Other researchers have questioned whether emotion-focused coping should be considered maladaptive. An explanation for why emotion-focused coping has been considered maladaptive may arise from adaptive and maladaptive emotion-focused strategies being grouped together within the same conceptual coping strategy (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). In contexts of conflict, emotion-focused and avoidance coping strategies may be more adaptive than previous research suggests. Distraction or “just trying to forget it” has been considered a maladaptive coping strategy; however, research in the Democratic Republic of Congo (DRC) with youth ages 13–21 found that disengagement strategies were preferred by youth in the DRC (Mels, Derluyn, Broekaert, & Garcia-Perez, 2013). Similarly, in Zimbabwean adolescents, there was greater use of emotion-focused strategies rather than problem-focused strategies with the latter viewed as more individualistic and less socially acceptable (Magaya, Asner-Self, & Schreiber, 2005). In environments such as humanitarian emergencies and armed conflict, problem-focused coping may be a less appropriate strategy than emotion-focused strategies because youth may be powerless to change stressors related to the conflict. Instead, emotion-focused coping may be an adaptive strategy that is more easily accessible and useful than problem-focused strategies within conflict settings. Other studies suggest that coping flexibility, or use of multiple strategies (i.e. problem and emotion-focused strategies) may particularly be critical to mental health resilience and suggest that coping flexibility may lead to better outcomes (Weisz, McCabe, & Dennig, 1994). Most research to date has focused on how coping strategies impact psychological symptoms; however, there are fewer studies on how coping may also impact measures of well-being such as self-esteem, outlook for the future, happiness.

**External factors**

Resilience includes relationships and resources external to the individual, at the peer, family and community level. Particularly with youth, resources and relationships with other people, settings and systems shape adaptive capacity (Masten, 2013). Having friends and feeling close to friends provide sources of emotional support for youth. Self-esteem, for example, may be enhanced when youth feel that their identity is respected
and they belong to a group (Pat-Horenczyk, Brom, & Vogel, 2014). Peer relationships can also be an important source of coping skill acquisition, exposing youth to ways others cope and providing opportunities to implement coping skills as a group such as engaging in a particular problem-solving strategy. Family is another critical resource that can impact youth mental health and well-being. Caretakers provide both material and emotional support. Caretakers can also model coping strategies and may influence the types of coping strategies youth perceive as normative reactions to stress. How caretakers employ adaptive and maladaptive coping strategies can contribute to the psychological symptom levels and well-being of their children (Compas, Orosan, & Grant, 1993). Research indicates that parental exposure to stress and coping may be a significant predictor of children’s mental health outcomes because youth rely on caregivers to interpret the severity of stressful situations (Norris, Friedman, & Watson, 2002; Pfefferbaum, Jacobs, Houston, & Griffin, 2015). Family can also be a protective factor. High levels of familial support have been associated with lower levels of avoidance coping in response to trauma and family resources and social support have been associated with increased use of cognitive coping strategies (Farhood, 1999). Community contexts and relationships can also influence children’s reactions to traumatic stress. Community exposure to conflict can result in normalization of violence and can lead to more aggressive behavior that shapes youth’s worldview (Barkin, Kreiter, & DuRant, 2001).

Understanding mental health resilience by investigating both individual level coping strategies and external factors that impact psychosocial symptoms and well-being can inform youth-based interventions in conflict and post-conflict settings. This research aims to identify paths from exposure to trauma, individual coping strategies and external factors and the effects on psychological distress and well-being outcomes. Furthermore, the hypothesis that there are gender-specific differences in these relationships is investigated.

**Methods**

**Study setting**

This study took place in rural villages in the Walungu territory in South Kivu, Eastern DRC. The Walungu territory is 50 km south of Bukavu, the capital of South Kivu, and has been afflicted by conflict since 1999. The study was conducted in partnership with Programme d’Appui aux Initiatives Economiques (PAIDEK), a non-profit, non-governmental Congolese microfinance organization and was nested within two microfinance projects, Rabbits for Resilience (RFR) and Pigs for Peace (PFP). RFR and PFP are pragmatic community trials to test the effectiveness of a youth-led rabbit animal husbandry microfinance program combined with an adult microfinance program aimed at improving health, economic stability and relationships between families and communities through loans of pigs and rabbits (Glass, Perrin, Kohli, & Remy, 2014). Each participant cares for their pig/rabbit loan, participates in the building of adequate shelter, provides adequate nutrition and health care with the support and supervision of Congolese research assistants. When the animal gives birth, participants repay their pig or rabbit loan in the form of two offspring, which are then used to provide new loans in the same village. The remaining offspring are available to households to continue to raise, breed and/or sell.
**Study procedures**

Ten rural villages of the Walungu Territory were selected for participation in RFR and PFP and were determined by the (1) operational feasibility, (2) commitment to the livestock microfinance approach and study by traditional chiefs and administrators and (3) findings related to the existence of other microfinance initiatives and social programs, village security and poverty from village-level assessments including review of administrative data and semi-structured interviews with key stakeholders. Within each village, a minimum of 20 households were invited to participate if they met established RFR and PFP criteria (resident of village, interest in animal husbandry, vulnerable children and families). Male or female children ages 10–15 were eligible for participation with RFR. Adults, aged 16 years and older, were eligible for participation with PFP. One youth and one adult per household was selected at random (stratified by gender) and enrolled to complete data collection. Youth selected to complete data collection were randomized to one of three intervention groups (PFP only, RFR + PFP and RFR only). The current analysis includes data collected at six-month follow-up from the RFR survey and PFP survey.

**Data collection**

Parents/caregivers of eligible youth were provided with the purpose of the study, risks and benefits of participation in the study and then were asked to provide verbal informed consent for their child to participate. If a parent/caregiver consented, their child was asked for verbal assent after receiving a description on the purpose of the study and prior to beginning the interview. Participants’ names were recorded separately from the interview questions and secured, all interviews were conducted in private and no information was shared outside the research team.

Experience during pilot tests with the survey instrument and prior experience working in these communities indicates that youth felt comfortable being interviewed by male and female team members (Glass et al., 2014; Kohli et al., 2015). The survey instrument was developed from existing, validated assessment tools and findings from the teams prior research, as described below, and administered electronically using a designed HTML5 survey application on tablet computers (iPad) using the iOS mobile platform (Apple Inc., Cupertino, CA) to ensure consistency and to allow for data to be securely stored in a password protected file on a server. All interviews were conducted by male and female Congolese researchers fluent in French, Swahili and a local language, Mashi. Interviewers were trained as research assistants with a focus on human subjects research ethics and safety for participants. Participants selected the language they preferred for the interview. Interviews were conducted in a private setting and ranged from 45 to 90 minutes. All participants were provided with compensation for their time equal to 2USD, an amount considered appropriate after consultation with village leaders and research team members.

**Survey measures**

*The Harvard Trauma Questionnaire (HTQ) Section I* was adapted to measure youth trauma exposure ($\alpha = .90$) (Mollica, 2004). The scale measures a variety of stressors experienced in an individual’s lifetime and was analyzed as a continuous variable (0–18 total
events). Potentially traumatic events included items within the categories of material deprivation (three events: lack of food or water, lack of shelter and ill health without access to medical care), bodily injury (four events: torture or witnessed torture, serious injury, rape or sexual assault, other type of sexual humiliation), experience in warlike conditions (one event: combat situation), coercion (six events: imprisonment, brainwashing, lost or kidnapped, being close to death, forced isolation, forced separation from family members), and witnessing violence to others (four events: unnatural death of family member or friend, murder of family member or friend, murder of stranger, witness rape or sexual assault). A 16-item version of *HTQ Section IV* was used to measure parental post traumatic stress disorder (PTSD) symptoms (Mollica, 2004). Symptoms consistent with PTSD (recurrent thoughts of harmful events, difficulty sleeping, trouble concentrating) were reported on a Likert scale with responses from never (1) to extremely (4). This measure has been used to understand symptoms of PTSD among conflict-affected populations and has good psychometric properties (Roberts, Ocaka, Browne, Oyok, & Sondorp, 2008; Ventevogel et al., 2007).

*The KidCope Checklist* was adapted to measure coping (Spirito, Stark, & Williams, 1988). The KidCope version used was designed for ages 7–12 (α = .65–.76) (Cheng & Chan, 2003). Individual items (i.e. “I just tried to forget it, I tried to fix the problem by thinking of others, I tried to calm myself down”) were measured on a binary yes/no to answer, “Did you do this?” Previous factor analysis revealed a four-factor solution with coping strategies defined as problem-focused (trying to fix the problem causing stress), emotion-focused (trying to regulate/calm emotions), avoidance (trying to forget the problem or distract oneself) and faith-based coping (praying) (Cherewick, Doocy, Tol, Burnham, & Glass, 2016). Regression factor scores were used to predict the score of each individual for the factor, a method which maximizes the correlation of factor scores to the estimated factor (DiStefano, Zhu, & Mindrila, 2009).

*The African Youth Psychological Assessment (AYPA)* was used to measure internalizing and externalizing problems, somatic symptoms and prosocial attitudes/behaviors (Betancourt, Yang, Bolton, & Normand, 2014). This scale was developed to assess emotional and behavioral problems in African youth and demonstrated good psychometric properties. The internalizing problems subscale included items such as “I feel sad”, “I feel a lot of pain in my heart” and “I have a lot of worries”. The externalizing problems subscale included items such as “I insult friends”, “I am disobedient” and “I am a rough person”. Somatic symptoms included items such as “I get headaches”, “I feel cold” and “I have pain all over the body”. The prosocial attitudes and behavior subscale included items such as “I play together with others”, “I help others” and “I share food and eat with others”. Each question has four response categories (none = 0, sometimes = 1, often = 2 and constant = 3) and mean scores are determined for each sub-dimension. All subscales have been shown to have satisfactory reliability with Cronbach’s α values of prosocial behaviors/attitudes (α = .72), externalizing problems (α = .83), internalizing problems (α = .88) and somatic symptoms (α = .74) (Betancourt et al., 2014).

*The Doucette and Bickman’s Hopefulness Scale: Youth Version* has demonstrated high reliability for youth ages 6–18 (α = .82) and was adapted to measure hope (Doucette & Bickman, 2001). The scale has 10 items designed to assess children’s levels of hopefulness in the last 30 days and each item is rated on a 3-point rating scale ranging from 1 (almost never), 2 (sometimes) and 3 (often). Examples of items include in the scale are “I was able
to accomplish the things I wanted to do in my life”, “there are people I counted on to help
out if I needed” and “my life has been going well”.

The Rosenberg Self-Esteem (RSE) Scale was used to measure self-esteem (Rosenberg, 1965). The RSE is 10-point scale constructed from dichotomous variables with questions such as “On the whole, I am satisfied with myself”, “I feel that I have a number of good
qualities” and “I feel that I’m a person of worth, at least on an equal plane with others”. The RSE has demonstrated excellent internal consistency ($\alpha = .92$) and test retest reliability with correlations of .85–.88 (Rosenberg, 1965).

Additional variables: Three variables measured belonging or closeness to friends, family
and the community. The scale had four response choices; 1 = very distant, 2 = distant, 3 =
close, 4 = very close. Home violence and village violence measured how safe or unsafe indi-
viduals felt in their home/village in the past six months with 1 = “unsafe” and 0 = “safe”.
School enrollment was included as a dichotomous. Happiness was measured with a single
item, “In general how happy do you consider yourself to be?” using a four-point scale. These variables were included based on input from the Congolese research team and
upon analysis of baseline data.

Ethics statement

The Johns Hopkins School of Medicine Institutional Review Board (IRB) approved this
study on 23 June 2014. A committee of respected Congolese educators at the Universite
Catholique at Bukavu reviewed and approved this study as there is no formal IRB in
South Kivu. The research team received approval to conduct the research with local part-
ners PAIDEK and by village traditional and administrative leaders.

Analysis

This analysis includes data collected at six-month follow-up interview with eligible youth
in the RFR microfinance intervention. All analyses were performed using Stata Version 12
(Stata Corporation, College Station, TX). The sample characteristics were described using
frequencies and means by age and gender. Descriptive statistics were used to check for
skewness and data non-normality. Structural equation modeling (SEM) was used to test
the relationship between total exposure to trauma, coping strategies and external factors
at the peer, family and community level on psychological distress and well-being out-
comes. The relationships exposure to trauma, individual coping and peer, family and com-
community factors on psychological distress and well-being are grounded in previously
developed theory identifying the importance of these relationships in resilience frame-
works (Masten, 2011, 2013; Ungar, 2012). The SEM tests the conceptual model, “Resili-
ence and mental health model” developed by Tol et al. (2013) for children and
adolescents living in areas of armed conflict (Tol et al., 2013). Each SEM was developed
separately for boys and girls. For each model tested, (1) overall fit, (2) the significance
of individual structural paths and (3) the amount of variability $R^2$ of the latent variables
accounted for by observed variables were assessed. Model fit was evaluated using good-
ness-of-fit indices including the chi-square ($\chi^2$), root mean square error of approximation
(RMSEA) (Steiger & Lind, 1980), the comparative fit index (CFI) (Bentler, 1990), the
Tucker–Lewis Index (TLI) (Tucker & Lewis, 1973) and the standardized root mean
residual (SRMR). A $\chi^2$ value of no more than twice the degrees of freedom indicates a well-fitting model (Bollen, 1989). The CFI and TLI compare the exiting model fit with a null model assuming uncorrelated variables (independence model). The RMSEA assesses overall fit but penalizes for less parsimonious models. The following statistical criteria were used to evaluate model fit: RMSEA < .06; CFI > .90, TLI > .90 and SRMR < .08 (Kline & Santor, 1999). To account for the cluster design (households clustered within 10 villages), robust cluster estimation was used and to correct for non-normality of the trauma exposure variable, quasi-maximum likelihood method was used. Modification indices were examined to improve the fit of the model according to theory and evidence from the correlation matrix (Kline & Santor, 1999).

**Results**

**Sample description**

The sample included 399 youth, 206 males (51.6%) and 193 girls (48.4%). Thirty-five cases were dropped from the original 434 eligible youth interviewed, because of missing data for the caregiver PTSD variable. Missing data were determined to be missing at random, therefore analysis preceded using data from the 399 youth that included caregiver PTSD information (Full Information Maximum Likelihood) (Oshri, Rogosch, & Cicchetti, 2013). Of the 399 caregivers included in this analysis 349 (85.5%) were female and 50 (12.5%) were male. Ages 10–12 comprised 45.2% and ages 13–15 comprised 54.8% of the sample, with mean age 12.8 (SD = 1.8). Table 1 presents the characteristics of all variables used in this study by sex. Total number of trauma exposure events experienced averaged 2.3 (SD = 2.0). There were no significant differences by sex in use of coping strategies, and the most commonly used coping strategy, among both boys and girls, was avoidance.

|                          | Male Mean (SD) | Female Mean (SD) | $\beta$ | $p$  | Total Mean (SD) |
|--------------------------|----------------|------------------|--------|------|-----------------|
| **Total trauma exposure**| 2.19 (2.05)    | 2.39 (2.04)      | 0.19   | .343 | 2.29 (2.04)     |
| **Coping strategy**      |                |                  |        |      |                 |
| Problem-focused          | 0.15 (0.35)    | 0.09 (0.28)      | −1.78  | .076 | 0.12 (0.32)     |
| Emotion-focused          | 0.14 (0.21)    | 0.16 (0.25)      | 0.83   | .406 | 0.15 (0.23)     |
| Avoidance                | 0.18 (0.39)    | 0.23 (0.40)      | 1.19   | .237 | 0.20 (0.39)     |
| Faith                    | 0.09 (0.30)    | 0.10 (0.30)      | 1.32   | .188 | 0.10 (0.30)     |
| Faith                    | 0.55 (0.62)    | 0.58 (0.65)      | 0.45   | .566 | 0.56 (0.63)     |
| **Psychosocial distress**|                |                  |        |      |                 |
| Internalizing problems   | 1.24 (0.23)    | 1.27 (0.29)      | 0.03   | .311 | 1.25 (0.26)     |
| Externalizing problems   | 1.19 (0.20)    | 1.20 (0.22)      | 0.01   | .510 | 1.19 (0.21)     |
| Somatic complaints       | 1.37 (0.41)    | 1.51 (0.49)      | 0.14   | .001**| 1.44 (0.45)     |
| **Well-being measures**  |                |                  |        |      |                 |
| Happiness                | 2.95 (0.60)    | 2.91 (0.63)      | −0.04  | .508 | 2.93 (0.61)     |
| Self-esteem              | 7.71 (1.12)    | 7.44 (1.31)      | −0.27  | .02**| 7.58 (1.22)     |
| Hope                     | 2.29 (0.36)    | 2.23 (0.41)      | −0.59  | .111 | 2.26 (0.38)     |
| **External factors**     |                |                  |        |      |                 |
| Closeness to friends     | 3.53 (0.62)    | 3.47 (0.72)      | 0.92   | .632 | 3.50 (0.67)     |
| Closeness to family      | 3.70 (0.55)    | 3.70 (0.54)      | 1.01   | .983 | 3.70 (0.55)     |
| Parental PTSD            | 1.88 (0.49)    | 1.88 (0.50)      | 0.00   | .993 | 1.88 (0.50)     |
| Home violence            | 3.33 (1.65)    | 3.48 (1.88)      | 0.15   | .368 | 3.40 (0.565)    |
| Village violence         | 1.76 (0.97)    | 1.82 (0.96)      | 0.05   | .594 | 1.79 (0.96)     |
| Enrolled in school       | 0.90 (0.30)    | 0.88 (0.33)      | 0.80   | .475 | 0.89 (0.31)     |
There were no significant differences by sex in internalizing problems (mean = 1.25) or externalizing problems (mean = 1.19); however, somatic complaints were significantly higher among girls ($\beta = 0.14$, $p = .001$). Levels of happiness and hope were similar for both boys and girls; however, girls reported lower self-esteem than boys ($\beta = -0.27$, $p = .022$). There were no significant differences between girls and boys in respect to external factors.

**Structural equation models**

SEM models tested the relationship between total trauma exposure, coping strategy and external factors (closeness to peers and family, enrollment in school, caregiver PTSD, home violence and village violence) on psychological distress and well-being domains. Coping strategies included problem-focused, emotion-focused, avoidance and faith-based strategies as well as the interaction of problem-focused and emotion-focused strategies. The interaction effect was included based on previous research indicating the significance of this effect (Mels et al., 2013) and existing theory that posits that use of both strategies is important and represents coping flexibility defined as “intra-individual variability in the deployment of diverse coping strategies and, more important, the capacity to exhibit such variability in a way that fosters adjustment to life changes” (Cheng, Lau, & Chan, 2014, p. 1582). Variables at the peer, family and community level were selected based on previous research that indicate significant relationships with mental health and well-being outcomes (Allen & Rosse, 2004; Barkin et al., 2001; Kidd & Shahar, 2008; Leipold & Greve, 2009; Lerner, Bowers, Geldhof, Gestsdottir, & Desouza, 2012; Mak, Ng, & Wong, 2011; Pat-Horenczyk et al., 2014; Pfefferbaum et al., 2015). Additional external variables were tested for significance (number of friends, days missed from school, closeness to community); however, those external variables that did not have significant relationships with outcomes were excluded to present a more parsimonious model. The measurement model for psychological distress was reflective of the AYPA subscales for internalizing problems, externalizing problems and somatic symptoms. The measurement model for well-being was reflective of measures for happiness, hope for the future and self-esteem.

The initial testing of the SEM with the entire sample indicated that adequate model fit could only be achieved by fitting models separately for boys and girls due to differences in significant path relationships between coping and outcomes. This finding is supported by existing research that there exists differences in associations between trauma, coping and psychological distress and well-being by gender in eastern DRC (Mels et al., 2013) and in other humanitarian settings (Qouta, Punamaki, Miller, & El-Sarraj, 2008; Reed, Fazel, Jones, Panter-Brick, & Stein, 2012). Finally, modification indices were examined to and paths included to improve model fit. Findings for girls and boys are presented in Figures 1 and 2, respectively. The structural model demonstrated good fit to the data for both girls ($\chi^2(95) = 119.48; p < .045; \chi^2/df = 1.25; \text{RMSEA} = .037; \text{CFI} = .94; \text{TFI} = .91; \text{SRMR} = .050$) and boys ($\chi^2(93) = 117.980; p < .041; \chi^2/df = 1.26; \text{RMSEA} = .036; \text{CFI} = .94; \text{TFI} = .92; \text{SRMR} = .051$) (Table 2). Standardized loadings on the latent factor for psychological distress ranged from .59 to .81 (all $p < .0001$) and for the latent factor well-being from .40 to .66 (all $p < .0001$). The SEM model for boys explained 25% of the variance in psychological distress, 49% of the variance in well-being and 58% of the
variance in the overall model. The SEM model for girls explained 25% of the variance in psychological distress, 35% of the variance in well-being and 39% of the variance overall.

Table 3 presents the standardized path coefficients and \( p \)-values for girls in the SEM model and Table 4 presents the standardized path coefficients and \( p \)-value for boys. Correlation between the latent factors psychological distress and well-being was significant for both boys (\( \beta = -0.33, p = .014 \)) and girls (\( \beta = -0.31, p = .009 \)). Correlation between

![Figure 1. SEM of resilience for girls.](image)

**Note:** Standardized coefficients are displayed.

| SEM model | \( \chi^2 \)  | \( (df) \) | \( p \) | CFI | TLI | RMSEA | SRMR |
|-----------|---------------|-----------|--------|-----|-----|-------|------|
| Girls     | 119.48        | 95        | .045   | .94 | .91 | .037  | .050 |
| Boys      | 117.980       | 93        | .041   | .94 | .92 | .036  | .051 |

Notes: RMSEA: root mean square error of approximation; CFI: Bentler’s comparative fit index; TLI: Tucker–Lewis index; SRMR: standardized root mean residual.
problem-focused and avoidance coping strategy was significant for girls ($\beta = -0.13, p = .024$). Correlation between emotion-focused and faith-based coping strategies was significant for boys ($\beta = -0.18, p = .008$).

Girls exposed to greater trauma used more emotion-focused coping ($\beta = 0.13, p < .0001$) and less avoidance coping ($\beta = 0.13, p = .025$). Problem-focused coping increased psychological distress in girls ($\beta = 0.29, p = .003$) but when problem-focused coping was used with emotion-focused coping the result was less psychological distress ($\beta = -0.22, p = .016$). Avoidance coping increased well-being in girls ($\beta = 0.19, p = .029$). Feeling close to peers significantly reduced psychological distress ($\beta = -0.211, p = .49$) and increased well-being ($\beta = 0.22, p = .046$) in girls. Girls who felt their home was not safe from violence had increased psychological distress ($\beta = 0.18, p = .018$) and lower well-being ($\beta = -0.19, p = .048$). Girls of parents with higher PTSD scores experienced more psychological distress ($\beta = 0.14, p = .014$). Girls who felt their village was more violent

Figure 2. SEM of resilience for boys.
Note: Standardized coefficients are displayed.
Boys exposed to greater trauma used more combined problem and emotion-focused coping (interaction effect) ($\beta = -0.005$, $p = .021$). For boys, use of problem-focused coping increased psychological distress ($\beta = 0.15$, $p = .021$) and decreased well-being ($\beta = -0.28$, $p < .0001$). However, when problem-focused coping was used with emotion-focused coping, the result was a decrease in psychological distress ($\beta = -0.54$, $p = .035$) and this result was more than 3.5 times the negative effect of using problem-focused coping alone. Boys who used avoidance coping had better well-being ($\beta = 0.14$, $p = .007$) and marginally lower psychological distress ($\beta = -0.06$, $p = .090$). Boys who used faith-based coping had greater well-being ($\beta = 0.30$, $p = .001$). Boys who felt closer to peers had lower psychological distress ($\beta = -0.30$, $p = .027$). Boys who felt close to their family had greater well-being ($\beta = 0.26$, $p = .038$). Boys who felt their home was not safe from violence had greater psychological distress ($\beta = 0.14$, $p = .007$) and lower well-being ($\beta = -0.30$, $p = .025$) and girls who attended school had significantly higher well-being ($\beta = 0.14$, $p = .037$).
being ($\beta = -0.28, p = .044$). Boys enrolled in school had improved well-being ($\beta = -0.35, p = .001$).

### Discussion

The aim of fitting SEM was to explain the covariance structure of all included variables in order to understand paths between exposure to potentially traumatic events as a risk factor; protective and promotive factors across socio-ecological levels (individual coping strategies, peer, family and community relationships) and outcomes of psychological distress and well-being.

Use of problem-focused coping strategies was associated with greater psychological distress in both boys and girls. However, when problem-focused coping was used with emotion-focused coping, the result was lower psychological distress in girls. An

| Structural paths                      | Coefficient | SE  | Z    | $p > |z|$ | Lower bound | Upper bound |
|---------------------------------------|-------------|-----|------|-------|-------------|-------------|
| Problem-focused                       |             |     |      |       |             |             |
| Child trauma total                    | -0.13       | 0.06| -2.04| .041* | -0.25       | -0.01       |
| Closeness to peers                    | -0.29       | 0.05| -6.18| .000  | -3.9        | -2.20       |
| Emotion-focused                       |             |     |      |       |             |             |
| Child trauma total                    | 0.05        | 0.07| 0.69 | .493  | -0.09       | 0.19        |
| Avoidance                             |             |     |      |       |             |             |
| Child trauma total                    | -0.10       | 0.07| -1.44| .149  | -0.23       | 0.04        |
| Faith                                 |             |     |      |       |             |             |
| Child trauma total                    | 0.01        | 0.08| 0.14 | .885  | -0.15       | 0.17        |
| Problem * emotion-focused             |             |     |      |       |             |             |
| Child trauma total                    | -0.12       | 0.05| -2.52| .012* | -0.21       | -0.03       |
| Psychological distress                |             |     |      |       |             |             |
| Problem * emotion                     | -0.18       | 0.11| -1.62| .106  | -0.40       | 0.04        |
| Problem-focused                       | 0.20        | 0.10| 2.06 | .040* | 0.01        | 0.40        |
| Emotion-focused                       | 0.11        | 0.09| 1.20 | .230  | -0.07       | 0.28        |
| Avoidance                             | -0.10       | 0.06| -1.63| .103  | -0.21       | 0.02        |
| Faith                                 | 0.06        | 0.08| 0.82 | .412  | -0.09       | 0.21        |
| Closeness to family                   | -0.16       | 0.12| -1.40| .162  | -0.39       | 0.07        |
| Village violence                      | -0.03       | 0.06| -0.59| 0.557 | -0.15       | 0.08        |
| Closeness to friends                  | -0.27       | 0.10| -2.82| 0.005**| -0.46      | -0.08       |
| Home violence                         | 0.19        | 0.08| 2.36 | 0.018*| 0.03        | 0.34        |
| Parent PTSD mean                      | 0.09        | 0.12| 0.76 | 0.450 | -0.14       | 0.32        |
| School                                | -0.12       | 0.07| -1.76| 0.079 | -0.25       | 0.01        |
| Well-being                            |             |     |      |       |             |             |
| Problem * emotion                     | 0.06        | 0.06| 0.94 | 0.346 | -0.06       | 0.18        |
| Problem-focused                       | -0.27       | 0.08| -3.28| 0.001**| -0.44      | -0.11       |
| Emotion-focused                       | 0.10        | 0.11| 0.90 | 0.368 | -0.11       | 0.31        |
| Avoidance                             | 0.16        | 0.06| 2.78 | 0.005**| 0.05       | 0.28        |
| Faith                                 | 0.26        | 0.07| 3.60 | <0.001***| 0.12      | 0.41        |
| Closeness to family                   | 0.15        | 0.06| 2.46 | 0.014*| 0.03        | 0.27        |
| Village violence                      | -0.22       | 0.16| -1.44| 0.151 | -0.53       | 0.08        |
| Closeness to friends                  | -0.06       | 0.05| -1.25| 0.210 | -0.15       | 0.03        |
| Home violence                         | -0.28       | 0.14| -2.01| 0.044*| -0.54       | -0.01       |
| Parent PTSD mean                      | -0.14       | 0.10| -1.32| 0.185 | -0.34       | 0.06        |
| School                                | 0.36        | 0.11| 3.29 | 0.001**| 0.14       | 0.57        |

Note: Standard error adjusted for 10 village clusters.

*p < .05.

**p < .01.

***p < .001.
explanation for the negative association between problem-focused coping strategies and mental health may be that without effective emotional regulation, trauma-affected children may employ harmful methods or behaviors employed to “fix a problem”. For example, research suggests that without effective emotional regulation, trauma-affected children may exhibit increased aggressive behavior (Pat-Horenczyk et al., 2014). Furthermore, without use of emotion-focused coping, youth may lack the psychological strength to make a problem-focused strategy effective. Effective emotion-focused coping has been shown to reduce distress and provide a calmer approach to problem-solving (Weinberg, Gil, & Gilbar, 2014). Previous research indicates that rather than focusing on the independent effect of a particular strategy, considering how strategies are used simultaneously may be informative because for example, trying to fix a problem may also be effective in calming ones emotions (Skinner, Edge, Altman, & Sherwood, 2003).

In both boys and girls, use of avoidant strategies improved well-being, though the total effect was slightly higher in girls. Avoidance coping strategies that seek to “just forget it” or distract oneself may be particularly suitable in context of ongoing conflict or contexts with profound limitations on the ability of an individual to engage with or “fix” their stressor. Some research suggests that avoidant coping strategies may be more adaptive in the short term but less adaptive in the long term (Fonagy & Target, 2003; Kerig & Becker, 2010; van der Kolk, 1996). While avoidant coping may be an appropriate immediate response to stress, other coping strategies or groups of strategies may be critical, particularly as youth get older and have more responsibilities. In boys, use of faith-based strategies also improved well-being. Faith-based coping may provide a source of social and community support. Faith-based coping may also be beneficial in supporting other types of coping strategies such as cognitive restructuring and emotion expression. In other conflict settings, faith-based coping has resulted in lower psychological distress symptoms, antisocial behavior, depressive symptoms and PTSD symptoms (Barber, 2001; Durakovic-Belko, Kullenovic, & Dapic, 2003; Klasen et al., 2010).

Investigation of external factors at the peer, family and community level inform a more nuanced understanding of youth resilience to stress. Particularly for girls, home environment, parental mental health and relationships with the family had a significant impact on psychological distress. Adults suffering from mental health disorders may not have the capacity to assist children and provide support (Belter & Shannon, 1993; La Greca, Silverman, Vernberg, & Roberts, 2002). Caregivers who are unable to be supportive to youth can result in increased distress and development of emotional suppression (Pat-Horenczyk et al., 2014), deficits in emotion understanding (Pears & Fisher, 2005) and less adaptive coping strategies (Compas et al., 2001). While the family environment impacted both boys and girl’s well-being measures, these data suggest that girls are impacted more by their caregiver’s PTSD than boys. In general, girls in the DRC spend more time in the home than boys and have less access and opportunities to engage in activities outside of the home. Therefore, girls having greater interaction with their parent/caregiver than boys, and this may make girls more vulnerable to poorer parent/caregiver mental health. Furthermore, the majority of caregivers in this analysis were women and women are more likely to have PTSD than men in humanitarian settings (Porter & Haslam, 2005; Roberts et al., 2008; Sabin, Lopes Cardozo, Nackerud, Kaiser, & Varese, 2003; Scholte et al., 2004).
Feeling close to peers significantly reduced psychological distress for both boys and girls and increased well-being in girls. As the only external factor shown to reduce psychological distress, supporting peer relationships and providing opportunities to strengthen bonds between peers are important to addressing psychological distress. Attending school improved well-being for both boys and girls, although the main effect on well-being was more than twice as high for boys than girls. At the community level, feeling their village was not safe impacted psychological health among girls but not boys. Furthermore, this factor had the greatest negative effect on girl’s well-being in comparison with all other factors evaluated. Boys may be more likely to engage in activities outside the home and have greater confidence in their ability to navigate threats and therefore suffer less direct psychological distress resulting from fear of community violence.

**Implications for interventions**

Ability of youth to find positive ways to cope with traumatic stress as well as everyday challenges has an impact on their well-being and mental health. Results from this study suggest that rather than focusing on strengthening individual strategies, interventions may seek to strengthen groups of coping strategies and capitalize on synergistic interaction effects of employing multiple coping strategies. For both girls and boys, the benefit of using both problem and emotion-focused coping strategies suggests that having a greater repertoire of effective coping skills can be more important than utilization of any particular strategy.

While avoidant strategies have traditionally been considered a more harmful strategy for mental health, it may be that avoidant strategies offer a reprieve from negative symptoms, especially in conflict settings. Rather than suppressing use of distancing and distraction, interventions may consider offering approaches that allow individual reflection and expression within a supported environment. For girls in this study, problem-focused and avoidance coping strategies were significantly correlated. Research suggests that problem-focused coping may be employed with other strategies in a cyclical way so that avoidant coping provides the reprieve necessary regain emotional strength to make problem-focused strategies successful (Skinner et al., 2003).

These results suggest that peer, family and community relationships can impact both psychological distress and well-being. Interventions targeting home violence reduction, caregiver mental health and improved family relationships could lower psychological distress and improve well-being. Interventions offering greater opportunity to form bonds with peers and the community may help to increase well-being. Schools are critical resource in contexts of humanitarian emergencies and not only provide a safe space but also promote social bonds with peers and with healthy adults in the community (teachers, youth group organizers).

These results reflect context-specific promotive and protective effects related to gender equity. Girls have more limited freedom outside the home and greater responsibility within the household. In contrast, boys have greater freedom to interact with peers and community members outside the home. This reality may limit the types of coping strategies girls learn and use and limit the gains received from greater coping flexibility. Peers and community members can be an important source of teaching coping skills and can be a healthy influence on mental health and well-being outside of the home.
Particularly for girls, providing opportunities to engage with healthy adults outside of the home may buffer the negative effects of poor caregiver mental health until those mental health needs can be fully addressed. Ensuring resources and activities are available to both boys and girls is important not only to improving gender equity, but to improving the coping repertoire and resulting mental health resilience of communities.

**Limitations**

First, while external factors at the peer, family and community level help explain a resilience framework for mental health and well-being, additional variables and more nuanced scales to represent those variables could be useful. For example, understanding types of peer relationships in greater detail may help to inform an understanding of how behaviors undertaken in friendship circles may help or hinder mental health resilience. Second, coping strategies that are used and their effectiveness may differ in young children and adults. Longitudinal studies are needed to explore how coping strategies impact mental health and well-being over time. Future research should consider whether coping strategies are particularly impactful during a developmental age range, or whether those strategies remain assets over the life course. Third, data from this study were based on self-reports and responses could be impacted by perceived desirability of response choices. Combining these data with more objective behavioral data would make the reliability of these data more robust. The scales used to measure self-esteem and hope have not been validated specifically in this context and future research should investigate use of these scales in post-conflict settings. Fourth, given that this study is nested within an intervention program with three intervention groups, it is possible that participation in an intervention group could bias results. However, we tested intervention group as a control variable in this study and these tests indicated that intervention group assignment did not significantly alter results. Given that the purpose of this study was not to evaluate the intervention, we excluded intervention group as a control to present a more parsimonious model. Finally, the cross-sectional nature of this study means that directionality of relationships cannot be unequivocally supported and there is a possibility of reciprocal relationships.

**Conclusion**

Findings from this study suggest that both individual coping strategies and external factors explain mental health resilience in conflict-affected youth. SEM of resilience as it pertains to trauma-affected youth mental health and well-being suggests that interventions should (1) target support for multiple (grouped) coping strategies at the individual level to build youth coping repertories and flexibility in coping strategy use, (2) support reduction in psychological distress through improved family relationships, caregiver mental health and home violence reduction and (3) target improved well-being through support for peer and community relationships and school enrollment. This research has the potential to contribute toward the production of more effective interventions for conflict and post-conflict settings that promote building a stronger set of coping strategies and expanding youths’ coping repertoire. Interventions should also include support for the protective and promotive factors at the peer, family and community level to reduce psychological distress and improve well-being.
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