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Resource Loss and Stress Outcomes in a Setting of Chronic Conflict: The Conservation of Resources Theory in the Eastern Congo

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The purpose of this cross-sectional study was to examine conservation of resources (COR) theory in the context of armed conflict in Africa. Specifically, within the setting of ongoing chronic conflict in the eastern Democratic Republic of the Congo (DRC), we tested the COR theory prediction that resource loss contributes to various stress outcomes. A randomly selected sample of 312 adults (125 men, 187 women) from villages in North Kivu, DRC completed orally administered measures of resource loss, daily stressors, and four stress outcomes: depression symptoms, anxiety symptoms, posttraumatic distress, and general distress. Consistent with COR theory, resource loss predicted all four stress outcomes above and beyond the contribution of demographics, relocation experiences, and daily stressors; however, this effect was small, $\Delta R^2 = .02–.06$. The most consistent and strongest predictors of stress outcomes were daily stressors, $\beta s = .42–.62$; number of relocation experiences, $\beta s = .33–.43$; and psychosocial resource loss (e.g., loss of hope, meaning or purpose in life, intimacy with friends and family, physical health of family), $\beta s = .17–.26$. Additionally, male sex predicted depression, anxiety, and trauma symptoms, and lower educational status predicted anxiety symptoms and general distress. Our exploratory mediation analysis showed that daily stressors partially mediated all four pairs of associations between psychosocial resource loss and mental health outcomes. We discuss the findings with consideration of research on disasters generally and armed conflicts specifically. We also discuss implications for humanitarian interventions with conflict-affected populations in Africa and beyond.

The conservation of resources (COR) theory (Hobfoll, 1988, 1989) explains people's experience of and response to stress. In 1989, Hobfoll positioned COR theory as a more complete, more objective (in that it did not depend on perception), and less tautological theory of stress compared to historic theories, such as balance theories of stress (McGrath, 1970), the stress-and-coping theory (Lazarus, 1999), and event-perception theories (Spielberger, 1966). The central tenet of COR is that people are motivated to obtain, protect, and pursue the acquisition of resources (i.e., things they value). Thus, stress results either from the threatened or actual loss of those resources or from not receiving enough gain in resources from an investment of other resources. Hobfoll (1989) defined stress as a reaction to the environment in which there is (a) the threat of a net loss of resources, (b) the net loss of resources, or (c) a lack of resource

gain following the investment of resources. Both resource loss (perceived or actual) and lack of resource gain can produce stress. Resources are defined as objects, conditions, personal characteristics, and energies that are valued by the person and by which the person can attain other resources.

To offset lost resources and gain and build up other resources, people either use the resources they already possess or draw on resources from their environment (e.g., social support). For example, people invest commitment, love, and affection, and, based on such investments, they receive a return. People invest time and energy to parlay them into more valued resources like power, influence, and money. Thus, Hobfoll (1989) posited four categories of resources: objects resources, conditions, personal characteristics, and energy resources. "Object resources" are physical objects that have exchange value, including homes, salaries, cars, and similar items. "Condition resources" include marriage or cohabitation, seniority, and employment. "Personal resources" are individual characteristics that strengthen resistance against loss or offer restoration after loss; these resources can include such traits as resilience, self-esteem, hardiness, optimism, sense of mastery, ego strength, low negative affectivity. "Energy resources" are things such as vitality (physical and psychological), time, money, knowledge, and learning ability,

which are not inherently valuable but are instead useful in obtaining other resources.

The COR theory has been supported empirically in many contexts, including natural disasters (Smith & Freedy, 2000), terrorist attacks (Hobfoll, Tracy, & Galea, 2006), mass shootings (Littleton, Axsom, & Grills-Taquechel, 2009), and business organizations (see Holmgreen, Tirone, Gerhart, & Hobfoll, 2017, for a review). The COR theory has also gained empirical support in the aftermath of armed conflict in the Middle East (Freedy, Hobfoll, & Ribbe, 1994; Heath, Hall, Russ, Canetti, & Hobfoll, 2012; Hobfoll, Hall, & Canetti, 2012; R. Johnson et al., 2009).

The purpose of the present study was to examine COR theory in a setting of ongoing chronic conflict and serial displacement in Africa. Globally, between 1989 and 2017, there were 846 armed conflicts (176 state-based and 670 non–state-based armed conflicts) and over 2.3 million battle-related deaths. Over that period, 5 of the 10 most conflict-affected countries worldwide were in Africa: Rwanda (520,586 battle-related deaths), Ethiopia (177,050 battle-related deaths), Sudan (91,920 battle-related deaths), Nigeria (50,282 battle-related deaths), and the Democratic Republic of the Congo (DRC; 105,482 battle-related deaths; Petterson & Eck, 2018). In these and other African countries, some factors that often characterize and fuel armed conflicts are postcolonial issues of weak infrastructure, corruption of leaders and systems, and exploitation of resources (Williams, 2016).

In several conflict contexts in Africa, survivors have experienced horrific levels and types of violence, including widespread rape, murder, torture, and maiming. These conflict-related atrocities have often gone on for years and left countless millions of survivors traumatized, frequently for long periods of time after the conflict has ended (Steel et al., 2009; Williams, 2016). For example, in two population-representative studies of armed conflict survivors in Liberia, almost 50% of survivors still met criteria for posttraumatic stress disorder (PTSD) several years after the Second Liberian Civil War ended in 2003 (Galea et al., 2010; K. Johnson et al., 2008). Importantly, war-related events commonly result in survivors experiencing countless stressors. Survivors often must deal with survival; loss of loved ones; economic strains; threats to their safety, health, and well-being; and relocation from conflict-ridden areas. In short, war survivors often lose many object, condition, personal, and energy resources.

As such, war-related humanitarian crises have drawn growing scholarly attention. Researchers have examined the psychological impact of armed conflict (Steel et al., 2009), the aftermath and fallout of conflict, and the effectiveness of mental health and psychosocial support interventions offered to conflict survivors (Tol et al., 2011). Most of this research has focused on the direct effect conflict exposure has on survivors' mental health. However, evidence that other factors may interact with conflict exposure and thereby affect survivors' mental health has been accumulating. For instance, there is growing evidence that daily stressors (Miller & Rasmussen, 2014) and relocation

experiences (Steel et al., 2009) might contribute as well. In fact, in war-affected countries and communities, people do not have to experience direct exposure to conflict to be strongly and negatively affected: Their community may be stressed, thus affecting or depleting the available resources that could contribute to a resilient response to potentially traumatic events (Bonanno, 2005).

According to the COR theory, a key factor that should contribute to survivors' mental health is the amount of accumulated resource losses they have experienced in the setting of chronic conflict. However, to our knowledge, no empirical studies have examined this possibility in a chronically conflict-affected population in Africa. To address this need, we analyzed data regarding resource loss and mental health in the DRC, a country that has for decades been beset by war, relocation, and destabilization that continues today (DR Congo, n.d.). Of note, there was neither a control sample nor an attempt to partition people based on who was more versus less directly affected by the war and its aftermath. Furthermore, a cross-sectional design was employed; thus, in the current study, we were not seeking to imply causality.

The conflict in the DRC has been called "the world's deadliest humanitarian crisis" (Coghlan et al., 2006, p. 44) and "among the most complex, deadly, and prolonged [humanitarian crises] ever documented" (Coghlan et al., 2007, p. ii). Since gaining its independence from Belgium in 1960, the DRC has been affected by recurrent state-based and non-state armed conflicts (DR Congo, n.d.). The most severe conflict was from 1998 to 2002, during what has been called "Africa's first world war" (Coghlan et al., 2006, p. 44) because it involved troops from seven countries in the region as well as numerous non-state groups. During that period, an estimated 3.3 million people died because of the war, and another 2.1 million individuals died between 2002 and 2007. Only a small percentage of those 5.4 million deaths were directly due to violence; most were due to preventable and treatable conditions that were caused or exacerbated by the conflict, including deaths due to untreated infectious diseases (e.g., malaria, pneumonia), which occurred because of the collapse of public healthcare services, and malnutrition, which occurred because of food insecurity (Coghlan et al., 2006, 2007). Ongoing conflict continues in the eastern DRC.

The eastern DRC is a pertinent setting in which to examine the COR theory in the context of armed conflict. This study focused on one severely conflict-affected region of the eastern DRC—North Kivu province (Stearns, 2012)—and tested COR theory's prediction that resource loss contributes to various stress outcomes. Specifically, we hypothesized that resource loss would contribute to depression symptoms, anxiety symptoms, posttraumatic distress, and general distress, above and beyond the contribution of (a) four demographic characteristics (age, sex, education level, and territory), (b) relocation experiences (e.g., number of relocations and total length of time relocated; cf. Steel et al., 2009), and (c) daily stressors (cf. Miller & Rasmussen, 2014).

Method

Participants

All participants had to be at least 18 years of age and reside currently in either the Rutshuru or Masisi territory of North Kivu, DRC; these are two of the most conflict-affected territories in North Kivu province (Stearns, 2012). Two individuals began the interview but declined to finish; thus, the response rate was 99.4%. Four individuals who completed the survey were missing data for age or gender and were not included in analyses. The final sample consisted of 312 adults residing in either the Rutshuru (70.2%) or Masisi (29.8%) territories. There were more women (59.9%) than men (40.1%). The mean age of participants was 40.88 years ($SD = 15.93$, range: 18–90 years), and most participants were married (78.5%). Nearly half the sample (49.7%) had no formal education, 24.4% finished primary school, and 25.9% completed some secondary school or higher. Regarding religious affiliation, most participants were Protestant Christian (48.4%) or Catholic Christian (47.4%). About half the participants (51.9%) reported that they had received medical services in the past year, and roughly one-fourth of participants (24.7%) had received counseling. Most participants (93.9%) indicated they had had to relocate at least once for safety reasons. The median number of relocations was two, with 41.3% of the sample reporting one relocation, 26.3% reporting two, 21.2% reporting three, and 5.1% reporting four relocations. The total length of relocation ranged from 0 to 315 months, with a median time of 6.00 months and mean of 16.02 months ($SD = 31.17$).

Procedure

Data were collected in 2017 by a nongovernmental organization (NGO) in the eastern DRC. The original data collection was approved by local village chiefs before conducting interviews in their respective villages. The data for this study were analyzed as a secondary data analysis, as approved by the institutional review board at the first author's institution. To recruit a representative sample in Rutshuru and Masisi, the project team used a stratified-sampling method. Village centers served as the "cluster points," in which households were selected and then individuals were selected. Within each cluster, the number of households and the gender ratio were proportional to the village population and its ratio of men to women, as obtained from the regional census office the week before the survey began.

Due to the relatively low literacy rate in the North Kivu province, oral consent was obtained, and all measures were administered orally in the national language (Swahili), following similar procedures used in prior research in the eastern DRC (K. Johnson et al., 2010; Veling, Hall, & Joose, 2013). All interviews were done by 24 native Swahili speakers (17 men and seven women) who were born in the eastern DRC and resided in North Kivu at the time of data collection. Interviewers completed 2 days of training before conducting any interviews; the training covered topics such as data collection

ethics, and it included instruction on all administration procedures. Interviewers also received as-needed field assistance from the project leadership team. To minimize researcher bias, interviewers were randomly assigned to cluster points, and they completed all interviews in their assigned clusters.

Upon entering each village, the project team first met with the local village chief to discuss the purpose of the project and obtain permission to collect data in each village. Each interviewer started recruitment at the center of the village, heading in a different direction from the village center and stopping at each fourth house to recruit a participant until the specified number of interviews were completed. Only one participant was interviewed per household, and interviews were typically conducted inside the participant's home. All men were interviewed alone; some women were interviewed with their husbands present, when requested. Interviewers typically took 30–45 min to administer all study measures orally. They audio-recorded participants' verbal answers to each item. After completing data collection but before data analysis, two staff members from the NGO staff entered the data into Microsoft Excel (Microsoft; Redmond, WA) with de-identified information.

Measures

Cultural adaptation of measures occurred using a committee approach, which is a recommended method to ensure linguistic equivalence of measures used in cross-cultural research (Sattler et al., 2006; Van de Vijver & Leung, 1997). This study's measure review committee consisted of the project leadership team (second author, country director, and project director) and 24 bilingual interviewers (see Procedure section). Cultural adaptation occurred in three stages. First, the committee reviewed each measure to ensure the cultural appropriateness and relevance of the items, instructions, and scaling. Second, each adapted measure was translated from English to Swahili by a professional interpreter who was employed by the United Nations as an interpreter in the DRC. Third, the review committee checked the translated measures to verify and refine each translation's accuracy.

Resource loss. Resource loss was measured using the Conservation of Resources Evaluation (COR-E; Hobfoll, Lilly, & Jackson, 1992). The original instrument consists of 74 items and assesses a wide range of tangible and intangible resources. Our measure review committee identified 33 items that were the most culturally appropriate, relevant, and salient to the eastern DRC context, and they modified 3 of the 33 identified items to use in our current study (e.g., "affection from others" was changed to "compassion from others"). Additionally, 7 items were created and added to capture loss that is uniquely relevant to the region's sociocultural and agricultural context: "faith in God," "separated from family," "loss (death) of family members," "loss of limb(s)," "opportunity for education," "livestock," and "farmland." In sum, there were 40 items in this culturally adapted version of the COR-E (33 existing and

7 new). The measure review committee also adapted the COR-E instructions by asking respondents, "What have you lost?" For all items, participants indicated the degree of their resource loss on a 5-point response scale ranging from 0 (*not at all/not applicable*) to 4 (*to a great degree*). Because the original authors (Hobfoll et al., 1992) did not propose a consistent factor structure of the measure across samples, and because many subsequent researchers have not used the full measure to explore its factor structure (Gerhart, Hall, Russ, Canetti, & Hobfoll, 2014), we conducted our own factor analysis to explore the structure of our adapted version of COR-E (see Results section).

Depression and anxiety symptoms.   The Hopkins Symptom Checklist–25 (HSCL-25; Winokur, Winokur, Rickels, & Cox, 1984) was used to measure symptoms of depression (15 items; e.g., "crying easily," "poor appetite") and anxiety (10 items; e.g., "feeling fearful," "heart pounding or racing"). This 25-item measure is a well-utilized and well-validated measure of depression and anxiety symptoms, and it is often used in studies of conflict-affected populations (e.g., Miller, Omidian, Rasmussen, Yaqubi, & Daudzai, 2008; Sweetland, Belkin, & Verdeli, 2014). We used the Swahili version of the HSCL-25, which has demonstrated good validation evidence in previous research in the DRC (Bass et al., 2013, 2016). We adapted the instructions by asking respondents to rate how much they were bothered or distressed by each symptom during the past week. Each participant responded on the original scale, which ranged from 1 (*not at all*) to 4 (*extremely*). Mean ratings were calculated, with higher scores indicating more depression or anxiety symptoms. For this study, Cronbach's alpha was .89 for both subscales.

Posttraumatic distress.   Posttraumatic distress was measured using the Impact of Events Scale–Revised (IES-R; Weiss & Marmar, 1997), one of the most cross-culturally utilized and well-validated measures of posttraumatic distress. It consists of 22 items (e.g., "I felt irritable and angry" and "I tried not to think about it"). We used the Swahili version of the IES-R, which has demonstrated good validation evidence in previous research with conflict-exposed samples in the DRC (Dossa, Zunzunegui, Hatem, & Fraser, 2015; Mels, Derluyn, Broekaert, & Rosseel, 2010). We adapted the instructions to ask how much "the difficult events of the past" had impacted participants, with responses given using a scale of 0 (*not at all/not applicable*) to 4 (*to a great degree*). A mean item rating was calculated, with higher scores indicating a higher level of posttraumatic distress. For this study, Cronbach's alpha was .91.

General distress.   General (i.e., nonspecific) psychological distress was measured using the Self-Reporting Questionnaire–20 (SRQ-20; World Health Organization [WHO], 1994), one of the most well-utilized and well-validated measures of general psychological distress, especially in developing (WHO, 1994) and sub-Saharan African countries (Sweetland et al., 2014). Respondents indicate *yes* (1) or *no* (0) in response to the scale's

20 items (e.g., "Do you often have headaches?," "Do you feel unhappy?," and "Is your daily work suffering?"). We used the Swahili version of the SRQ-20, which has demonstrated good validation evidence in previous research in the DRC (Dossa et al., 2015). A total sum score was calculated, with higher scores indicating a higher level of general distress. For this study, Cronbach's alpha was .82.

Daily stressors.   Daily stressors were measured using the Afghan Daily Stressors Scale (Miller et al., 2008), which has demonstrated good validation evidence with conflict-affected adults in Afghanistan. We used all 26 original items (e.g., "roadblocks," "financial problems," "air pollution") and added 4 new items that were also culturally salient: "distressed about missing family members," "distressed from hearing stories of violence," "distressed over trying to help people who are suffering," and "feeling frightened by violence going on around me." On this 30-item culturally adapted measure, participants used the measure's original scale to rate their stress level on a scale of 1 (*not at all stressful*) to 3 (*very stressful*). A mean item rating was calculated, with higher scores indicating more daily stressors. In the current sample, Cronbach's alpha was .81.

Data Analysis

We used SPSS (Version 24) for all data analyses. Despite the fact Little's missing completely at random test was significant, $\chi^2(17{,}076, N = 316) = 18{,}520.18, p < .001$, the low levels of missing data (i.e., less than 2%) at the item level allowed us to use the expectation maximization method to impute missing values. Next, we found several univariate outliers (one for psychosocial resource loss, three for depression symptoms, and two on general distress) and replaced each one with the nearest nonextreme value. Four cases missing data for either gender or age were deleted, leaving 312 cases. Mahalanobis distances revealed only one multivariate outlier. Deleting this case resulted in our final sample size of 311, which was used for all analyses.

Results

Descriptive Statistics and Exploratory Factor Analysis

Univariate normality of the current data set was acceptable (skewness and kurtosis values ranged from –0.65 to 0.68). For intercorrelations, we Bonferroni-corrected the omnibus alpha to .002 due to the large number of correlation coefficients that were computed. Means, standard deviations, and intercorrelations are presented in Table 1.

Next, the dimensionality of the 40-item scale of the culturally adapted COR-E was examined using principal axis factoring to determine its factor structure and subsequent scoring for analyses. The Kaiser–Meyer–Olkin measure revealed the data was adequate for factor analysis, KMO = 0.88, and the significance of Bartlett's test of sphericity indicated the appropriateness for conducting factor analysis, $\chi^2(780, N = 311) = 5{,}379.32$,

Table 1
Means, Standard Deviations, and Intercorrelations for Major Study Variables

Measure	1	2	3	4	5	6	7	8	*M*	*SD*	Possible Range
1. Psychosocial resource loss	.86	.21***	.28***	.52***	.47***	.47***	.37***	.45***	1.66	0.73	0–4
2. Object resource loss		.88	.18	.29***	.27***	.30***	.20***	.43***	2.59	0.95	0–4
3. Energy resource loss			.73	.32***	.24***	.33***	.13	.48***	1.38	0.99	0–4
4. Depression symptoms				.89	.83***	.73***	.67***	.63***	2.13	0.57	1–4
5. Anxiety symptoms					.89	.72***	.65***	.55***	2.31	0.66	1–4
6. Posttraumatic distress						.91	.53***	.50***	1.98	0.75	0–4
7. General distress							.82	.39***	13.34	4.25	0–20
8. Daily stressors								.81	2.15	0.28	1–3

Note. $N = 311$. Cronbach's alphas are presented in italics along the diagonal. Bonferroni-corrected $\alpha = .001$.
*** $p < .001$.

$p < .001$ (Field, 2012). The initial analysis revealed a multidimensional rather than unidimensional underlying structure.

We used two methods to determine the appropriate number of factors to retain. First, we did a parallel analysis, and, using principal axis factoring of a random set of numbers of the same size as our data set, we found that four factors yielded eigenvalues greater than the scree plot of random data. However, the fourth factor was a single item, which we therefore did not consider to be a factor. Second, we used the scree plot of eigenvalues for our data. The four highest eigenvalues were 8.36, 4.64, 2.19, and 1.17. According to DeVellis (2012), an eigenvalue can be interpreted as the value indicating the relative power of predictability of the linear combination of items in the factor, compared to one single item. Because the fourth eigenvalue was not reliably different from 1, it indicated that the fourth factor may not be a distinct factor. In short, both tests indicated that three factors should be retained.

We the used principal axis factoring to extract three factors, using oblimin rotation. The results of this factor analysis are presented in Table 2. We used a criterion of .40 for inclusion of an item in the interpretation of a factor, and we required that (a) there was at least a .20 difference between the primary and secondary loadings and (b) that there was no more than a .30 cross-loading on another factor. Using these criteria, 12 items loaded on Factor 1, 8 on Factor 2, and 6 on Factor 3. The factors were respectively labeled *psychosocial resource loss* (e.g., "losing companionship" and "losing a feeling that my life is peaceful"), *object resource loss* (e.g., "losing adequate food" and "losing adequate income"), and *energy resource loss* (e.g., "losing one's role as leader" and "losing the opportunity for education"). Fourteen items either cross-loaded on two factors (5 items) or did not load on any factor (9 items) and were thus not included in the final scale. After rotation, the first factor accounted for 22.1% of the variance, the second factor for 12.9%, and the third factor for 6.7%. Together, this 26-item culturally adapted COR-E had a three-factor multidimensional factor structure; hence, total scores were not calculated. Cronbach's alpha values for the three factors were .86, .88, and .73, respectively.

Regression Models Predicting Stress Outcomes

Depression symptoms. Next, we conducted four hierarchical regression analyses (see Table 3). Because so many tests were performed, we Bonferroni-corrected the omnibus alpha to .001. Results indicated that resource loss significantly predicted depression symptoms, Step 4 $\Delta R^2 = .05$, $p < .001$, above and beyond the influence of demographics, relocation experiences, and daily stressors. However, the size of this effect was small. Based on the ranking of standardized regression coefficients in the final model, the daily stressors rating was the strongest predictor of depression symptoms, followed by number of relocations, psychosocial resource loss, and sex. The full model predicted 53% of the variance in depression symptoms.

Anxiety symptoms. Results indicated that resource loss also significantly predicted anxiety symptoms, Step 4 $\Delta R^2 = .04$, above and beyond the same variables. Again, the effect size was small. Based on the ranking of standardized regression coefficients in the final regression model, the level of daily stressors was again the strongest predictor of anxiety symptoms, followed by the number of relocations, psychosocial resource loss, sex, and education level. The full model predicted 49% of variance in anxiety symptoms.

Posttraumatic distress. Resource loss significantly predicted posttraumatic distress as well, Step 4 $\Delta R^2 = .06$, above and beyond the same variables. Once more, the effect size was small. Based on the ranking of standardized regression coefficients in the final model, level of daily stressors was the strongest predictor of posttraumatic distress, followed by the number of relocations, sex, and psychosocial resource loss. The full model predicted 45% of the variance in posttraumatic distress.

General distress. Resource loss significantly predicted general distress but only at $p = .008$, Step 4 $\Delta R^2 = .02$, above and beyond the same variables. However, because the Bonferroni-corrected alpha was set to .001, the effect was not

Table 2

Summary of Factor Loadings for Principal Axis Factoring With Oblimin Rotation for a Forced Three-Factor Solution for the Culturally Adapted Conservation of Resources Evaluation

	Factor loading		
Item	Psychosocial	Object	Energy
Factor 1: Psychosocial Resources			
22. Self-discipline	.67	−.11	.03
27. Compassion from others	.66	.11	−.16
30. Loyalty of friends	.66	−.01	−.06
26. Companionship	.64	.10	−.12
19. Feeling that my life is peaceful	.64	.23	−.28
28. Feeling that my life has meaning/purpose	.61	−.01	−.14
20. Intimacy with at least one friend	.59	.10	−.07
12. Stamina/endurance	.51	.03	.12
6. Intimacy with one or more family members	.53	−.03	.15
10. Hope	.47	−.01	.05
5. Family stability	.45	.07	.18
32. Health of family members	.43	.13	.04
Factor 2: Object Resources			
23. Savings or emergency money	−.04	.78	.02
14. Adequate food	.00	.76	.08
25. Adequate income	.01	.70	−.03
13. Necessary home appliances	.02	.70	−.06
9. Necessary tools for work	−.13	.68	.17
33. Financial help if needed	.19	.65	−.18
4. Adequate clothing	.08	.60	.08
21. Money for "extras"	−.02	.59	−.10
Factor 3: Energy Resources			
1. Personal transportation (car, truck, etc.)	−.18	.15	.63
34. Farmland	.08	.12	.56
36. Loss (death) of family members	.03	.07	.52
40. Loss of limb(s)	.00	−.18	.52
17. Role as leader	.20	.11	.52
39. Opportunity for education	.08	.03	.41
2. Time for adequate sleep	.17	.31	.25
3. Good marriage	.42	−.15	.29
7. Time for work	.07	.39	.09
8. A good relationship with my children	.41	−.02	.28
11. Children's health	.42	.14	.23
15. Stable employment	.07	.33	.27
16. Intimacy with spouse	.45	−.12	.36
18. Providing children's essentials	.40	.45	−.07
24. Spouse's health	.39	.05	.31
29. Involvement with church	.64	−.35	.11
31. Help with childcare	.29	.04	.34
35. Livestock	−.14	.48	.34
37. Faith in God	.57	−.39	.23
38. Separated from family	.39	.06	.24

Note. N = 311.

Table 3

Hierarchical Regression Analyses for Variables Predicting Depression, Anxiety, Posttraumatic Distress, and General Distress

Variable	Depression Symptoms			Anxiety Symptoms			Posttraumatic Distress			General Distress		
	B	*SE B*	β	*B*	*SE B*	B	*B*	*SE B*	β	*B*	*SE B*	β
Step 1: Demographics												
Age	−0.00	0.00	.03	0.00	0.00	.02	−0.01	0.00	−.01	−0.01	0.01	.04
Sex (0 = male)	−0.07	0.06	−.20***	−0.12	0.07	−.18	−0.24	0.08	−.25***	1.64	0.49	.09
Education level	−0.02	0.06	−.12	−0.06	0.03	−.17	0.01	0.03	−.06	−0.65	0.20	−.22***
Territory (0 = Rutshuru)	−0.27	0.06	−.09	−0.37	0.07	−.10	−0.36	0.08	−.08	−3.03	0.49	−.17***
R^2	.06			.06***			.06***			.11***		
Step 2: Relocation												
Number of times relocated	0.17	0.03	.33***	0.24	0.03	.43***	0.24	0.04	.39***	1.33	0.22	.36***
Total length of relocation	0.15	0.03	.05	−0.00	0.00	.01	−0.00	0.00	−.03	0.00	0.01	.06
R^2	.15***			.20***			.18***			.22***		
Step 3: Daily stressors												
Daily stressors	1.00	0.11	.62***	1.02	0.13	.53***	0.78	0.16	.49***	5.07	0.94	.42***
R^2	.48***			.45***			.38***			.37***		
Step 4: Resource loss												
Psychosocial resource loss	0.20	0.04	.26***	0.22	0.04	.24***	0.27	0.05	.26***	0.99	0.31	.17***
Object resource loss	−0.00	0.03	−.00	0.00	0.03	.01	0.07	0.04	.09	−0.12	0.22	−.03
Energy resource loss	0.01	0.03	.02	−0.02	0.03	−.03	0.05	0.04	.07	0.16	0.24	.04
R^2	.53***			.49***			.45***			.40***		
F for ΔR^2 in Step 4	10.82***			8.08***			11.58***			4.00		

Note. N = 311. Bonferroni-corrected α = .001.

*** $p < .001$.

significant, strictly speaking. Regardless of whether it reached statistical significance, the size of this effect was small. We again observed daily stressors as the strongest predictor of the outcome variable, followed by number of relocations, educational level, psychosocial resource loss, and territory. The full model predicted 40% of the variance in general distress.

Exploratory Mediation Analyses

In all previously described regression models, the level of daily stressors was the strongest predictor of all four stress outcomes. Indeed, previous research has suggested that daily stressors may mediate (i.e., explain) the link between accumulated psychosocial resource loss and mental health outcomes (Miller & Rasmussen, 2014). For exploratory purposes, we conducted a series of four simple mediation analyses. For each analysis, we used Hayes's (2013) PROCESS macro to test the hypothesis that daily stressors mediate the association between accumulated psychosocial resource loss (*X*) and stress outcomes (*Y*). For each outcome variable (depression symptoms [Y_1], anxiety symptoms [Y_2], posttraumatic distress [Y_3], and general distress [Y_4]), psychosocial resource loss had both a direct effect on stress outcomes (*c′* ranged from 0.23 to 1.39) and an indirect effect on stress outcomes through daily stressors (*ab* ranged from 0.17 to 0.74) based on 95% bias-corrected bootstrap confidence intervals with 10,000 bootstrap samples. In sum, daily

stressors partially mediated the link between psychosocial resource loss and all four stress outcomes (see Table 4 for model results).

Discussion

Taken together, the current results generally provided support for our study hypotheses. Resource loss significantly predicted three of four stress outcomes: depression symptoms, anxiety symptoms, and trauma symptoms. However, strictly speaking, it did not predict general distress. This study makes some noteworthy contributions to the literature. To our knowledge, it was the first study to (a) test COR theory in the setting of ongoing chronic conflict and serial displacement in Africa; (b) examine how resource loss and daily stressors interact in affecting conflict survivors' mental health outcomes; and (c) use a Swahili-language, culturally adapted version of the COR-E (Hobfoll et al., 1992). We also used population-based random sampling and recruited a relatively large sample size (*N* = 312), especially considering the difficulty recruiting samples in areas affected by ongoing and chronic conflict, such as North Kivu. This study contributes to research on COR theory in general and in settings affected by chronic conflict specifically.

The results generally support COR theory's prediction that resource loss contributes to stress outcomes (Hobfoll, 1988, 1989, 2001). However, our findings do not map precisely onto

Table 4

Mediation Models for Daily Stressors Mediating the Relationships of Psychosocial Resource Loss With Various Psychological Outcomes

Mediation Model Steps	Depression Symptoms		Anxiety Symptoms		Posttraumatic Distress		General Distress	
	B	t(df)	B	t(df)	B	t(df)	B	t(df)
Step 1								
Psychosocial resource loss predicting outcome	0.40	9.02*** (309)	0.43	8.00*** (309)	0.48	8.60*** (309)	2.13	6.42*** (309)
Step 2								
Psychosocial resource loss predicting daily stressors	0.18	7.81*** (309)	0.17	7.81*** (309)	0.17	7.81*** (309)	0.17	7.81*** (309)
Step 3								
Daily stressors predicting outcome when controlling for psychosocial resource loss	1.00	10.00*** (308)	1.00	7.01*** (308)	0.98	6.64*** (308)	4.34	4.53*** (308)
Step 4								
Psychosocial resource loss predicting outcome when controlling for daily stressors	0.23	6.27*** (308)	0.26	5.31*** (308)	0.32	5.72*** (308)	1.39	3.92*** (308)
z for Sobel test for the indirect effect	6.13***		5.46***		5.03***		3.89***	

Note. $N = 311$. Bonferroni-corrected $\alpha = .001$.

*** $p < .001$.

COR theory. Hobfoll (1989) suggested there are four main types of resource loss: object, conditions, personal, and energy losses. In our study, neither object losses nor energy losses predicted any of the stress outcomes. Additionally, our factor analytic solution to the adapted COR-E did not yield a factor for conditions resource loss; it is impossible to know whether that was because we did not select the relevant items or whether respondents just did not endorse a cluster of such items. Personal losses were similar (but not identical) to what we labeled psychosocial losses. Indeed, our findings highlighted the role that psychosocial resource losses in the context of chronic conflict (e.g., potentially traumatic stressors such as violence, relocation, and other similar experiences) can play in an individual's mental health. In so doing, our results are consistent with previous findings from longitudinal research conducted after several disasters in the United States, including a natural disaster (Smith & Freedy, 2000), terrorist attack (i.e., September 11, 2001; Hobfoll et al., 2006), and mass shooting (Littleton et al., 2009). They are also consistent with studies of armed conflict survivors in Israel (Johnson et al., 2009) and the Palestinian Authority (Heath et al., 2012; Hobfoll et al., 2012). Yet, our sample was more diffuse than these previous samples in that our focus was not as targeted as previous studies (e.g., we asked about loss generally rather than about loss from a particular disaster), and the present study's participants presumably had widely varying types of conflict exposure and stressors over a longer period of time in the context of chronic and ongoing conflict in the eastern DRC. Thus, our study might provide a broader test of COR theory than previous disaster studies.

It is important to note that, after removing the variance from other predictors, the size of each resource-loss effect size was quite small, explaining only 2%–6% of the variance. Of the three types of resource loss that participants reported (psychosocial, object, and energy resource loss), only psychosocial resource loss (e.g., loss of hope, meaning or purpose in life, intimacy with friends and family, physical health of family) was a unique predictor of stress outcomes. Our results are somewhat inconsistent with those reported in prior disaster studies (e.g., Smith & Freedy, 2000) in that psychosocial resource loss did not seem to affect armed conflict survivors' mental health as much as other factors, such as daily stressors and relocation frequency.

Indeed, our findings are highly consistent with empirical evidence that daily stressors are a key mechanism in explaining the effect of conflict exposure on survivors' mental health (Miller & Rasmussen, 2014). Our results are also consistent with meta-analytic evidence showing that relocation experiences put armed conflict survivors at an increased risk of negative mental health outcomes (Steel et al., 2009). Taken together, within the context of armed conflict in the eastern DRC, survivors' mental health seems impacted somewhat by their accumulated psychosocial resource loss, but it seems impacted more by the number of times they have been relocated from their home and the number of daily stressors they are currently facing, which may be affected by continued conflict in the eastern DRC. Across all four of our regression models, the strongest predictors of stress outcomes were daily stressors and relocation frequency. Most likely, there is a reciprocal interaction

among survivors' psychosocial resource loss, daily stressors, relocation experiences, and mental health (Miller & Rasmussen, 2014). That possibility is resonant with COR theory's prediction about "loss spirals" (Hobfoll, 2001, p. 355), which posits that "those who lack resources are not only more vulnerable to resource loss, but that initial loss begets future loss" (Hobfoll, 2001, p. 354; see Holmgreen et al., 2017). It is also resonant with longitudinal research on armed conflict survivors in the Palestinian Authority. Specifically, Heath et al. (2012) found that psychological distress predicted psychosocial resource in the short term (6 months), whereas psychosocial resource loss predicted psychological distress in the long term (12 months).

Our findings were inconsistent with robust evidence that women survivors of various forms of organized violence (e.g., war, armed conflict, or terrorism) tend to report more adverse mental health outcomes than their male counterparts (Tolin & Foa, 2006). In our sample, being male predicted higher levels of depression, anxiety, and trauma symptoms. It is possible this finding was partly due to our study methodology. There is evidence that interview-based studies of conflict survivors may not reveal the same sex differences as questionnaire-based studies (Tolin & Foa, 2006). Previous interview-based studies of conflict survivors in the eastern DRC have either revealed no significant sex differences in rates of adverse mental health outcomes (Johnson et al., 2010; Pham, Vinck, Kinkodi, & Weinstein, 2010) or higher rates among women compared with men (Veling et al., 2013).

The current findings must be interpreted considering our study's limitations. First, our study was cross-sectional, thereby limiting conclusions about the directionality of studied associations (e.g., between resource loss and mental health outcomes). Second, we did not measure some variables that may have contributed meaningfully to respondents' mental health, such as exposure to torture and other potentially traumatic events, experience as a combatant or perpetrator of violence, amount of war-related trauma experienced, and when such experiences occurred (cf. K. Johnson et al., 2008, 2010; Steel et al., 2009). Third, some measures (e.g., assessments of resource loss and daily stressors) were culturally adapted and have not previously been psychometrically tested within conflict-affected populations in the DRC. Fourth, our sample was recruited from only one DRC province (North Kivu) and two territories within that province (Rutshuru and Masisi), which thereby limits the generalizability of our findings to armed conflict survivors in other parts of the DRC, other countries in Africa, and other countries outside the African continent. Fifth, because all measures were administered in person, some people may have responded in a socially desirable way.

Finally, and perhaps of most importance, there may have been conceptual overlap among some study variables. In the field of trauma research, it is virtually impossible to study stress-related variables that do not have some measure of overlap. For example, daily stressors might have overlapped with certain resource losses. We checked for multicollinearity between daily stressors and each resource-loss type. The variance inflation factor indicated no multicollinearity (i.e., all values under 2), but the condition index of 39.67 for energy loss in the last step of all regression models indicated mild multicollinearity between energy loss and daily stress. We could have dealt statistically with this multicollinearity in one of two ways: (a) by combining items into a single measure, which we decided against because the concepts are different; or (b) by eliminating one of the two variables, which we decided against as we wanted to test COR theory. These decisions limit any statement about whether energy losses predict mental health outcomes.

There also was potential overlap between anxiety and depression symptoms, as suggested by their bivariate correlation of .83. Although multicollinearity was not a concern as they were criterion measures in separate regression analyses, their overlap is important in terms of data interpretation. Predicting each variable with the same predictors means their predictions are not independent. Even so, there is well-established co-occurrence between these two variables, as evidenced by their high prevalence of comorbidity (American Psychiatric Association, 2013); thus, having similar predictors in this context is indeed possible.

The results of the present study have multiple implications for mental health and psychosocial support interventions offered in humanitarian contexts. Our findings support growing evidence that psychosocial resources (e.g., hope, meaning or purpose in life, and intimacy with friends and family) are an important target for interventions with survivors of armed conflict (Heath et al., 2012; Hobfoll et al., 2012; R. Johnson et al., 2009) and other disasters (e.g., natural disasters; Littleton et al., 2009). There is also mounting evidence that interventions with conflict-affected populations can help improve survivors' mental health by targeting the mitigation of their daily stressors (Miller & Rasmussen, 2014). For example, basic counseling could help survivors cultivate coping skills for navigating the daily stressors they face. Community-based interventions could support the social networks (e.g., relationships with family, friends, and community leaders) and structures (e.g., faith communities) that help community members cope with daily stressors. Furthermore, at a macro level, prevention through advocacy with state and nonstate actors (e.g., to protect human rights) to limit ongoing conflict could help reduce survivors' daily stressors, risk for relocation, and exposure to potentially traumatic events (Miller & Rasmussen, 2014).

Finally, our findings highlight the importance of prioritizing the provision of interventions to armed conflict survivors who have been frequently relocated. These survivors seem to be at particular risk of developing adverse mental health outcomes. Given this vulnerability, prevention programs could identify relocated individuals and families as high-risk groups who need prioritized access to mental health and psychosocial interventions.

There are many promising avenues for future research in this area. For instance, researchers can further examine COR theory's various principles and corollaries in conflict settings, both within and outside Africa. In such settings, it is especially

important to test COR theory's predictions through longitudinal studies, so the directionality or bidirectionality of associations can be examined (see Heath et al., 2012, for an example). We encourage researchers to conduct longitudinal studies that test Miller and Rasmussen's (2014) model of the proposed reciprocal interaction among survivors' conflict-related experiences (e.g., psychosocial resource loss, traumatic event exposure, relocation experiences), daily stressors, and mental health.

In the present study, only psychosocial resource losses were associated with mental health outcomes. Future studies in conflict settings should examine these types of differential associations between different resource loss types and various mental health outcomes. Such investigations may help to refine or develop COR theory, while also informing interventions.

This study partially supports COR theory's prediction that resource loss contributes to various stress outcomes, providing preliminary empirical support for the first time in the context of armed conflict in Africa. However, at least within the present sample of ongoing conflict–exposed individuals in the North Kivu province of the eastern DRC, what seems to contribute more to survivors' mental health is their daily stressors and the number of times they have been relocated. Countless research questions remain, particularly considering the cultural complexity and diversity of Africa's countries and the extent to which individuals' culture informs both what resources they value and how the loss or gain of those resources impacts their mental health (Hobfoll, 2001). We look forward to seeing what future research reveals, especially as insofar as it helps inform the provision of effective mental health and psychosocial interventions in conflict settings worldwide.

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