

Mediators and Moderators of a Psychosocial Intervention for Children Affected by Political Violence

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Objective: The authors examined moderators and mediators of a school-based psychosocial intervention for children affected by political violence, according to an ecological resilience theoretical framework. **Method:** The authors examined data from a cluster randomized trial, involving children aged 8–13 in Central Sulawesi, Indonesia (treatment condition $n = 182$, waitlist control condition $n = 221$). Mediators (hope, coping, peer/emotional/play social support) and moderators (gender, age, family connectedness, household size, other forms of social support, exposure to political violence, and displacement) of treatment outcome on posttraumatic stress symptoms and function impairment were examined in parallel process latent growth curve models. **Results:** Compared with the waitlist group, those receiving treatment showed maintained hope, increased positive coping, maintained peer social support, and increased play social support. Of these putative mediators, only play social support was found to mediate treatment effects, such that increases in play social support were associated with smaller reductions in posttraumatic stress disorder (PTSD) symptoms. Furthermore, the authors identified a number of moderators: Girls showed larger treatment benefits on PTSD symptoms; girls, children in smaller households, and children receiving social support from adults outside the household showed larger treatment benefits on function impairment. **Conclusions:** Findings provide limited evidence for an ecological resilience theoretical framework. On the basis of these findings, the authors recommend a stronger separation between universal prevention (e.g., resilience promotion through play) and selective/indicated prevention (e.g., interventions aimed at decreasing posttraumatic stress symptoms). Play-based interventions should be careful to exclude children with psychological distress. In addition, treatment effects may be augmented by selecting girls and socially vulnerable children.

Keywords: mediators, moderators, political violence, PTSD, function impairment

A recent review pointed to the paucity of research on emergency-related mental health interventions in low- and middle-income countries (Patel et al., 2007) despite a body of research demonstrating the negative impact of political violence on child mental health and psychosocial well-being (Attanayake et al., 2009). Of late, a number of rigorous studies have started to address

treatment outcome of mental health and psychosocial support for children affected by political violence.

Five randomized controlled trials have now been published, focused on children in Bosnia and Herzegovina (Dybdahl, 2001; Layne et al., 2008), Northern Uganda (Bolton et al., 2007), Indonesia (Tol et al., 2008), and Nepal (Jordans et al., 2010). Dybdahl

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(2001) reported the findings of weekly semistructured group discussion meetings with internally displaced mothers of 5- to 6-year-old children over a 5-month period. Compared with a control group receiving basic medical care, mothers and children receiving the psychosocial intervention and basic medical care evidenced greater improvements on children's weight gain as well as greater reduction in maternal posttraumatic stress symptoms and psychologist-rated emotional distress. Layne and colleagues (2008) studied the efficacy of a 17-session school-based trauma and grief-focused component group therapy (TGCT) with adolescents aged 13–19 years. Participants in the treatment condition (TGCT and a classroom-based psychoeducation and skills intervention) and comparison condition (only the psychoeducation and skills intervention) showed significant reductions at posttreatment and 4-month follow-up on posttraumatic stress disorder (PTSD) and depression symptoms.

Bolton and his team (2007) examined the efficacy of creative play and group interpersonal psychotherapy with internally displaced adolescent survivors (aged 14–17 years) of war and displacement in Northern Uganda. They found significantly greater reduction in symptoms of depression for female adolescents receiving group interpersonal psychotherapy compared with a waitlist control condition for both genders. Adolescents receiving creative play did not evidence change in these outcome measures. In Indonesia, children aged 8–12 years participating in a 15-session classroom-based psychosocial intervention were compared with a waitlist control condition. This study reported improvements of PTSD symptoms, function impairment, and maintained hope for girls and maintained hope only for boys receiving the intervention at a 6-month follow-up (Tol et al., 2008). Finally, the same intervention was evaluated in a cluster randomized trial with children aged 11–14 years in Nepal. Although no main effects were found for treatment immediately after completion, subgroup analyses showed increased prosocial behavior for girls, reduced psychological difficulties and aggression in boys, and increased hope in older children in the treatment condition (Jordans et al., 2010).

In conclusion, rigorous evaluations of diverse mental health and psychosocial interventions for children affected by political violence show some promising effects, but only on a limited number of assessed outcome instruments, and two studies (Uganda, Indonesia) show greater effects for girls. Although the above studies represent crucial steps in building an evidence base, they provide little direction on how treatments achieve effects. Randomized controlled trials in this field, as in high-income settings, have focused mainly on demonstrating effects on indicators of psychosocial well-being, whereas further treatment development and improvement would benefit from identifying mediators and moderators of intervention (Kazdin, 2007).

To start addressing this gap in the literature, we aimed to examine moderators and mediators of treatment outcome of a school-based psychosocial intervention for children affected by political violence in Indonesia. Identification of moderators and mediators is ideally guided by theory and is strengthened by drawing on diverse bodies of findings (Kazdin, 2007; Kraemer, Wilson, Fairburn, & Agras, 2002). In formulating hypotheses, we drew on an ecological-transactional perspective (Cummings, Goeke-Morey, Schermerhorn, Merrilees, & Cairns, 2009; Lynch & Cicchetti, 1998; Zielinski & Bradshaw, 2005) and the resilience

literature (Betancourt, 2008; Layne et al., 2009), which may be subsumed under the notion of “ecological resilience” (Tol, Jordans, Reis, & De Jong, 2009). Ecological resilience has been defined as those assets and processes on all social-ecological levels (individual, family, peer, neighborhood variables) that have been shown to be associated with positive developmental outcomes despite serious threats to adaptation and development. According to this theoretical framework, treatment may decrease psychological symptoms by strengthening protective resources in children and their social-ecological environment. The literature on such resources has included investigations of coping styles, social support, hope, and family-level variables.

Our hypotheses are schematically depicted in Figure 1. In this figure, the relation between treatment and changes in PTSD symptoms and function impairment is thought to occur through mediators (above) and moderators (below). We were specifically interested in PTSD symptoms and function impairment, as an earlier study confirmed treatment effects on these variables at immediate and 6-month follow-up (Tol et al., 2008). Mediators are variables that identify why and how treatments have effects, whereas moderators are variables that identify on whom and under what circumstances treatments have different effects (Kraemer et al., 2002).

First, we anticipated that coping, social support, and hope would mediate the relation between treatment and outcome variables, specifically that treatment would increase positive coping, social support, and hope and that it would decrease negative coping, which would in turn decrease symptomatology. The intervention we examined, described in more detail elsewhere (Macy, Johnson Macy, Gross, & Brighton, 2003), contains activities specifically aimed at strengthening coping, social support, and hope. Three out of the 15 sessions are aimed at improving coping strategies (e.g., cognitive restructuring, seeking social support, and identifying resources in the environment), and the final session is aimed at stimulating a positive future orientation. In addition, each of the 15 sessions consists of cooperative play (i.e., play in which all group members have to work together to overcome a challenge), aimed at strengthening peer-level social support. Therefore, we were specifically interested in social support provided by peers and through play. We expected that increasing hope in children through treatment would lead to decreased symptomatology, because of the provided opportunity to master new challenges in a controlled environment (e.g., learning new drama/dance activities and roles).

Previous research on coping has generally confirmed relations between coping behaviors and psychological outcomes but has been inconclusive with regards to which type of coping styles (e.g., emotion focused vs. problem focused) may be most protective against negative psychological outcomes (Punamaki, 2006). This seems to depend on the intensity and type of stressor (Punamaki & Puhakka, 1997; Weisenberg, Schwarzwald, Waysman, Solomon, & Klingman, 1993), time since exposure to the stressor (Kuterovic-Jagodic, 2003), and may be symptom specific (Punamaki, Muhammed, & Abdulrahman, 2004).

With regard to social support, Kuterovic-Jagodic (2004) and Jovanovic, Aleksandric, Dunkic, and Todorovic (2004) reported a relation between social support and lower PTSD symptoms among Croatian and Serbian children, respectively. In Kuwaiti children, the relation between traumatic exposure and distress was moder-

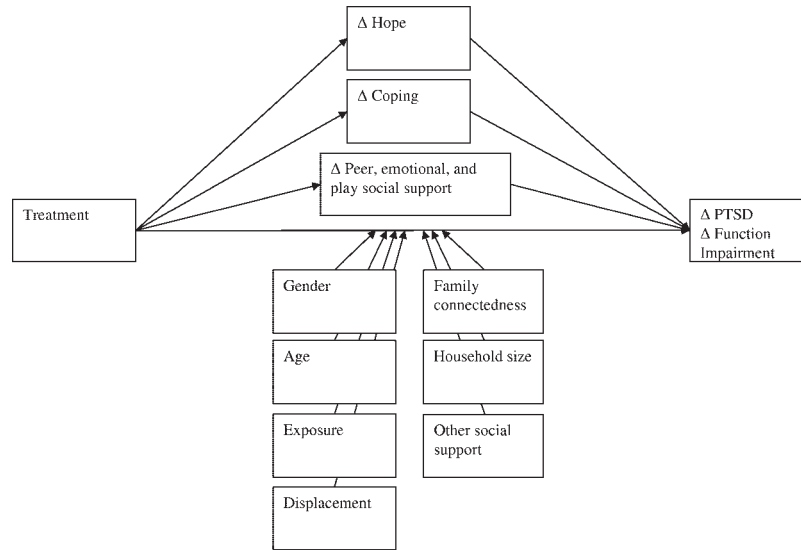


Figure 1. Hypothesized moderators and mediators for treatment effects on posttraumatic stress disorder (PTSD) symptoms.

ated by social support only for girls (Llabre & Hadi, 1997). In addition, positive peer relations were associated with lower symptomatology in children exposed to community violence in the United States (Hill, Levermore, Twaite, & Jones, 1996; Hill & Madhere, 1996; O'Donnell, Schwab-Stone, & Muyeed, 2002).

A recent extensive review conducted by an international expert panel identified the promotion of hope as an evidence-based intervention principle following mass trauma in adults (Hobfoll et al., 2007). These findings resonate with findings in the resilience literature that evidence the protective nature of self-esteem for children exposed to adversity and war (Baker, 1990; Cicchetti & Rogosch, 1997; Garbarino & Kostelny, 1996), a different but similar construct (Snyder, 1995).

Second, we expected that individual variables (gender, age, exposure, and displacement, below left in Figure 1) would moderate treatment effects. Earlier findings have found stronger treatment effects in girls (Bolton et al., 2007) and older children (Jordans et al., 2010). Displaced children may have less access to social support and may therefore benefit more from treatment. In addition, because the treatment was implemented by trained local paraprofessionals, we anticipated that children who were exposed to more diverse types of potentially traumatic events would benefit less from treatment.

Third, we hypothesized that family connectedness, household, and other forms of social support size (below right in Figure 1) would moderate the relation between treatment and reduced symptomatology. Previous research has emphasized the importance of family-level variables for children affected by political violence. Family connectedness (Betancourt, 2004), family hardiness (Jovanovic et al., 2004), family monitoring (Barber, 2001), and positively perceived parenting practices have been reported as protective factors for children living in situations of political violence (Punamaki, Qouta, & El Sarraj, 1997, 2001). Concerning family connectedness, we hypothesized moderation rather than mediation, because we did not expect that a school-based group intervention—with a central

focus on peer relations, rather than the parent–child relationship—would significantly alter family connectedness. We expected children in smaller households would benefit more from treatment because of their more limited access to social support in the home. Also, we hypothesized that children who received less social support from family members and others at baseline would benefit less from treatment.

Method

Design, Sampling, Participants, and Intervention

We refer to Tol et al. (2008) for a detailed description of the methodology and sample of the study. In short, a cluster randomized trial with a waitlist control condition in Central Sulawesi, Indonesia, was used, an area affected by communal armed conflict since 1998. Schools were randomized to avoid contamination between study conditions within schools. The province is one of the poorer provinces of Indonesia, with 25% of the population below the poverty line. Fourteen out of 21 eligible schools in the most affected areas of Central Sulawesi were randomly assigned to either a treatment (seven schools, $n = 182$) or a waitlist control condition (seven schools, $n = 221$). In these schools, 495 children in Grades 4 and 5 were screened for exposure to political violence events (one or more), PTSD symptoms, and anxiety using standardized checklists, and included 403 children. These outcome measures were judged relevant for the particular context based on previous qualitative research in the area (Tol, Reis, Susanty, & de Jong, 2010). Children were excluded if they were assessed as unable to function in a group setting and/or showed signs of severe psychiatric problems (e.g., mutism, dissociation, substance abuse; $n = 3$) as judged by trained counselors. The sample consisted of 207 boys (51.4%) and 196 girls (48.6%) between the ages of 7 and 15 years (mean age = 9.9, $SD = 1.2$). One hundred thirty-three children were Muslim (31.1%), 189 were Protestant (46.9%), 52

were Hindu (12.9%), 7 were Catholic (1.7%), 21 were of other religions (5.2%), and one child did not report religion. Children reported to have been exposed to an average of 3.9 types of violence events, 27.8% of the sample was displaced, and mean baseline levels for PTSD symptoms and function impairment were 21.7 (range = 0–51) and 18.0 (range = 10–40), respectively.

Comparisons between the treatment and waitlist conditions at baseline revealed differences on age (treatment group was, on average, 4 months older), $t(398) = 2.288, p = .023$; gender (more girls in the treatment condition), $\chi^2(1, N = 403) = 4.408, p = .045$; displacement (more displacement in the waitlist condition) $\chi^2(3, N = 403) = 17.434, p = .001$; and parent-rated aggression (higher in the waitlist condition), $t(382) = -2.230, p = .026$.

Assessments took place before, 1 week after, and 6 months after treatment by four independent research assessors (i.e., not involved in provision of services) trained in a 5-week course. Assessments were nonblinded, as schools were randomized, and expected children may disclose whether their school received intervention upon assessors' visits. Children and parents provided written informed consent, and the study was approved by the ethical review board at VU University Amsterdam.

The intervention consisted of 15 sessions over 5 weeks of a manualized classroom-based intervention (Macy et al., 2003), combining cognitive-behavioral and creative-expressive techniques in a structured format. Interventionists were paraprofessionals without former mental health backgrounds, trained over 3 weeks to administer the intervention. Fidelity to the treatment manual was scored by the research assessors using a structured checklist and evaluated as excellent (90%).

Instruments

Assessments were composed of verbally administered structured questionnaires. All instruments were child reported, except where otherwise noted.

Dependent variables. PTSD symptoms were measured using the child-rated Child PTSD Symptom Scale (CPSS; Foa, Johnson, Feeny, & Treadwell, 2001), which contains 17 items scored on a 4-point scale (from 0 [*not at all/only at one time*] to 3 [*5 times a week/almost always*]; range = 0–51; higher score indicates more PTSD symptoms; Cronbach's $\alpha = .85$; test–retest reliability = .65). Function impairment was scored with a child-rated checklist constructed locally through qualitative research methods (Tol, Komprou, Jordans, Susanty, & de Jong, 2010). This checklist contains 10 questions concerning impairment in individual (hygiene, sleep, eating, praying), family (household chores, social interaction with family members), peer (play, social interaction with peers), and school functioning (studying, school chores), scored on a 4-point scale (from 1 [*no difficulty*] to 4 [*can't do activity*]; range = 10–40; Cronbach's $\alpha = .77$; test–retest reliability = .78). Dependent variables were assessed concurrently with mediators and moderators.

Mediators and moderators. Hope was assessed using the Children's Hope Scale (CHS; Snyder et al., 1997), a child-rated checklist of six items scored on a 6-point scale (from 1 [*none of the time*] to 6 [*all of the time*]; range = 6–36; higher score indicates more hope; Cronbach's $\alpha = .62$; test–retest reliability = .67). The hope construct in this scale is operationalized as consisting of (a) agency (the perception that children can initiate and sustain action

toward a desired goal) and (b) pathways (a child's perceived capability to produce routes to these goals) (Snyder et al., 1997).

Coping repertoire and satisfaction were assessed with the child-rated Kidcope (Younger Version for ages 7–12; Spirito, Stark, & Williams, 1988). The Kidcope contains 15 questions concerning 10 coping strategies, which were assessed in relation to an imagined school problem (working hard but receiving bad grades) by asking which coping strategies were used (dichotomous items: yes/no) and how children rate their satisfaction with employed coping methods (3-point scale; 1 = *not at all*, 2 = *a little*, 3 = *a lot*). The scale allows a division of 10 coping strategies into positive (approach) and negative (avoidance) strategies. However, because of mixed evidence of these constructs for children affected by political violence (Punamaki, 2006), each coping strategy was analyzed separately, as suggested by the scale developers. Bivariate correlations (Pearson) between individual coping methods and other measures at baseline were calculated. Coping methods were categorized as negative when they were positively statistically significantly associated ($\alpha = 0.05$) with symptom measures (PTSD symptoms, anxiety, depression, trauma idiom, function impairment) or negatively with measures of positive well-being (coping, social support, hope). In contrast, coping methods were categorized as positive if they correlated negatively with symptom measures and positively with measures of positive well-being. Included items had at least one expected zero-order correlation with other measures, and no items correlated inconsistently (e.g., a positive correlation with both a symptom measure and a strength measure). One item that did not correlate with any measures was excluded from analysis. The resulting items were examined for face validity, and positive items were generally regarded as more constructive methods to deal with problems than negative methods. Exceptions were self-criticism and wishful thinking, which correlated negatively with symptoms and positively with strength variables. The word *wishing* in Bahasa Indonesia was translated as *berharap*, which may also mean hoping/praying and has more positive and active connotations than the English original. Praying was one of the most often mentioned coping methods of parents to deal with mental health and psychosocial problems (Tol et al., 2010). This procedure resulted in a positive coping scale of 10 items (0–10; e.g., distraction, seeing the good side of things, problem solving, wishful thinking) and a negative coping scale of five items (0–5; social withdrawal, blaming others, yelling/screaming, resignation).

Social support was measured with the child-rated Social Support Inventory Scheme (SSIS; Paardekooper, de Jong, & Hermanns, 1999). This measure asks children whether they did or did not receive *material* social support (i.e., "Does [name] give you any material assistance, such as, for example, food, clothes, school fee, or do something for you like helping you with fetching water or making homework?") (range = 0–5), *emotional* social support (i.e., "Does [name] give you any emotional support, like cheering you up, listening to you, attending to your problem, or could you talk to this person about feeling sad or lonely?") (range = 0–5), *guidance* social support (i.e., "Does [name] give you any Guidance, like giving you advice on what to do, showing you how to do something, or teaching you something?") (range = 0–5), and *play* social support (i.e., "Does [name] have any time to play with you, or do you enjoy singing or dancing or storytelling with him or her, or do you do any other activity together to forget problems and

enjoy yourselves?") (range = 0–5) from up to five self-chosen persons. Two types of summary measures may be calculated from the SSIS: (a) from *whom* social support was received (from parents, siblings, extended family, peers, and adults outside the household [72.4% teachers in our sample]; range = 0–5) and (b) what *type* of social support was received (material, emotional, guidance, play social support; range = 0–5 times).

Gender, age, household size, religion, and displacement were assessed by one-item questions as part of a demographics section. Exposure to traumatic events was measured with a dichotomous nine-item locally constructed questionnaire (range = 0–9), which was developed through free listing with staff working in the area. This questionnaire asked, for example, whether children (yes/no) witnessed attacks on people, bomb explosions and burning of villages, and experienced displacement. Family connectedness was rated by parents using an 11-item collection (range = 11–33; internal reliability = .72) (Betancourt, 2004) of statements that were rated on a 3-point scale (1 = *true*, 2 = *somewhat true or sometimes true*, or 3 = *very true or often true*). Items on this questionnaire included, for example, "People in my family have fun together"; "People in my family care about my child"; and "Most of the time, people in my family are warm and loving towards my child."

Statistics

Analyses were conducted in three steps. First, as an exploratory strategy, a test was conducted to determine whether treatment had a statistically significant relationship with the hypothesized mediators (hope, coping, social support). Linear mixed-effects regression models were used, including fixed and random effects. The random effects specified in these models provide the method needed to account for clustering or potential lack of independence that may exist between scores of children from the same school. Intervention and control groups were compared, adjusting standard errors for clustering at the school level, by testing a random intercept model that included the fixed and random effects of time and intervention (cf. Tol et al., 2008). Impact of missing data on this procedure was very limited; the highest amount of missing data of variables included in the analyses was 15 out of 1,209 data points (1.2%). Only hypothesized mediating variables for which significant treatment effects were found were included in subsequent steps.

Second, to examine the longitudinal relations among the study variables, parallel process latent growth curve models (LGCM) were used in a structural equation modeling (SEM) framework (Muthén, 1997; Muthén & Muthén, 1998–2008). LGCM allows for the modeling of growth processes using child-specific random intercepts and slopes. A parallel process LGCM characterizes child-specific growth processes for each mediator and the PTSD outcome simultaneously, and relates the growth processes with each other while also enabling an assessment of the influence of time-invariant and time-varying variables. A major advantage of LGCM is the ability to study individual change trajectories by simultaneously taking into account data from all measured time points in the study, in our case, pretreatment, posttreatment and follow-up. Longitudinal mediation was assessed by regressing the child-specific random slopes, or trajectories, for the PTSD outcome on the random slope for the mediator. The mediator slope was also regressed on an indicator for treatment status (the inde-

pendent variable). In separate models for each mediator, latent intercepts and slopes were estimated for the mediator and PTSD/function impairment. In a final modeling phase, all mediators were combined in a single SEM.

Third, moderation was tested in a two-group SEM setting. Random slopes for PTSD trajectories were regressed on the hypothesized moderators in both the waitlist control and treatment groups, both in free and constrained models. Likelihood ratio tests were used to test for equality of regression parameters across intervention groups. The same was done for function impairment.

Step 1 was conducted within SPSS 17.0, and the Mplus (Version 5.1) software package was used to perform Steps 2 and 3 (Muthén & Muthén, 1998–2008). All variables were centered at their baseline means before computing interaction terms or estimating models in order to avoid multicollinearity (Marquardt, 1980). All variables were checked for normality by examining skewness and kurtosis. Skewness was acceptable for all variables (i.e., within –3.00 and 3.00 thresholds). Kurtosis was acceptable for most variables, except for peer and guidance social support (kurtosis = 3.35 and 9.62, respectively), social support provided by adults outside the household (kurtosis = 10.95), and family connectedness (kurtosis = 5.02). The parallel process LGCMs were estimated using a full information maximum likelihood (FIML) estimator with a Huber-White covariance adjustment, which is robust to nonnormality of observations.

Analyses had to take into account two types of missing data: (a) blank items within checklists and (b) missing data due to noncompletion. The first category concerned 73 of 100,561 questions (.07%). After visual inspection, these data were concluded to be missing at random; therefore, missing values were replaced with group (treatment or waitlist condition) means. Noncompletion was limited at both first ($n = 10$, 3%) and 6-month follow-up ($n = 35$, 9%). Those who completed did not significantly differ from those who did not complete intervention on gender, age, ethnicity, household size, religion, traumatic exposure, the symptom measures, and the far majority of the positive well-being indices. However, those who did not complete were more often displaced, $\chi^2(1, N = 403) = 6.135, p = .013$, and reported less parental social support, $t(401) = 2.834, p = .005$. Parameter estimates from Mplus adjust for missing data using FIML estimation, which assumes data are missing at random conditioning on covariates included in the models. This method uses all available data from each participant and assumes data are missing at random. To further illustrate the extent of missing data in a data set, Mplus provides a covariance coverage matrix that shows the proportion of observations available for each pair of variables. In the present study, the coverage proportion between any two variables ranged from 91% to 100%. The minimum coverage proportion needed for accurate estimates in Mplus is 10%, and so missingness was not deemed a considerable problem for these data.

Results

Mediators

First, we tested whether treatment had a significant relation with putative mediators. As depicted in Table 1, mixed methods regression analyses showed significant associations between treatment and better outcomes on hope, positive coping, peer, and play social

Table 1
Mixed-Methods Regression Analyses of Putative Mediators

Putative mediator	Mean at baseline	SE	Mean change	SE	Mean change difference	SE	Mean change difference 95% confidence interval
Hope	15.37	.47	0.42	.51	2.39**	.70	-3.77, 1.00
Positive coping	6.67	.24	1.86	.20	0.66*	.27	-1.20, .13
Negative coping	1.85	.10	-0.13	.11	0.10	.15	-.40, .20
Peer social support	0.57	.10	0.06	.09	0.41**	.12	-.64, .18
Emotional social support	3.96	.10	-0.11	.13	0.24	.17	-.58, .10
Play social support	3.78	.11	0.17	.13	0.69**	.18	-1.04, .34

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

support, but not on negative coping and emotional social support. Hope and peer social support were maintained in the treatment condition, whereas they deteriorated in the waitlist condition. Positive coping and play social support showed larger increases in the treatment group as compared with the waitlist condition. These four variables were subsequently analyzed in LGCM as mediators for the relation between (a) treatment and PTSD and (b) treatment and function impairment. Results of these analyses are provided in Tables 2 and 3.

Model fit statistics for testing mediational parallel process models with PTSD (root-mean-square error of approximation [RMSEA] = 0.07; standardized root-mean-square residual [SRMR] = 0.06) and function impairment (RMSEA = 0.068; SRMR = 0.06) as outcomes were acceptable. Analyses confirmed a significant association between treatment condition and the putative mediators—a precondition for mediation. Treatment had statistically significant associations with the putative mediators hope, positive coping, peer social support, and play social support in both the PTSD and function impairment models. For these associations, regressions of change in a mediator on treatment are interpretable as the average weekly change associated with being in the treatment condition. However, we did not find evidence for other conditions necessary to support mediation (e.g., statistically significant relations between putative mediators and outcome vari-

ables). The only exception concerned play social support as a mediator for PTSD symptoms. Treatment was associated with steeper trajectories of play social support, which in turn was associated with *smaller* reductions in PTSD symptoms over time. Hope, positive coping, peer, and play social support did not appear to mediate treatment effects on PTSD symptoms. With regards to the function impairment models, we did not find evidence for a relation between any of the putative mediators with function impairment, thus ruling out mediation roles for these variables (see Table 3).

Moderators

Model fit statistics for the PTSD moderation model with fully constrained parameters across groups suggested an excellent fit to the data (RMSEA = 0.064; SRMR = 0.033). The same was true for an analogous LGCM for function impairment (RMSEA = 0.055; SRMR = 0.027). We used likelihood ratio tests to compare relative improvements in fit brought by allowing each moderator individually to vary across intervention group. Results are presented in Tables 4 (PTSD symptoms) and 5 (function impairment). Coefficients in Tables 4 and 5 are interpretable as changes in PTSD symptoms (in *SD* units) over 6 months for a one-unit increase in the predictor. Reported p values represent statistical

Table 2
Mediation Models for PTSD Symptoms

Mediator	Relationship modeled	Coefficient	p	95% CI
Hope	Δ Hope on Treatment	.016	.001**	(.007, .026)
	Δ PTSD symptoms on Δ Hope	-.127	.815	(-1.194, .939)
	Δ PTSD symptoms on Treatment	-.011	.556	(-.048, .026)
	Mediated effect	-.002	.816	(-.019, .015)
Positive coping	Δ Positive coping on Treatment	.011	.015*	(.002, .021)
	Δ PTSD symptoms on Δ Positive coping	-.090	.941	(-2.490, 2.310)
	Δ PTSD symptoms on Treatment	-.011	.556	(-.048, .026)
	Mediated effect	-.001	.941	(-.029, .027)
Peer social support	Δ Peer social support on Treatment	.016	<.001**	(.008, .023)
	Δ PTSD symptoms on Δ Peer social support	-.018	.921	(-.365, .330)
	Δ PTSD symptoms on Treatment	-.011	.556	(-.048, .026)
	Mediated effect	.000	.921	(-.006, .005)
Play social support	Δ Play social support on Treatment	.022	<.001**	(.010, .033)
	Δ PTSD symptoms on Δ Play social support	.164	.023*	(.023, .306)
	Δ PTSD symptoms on Treatment	-.011	.556	(-.048, .026)
	Mediated effect	.004	.039*	(.000, -.007)

Note. PTSD = posttraumatic stress disorder; CI = confidence interval.
* $p < .05$. ** $p < .01$.

Table 3
Mediation Models for Function Impairment

Mediator	Relationship modeled	Coefficient	<i>p</i>	95% CI
Hope	Δ Hope on Treatment	.016	.001**	(.007, .026)
	Δ Function impairment on Δ Hope	.016	.955	(-.546, .794)
	Δ Function impairment on Treatment	-.004	.554	(-.064, .060)
	Mediated effect	.000	.955	(-.009, .013)
Positive coping	Δ Positive coping on Treatment	.011	.016*	(.002, .021)
	Δ Function impairment on Δ Positive coping	-.177	.444	(-5.797, 4.245)
	Δ Function impairment on Treatment	-.004	.554	(-.064, .060)
	Mediated effect	-.002	.469	(-.067, .049)
Peer social support	Δ Peer social support on Treatment	.016	<.001**	(.008, .023)
	Δ Function impairment on Δ Peer social support	.012	.953	(-.613, 1.024)
	Δ Function impairment on Treatment	-.004	.554	(-.064, .060)
	Mediated effect	.000	.953	(-.010, .016)
Play social support	Δ Play social support on Treatment	.022	<.001**	(.010, .033)
	Δ Function impairment on Δ Play social support	-.035	.656	(-.267, .168)
	Δ Function impairment on Treatment	-.004	.554	(-.064, .060)
	Mediated effect	-.001	.659	(-.006, .004)

Note. CI = confidence interval.

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

tests of differences across groups using chi-square tests. If putative moderators have a different association with PTSD and function impairment trajectories over time between treatment and waitlist conditions, then moderation may be presumed. The relation between treatment and PTSD symptoms (see Table 4) was moderated by gender, such that girls showed larger treatment gains. Family connectedness, household size, the various examined forms of social support (material and guidance social support; social support provided by parents, siblings, extended family members, and adults outside the household), and exposure and displacement did not appear to moderate the association between treatment and PTSD symptoms. Moderation by age of the relation between treatment and PTSD showed marginal statistical significance ($p = .052$).

The association between treatment and function impairment (see Table 5) was moderated by gender, household size, and social support from adults outside of the household (72.4% teachers in our sample). Girls, children in smaller households, and children who reported more social support from adults outside the household evidenced larger treatment effects. Age, family connectedness, material and guidance social support, social support provided by family members, exposure, and displacement were not found to moderate the relation between treatment and function impairment.

Discussion

In the present study, we aimed to examine moderators and mediators of a classroom-based psychosocial group intervention in

Table 4
Moderators of the Relation Between Treatment and Changes in PTSD Symptoms

Moderator	Treatment condition ($n = 182$)	Waitlist condition ($n = 221$)	Test of constrained vs. unconstrained models for each predictor	
	β (95% CI)	β (95% CI)	χ^2 (403)	<i>p</i> value
Age	0.018 (-0.017, 0.053)	-0.012 (-0.047, 0.023)	1.71	.19
Exposure	-0.018 (-0.042, 0.006)	-0.024 (-0.048, 0.000)	0.38	.54
Gender (female)	-0.090 (-0.161, -0.019)	0.060 (-0.011, 0.131)	8.15	.004
Family connectedness	-0.006 (-0.018, 0.006)	0.000 (-0.012, 0.012)	0.19	.66
Displacement	0.078 (-0.016, 0.172)	0.018 (-0.064, 0.100)	1.16	.282
Material social support	-0.018 (-0.053, 0.017)	-0.018 (-0.053, 0.017)	0.01	.94
Guidance social support	0.012 (-0.023, 0.047)	0.012 (-0.023, 0.047)	0.02	.877
Household size	0.000 (-0.024, 0.024)	0.018 (-0.006, 0.042)	1.39	.238
Parental social support	0.036 (-0.023, 0.095)	-0.030 (-0.077, 0.017)	2.37	.123
Sibling social support	0.000 (-0.047, 0.047)	0.000 (-0.047, 0.047)	0.00	.99
Extended family social support	0.012 (-0.023, 0.047)	0.012 (-0.023, 0.047)	0.00	.952
Social support from others	-0.012 (-0.094, 0.070)	0.012 (-0.047, 0.071)	0.23	.634

Note. Coefficients represent the change in posttraumatic stress disorder (PTSD) symptom standard deviations over 6 months for a one-unit increase in the predictor. CI = confidence interval.

Table 5
Moderators of the Relation Between Treatment and Changes in Function Impairment

Moderator	Treatment condition (<i>n</i> = 182)	Waitlist condition (<i>n</i> = 221)	Test of constrained vs. unconstrained models for each predictor	
	β (95% CI)	β (95% CI)	χ^2 (403)	<i>p</i> value
Age	0.018 (−0.006, 0.042)	0.000 (−0.024, 0.024)	0.89	.346
Exposure	−0.012 (−0.036, 0.012)	−0.006 (−0.018, 0.006)	0.15	.698
Gender (female)	−0.120 (−0.179, −0.061)	0.012 (−0.047, 0.071)	8.14	.004
Family connectedness	0.000 (−0.012, 0.012)	0.006 (−0.006, 0.018)	0.78	.378
Displacement	0.072 (−0.010, 0.154)	0.000 (−0.071, 0.071)	2.02	.155
Material social support	0.018 (−0.017, 0.053)	0.006 (−0.018, 0.030)	0.44	.505
Guidance social support	0.018 (−0.006, 0.042)	0.024 (0.000, 0.048)	0.03	.861
Household size	0.018 (−0.006, 0.042)	−0.018 (−0.042, 0.006)	5.67	.017
Parental social support	0.036 (−0.023, 0.095)	0.000 (−0.047, 0.047)	1.01	.315
Sibling social support	0.024 (−0.011, 0.059)	−0.030 (−0.065, 0.005)	4.74	.029
Extended family social support	0.006 (−0.029, 0.041)	−0.006 (−0.041, 0.029)	0.27	.601
Social support from others	−0.090 (−0.161, −0.019)	0.018 (−0.041, 0.077)	6.42	.011

Note. Coefficients represent the change in function impairment standard deviations over 6 months for a one-unit increase in the predictor. CI = confidence interval.

Indonesia for children affected by political violence, following an ecological resilience theoretical framework. First, we hypothesized that hope, positive/negative coping, emotional/play social support, and social support provided by peers would mediate associations between treatment and outcome variables (PTSD symptoms and function impairment). We generally found statistically significant associations between treatment and these putative mediators—one of the requirements to determine mediation. We did not find a statistically significant association between treatment and negative coping, and between treatment and emotional social support, excluding possible mediation roles for these two variables. Despite meeting this condition for mediation, putative mediators were generally not found to satisfy other conditions for mediation (e.g., a relation with changes in PTSD symptoms or impaired functioning). As an exception, play social support appeared to mediate the relation between treatment and PTSD symptoms, but in an unanticipated direction.

Second, we hypothesized that individual levels (gender, age, exposure, displacements) would moderate the relation between treatment and outcome variables. We identified gender as a moderator of the relation between treatment and PTSD symptoms and treatment and function impairment (girls showed higher benefits from treatment), but age, exposure, and displacement did not moderate these relations.

Third, we hypothesized that a number of contextual variables would moderate the relation between treatment and outcome variables. The relation between treatment and function impairment was moderated by household size and social support from adults outside the household, but family connectedness and a variety of other forms of social support did not function as moderators. Those in smaller households and relying more on social support from outside the household showed stronger benefits from treatment. We interpret these findings in terms of vulnerability; children with less social support at the start of intervention (i.e., those in smaller households and those relying on social support from outside of the household) benefit more from intervention.

Despite the identification of contextual moderators of treatment, these findings provide limited evidence for an ecological resilience

theoretical framework, which assumes that augmenting positive aspects of well-being—both individual and contextual—will result in reduced psychological distress and symptomatology. In contrast, strengthening play social support seemed to obstruct reductions in PTSD symptoms.

In our opinion, these findings raise three important questions for further study. First, which types of variables may account for the identified treatment effects on PTSD symptoms and impairment in functioning? Variables that we did not consider include changes in cognition. The only study in which mediators and moderators of treatments for children exposed to traumatic events were assessed found that changing maladaptive cognitions mediated treatment effects on PTSD symptoms (Smith et al., 2007). Furthermore, the identified moderators in this study may point in the direction of possible mediators. In our opinion, these show that children who were especially vulnerable before treatment (children living in smaller households and children relying on social support outside of the household) showed the strongest treatment benefits. Treatment effects may be strengthened by including these indicators in screening procedures. Further research is necessary to identify why these children benefit more from the intervention. Also, future research should address the reasons for gender effects in treatment, a finding consistent with other studies (Bolton et al., 2007; Jordans et al., 2010).

Second, and related, what are appropriate objectives for preventive interventions with children affected by political violence? On the basis of these research findings, it may be hypothesized that resilience-promoting interventions (e.g., those interventions aimed at universal prevention through play activities) may unintentionally slow down symptom reduction in children who present with specific psychological distress (i.e., posttraumatic stress symptoms). Corroborating evidence for this statement may be found in reports that nontrauma-focused therapies seem to be less effective in adults with PTSD complaints (Bisson & Andrew, 2005), as well as the stronger evidence base for trauma-focused cognitive behavioral therapy in children in high-income settings in relation to reducing symptomatology as compared with play therapy (Silverman et al., 2008; Task Force on Community Preventive Services,

2008). However, given the large number of children at risk and the general lack of specialized mental health professionals in settings affected by political violence, there is a clear need for universal preventive interventions (de Jong, 2002). The studied intervention was effective in increasing hope, positive coping, peer social support, and social support provided by peers, and these by themselves may constitute valid intervention objectives. Although our data are in need of replication, we suggest a stronger separation between universal interventions and selective/indicated interventions based on our findings. In other words, interventions aimed at working with large population groups to promote mental health through play should be careful to exclude children with specific psychological distress. Such children would likely be better assisted with more focused interventions.

Third, what do these findings mean for an ecological resilience theoretical framework? As stated, our findings do not provide evidence for the hypothesis that increasing children's strengths will lead to decreased symptomatology. It may be that increasing strengths and decreasing symptoms encompass relatively separate trajectories. Alternatively, it is possible that our operationalization of ecological resilience through hope, coping, and social support measures did not fully capture the intended constructs. Compared with transcultural adaptation of symptom measures, little attention has been given to applying resilience measures over varying sociocultural settings (Ungar, 2008). Given the general lack of attention to moderators and mediators in treatment studies with children exposed to adversity globally and the lack of longitudinal studies with children affected by political violence, this remains an open question. Future research needs in this respect concern multilevel longitudinal studies that are able to confirm causal links between risk and protective factors for children affected by political violence. Such studies would likely strengthen methodological and theoretical development in this area, which in turn may lead to intervention studies capable of disentangling the complex processes underlying psychological outcomes in this population (e.g., Medical Research Council, 2008).

Limitations

Previously reported limitations to this study include the fact that assessors were not blinded and that findings can be generalized only to the Indonesian school setting. Nonblinded assessors may bias results in favor of identifying treatment effects (Tol et al., 2008). In addition, we would like to draw attention to a number of additional limitations. First, mediators and dependent variables were assessed concurrently, whereas mediators are ideally assessed at multiple time points in order to ensure temporal precedence of the mediator (Kazdin, 2007). Second, family connectedness was rated by parents. It is possible that parents, more than children, felt uncomfortable to disclose disrupted family relations, thereby measurement validity of parent reports may have been threatened by a tendency toward social desirability. We chose to include a parent report of family connectedness, as we wanted to limit the interview burden for children to around 1 hr. We recommend that future researchers assess quality of family relations from parents', children's, and teacher's perspectives. Third, as described above, we did not assess a number of other variables that may have mediated treatment changes, for example, trauma-related cognitions and ideological commitment (e.g., feelings of current safety,

feelings of justice and revenge), intelligence, subjective appraisals of traumatic experiences, and other sociocultural variables (e.g., socioeconomic status). Fourth, we used checklists originating in Western, high-income settings to assess symptoms and strengths in a rural non-Western setting. Following international standards, we performed detailed qualitative analyses to ensure the cross-cultural validity of the symptom measures (Tol et al., 2010) and followed a meticulous approach to translation (van Ommeren et al., 1999). However, we feel more work is needed to ensure development and adaptation of culturally sensitive measures of strength-based measures (e.g., coping). Relatedly, we used an innovative measure to assess function impairment. However, psychometric testing of this instrument showed good internal reliability, acceptable convergent and discriminant validity, and good construct validity (data not shown; Tol et al., 2010). Fifth, our data contains missing data, as is common in longitudinal studies. Although our longitudinal analyses adjusted for missing data using FIMLs, results may have been biased if it concerned informative missing data. Missing data in our longitudinal analyses ranged from 0% to 9%, and bias caused by informative missing data was likely limited. Finally, identification of mediators and moderators is a complex task that requires replication over several studies (Kazdin, 2007). Due to sample size considerations, we were not able to separately examine moderators and mediators for boys and girls. Earlier epidemiological research has shown that social support may have different relations with psychological outcomes among boys and girls (e.g., Llabre & Hadi, 1997).

Despite these limitations, this study presents a first attempt to examine mediators and moderators of an intervention with children affected by political violence in a low-income setting. Given the limited evidence base for prevention interventions with children affected by political violence (Jordans, Tol, Komproe, & de Jong, 2009; Peltonen & Punamaki, 2010), further rigorous evaluation studies are clearly indicated.

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