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Regular Article

Role of adolescent exposure to rockets in the links between personality vulnerability and psychopathology

Golan Shahar[1] and Christopher C. Henrich[2]

[1]Department of Psychology, Ben-Gurion University of the Negev, Be'er Sheva, Israel and [2]Department of Psychology, Georgia State University, Atlanta, GA, USA

Abstract

The aim of this study is to examine the role of repeated exposure to rocket attacks in the links between personality vulnerability (dependency and self-criticism) and internalizing/externalizing psychopathology. A main-effect vulnerability model (personality leads to psychopathology) was compared with a main-effect scarring model (psychopathology leads to personality vulnerability). Also, a stress-diathesis pattern (personality vulnerability is activated under stress) was compared to a dual-vulnerability pattern (either personality vulnerability or stress, but not both, lead to psychopathology). Israeli adolescents (N = 362) repeatedly exposed to rocket attacks were assessed annually over 3 years. In 2008 and 2010, personality and psychopathology were assessed. Cumulative exposure was measured as the sums of exposure across the three assessment waves. Theoretical models were tested via Autoregressive Cross-Lagged Structural Equation Modeling analyses. Baseline dependency and self-criticism were associated with an increase in anxiety, whereas baseline depression was associated with an increase in dependency. Under low, not high, levels of rocket exposure, self-criticism and depression were longitudinally associated. Violence commission was associated with an increase in dependency under high, not low, cumulative exposure. Results are consistent with both scarring and vulnerability models, and with both stress-diathesis and dual-vulnerability patterns of adolescent risk and resilience.

Keywords: adolescence, personality-vulnerability, political-violence, psychopathology, terrorism

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Exposure to political violence adversely affects children and adolescents' development and mental health (Comer & Kendall, 2007; Comer et al., 2014; Henrich & Shahar, 2008; Henrich & Shahar, 2013; La Greca, 2007). Most, if not all, extant research focuses either on a main effect of exposure to terrorism on mental health, or on protective factors buffering against the latter's adverse effects (Betancourt et al., 2015; Dubow et al., 2012; Henrich & Shahar, 2008; Henrich & Shahar, 2013; Punamäki, Palosaari, Diab, Peltonen, & Qouta, 2015; Shahar, Cohen, Grogan, Barile, & Henrich, 2009; Shahar & Henrich, 2016). More recent studies, however, have been focusing on the moderating role of exposure to political violence on the links between risk factors and development/psychopathology (Busso, McLaughin, & Sheridan, 2014; Farach, Mennin, Smith, & Mendelbaum, 2008; McLaughin et al., 2014; Noyman-Veksler, Shalev, Brill, Rudich, & Shahar, 2017). Extending this body of research, we examined the moderating role of exposure to political violence in the links between adolescent *personality vulnerability* and internalizing and externalizing *psychopathology*.

Author for correspondence: Golan Shahar, Department of Psychology, Ben-Gurion University of the Negev, Be'er Sheva 84105, Israel; E-mail: shaharg@bgu.ac.il or Golan.shahar878@gmail.com

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Personality and psychopathology in adolescence

Vulnerability versus scarring models

Research on the role of personality in psychopathology abounds (Blatt, 2004; Shahar, 2015; Zuckerman, 2005). Adolescence appears to be a focal developmental phase for this line of inquiry because this is a period during which youth establish their identity in the face of notable biological, psychological, and social changes (Blatt, 2008; Jushner, 2015; Shafran, Shahar, Berant, & Gilboa-Schechtman, 2016). A leading personality/psychopathology theory in the field is Blatt's *polarities model* (Blatt, 2004; Blatt, 2008; Blatt, Shahar, & Zuroff, 2001; Blatt & Zuroff, 1992; Kopala-Sibley & Zuroff, 2014; Luyten & Blatt, 2013). The theory construes interpersonal-relatedness and self-definition as two central "personality vectors" that begin developing in early childhood due to parent–child relationships and continue to unfold over the life span (Blatt, 2008). Interpersonal-relatedness pertains to the attainment of nurturing and supportive relationships, whereas self-definition refers to securing a coherent, essentially positive, sense of self and identity. A successful development in one "vector" bolsters the other, and the integration of both underlies a healthy personality development (Blatt, 2008; Blatt & Zuroff, 1992; Kopala-Sibley & Zuroff, 2014; Shahar, Henrich, Blatt, Ryan, & Little, 2003; Zuroff, Mongrain, & Santor, 2004). In contrast, disruptions of such an integration, usually resulting from adverse parent–child relationships, lead to either *anaclitic* or *introjective vulnerabilities*. An anaclitic vulnerability reflects

an emphasis on relatedness rather than self-definition, and manifests itself via depression centered on loneliness and object loss, somatization, and panic attacks. In contrast, an introjective vulnerability represents an emphasis on self-definition rather than relatedness, manifesting in self-critical depression, obsessive-compulsive and paranoid symptoms, and narcissistic personality features (Blatt, 2008; Kopala-Sibley & Zuroff, 2014; Luyten & Blatt, 2013; Shahar et al., 2003; Zuroff et al., 2004).

Blatt's theory has stirred voluminous research across the life span, albeit with a particular focus on adolescence (e.g., Kopala-Sibley, Klein, Perlman, & Kotov, 2017; Leadbeater, Kuperminc, Blatt, & Herzog, 1999; Shahar & Priel, 2003). The overarching pattern of findings emerging from this body of research is quite complex. First, although several studies confirm the vulnerability of both the anaclitic and introjective vulnerabilities to depression, findings are much more consistent with respect to the introjective, self-critical, vulnerability (Coyne & Whiffen, 1995; Shahar, 2015). In fact, dependency was found to also include some aspects of resilience, for instance, an ability to enlist social support and generate positive life events (Bornstein, 1998; Mongrain, 1998; Shahar, 2008; Shahar & Priel, 2003). Second, self-criticism was shown to be implicated in a host of other psychopathologies, including anxiety and eating disorders, depression, suicidality, and externalizing symptoms such as aggression and violence (see Enns, Cox, & Inayatulla, 2003; Shahar et al., 2003; Shahar, 2015). In fact, such robust, self-critical vulnerability has been demonstrated even after controlling for a host of potential confounds, including (most compellingly) neuroticism. The latter pertains to a chronic tendency to experience distress and is considered a major risk factor for psychopathology (Lahey, 2009). Yet, even with neuroticism as a covariate, self-criticism still predicts psychopathology, both in cross-sectional and longitudinal research (Bareket-Bojmel & Shahar, 2011; Clara, Cox, & Enns, 2003; Cox, Enns, & Clara, 2004; Dunkley, Sanislow, Grilo, & McGlashan, 2009; Enns et al., 2003; Kopala-Sibley et al., 2017). In contrast, the vulnerability of dependency, when it surfaces, appears to be confined to depression and anxiety (Blatt & Zuroff, 1992; Kopala-Sibley, Zuroff, Hankin, & Abela, 2015). Indeed, Kopala-Sibley, Klein, Perlman, and Kotov (2017) showed that dependency and self-criticism predict first-onset anxiety disorders even after controlling for neuroticism.

Third, several findings suggest that self-criticism also constitutes an outcome of, rather than a risk for, depression and related psychopathology. The impetus for testing this possibility is *the scarring hypothesis*, according to which psychopathology damages personality (Lewinsohn, Steinmetz, Larson, & Franklin, 1981; Rhode, Lewinsohn, & Seeley, 1994). Initial tests of the scarring hypothesis, predicated upon a binary definition of depression, yielded mostly null findings (Lewinsohn et al., 1981; Rhode et al., 1994). In contrast, recent studies based on continuous psychopathology scores rather than discrete diagnoses, and espousing a developmental perspective, demonstrated the scarring effect on a host of symptoms on the self-concept, particularly in adolescence and young adulthood (Schiller & Shahar, 2016; Shahar, Blatt, Zuroff, Kuperminck, & Leadbeater, 2004; Shahar & Henrich, 2010). Shahar et al.'s (2004) study is particularly relevant here. Analyzing data collected from American early adolescents based on two assessment waves separated by a 1-year interval (Leadbeater et al., 1999), these investigators compared main-effect vulnerability and scarring models of dependency/self-criticism on the one hand and depressive symptoms on the other hand. They found that among early adolescent girls (not boys), depressive symptoms and self-criticism, but not dependency, were longitudinally associated with each other over time. Shahar (2015) terms this pattern the *self-critical cascade*, that is, a process whereby self-critical vulnerability maintains itself over time. More generally, these findings highlight the need to repeatedly compare vulnerability and scarring models in developmental psychopathology research.

Role of stress in the link between adolescent personality and psychopathology

The previously reviewed literature relies upon a main-effect description of the links between personality and psychopathology. From its inception, however, research in the field has taken into consideration the intervening role of stress in the personality/psychopathology link. The field has been particularly influenced by the stress-diathesis pattern (Monroe & Simons, 1991; Zubin & Spring, 1977), according to which a diathesis, or vulnerability, leads to psychopathology when it is activated via external stress. An even more particularized version, titled the congruency hypothesis, was formulated: Dependency was expected to lead to depression in the presence of interpersonal stressful events such as loss and separation, whereas self-criticism was posited to bring about depression in the presence of failure-related stress (for a review, see Coyne & Whiffen, 1995). Empirical findings, however, only provide support for the dependency by interpersonal stress interaction (e.g., Priel & Shahar, 2000; Shahar, Joiner, Zuroff, & Blatt, 2004), and even this empirical support is inconsistent (Shahar, 2015). Findings are more consistent with the general stress-diathesis model, according to which dependent and self-critical individuals, adolescents in particular, become depressed under nonspecific stressful life events (Abela, Webb, Wagner, Ho, & Adams, 2006; Auerbach, Ho, & Kim, 2014).

A recent alternative to the stress-diathesis pattern is the *dual-vulnerability* pattern (Jushner, 2015; Moriss, Ciesla, & Garber, 2008; Raine, 2002). Whereas the stress-diathesis pattern depicts psychopathology as a confluence of vulnerability *and* stress, the dual-vulnerability pattern construes psychopathology as resulting from *either* vulnerability *or* stress, but not both. This means that to the extent that vulnerability (e.g., personality) leads to psychopathology, stress does not, and vice versa. In the context of biological research on aggression and violence, this pattern goes by the name of *social path* (Raine, 2002) because it stipulates that biological vulnerability leads to aggression and violence only when social conditions are favorable (i.e., low levels of social stress).

There is only a little evidence to date consistent with the dual-vulnerability pattern for dependency and self-criticism. One exception is a recent study (Kopala-Sibley et al., 2017), which assessed female adolescents three times, separated by 9-month intervals. The investigators found that Time 1 dependency and self-criticism predicted the first onset of nearly all depressive and anxiety disorders, operationalized on a binary basis and assessed using state-of-the-science semi-structured interviews. They also found that stressful events, assessed subsequent to the measurement of personality, also using an advanced semi-structured interview, moderated the prospective prediction of depressive and anxiety disorders by dependency and self-criticism. The findings were consistent with a dual-vulnerability pattern, in that dependency and self-criticism predicted depressive/anxious disorders onset under *low levels* of stress. The inverse

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was also found: Stress predicted onset under *low levels* of dependency and self-criticism.

Exposure to political violence as a human-ecological risk

Adding the intervening role of stress to the understanding of the vulnerability of dependency and self-criticism brings the field closer to the overarching, highly influential, ecodevelopmental perspective in developmental psychopathology (Bronfenbrenner, 1979, 1994; Cicchetti & Lynch, 1993; Szapocznik & Coatsworth, 1999). This perspective has illuminated the role of the social context (families, schools, neighborhoods, communities, and cultures) in adolescent development, and has been conductive in shedding light on the development of both internalizing and externalizing psychopathology. As emphasized at the beginning of this article, *exposure to political violence,* especially when repeated and/or chronic, appears to epitomize human-ecological risk because it cuts across cultures, societal structures, neighborhoods, schools, families, and peer relationships. Surprisingly, we were able to locate only two articles describing the intervening role of exposure to political violence in the link between dependency/self-criticism and psychopathology, both of which targeted adults (Besser & Priel, 2009; Lassri, Soffer-Dudek, Lerman, Rudich, & Shahar, 2013). Namely, in two cross-sectional studies, Besser and Priel (2009) demonstrated cross-sectional associations between dependency and posttraumatic stress disorder (PTSD)-severity among adults directly exposed to rocket attacks, and between self-criticism and PTSD-severity in indirectly exposed adults. In three prospective, two-way studies, Lassri et al. (2013) reported that adults' self-criticism was longitudinally associated with an increase in psychopathological symptoms under high levels of perceived stress related to rocket attacks. Assessment of both vulnerability and scarring models, and of both stress-diathesis and dual-vulnerability patterns, focusing on adolescents rather than adults, is therefore conspicuously absent.

The present investigation

The Development Under Duress Project is an ongoing, longitudinal, multi-wave study focusing on the developmental and clinical consequences of chronic and repeated exposure to terrorism and political violence in adolescents residing in the Israeli Negev (Henrich & Shahar, 2008, 2013; Shahar et al., 2009; Shahar & Henrich, 2016). Initial phases in this program of research consisted of small scale, two-wave studies focusing on the effect of exposure to political violence on adolescent depressive symptoms, as well as on the potentially buffering effect of social support.

The present report constitutes an extensively upgraded, four-wave longitudinal study based on annual assessments in Sderot and the neighboring Kibbutz Sha'ar HaNegev between 2008 and 2011. Assessments included personality vulnerability (dependency and self-criticism), psychopathology (depression and anxiety as internalizing symptoms; moderate aggression and severe violence commission as externalizing symptoms), resilience (self-efficacy and social support), and minor life stress. Previous analyses of this four-wave study (Shahar et al., 2009; Shahar & Henrich, 2016) revealed that exposure to the rockets during 2009 was associated with an increase in depression, anxiety, moderate aggression (only under low levels of family support), and severe violence commission during the 2009–2010 period, shortly after the end of Operation Cast Lead ("Oferet Yetzuka"), also known as the First Gaza War. Under high levels of family social support, exposure assessed at 2009 was no longer associated with an increase in depression, aggression, or violence during 2009–2010, and actually predicted *a decrease* in moderate aggression. Another intriguing finding emerging from this four-wave study was that retrospectively recalled exposure to rockets prior to the beginning of the study (i.e., before 2008) was associated with an increase in severe violence commission at the fourth wave, that is, during 2011. Although this effect was robust in the face of a host of controls, including baseline violence commission in 2008, 2009, and 2010, it was based on Sha'ar HaNegev participants only, because Sderot participants were forbidden from attending the 2011 assessment due to security concerns.

This is the third report from the previously described longitudinal study. We operationalized chronic ecological risk as the average level of exposure experienced by participants over the first three assessment waves. We did not use the fourth wave because it was based on only a subset of the original sample from one school. Our aim was to examine longitudinal links involving personality (dependency and self-criticism) and psychopathology (internalizing and externalizing symptoms) during 2008–2010, moderated by the cumulative exposure to rockets during this time period. More specifically, a vulnerability model, whereby personality leads to psychopathology, was compared with a scarring model stipulating the inverse relationship. Also, a stress-diathesis model, according to which exposure to stress, that is, rockets exposure, bolsters the links between personality and psychopathology, was compared with a dual-vulnerability model whereby either personality or stress predicts psychopathology, and either psychopathology or stress predicts personality. A conceptual model of the study design is presented in Figure 1.

Method

Study sample and procedure

This study was approved by the Ethical Committee of the Department of Behavioral Sciences at Ben-Gurion University, as well as by the Chief Scientist of the Ministry of Education in Israel. Institutional review board approval was also obtained from Georgia State University. No adverse events were documented.

Recruitment was made from a school in the town of Sderot (36%) and the neighboring Kibbutz Sha'ar-HaNegev (64%). Active consent forms were signed by the participants' parents. Participants completed an assessment battery at each wave at the school. Protocols were group-administered by trained research assistants.

Participants included 362 (54% female) Israeli adolescents from the seventh through tenth grade at the start of study (median grade = 8; median age = 14 years; age range: 12–16 years), and who participated in at least one of two assessment waves transpiring in May–June 2008, February 2009, and March 2010. The vast majority of adolescent participants were born in Israel (89.7%). Participants' fathers were born in Israel (55.3%), Africa (16.4%), Europe (10.5%, either Eastern or Western), North or South America (6%), the Far East (0.2%), or had missing values on this variable. Participants' mothers were born in Israel (60.5%), Africa (10.5%), Europe (12.7%, either Eastern or Western), North or South America (5.5%), the Far East (3%), or had missing values on this variable. The demographics of the sample mirrored those of the overall student bodies of the two schools.

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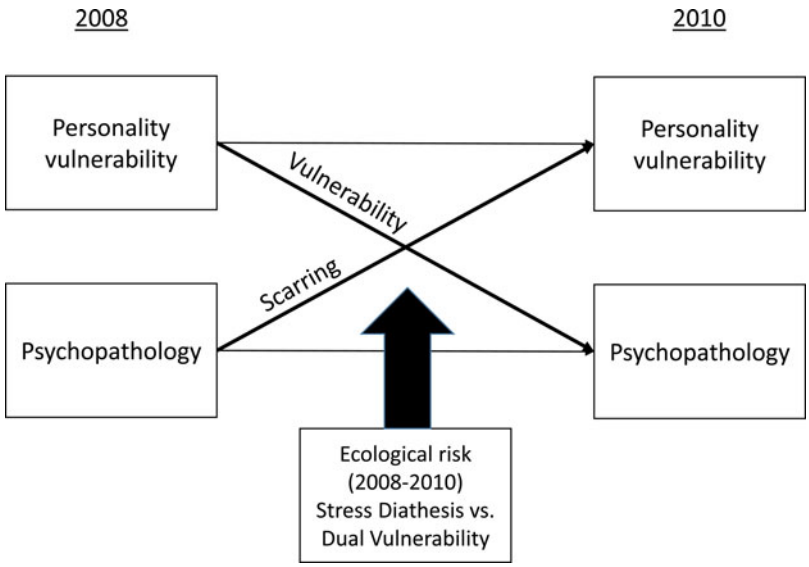

Figure 1. Study design and hypotheses.

Attrition resulted from students moving away, graduating and entering the military, or being forbidden from participating due to security concerns (e.g., Sderot participants in 2010). The sample sizes with complete data were $N = 315$ in 2008, $N = 305$ in 2009 (including 31 students who had not participated in Wave 1), and $N = 263$ in 2011. For the purposes of this study, assessments for most variables came from the 2008 and 2010 waves of assessment, for a two-wave cross-lagged panel model. Of the sample, 37 (10%) were missing data from 2008, and 102 (28%) were missing data from 2010. In total, 130 (36%) were missing some data across the waves. Little's *missing completely at random* (MCAR) test was not statistically significant, $\chi^2_{(170)} = 178.39$, $p = .31$, providing some evidence that data may be MCAR. Additional analyses conducted on predicting the likelihood of attrition in 2010 from study variables assessed in 2008 only indicated that students from Sderot were more likely to drop out of the study, odds ratio (OR) = 2.57, 95% CI [1.47, 4.49], $p = .001$. This variable was included as a covariate in the analyses.

Measures

Personality vulnerability

Dependency and self-criticism were assessed via the Depressive Experiences Questionnaire, Adolescent Short Form (DEQ-A) (Fichman, Koestner, & Zuroff, 1994). Blatt and colleagues developed the original DEQ to assess personality traits implicated in depression, but which are not themselves symptoms of depression (Blatt, D'Afflitti, & Quinlan, 1976). Principal component analyses of the DEQ revealed three factors: dependency and self-criticism (per Blatt's polarities model), and personal efficacy, which reflects general resilience. Blatt and colleagues then adapted the DEQ to adolescents (Blatt, Schaffer, Bers, & Quinlan, 1992). However, because the DEQ and DEQ-A are quite lengthy (i.e., are based on 66 items), Fichman et al. (1994) identified a short DEQ-A version that consists of eight items for dependency (e.g., "I have difficulty breaking off a friendship that is making me unhappy"), eight items for self-criticism (e.g., "I often find that I fall short of what I expect of myself"), and four items for efficacy (e.g., "I am a very independent person"). Items were identified based on loadings on the three components derived from the original analyses of the DEQ-A. For instance, the eight dependency items loaded strongly on the dependency component, and low items on the other two components (self-criticism and efficacy).

The DEQ-A Short Form has been translated and back-translated to Hebrew more than a decade ago, and was used successfully in a study of Israeli adolescents, demonstrating adequate reliability and validity coefficients (Shahar & Priel, 2003). In the present study, we used the dependency and self-criticism subscales. The internal consistency of the self-criticism scale was $\alpha = .78$ in 2008 and $\alpha = .77$ in 2010. The internal consistency of the dependency scale was $\alpha = .71$ in 2008 and $\alpha = .68$ in 2010. The observed range of scores for dependency was 1–6.67 in 2008 and 1–6.5 in 2010. The observed range of scores for self-criticism was 1–1.63 in 2008 and 1–6 in 2010.

Psychopathology

Internalizing symptoms. Depression was assessed at each wave with the Center for Epidemiological Studies Depression Scale for Children (CES-DC) (Weissman, Orvaschel, & Pedian, 1980), a 20-item measure of depressive symptoms with a widely used Israeli translation. The internal consistency of the CES-DC was $\alpha = .81$ in 2008 and $\alpha = .83$ in 2010. The observed range of scores for CES-DC was 0–58 in 2008 and 0–51 in 2010.

Anxiety was assessed at each wave using seven items, averaged to form a composite scale, from the Hebrew version of the extensively used State Anxiety Inventory (SAI) (e.g., "I am anxious"; Spielberger, 1972; Teichman & Melnik, 1968). The internal consistency of the anxiety scale was $\alpha = .85$ in 2008 and $\alpha = .89$ in 2010. The observed range of scores for the abbreviated, seven-item SAI measure was 1–4 in both 2008 and 2010.

Externalizing symptoms. Aggression was assessed at each wave with the 11-item Aggression Scale (Orpinas & Frankowski, 2001), which measures aggressive behaviors (e.g., hitting, pushing, name calling, threatening) in the past week. The frequency of each item is measured on a scale ranging from 0 to 6. The internal consistency of the aggression scale was $\alpha = .90$ in 2008 and $\alpha = .88$ in 2010. The observed range of score at both waves was 0–6.

Violence commission was assessed at each wave with four items from the Social and Health Assessment (SAHA), gauging

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commission of severe forms of community violence in the past year (Brookmeyer, Henrich, & Schwab-Stone, 2005). Items included having hurt someone so badly in a physical fight that the individual had to seek medical treatment (endorsed by 9.7% of the sample at 2008), being involved in a gang fight (8.2% of the sample at Wave 1), being arrested by the police for a violent crime (6.4% of the sample at Wave 1), and having carried a weapon (8.4% of the sample at Wave 1). Versions of this measure have been used in several countries, including Israel, and all include the weapon-carrying item, which, although it does not ask about committing violence per se, loads on the same factor with the other items. Each item was scored as not endorsed/committed (score of 0) or endorsed as committed one or more times (score of 1) and summed, so scores ranged from 0 (no commission) to 4 (committed all acts at least once). The majority of adolescents reported committing no violence. Because of this, the variable was recoded into a binary variable in which 0 = no violence commission, and 1 = one or more types of violence commission.

Ecological risk (rocket exposure)

Exposure to rocket attack. The scale was adapted from previous research in Israel and was used successfully in the population sampled for this study (Kirschenbaum, 2006). At each wave, participants were asked six yes/no questions about whether, in the past several months, they had been physically hurt in a rocket attack, had themselves experienced property damage from a rocket attack, had friends or family physically or mentally hurt by a rocket attack, or had property damage from a rocket attack. Answers were summed together (possible and observed range of 0–6). For the present study, we averaged the exposure scores derived from each year (2008, 2009, and 2010) to form a cumulative exposure index that spanned all waves of assessment.

Controls

We controlled for gender, grade, and place of residence, that is, Sderot versus Sha'ar HaNegev.

Data analysis

After computing descriptive statistics, we tested our hypotheses using an autoregressive cross-lag model across the 2 years of assessment (2008 to 2010) with the Mplus 7.1 software. Separate models were run for each psychopathology outcome (depressive symptoms, anxiety, aggression, and violence commission). In each of these models, the specified outcome (e.g., depressive symptoms) in 2010, along with 2010 assessments of self-criticism and dependency, was regressed on the rocket attack exposure variable, gender, grade-level, 2008 measures of that outcome, the other internalizing and externalizing problems (e.g., anxiety, aggression, and violence commission), self-criticism and dependency, and product terms testing for interaction effects of rocket attack exposure with self-criticism and dependency (exposure X self-criticism, and exposure X dependency). Additionally, a product term testing for an interaction between rocket attack exposure and the specified outcome (e.g., exposure X depressive symptoms) was included when the outcomes were self-criticism and dependency. A robust maximum likelihood estimator was used, full information maximum likelihood (FIML) fitting was used to address missing data, and variables were mean-centered prior to computing product interaction terms. Results are reported here by outcome.

Statistically significant interactions were probed in two ways. First, we calculated simple slopes of one of the variables involved in the interaction, deemed as the "predictor," at ±1 *SD* above/below the center mean of the other variable, deemed as the "moderator." We then switched the "predictor" and "moderator" and recalculated simple slopes (Aiken & West, 1991). The unique advantage of this probing procedure is that it enables comparison of the effect of a predictor under conventionally high versus low levels of the moderator. Second, we conducted a regions of significance (RoS) analysis, which computes the lower and upper values of each of the variables involved in the interaction in which the simple slopes of the other variable are statistically significant (Roisman et al., 2012). A key advantage of the RoS analysis is that it identifies specific levels of one variable, for example, exposure to rockets, that are required to moderate another variable, for example, personality. Another advantage of this way of probing interaction is that it can ascertain that potential moderating values are indeed observed in the data, which lend more credibility to the interactions identified. The inverse also holds: When a RoS analysis identifies moderating values (e.g., 4 *SD* above the mean of the moderator) that are beyond the observed range, or are very infrequent in the sample, the identified interaction is suspect. Both probing procedures thus complement each other, providing a robust evaluation of the interactions identified by the analyses.

Results

Descriptive statistics

Means and standard deviations of the main variables in the study, as well as their intercorrelations, are presented in Table 1. Means and standard deviations of the study variables were placed within the context of previous research. The means and standard deviations of DEQ-self-criticism and DEQ-dependency in 2008 were very similar to means reported for these studies in Israel (e.g., Shahar & Priel, 2003). Self-criticism remained stable in 2010, $t = 0.44$, $p = .66$, but dependency dropped significantly, $t = 2.73$, $p = .01$. In addition, the means and standard deviations of CES-D in both 2008 and 2010 were similar to the ones reported in Israel (e.g., Shahar & Priel, 2003). Interestingly, these means, which were stable over time, $t = 0.04$, $p = .97$, exceed the most extensively used, albeit quite lenient, cutoff for clinical depression in the CES-D for adolescents (i.e., a score of 16; see Roberts, Andrews, Lewinsohn, & Hops, 1990) but were lower than a more robust cutoff (i.e., 23; Roberts et al., 1990). The means and standard deviations of SAI-anxiety, which decreased over time, $t = 3.28$, $p < .01$, could not be located in the context of previous research because our abbreviated version has not been used previously.

Means and standard deviations of aggression in 2008 and 2010, also stable over time, $t = 1.65$, $p = .10$, were lower than those reported in the past for American adolescents (e.g., Washburn, McMahon, King, Reinecke, & Silver, 2004) and adolescents in Northern Ireland (Merrilees et al., 2014). We are not aware of studies other than our own in Israel using this measure.

Finally, the proportion of adolescents in our study who committed severe violence was 18% in 2008 and 17% in 2010, with differences across time being nonsignificant ($\chi^2_{(1)} = 0.96$, $p = .33$). Because this study is the only one in which the four items from the SAHA was used to assess severe violence commission, aggregate scores could not be located in the context of previous research. However, a prevalence of *severe* violence

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Table 1. Means and standard deviations of study variables

	M (*SD*)	2	3	4	5	6	7	8	9	10	11	12	13
1. Kassam exposure	1.48 (0.96)	−.04	.17**	.18**	.25**	.10	−.07	.02	.04	.17**	.24**	.06	.11
2. Self-criticism (2008)	3.06 (1.10)		.36**	.53**	.31**	.25**	.17**	.53**	.35**	.41**	.34**	.10	−.01
3. Dependency (2008)	3.66 (1.15)			.40**	.36**	.16**	.01	.20**	.52**	.34**	.37**	.10	−.03
4. Depressive symptoms (2008)	17.06 (9.86)				.60**	.30**	.12*	.38**	.39**	.47**	.38**	.12*	.14*
5. Anxiety (2008)	2.06 (0.76)					.21**	−.01	.24**	.27**	.32**	.38**	.03	.03
6. Aggression (2008)	1.25 (1.19)						.46**	.27**	.04	.20**	.13	.55**	.31**
7. Violence (2008)	0.18							.10	−.02	.03	.03	−.03	.31**
8. Self-criticism (2010)	3.03 (1.06)								.41**	.61**	.39**	.27**	.14*
9. Dependency (2010)	1.16 (1.08)									.44**	.35**	.03	−.04
10. Depressive symptoms (2010)	17.03 (10.11)										.65**	.22**	.22**
11. Anxiety (2010)	1.90 (0.72)											.10	.08
12. Aggression (2010)	1.13 (1.11)												.50**
13. Violence (2010)	0.17												1.0

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

Note: Means of the dichotomous violence commission variables represent the proportion of participants who reported committing violence. The correlation reported between violence variables is a phi coefficient.

commission approaching 20% of the sample is arguably high on all counts. Nevertheless, scores of specific items are comparable with Brookmeyer, Henrich, Cohen, and Shahar (2011), who investigated adolescents in Sderot and Dimona (a town in the Eastern Negev, which is not exposed to missile attacks), using these four items as well as other violence commission items. Comparable percentages were revealed for two items: tapping hurting someone so that they needed medical treatment (9.7% vs. 11.3% in this study and Brookmeyer et al., 2011) and being involved in a gang fight (8.2% vs. 7.0%, respectively). However, for the two other items, percentages in this study were twice as high as those reported in Brookmeyer et al. (2011), specifically, being arrested by the police for violence, 6.4% versus 3.2%, respectively; and carrying weapons, 8.4% versus 3.8%, respectively. Thus, this sample appears to be more violent than that studied by Brookmeyer et al. (2011).

Auto-regressive correlations were not particularly high (ranging from $r = .38$ to $r = .55$), indicating a good deal of residualized change in the variables over the 2-year period. Models also included gender and grade-level as covariates. Males scored lower in dependency ($r = -.26$, $p < .01$ in 2008, and $r = -.30$, $p < .01$ in 2010), depressive symptoms ($r = -.18$, $p < .01$ in 2008, and $r = -.25$, $p < .01$ in 2010), and anxiety ($r = -.22$, $p < .01$ in 2008, and $r = -.16$, $p < .01$ in 2010). However, males also scored higher in aggression ($r = .20$, $p < .01$ in 2008, and $r = .29$, $p < .01$ in 2010) and were more likely to commit violence (*phi* = .28, $p < .01$ in 2008, and *phi* = .20, $p < .01$ in 2010). Older students had higher self-criticism scores in 2008 ($r = .13$, $p = .03$), but not in 2010. Older students also endorsed more depressive symptoms in 2008 ($r = .19$, $p < .01$), but not in 2010. At both time points, older students reported a higher dependency ($r = .13$, $p = .03$ in 2008, and $r = .21$, $p < .01$ in 2010) and more anxiety ($r = .15$, $p = .01$ in 2008, and $r = .17$, $p = .01$ in 2010).

Participants living in Sderot reported higher levels of rocket exposure ($r = .18$, $p < .01$). They also reported less self-criticism at both time points ($r = -.25$, $p < .01$ in 2010, and $r = -.17$, $p = .01$ in 2010) and less dependency in 2010 ($r = -.13$, $p = .03$). Participants living in Sderot were also somewhat more likely to commit violence in 2010 (*phi* = .14, $p = .03$).

Hypotheses testing

Results appear in Tables 2–5 by psychopathology outcome (depressive symptoms, anxiety, aggression, and violence commission, respectively).

Depressive symptoms

Prediction of depression. Self-criticism was longitudinally associated with increased depressive symptoms over time, although this effect was conditional upon the level of rocket exposure, as indicated by a statistically significant exposure X self-criticism interaction term, presented in Figure 2. There was no effect of dependency on depressive symptoms, and no exposure X dependency interaction was detected.

We first probed the previous interaction by calculating simple slopes of self-criticism at±1 *SD* levels of rocket exposure (Aiken & West, 1991). At low levels of rocket exposure, there was a strong longitudinal association between self-criticism and increased depressive symptoms, $\beta = 0.39$, $SE = 0.11$, $p < .01$, whereas at high levels of rocket exposure there was no association, $\beta = 0.06$, $SE = 0.11$, $p = .55$. Probed from the point of view of self-criticism as a moderator, we found that, at low levels of self-criticism,

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Table 2. Depressive symptoms

	Depressive symptoms (2010)		
	β	*SE*	*p*
Male	−0.19	0.06	<0.01
Grade-level	0.04	0.06	0.54
Sderot	−0.01	0.06	0.88
Rockets exposure	0.07	0.07	0.33
Self-criticism (2008)	0.23	0.09	0.01
Dependency (2008)	0.07	0.06	0.27
Depressive symptoms (2008)	0.24	0.10	0.02
Anxiety (2008)	−0.03	0.07	0.65
Aggression (2008)	0.13	0.07	0.08
Violence commission (2008)	0.01	0.07	0.94
Exposure X self-criticism	−0.18	0.08	0.02
Exposure X dependency	0.04	0.06	0.53

	Self-criticism (2010)			Dependency (2010)		
	β	*SE*	*p*	*β*	*SE*	*p*
Male	−0.03	0.06	0.58	−0.15	0.05	0.01
Grade-level	−0.11	0.06	0.07	0.11	0.06	0.07
Sderot	−0.07	0.05	0.20	−0.07	0.06	0.22
Rockets exposure	0.06	0.07	0.82	−0.01	0.07	0.89
Self-criticism (2008)	0.41	0.08	<0.01	0.09	0.08	0.24
Dependency (2008)	−0.04	0.06	0.44	0.37	0.06	< 0.01
Depressive symptoms (2008)	0.15	0.09	0.09	0.21	0.08	0.01
Anxiety (2008)	0.03	0.07	0.65	−0.03	0.07	0.72
Aggression (2008)	0.16	0.08	0.05	−0.09	0.07	0.21
Violence commission (2008)	0.01	0.09	0.99	0.04	0.07	0.56
Exposure X depressive symptoms	−0.17	0.06	<0.01	−0.07	0.06	0.21

rocket exposure was associated with increased depressive symptoms, $\beta = 0.23$, $SE = 0.02$, $p = .01$, whereas, at high levels of self-criticism, there was no association, $\beta = -.09$, $SE = 0.10$, $p = .36$.

Second, we conducted an RoS analysis (Roisman et al., 2012) and found that self-criticism was associated with increased depression over time when rocket exposure was below 1.8, which is about a ½ *SD* above the mean of exposure. Also, exposure was associated with increased depression over time when self-criticism was below 2.53, which is approximately ½ *SD* below the mean of self-criticism. Thus, statistically significant slopes of both self-criticism and exposure reside in values that are well within the observed range of values in this sample, and below the mean of each of these variables.

Prediction of personality. Depressive symptoms were associated with increases in dependency, and this effect was not conditional upon levels of rocket exposure. There was a statistically significant exposure X depressive symptoms interaction predicting self-criticism, which is presented in Figure 3. At low (−1 *SD*) levels of rocket exposure, depressive symptoms were associated with increased self-criticism over time, $\beta = 0.28$, $SE = 0.11$, $p = .01$. At high (+1 *SD*) levels of rocket exposure, however, depressive symptoms were not longitudinally associated with self-criticism, $\beta = 0.02$, $SE = 0.09$, $p = .81$. Also, at low levels of depressive symptoms, exposure was marginally associated with increased self-criticism, $\beta = 0.19$, $SE = 0.10$, $p = .05$. This longitudinal association was nonsignificant at high levels of depressive symptoms, $\beta = -0.07$, $SE = 0.07$, $p = .27$. RoS analysis revealed that depressive symptoms were associated with an increase in self-criticism over time when levels of exposure were below 1.27, which were less than ¼ *SD* below the exposure's mean. In contrast, exposure was associated with increased self-criticism over time when levels of CES-D symptoms were below 7.36, which is one half of and approximately 1 *SD* below the mean of depressive symptoms. Thus, similar to the prediction of depressive symptoms, conditional effects of both depressive symptoms and exposure occur in values that are well within the observed range of values in this sample. At the same time, whereas the longitudinal association between depressive symptoms and increased self-criticism ceases to be significant very close to the mean of exposure, the longitudinal

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Table 3. Anxiety

	Anxiety (2010)		
	β	*SE*	*p*
Male	−0.01	0.06	0.85
Grade-level	0.10	0.06	0.11
Sderot	0.03	0.06	0.64
Rockets exposure	0.15	0.07	0.03
Self-criticism (2008)	0.20	0.08	0.02
Dependency (2008)	0.18	0.07	0.01
Depressive symptoms (2008)	0.06	0.09	0.52
Anxiety (2008)	0.13	0.08	0.08
Aggression (2008)	0.08	0.07	0.28
Violence commission (2008)	−0.15	0.08	0.07
Exposure X self-criticism	−0.11	0.09	0.25
Exposure X dependency	0.02	0.07	0.72

	Self-criticism (2010)			Dependency (2010)		
	β	*SE*	*p*	*β*	*SE*	*p*
Male	−0.04	0.06	0.54	−0.14	0.05	0.01
Grade-level	−0.10	0.06	0.08	0.11	0.06	0.07
Sderot	−0.07	0.06	0.21	−0.08	0.06	0.16
Rockets exposure	0.06	0.07	0.42	0.02	0.07	0.77
Self-criticism (2008)	0.42	0.08	<0.01	0.08	0.08	0.29
Dependency (2008)	−0.04	0.06	0.51	0.37	0.06	<0.01
Depressive symptoms (2008)	0.12	0.09	0.16	0.20	0.08	0.01
Anxiety (2008)	0.04	0.07	0.52	−0.02	0.07	0.84
Aggression (2008)	0.16	0.08	0.05	−0.09	0.07	0.23
Violence commission (2008)	−0.01	0.08	0.98	0.04	0.07	0.58
Exposure X anxiety	−0.11	0.06	0.06	−0.11	0.07	0.11

association between exposure and increased self-criticism ceases to be significant at relatively low levels of depressive symptoms, that is, at half of the latter's mean.

Anxiety

Prediction of anxiety. Rocket exposure, self-criticism, and dependency were associated with increased anxiety over time. No interaction effects were detected.

Prediction of personality. No effects were detected over and above the autoregressive effects of personality.

Aggression

Prediction of aggression. Boys reported more aggression than girls did. No main or interactive effects of personality variables were detected.

Prediction of personality. Aggression was marginally associated with increased self-criticism over time ($p = .08$ in the model that included an exposure X aggression interaction term; $p = .05$ in the models for the other outcomes in which aggression was included as a covariate) but was unrelated to change in dependency. No interaction effect was detected.

Violence commission

Prediction of violence. Depressive symptoms assessed in 2008 were associated with increased odds of committing violence in 2010. No interaction effects were detected.

Prediction of personality. There was a positive rocket exposure X violence commission interaction predicting an increase in dependency, presented in Figure 4. Violence commission was associated with increased dependency over time at high (+1 *SD*) levels of rocket exposure, $\beta = 0.24$, $SE = 0.11$, $p = .03$, whereas at low (−1 *SD*) levels of rocket exposure, violence commission was associated with decreased dependency over time, $\beta = -0.22$, $SE = 0.09$, $p = .02$. Also, for participants who reported no violence commission in 2008, rocket exposure was not associated with dependency in 2010, $\beta = -0.10$, $SE = 0.01$, $p = .15$, whereas for participants who reported committing violence, rocket exposure was associated with increased dependency, $\beta = 0.50$, $SE = 0.17$, $p < .01$.

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Table 4. Aggression

	Aggression (2010)		
	β	*SE*	*p*
Male	0.17	0.06	0.01
Grade-level	−0.04	0.05	0.46
Sderot	0.08	0.06	0.19
Rockets exposure	−0.01	0.07	0.97
Self-criticism (2008)	−0.01	0.07	0.83
Dependency (2008)	0.08	0.06	0.13
Depressive symptoms (2008)	0.04	0.08	0.62
Anxiety (2008)	−0.07	0.07	0.31
Aggression (2008)	0.46	0.08	<0.01
Violence commission (2008)	0.12	0.10	0.23
Exposure X self-criticism	−0.01	0.08	0.89
Exposure X dependency	0.03	0.06	0.62

	Self-criticism (2010)			Dependency (2010)		
	β	*SE*	*p*	*β*	*SE*	*p*
Male	−0.05	0.06	0.43	−0.15	0.05	<0.01
Grade-level	−0.10	0.06	0.08	0.11	0.06	0.06
Sderot	−0.06	0.06	0.33	−0.07	0.06	0.26
Rockets exposure	0.01	0.07	0.89	−0.04	0.07	0.61
Self-criticism (2008)	0.44	0.08	<0.01	0.11	0.08	0.17
Dependency (2008)	−0.04	0.06	0.46	0.38	0.06	<0.01
Depressive symptoms (2008)	0.11	0.09	0.20	0.18	0.08	0.02
Anxiety (2008)	0.03	0.07	0.64	−0.03	0.07	0.68
Aggression (2008)	0.14	0.08	0.08	−0.10	0.07	0.16
Violence commission (2008)	0.02	0.09	0.86	0.04	0.07	0.56
Exposure X aggression	−0.04	0.07	0.55	0.03	0.05	0.56

RoS analyses indicated that violence commission was significantly associated with increased dependency when rocket exposure was greater than 2.23, which is about 1 *SD above* the mean of exposure, and was significantly associated with decreased dependency when rocket exposure was less than 0.79, which is slightly above 1 *SD below* the mean of exposure. This pattern suggests that, although the statistical significance of the association between violence commission and increased/decreased dependency occurs for values of rocket exposure that are well observed in the data, these values are in the extreme range of the exposure distribution. Finally, because violence commission is binary, RoS cannot be implemented when this variable is a moderator.[1]

Discussion

Investigating a large sample of Israeli adolescents who were repeatedly exposed to rocket attacks during 2008–2010, we examined the links between personality (dependency and self-criticism) and psychopathology (internalizing and externalizing symptoms). Our sample exhibited characteristics similar to previously studied samples of Israeli adolescents, particularly in terms of depression, dependency, and self-criticism. Levels of aggression in this sample were somewhat lower than those reported for American and North Irish adolescents, possibly because this sample exhibited a substantial prevalence of serious violence

1. In light of our previous findings (Henrich & Shahar, 2008; Shahar & Henrich, 2016), which suggest that perceived social support (PSS) from parents, family members, and school personnel plays an important role in internalizing and externalizing symptoms in this population, we repeated our analyses while treating the three social support variables, assessed in 2008, as covariates. We measured PSS from friends, family, and school personnel via an abbreviated form of the PSS scale (Procidano & Heller, 1983; see Shahar et al., 2009, in the Appendix). We found that school support in 2008 was positively associated with dependency in 2010 ($\beta = .13$, $p < .05$). Importantly, however, social support was not related to any of the other outcomes. The pattern of results for aggression and depression remained the same while controlling for the social support variables. There were minor changes in the findings for anxiety and violence. For anxiety, the exposure X anxiety interaction term predicting self-criticism, which was marginally significant at $p = .06$, turned into a more marginally significant trend: $p = .05$. For violence, there was a main effect of violence commission on dependency ($\beta = -.16$, $p = .04$) in addition to the exposure X violence commission interaction. To conclude, treating social support as a covariate did not change the pattern of results.

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Table 5. Violence commission

	Violence commission (2010)		
	B	*SE*	*p*
Male	0.10	0.07	0.11
Grade-level	−0.06	0.07	0.42
Sderot	0.09	0.07	0.16
Rockets exposure	0.08	0.09	0.35
Self-criticism (2008)	−0.12	0.08	0.12
Dependency (2008)	−0.05	0.06	0.41
Depressive symptoms (2008)	0.20	0.10	0.04
Anxiety (2008)	−0.07	0.08	0.38
Aggression (2008)	0.18	0.10	0.06
Violence commission (2008)	0.20	0.11	0.06
Exposure X self-criticism	−0.12	0.10	0.23
Exposure X dependency	−0.04	0.09	0.63

	Self-criticism (2010)			Dependency (2010)		
	β	*SE*	*p*	*β*	*SE*	*p*
Male	−0.04	0.06	0.49	−0.14	0.05	0.01
Grade-level	−0.10	0.06	0.11	0.13	0.06	0.02
Sderot	−0.06	0.06	0.31	−0.08	0.06	0.14
Rockets exposure	−0.02	0.08	0.84	−0.10	0.07	0.15
Self-criticism (2008)	0.44	0.07	<0.01	0.10	0.08	0.20
Dependency (2008)	−0.03	0.06	0.58	0.38	0.06	<0.01
Depressive symptoms (2008)	0.11	0.08	0.20	0.19	0.08	0.01
Anxiety (2008)	0.02	0.07	0.74	−0.03	0.07	0.71
Aggression (2008)	0.16	0.08	0.05	−0.11	0.07	0.10
Violence commission (2008)	−0.03	0.07	0.63	0.01	0.07	0.90
Exposure X violence commission	0.07	0.08	0.36	0.26	0.07	<0.01

commission. In the following sections, we summarize the findings, discuss their theoretical implications, note limitations and strengths of this study, and suggest several clinical implications.

Summary of the findings

As presented in Figure 1, we tested both vulnerability and scarring models linking adolescent personality (dependency and self-criticism) and internalizing (depression and anxiety) and externalizing (aggression and violence) psychopathology. Whereas the vulnerability model depicts personality as the cause and psychopathology as the effect, the scarring model reverses this role of personality and psychopathology. As is also depicted in Figure 1, we also tested stress-diathesis and dual-vulnerability patterns of the role of adolescent exposure to rockets in the links between personality vulnerability and psychopathology. Whereas stress-diathesis models suggest that stress (in this case, exposure to political violence) augments these links, dual-vulnerability patterns posit that stress diminishes these links. Our findings are described below as they relate to these different models.

First, we found support for both main-effect vulnerability scarring models. Thus, consistent with the personality vulnerability model, dependency and self-criticism were longitudinally associated with an increase in anxiety. In addition, consistent with the scarring model, depressive symptoms were associated with an increase in dependency over time. Aggression was associated with an increase in self-criticism over time; in some analyses, reaching conventional statistical significance and, in others, exhibiting a nonsignificant trend.

Second, when depressive symptoms served as both an outcome and a predictor, a clear pattern consistent with dual-vulnerability was found. Namely, under low levels of rocket exposure, self-criticism was longitudinally associated with an increase in depressive symptoms (consistent with personality vulnerability). Also, under low levels of rocket exposure, depressive symptoms were longitudinally associated with an increase in self-criticism (consistent with scarring).

Third, in line with the stress-diathesis pattern, violence commission was longitudinally associated with an increase in dependency under high levels of rocket exposure. However, it

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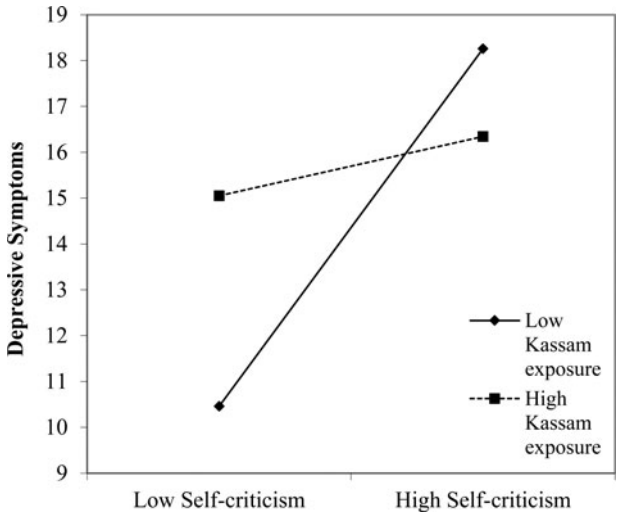

Figure 2. Depressive symptoms as a function of kassam exposure and self-criticism.

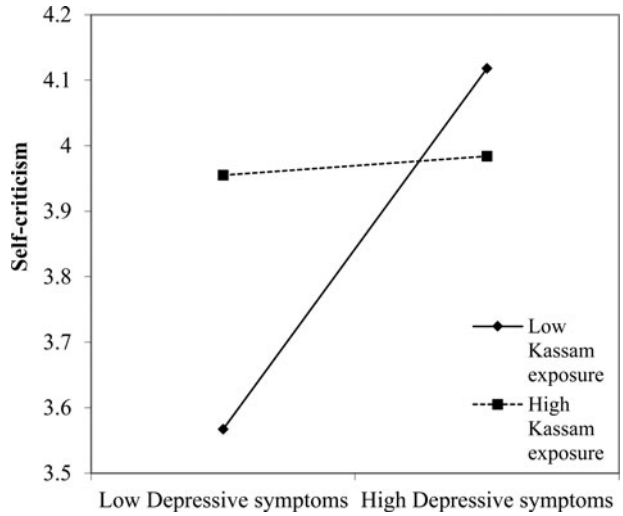

Figure 3. Self-criticism as a function of kassam exposure and depressive symptoms.

should be mentioned that, under low levels of exposure, violence commission was longitudinally associated with *a decrease* in dependency.

Theoretical implications

Overall, different findings in this study are consistent with all of the various models and patterns presented in the Introduction section and in Figure 1. Thus, the finding whereby dependency was longitudinally associated with an increase in anxiety lends support to Blatt's original polarities model (Blatt, 2004; Blatt, 2008; Kopala-Sibley & Zuroff, 2014; Luyten & Blatt, 2013; Zuroff et al., 2004), which construes *both* dependency and self-criticism as serious dimensions of vulnerability. This comes at a time when researchers have questioned the relative importance of dependency compared with that of self-criticism. Specifically, intrigued by findings concerning the resilience-related nature of dependency (Bornstein, 1998; Shahar, 2008; Shahar, 2015), several investigators (ourselves included) have questioned the latter vulnerability status, deeming self-criticism as the "real culprit" (Shahar, 2015). This conclusion might have been premature, as is gleaned from recent findings (Abela et al., 2006; Auerbach et al., 2014; Kopala-Sibley et al., 2017). In particular, findings of Kopala-Sibley et al. (2017), coupled with ours, construe dependency as a strong and robust risk factor for *anxiety*. Whereas Kopala-Sibley et al. (2017) also found main-effects of dependency on depressive disorders, we did not find this effect, and the literature is much less certain with respect to the effect of dependency on depression (Coyne & Whiffen, 1995; Shahar, 2015). In fact, our findings indicate that dependency might constitute a consequence, rather than an antecedent, of depression (see Table 2). Increased dependency was also associated with baseline violence commission under high levels of exposure to rockets. It is difficult to provide an integrated explanation to both findings, but a clue might be found in the cultural context within which the study was conducted. In the Israeli society, values of independence and heroism, but also of self-control and solidarity, are emphasized (Almog, 2000; Shahar, 2013). In this cultural context, the manifestation of depression on the one hand and serious misconduct (severe violence) on the other hand might be strongly frowned upon, soliciting pressure upon the adolescent to conform, which might in turn translate into elevated dependency. Clearly, more research into this supposition is needed.

Our most intriguing finding concerns the reciprocal longitudinal association among self-criticism and depressive symptoms *under low*, but not high, levels of rocket exposure. The reciprocal relationships involving both variables were already detected previously, albeit without the moderating role of stress. The specific pattern revealed here is consistent with the ones obtained by Kopala-Sibley et al. (2017), who demonstrated that self-criticism predicted first onset of depressive and anxious disorders under low, but not high, levels of life stress. However, Kopala-Sibley et al. (2017) demonstrated this pattern for both dependency and self-criticism, and with respect to normative stressful life events rather than chronic trauma, that is, exposure to rockets. In addition, Kopala-Sibley et al. (2017) did not find the scarring patterns obtained here. Nevertheless, the findings of Kopala-Sibley et al. (2017) as well as ours suggest that the interactions between dependency/self-criticism and stress might conform to a dual-vulnerability pattern (Kushner, 2015; Morris et al., 2008; Raine, 2002), rather than to the extensively investigated stress-diathesis one. However, because stress-diathesis patterns involving adolescent dependency/self-criticism were also reported (e.g., Abela et al., 2006), the scientific jury is still out as to the exact pattern of interactions between dependency/self-criticism and stress in predicting psychopathology. Possibly, a *higher-order moderator* might determine under which conditions each pattern is relevant.

What might explain the dual-vulnerability pattern found in this study and in Kopala-Sibley et al.'s (2017) for self-criticism and stress in predicting depression? One possibility is that the more stress increases, the greater the likelihood that adolescents summon inner and outer resources in response to this stress, eventually escaping psychopathology and/or increased personality vulnerability. This possibility is consistent with the flatline representing no longitudinal relationships between self-criticism and depressive symptoms under high rocket exposure in Figures 2 and 3, as well as the RoS showing that the longitudinal associations among self-criticism and depressive symptoms become non-significant *already around the mean of rocket exposure*. Theoretically, for self-critical *and* depressed adolescents, the very existence of severe external stress may serve as an encouragement to direct attention outward, which in turn might assist in

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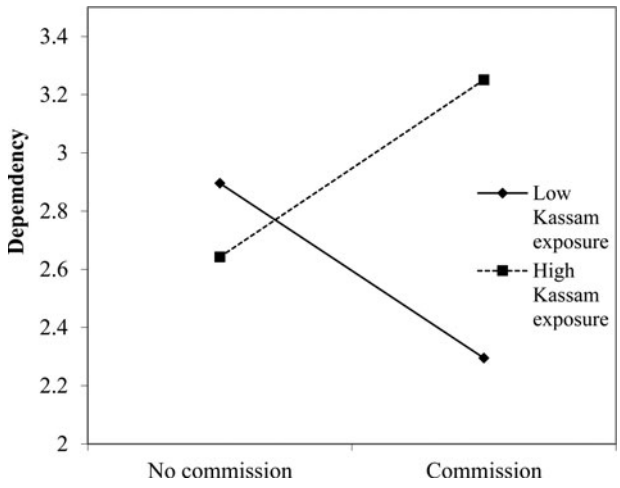

Figure 4. Dependency as a function of kassam exposure and violence commission.

neutralizing self-critical ruminations (Schiller & Shahar, 2016) and/or in enlisting social support. Indeed, increased social cohesion and a sense of meaning were found to be typical among victims of mass disaster, in turn, reducing distress (Cerdá, 2014; Chen et al., 2016).

Another possibility for the disappearance of the reciprocal link between self-criticism and depressive symptoms at high levels of rocket exposure is the potency of either self-criticism/depression or exposure in predicting depression/self-criticism. This potency is likely to lead to a restriction of range in one of the two factors, rendering the other factor irrelevant to the prediction of the outcome.[2] Statistically, the restriction of range explanation is supported by the pattern gleaned from Figure 2, whereby under both high self-criticism and high exposure, levels of depression are already quite high (i.e., approaching or exceeding 16, which is a lenient cutoff for clinical depression). A similar pattern is revealed in Figure 3, although there are currently no cutoff scores for self-criticism within which to ground this pattern. Conceptually, the restriction of range possibility tells a very interesting tale of those adolescents who have neither vulnerability – self-criticism/depression or rocket exposure – and who are therefore free of depression and increased self-criticism (*lower left corner* in Figures 2 and 3). In other words, the restriction of range possibility tells the tale of (poorly understood) resilience.

Study limitations and strengths

The first limitation to be discussed is the high attrition rate identified in this study. Such a high attrition might threaten both internal and external validity. Specifically, it is possible that with fewer participants dropping out, additional findings linking personality and psychopathology under stress might have been detected (internal validity). Also, attrition potentially changed the nature of what was initially a representative sample of Israeli adolescents exposed to political violence, rendering generalizability to other high-risk populations more difficult (external validity).

Another important limitation is our exclusive reliance on self-reports. Such reliance is likely to inflate shared method variance, in turn inflating the magnitude of the associations found in this study. It is therefore crucial that future studies use informant data and and/or semi-structured interviews of personality and psychopathology in adolescents' exposure to political violence. In addition, the SAI, although used extensively in psychopathology research, might not be the only, or even the best, measure of adolescent anxiety. In fact, we used only seven items from the SAI, which further limits generalizability. At the same time, this seven-item version did yield important findings in the present studies.

Yet another important limitation pertains to causality. Although our findings are based on a prospective-longitudinal design, the correlational nature of our design still limits causal inference. It should be noted, however, that previous research has shown that effects of self-criticism on internalizing psychopathology are robust in the face of controlling for a host of potentially confounding factors, including strong covariates such as neuroticism (for a review, see Shahar, 2015). This, of course, does not exempt researchers from controlling for additional confounds (e.g., temperament) in future research. Such stringent controls are essential given the ethical and logistic inability to use experimental manipulations in personality and psychopathology research.

With these limitations in mind, this study, to the best of our knowledge, is the first to provide a robust test for both the vulnerability and scarring models of adolescent personality and psychopathology, while taking into consideration the moderating role of higher-order, human-ecological risk, namely, exposure to rockets. That our multifaceted design yielded findings consistent with both personality vulnerability and scarring models, and stress-diathesis and dual-vulnerability (rival vulnerabilities) patterns, attests to the complex and dialectic nature of adolescent stress, risk, and resilience (Shahar, Elad-Strenger, & Henrich, 2012).

Clinical and public health implications

As suggested by our findings, juxtaposed against previous research, personality might both lead and stem from internalizing and externalizing symptoms. Accordingly, personality vulnerability should be routinely assessed when intervening with adolescents exposed to political violence. Another implication pertains to our finding whereby the pernicious cycle involving self-criticism and depression disappeared under high rocket exposure. It would, of course, be absurd to recommend exposure to political violence for the benefit of severing the link between adolescent self-criticism and depression. Nevertheless, as soon as adolescents are trapped within such an exposure, psychosocial and community-based interventions may use aspects of the exposure, such as the aforementioned potential of increased social cohesion and outwardly directed attention. Specifically, adolescents may be explicitly encouraged to get immersed in activities that would prevent them from ruminating, consequently diffusing the self-criticism-depression cycle. For instance, *volunteer work*, repeatedly demonstrated to enhance physical and mental health (Poulin, 2014), may constitute a promising avenue for interventions with youth afflicted by political violence. Thus, exposed adolescents may be trained to help other exposed teens in coping, thus empowering both parties, and the society at large (Rhodes & DuBois, 2008).

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