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## Brief report: Adolescents under missile attacks: Sense of coherence as a mediator between exposure and stress-related reactions

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### A B S T R A C T

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Employing the salutogenic approach (Antonovsky, 1987), this pilot study aimed at exploring the mediation effect of Sense of Coherence (SOC) on the relationships between exposure to missile attacks and stress-related reactions among adolescents. A strong SOC means a tendency to see the world as more comprehensible, manageable and meaningful. Data were gathered during August 2006 (Second Lebanon War) from 230 Israeli adolescents, 12–18 years old. Adolescents filled out self-reported questionnaires, including demographics, level of physical exposure, SOC, Scale of Psychological Distress (SPD), State Anxiety and State Anger. Exposure to missile attacks was found to be significantly positively linked to stress reactions; exposure was negatively linked to SOC which was also negatively linked to stress reactions. The mediation hypothesis was supported, with SOC mediating the effect of exposure to missile attacks on stress reactions. It seems that SOC may have a protective effect against stress reactions among adolescents exposed to political violence. This should be further studied in a longitudinal research.

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Employing the salutogenic approach, the aim of our study was to investigate resources that may reduce distress reactions and enable adolescents to stay healthy despite a stressful situation of war. Antonovsky (1987) sought to explain successful coping with stressors by the cognitive orientation of sense of coherence (SOC). He defined SOC as a tendency to see the world as more or less comprehensible, manageable and meaningful. SOC describes how individuals perceive the world and the events that happen to them, and has implications for individual responses in various stressful situations (Antonovsky, 1987). People with weak SOC may react with more stress-related symptoms and/or maladaptive coping compared to those with strong SOC (Eriksson & Lindström, 2006). Moreover, SOC was found to be a mediator between exposure to violence and stress reactions (Hogh & Mikkelsen, 2005).

Antonovsky (1987) emphasized that SOC is a developmental construct that becomes crystallized around the age of 30. However, several studies over the last decade have indicated that SOC is stable from mid-adolescence (e.g., Ristkari et al., 2009) and that during adolescence SOC may contribute to moderating stress experiences similar to the way it does in 'mature' adults (Sagy, 1998; Sagy & Braun-Lewensohn, 2009).

Regarding the effects of political violence on adolescents, previous research has shown that part of the adolescent population suffers from psychological difficulties (e.g., Braun-Lewensohn, Celestin-Westreich, Verte, Celestin, & Ponjaert-Kristoffersen, 2009a; Solomon, Laufer, & Lavi, 2005) while the majority of adolescents tended to exhibit resilience and coped well (Sagy, 2002; Sagy & Braun-Lewensohn, 2009; Zeidner, 2005).

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Indeed, different types of exposure to stressful experiences were found to be explanatory factors of psychological problems among individuals following such events (Braun-Lewensohn, Celestin-Westreich, Celestin, Verte, & Ponjaert-Kristoffersen, 2009b; Pfefferbaum et al., 2002). Living in a region highly threatened by attack, as well as proximity to actual missile damage, was found to be a primary factor for higher rates of psychological problems (Abo & Zalsman, 2003; Braun-Lewensohn et al., 2009b; Shaw, 2003). However, physical exposure could explain only limited amounts of the variance in stress reaction outcomes (Braun-Lewensohn et al., 2009b; Pfefferbaum et al., 2001). Thus, it appears important to explore the process in which adolescents do or do not develop symptoms of stress reactions when facing missile attacks and wars (Sagy & Braun-Lewensohn, 2009).

This pilot research was conducted among northern Israeli adolescents, who were exposed to intensive missile attacks during the Second Lebanon War in July and August 2006. These missiles killed and injured citizens, including children and adolescents. We asked:

1. What were the relationships between exposure to missile attacks, SOC and stress reactions? We hypothesized that level of exposure would be linked to stress reactions (e.g., Braun-Lewensohn et al., 2009b); SOC would be negatively linked to stress reactions (Eriksson & Lindström, 2006) and to exposure (Hogh & Mikkelsen, 2005).
2. Did SOC mediate the relationships between exposure and stress reactions? We hypothesized that SOC would partially mediate the relationships between exposure to missile attacks and stress reactions (Eriksson & Lindström, 2006).

## Method

### *Participants and procedures*

Two hundred and thirty teenagers living in northern Israel participated in the study. The mean age of the sample was  $M = 15.3$   $SD = 1.53$ , and 68% were girls.

The correspondent author and research assistants administered questionnaires in summer camps which were organized by the Israeli Scouts and the Jewish Agency for young people from the north of Israel to provide a respite during the Second Lebanon War (149 questionnaires). Additionally, five adolescent girls were recruited and were supervised by the researchers to administer self-reported questionnaires to their peers in their homes or shelters (63 questionnaires). In one kibbutz settlement, the youth counselor administered the questionnaires to the adolescents (18 questionnaires). Participation was voluntary, anonymity was emphasized and permission from parents was received.

## Measurements

**Physical exposure to missile attacks** was assessed by three yes/no questions: whether a missile had fallen on one's home, in one's neighborhood, or whether one had been hurt by a missile.

**Sense of Coherence (SOC)** (Antonovsky, 1987) short form consists of 13 items, on a seven-point Likert scale. High scores indicate a strong SOC. Reliability and internal consistency of the SOC questionnaire are high (Eriksson & Lindström, 2006). In the present study, the Cronbach's alpha was .75.

**State Anxiety & State Anger** (Spielberger, Gorsuch, & Lushen, 1970) was used in order to assess adolescents' state anxiety and anger. The Hebrew translation was found to be reliable, valid and equivalent to the English Inventory (Teichman, 1978). State anxiety consists of eleven items and state anger of six items on a four-point Likert scale. Cronbach alpha reliability was .87 and .81 respectively in this study.

**Psychological Distress** is a six-item psychosomatic symptom scale, referring to frequency of occurrence of familiar psychosomatic symptoms. The scale was developed in Hebrew (Ben-Sira, 1979) and has satisfactory psychometric properties (Ben-Sira, 1988). It was elaborated by Sagy for use in a population of children and some of the symptoms were modified (Sagy & Dotan, 2001). In this format, the questionnaire included five items and was scored on a scale of 1–4. Cronbach alpha was .74.

Factor analysis was run on the outcome scales- 'state anxiety', 'state anger' and 'psychological distress' to create one variable of 'stress reactions'. One factor emerged with total variance of 63.77%. Cronbach alpha for the new scale was .71. Preliminary assumption testing was conducted to check for normality, linearity, outliers and multicollinearity and no serious violations were noted. ( $M = .12$ ,  $SD = 1.00$ , range:  $-1.97$ – $2.91$ ).

## Results

Physical exposure was reported by 47% of the youths; 44% reported missiles in their neighborhood, 10% had been hurt by a missile and 6% had a missile fall on their home.

Following Baron and Kenny's approach (1986), the mediating role of sense of coherence was assessed as follows: (a) Does exposure significantly predict stress reactions? and (b) Does the inclusion of sense of coherence significantly reduce the predictive power of exposure, thereby establishing sense of coherence as the mediator?

Each of the predictor variables had a significant zero-order correlation with stress reactions. The exposure measure was significantly and positively linked to stress reactions (.31\*\*) and SOC was negatively linked to stress reactions (–.42\*\*).

A hierarchical regression analysis was used to develop a model for predicting stress reactions from exposure and SOC. Both had significant partial effects in the full model. Exposure was found as a significant explanatory factor to stress reactions with a total variance of 10% ( $\beta = .32, p < .01$ ). The two predictor model exposure ( $\beta = .26, p < .01$ ) and SOC ( $\beta = -.35, p < .01$ ) was able to account for 20% of the variance. Beta's differences were shown for exposure between the first regression and the second one. A Sobel test showed a significant partial mediation ( $z = 3.41, p < .000$ ), thus indicating that sense of coherence significantly mediated the relationships between exposure and stress reactions.

## Discussion

The results of this pilot study support previous findings of physical exposure to political violence as related to higher levels of stress reactions (Braun-Lewensohn et al., 2009b). Our main question, however, related to the mediation effect of SOC between exposure and stress reactions. Strong SOC was related to higher resiliency and to lower levels of stress-related reactions. These results support the salutogenic approach of Antonovsky (1987) indicating mediating relationships between exposure to stress and stress-related reactions by the personal orientation of SOC. According to Rutter (2000), mediating mechanisms in protective processes during adolescence may reduce the impact of the risk and the negative chain reactions. SOC, at least in our pilot study, seems to play this protective role during adolescence.

This pilot research is clearly exploratory in nature and the findings should be considered with appropriate reservations. Our data were collected in various ways in the midst of a war. Therefore, the sample is neither representative nor random but rather consists of youngsters whom we were able to reach during such a difficult time. Thus, some degree of potential sample bias should be taken into account. The distribution according to socio-demographic criteria was not sufficient and the sample included a higher percentage of girls than boys. Moreover, although young people's self-reports are generally a reliable source of information about their stress experiences, a multi-informant paradigm could enhance the data. Finally, in the absence of a base rate for the participants' stress reactions prior to the study period, we cannot state with certainty whether or not the observed outcomes are due solely to the impact of the war.

In spite of these limitations, the importance of this research lies in the fact that it constitutes field research in the midst of the stressful situation of war. The conflictual violent situation in the area serves as a "natural laboratory" for investigation which is essential for studying human behavior (Lazarus, 1982).

To summarize, our study aimed to investigate SOC as a mediator between exposure to missile attacks and stress reactions. The results support our hypothesis, meaning that SOC had both direct and mediation effects on stress reactions. Adolescents with high SOC, despite exposure to missile attacks, had lower stress reactions. It seems that SOC had a protective effect. These results, however, deserve further research in a longitudinal research in order to make generalization and to draw practical implications.

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