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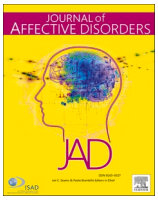

Research paper

Complexity of exposure to mass-casualty conflict and terror stress: A population study following a major civilian targeted event

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ABSTRACT

Objectives: The October 7, 2023 events exposed both Israelis, Palestinians, and the entire middle east to unprecedented complex trauma. Guided by theoretical considerations and expert panel discussions, we identified seven distinct exposure domains: missile attacks, physical violence, evacuation, combat participation, hostage involvement, media exposure, and group-based marginalization. We examined actual exposure, that of self and significant others, to these domains alongside subjective stress and major stressful life events. Outcomes included PTSD, depression, anxiety, and somatic symptoms.
Methods: A representative sample of Israeli-Jewish adults (N = 928) surveyed for political stress prior to the October 7th 23 events were assessed again in December 2023. They completed a newly developed measure capturing the above seven exposure domains, a measure of major stressful events, and measures of the above outcomes. Hierarchical Regression Analysis was employed to identify both linear and curvilinear effects of exposure, moderated by life stress.
Results: Self and significant others' exposure were unrelated to subjective stress (*r*s: 0.09 and 0.14, ns) but differentially predicted all symptom types. Subjective stress was the strongest predictor of outcomes overall (βs: 0.18–0.35). Curvilinear effects and interactions between trauma exposure and major life stress were documented, although the latter interactions were substantially trimmed by sensitivity analyses.
Conclusions: A comprehensive conceptualization and assessment mass-casualty armed conflict is essential for identifying stress–distress profiles and guiding personalized care and preventive interventions worldwide.

Trauma research has recently addressed multifaceted conditions such as "Complex Trauma/PTSD" (Cloitre et al., 2013), "compounded community trauma" (Horowitz et al., 1995), "ongoing trauma" (Dafna-Tekoah and Harel, 2023), and "mass trauma" (Erikson, 1994). However, research on civilians facing multifaceted, mass-casualty, armed conflict is scarce. This study examined responses to one of the most complex cases: the October 7, 2023 mass-casualty attack on the Israeli Negev and the ensuing Israel-Gazza war.

1. Description of the armed conflict

On October 7th, 2023, Hamas Organization, which controls the

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Gazza Strip that borders Israel, launched an assault on Israel's western Negev, firing ~3000 rockets and infiltrating by land, air, and sea (Reuters, 2023a; Associated Press, 2023). Armed militants infiltrated civilian communities, causing ~1200 deaths and capturing 251 hostages (BBC, 2025). Compelling evidence of sexual assaults accompanying the attacks surfaced (United Nations Security Council, 2024; United Nations Office of the Special Representative of the Secretary-General on Sexual Violence in Conflict, 2024). Concurrently, Hesbollah Organization at Lebanon began firing missiles at Israel's Northern border.

An emergency decree mobilized over 300,000 reservists - Israel's largest call-up. By October 10th, the IDF reported all infiltrators had been either killed or expelled (Times of Israel, 2023c). Simultaneously, over 110,000 residents were evacuated from border areas - a process widely criticized as chaotic (Times of Israel Staff, 2024). Civil society groups mobilized ~15,000 volunteers to aid evacuees (Reuters, 2023c; Times of Israel, 2023b). After securing its territory, the IDF launched airstrikes in Gaza and Lebanon, followed by a ground invasion beginning October 27, 2023.

Domestically, hostages became rallying symbols amid renewed political polarization. Graphic footage filmed by militants spread widely on social media, with one survey linking such viewing to heightened anxiety among Israeli students (Dopelt and Houminer-Klepar, 2024). Still, public focus soon centered on the hostages.

The war sparked global protests and rising hate crimes: 9354 antisemitic incidents were recorded in the U.S. (Anti-Defamation League, 2024), and CAIR reported a 180% rise in anti-Muslim complaints (Council on American-Islamic Relations, 2024).

As of July 2025, the Gaza Health Ministry reported over 60,000 deaths (PBS, 2025), including significant numbers of women and children, while international humanitarian organizations documented the displacement of around 600,000 Palestinians, widespread destruction of hospitals, schools, and residential areas, and severe shortages of food, water, and medical supplies (UNRWA, 2025). The conflict also caused widespread disruption to medical care, sanitation, and access to necessities in Gaza, compounding the psychological toll on its residents. These events sparked intense domestic debates within Israel about proportionality, civilian protection, and the moral implications of military operations, dividing public opinion and adding another layer of complexity to an already polarized society.

The war in Gaza was compounded by a widening regional conflict involving the "Axis of Resistance." Beginning on October 19, 2023, the Houthi movement in Yemen initiated a campaign of long-range missile and drone attacks targeting the southern port of Israel, international shipping lanes, and major Israeli cities. These attacks persisted through the end of the conflict as a stated act of solidarity with Gaza. The most significant escalation, however, was the shift toward direct military confrontation with Iran. Following reciprocal strikes in April and October 2024, the tension culminated in June 2025 in the "Twelve-Day War." On June 13, 2025, Israel launched a massive air campaign against Iranian military and nuclear infrastructure, to which Iran retaliated with an unprecedented barrage of over 1500 ballistic missiles and drones to Israeli cities. While many were intercepted, several breached defense systems, striking civilian centers.

Hostilities finally subsided in late 2025 following the assassinations of senior Hamas and Hezbollah leadership and diplomatic intervention by the Trump administration. A multi-phase ceasefire brokered in October 2025 facilitated the final release of the remaining living and dead Israeli hostages in exchange for Palestinian prisoners. Under the terms of the agreement, the IDF began a phased withdrawal from Gaza's urban centers, while international agencies initiated a large-scale humanitarian stabilization effort for the displaced Palestinian population. Although the official war concluded, the psychological scars of the multi-front conflict remain a defining feature of contemporary Israeli identity.

2. Mapping the complexity of military/terror stress

We sought to investigate the mental health implications of this armed conflict as soon as it erupted. However, we did not find an adequate measure that taps the magnitude and complexity of the unfolding. Hence, we set out to develop such a measure.

First, we aimed at mapping the important parameters of the armed conflict. Conducting informal interviews with "experts by experience", an extensively used practice in psychiatric research (Fusar-Poli et al., 2022). In Israel, there is no shortage of such experts as the country is routinely targeted by armed conflicts, mass medical crises, and other traumatic situations. We also drew from our own experience as clinicians working with traumatized individuals both in Israel and abroad. These resources, juxtaposed against extant literature, has led us to identify four broad parameters relevant to this armed conflict: (1) exposure dimensions, (2) multiple outcomes, (3) nonlinearity, and (4) co-occurrence with other major stressors.

2.1. *Exposure dimensions*

This refers to the multitude of potentially traumatizing exposure of numerous dimensions propelled by the entire situation, in a manner akin to "confounded trauma". Again, consulting with experts by experience and with our own past and incoming clinical work, we identified seven exposure domains, all relevant to the current circumstances. These are: (1) missile attacks, (2) physical violence (including sexual assault), (3) evacuation, (4) hostage involvement, (5) combat participation (reservists/armed civilians), (6) intensive media exposure (e.g., Hamas footage), and (7) group-based marginalization. The latter dimension pertained to wartime prejudice, discrimination, and hate crimes, leveled against both Jewish and non-Jewish individuals (Anti-Defamation League, 2024; Oswald, 2005; Reuters, 2023b). In this study, all seven exposure domains were assessed.

2.2. *Multiple outcomes*

This parameter refers to the fact that traumatic circumstances lead to numerous psychopathological outcomes. While PTSD is often seen as trauma's primary outcome, other sequelae include anxiety, depression, and somatization (e.g., Hogg et al., 2023; Gerson and Heppell, 2018; Moran et al., 2023; Shabat et al., 2024). For instance, trauma survivors are nearly three times more likely to have chronic pain (Afari et al., 2014). This study assessed four outcomes: PTSD, depression, anxiety, and somatization.

2.3. *Curvilinearity*

Whereas the overarching expectations of stress/trauma researchers is that the effect of stress on distress/psychopathology is linear, this is often not the case. Instead, two potential non-linear, more specifically curvilinear, patterns could be surmised. One is *acceleration:* while relatively low (or low to medium) levels of exposure may be benign (i.e., unrelated to symptoms) or only mildly aversive, at a certain point the effect of exposure on outcomes might become stronger (i.e., steeper; Wang et al., 2023). The second is a eustress pattern, according to which several regions of exposure along the entire exposure continuum may enhance adaptation, in turn reducing symptoms. This would echo the Yerkes and Dodson (1908), Selye's (1975) General Adaptation Syndrome (GAS) and the hormesis based model of resilience (Oshri, 2023). Hormesis is a term burrowed from toxicology and pharmacology, and it dates back to Hugo Shultz's discovery that at low levels, certain toxins acts as stimulants of yeast metabolism (Schulz, 1887; Oshri, 2023). Correspondingly, the hormesis model of resilience suggests that exposure to low stress may actually increase adaptation.

2.4. Role of major stressful life events

Complex trauma often co-occurs with unrelated stressors. Negative life events, both childhood and postwar, was shown to predict PTSD beyond initial symptoms and war-related stress (Solomon et al., 2008), and postwar stress predicts insecure attachment beyond prior stress and PTSD (Horesh et al., 2014). What is conspicuously lacking in extant research is the examination of interactions between focal traumatic events and life stress that occurs alongside the trauma. Specifically, do major stressful life events unrelated to the trauma amplify the effect of trauma exposure on psychopathological symptoms? Similarly, does exposure to the trauma exacerbates the effects of major stressful life events on psychopathology? These possibilities were addressed in the present investigation.

3. The present investigation

The study's conceptualization and measures is graphically presented in an **Online Supplementary Material #1.** The measure, which we tentatively term *Mass, Multidimensional Armed-Conflict Trauma Measure **(M2D-ACTM)*** assesses both actual exposure, which would probably be labeled by Brown and Harris (1978) as "contextual threat", and a subjective perception of stress ("perceived stress"). Research on perceived stress (e.g., Cohen et al., 1983; Shahar et al., 2009) shows subjective experience often predicts adverse outcomes better than actual exposure, warranting its inclusion. **M2D-ACTM** also distinguishes between self-exposure and exposure through and significant-other (SO), which has shown to yield an adverse impact upon the self (e.g. Cozza and Guimond, 2011).

Each of the above noted seven exposure domains were assessed by presenting participants with five brief scenarios, ordered from least to most threatening, reflecting a dose–response effect (Mollica et al., 1998). The sencarios were consensually embraced by the research team. Identical scenarios, anchors, and opt-outs are used for self and SOs. After each domain, participants rated perceived stress regarding the domain's existence, regardless of actual exposure (see Method section).

M2D-ACTM was administered online to a representative sample of Jewish adults previously surveyed in August 24th, 2023 (T1), namely, prior to the October 23 eventualities. At that time, participant recruitment focused on their responses to the highly controversial judicial reform launched by the current coalition (Meirovitch-Shoham et al., 2025).

On January 15, 2024 (T2), about four months after T1 and three months after the IDF's entered Gazza, the same participants completed the **M2D-ACTM** along with measures of major stressful life events, PTSD, depression, anxiety, and somatization. This manuscript, comprising our first report, focuses on presence vs. absence of exposure to the seven putative trauma domains. Dose-response findings will appear in a future report. We focused on cumulative self-exposure (SELF), cumulative exposure of significant others (SOs), and subjective stress (SUBJ).

Our hypotheses were:

H1. Cumulative exposure of both SELF and SOs would predict all four clinical outcomes (PTSD, depression, anxiety and somatization symptoms).

H2. subjective reaction to the trauma (perceived stress) would usurp actual exposure by self and through SOs in predicting symptoms. No a-priori hypotheses were formulated regarding the differences between the two actual types of exposure.

H3. Effects of exposure to the trauma on the clinical outcomes would be both linear and curvilinear. Two curvilinear patterns were considered: Acceleration (effect of trauma becomes steeper at a certain point along the exposure continuum) and eustress/hormesis (at low end exposure, several regions of exposure are associated with reduced symptoms).

H4. Major stressful life events would interact with trauma exposure (SELF, SOs, and SUBJ) in predicting clinical outcomes.

4. Method

4.1. Participants and procedure

This study was approved by the Institutional Review Board (IRB) of Ben-Gurion University of the Negev in Israel (Protocol #623–1).

Data was collected online via the MIDGAM PANEL, a large academic research platform. The sample was representative of Israeli-Jewish adults by gender, age, and closely matched on residence, religiosity, education, and socioeconomic status (see Shahar et al., 2022; Web Tables 1–4 and Fig. 1a-1d). Per both the IRB protocol and the MIDGAM PANEL infrastructure, participants signed an informed consent electronically prior to being recruited to the study. Unfortunately, as online panels in Israel lack access to a nationally representative samples of Israeli Arabs (Palestinian citizens of Isreal), only Jewish participants were

Table 1
Sample demographics.

Category	Distribution
Sex	**Females**: 466 (50.21%).
Age	**18–24:** 73 (7.86%), **25–34:** 140 (15.08%), **35–44:** 179 (19.28%), **45–54:** 15 (16.48%), **55–64:** 148 (15.94%) **65+:** 235 (25.32%).
Religious Identification	**Secular:** 567(61.09%). **"Traditional:**: 186 (20.04%) **Religious:** 129 (13.90%). **Ultra Orthodox:** 46 (4.95%).
Income (subjectively assessed)	**No income:** 13 (1.40%). **Way below average:** 162 (17.45%). **Below average:** 171 (18.42%) . **Average:** 297 (32.00%) . **Above average:** 180 (19.39%) . **Way above average:** 41 (4.41%). **Refused to answer:** 64 (6.89%) .
Education	**Academic education:** 403 (43.42%). **No academic education:** 525(56.57%).
Geographic background	**South:** 93 (10.02%) **Center/Tel-Aviv:** 495 (53.34%). **North/Haifa:** 210 (22.62%). **Judea and Samaria ("West Bank"):** 43 (4.63%). **Jerusalem area:** 87(9.37%).
Country of birth	**Israel:** 715 (77.07%) **Former USSR:** 81 (8.72%) **Eastern Europe:** 26 (2.80%) **South America:** 16 (1.72%) **Western Europe:** 15 (1.61%) **North America**: 11 (1.18%) **Oceania, Asia, Africa, the Middle East, Maghreb countries, and Central America:** (10\) were thinly spread around **Missing:** 39.

Table 1
Means, standard deviations, and intercorrelations.

	1	2	3	4	5	6	7	8	9	10
1. DEPT1	–									
2. DEPT2	0.50	–								
3. ANXT1	0.73	0.51	–							
4. ANXT2	0.42	0.73	0.48	–						
5. PTSDT2	0.38	0.58	0.41	0.63	–					
6. SOMT2	0.38	0.50	0.40	0.55	0.64	–				
7. SELFT2	0.14	0.18	0.12	0.21	0.28	0.34	–			
8. SOT2	0.10	0.23	0.09	0.21	0.25	0.24	0.53	–		
9. SUBJT2	0.19	0.37	0.24	0.44	0.38	0.28	0.09	0.14	–	
10. SEX	0.13	0.19	0.17	0.22	0.09	0.15	−0.10	0.03	0.33	–
M	1.54	1.92	1.68	1.91	3.53	0.48	2.41	3.40	39.80	
SD	1.55	1.73	1.64	1.76	3.68	0.67	1.25	1.71	10.33	

Notes
DEP = Depression subscale of the PHQ-4; ANX = Anxiety subscale of the PHQ-4; PTSD – PCL5 – Four-item measure; SOM = Somatization subscale of the BSI; SELF = Participants' reports on their own exposures; SO = Participants' reports on exposures of significant others; SUBJ = Subjective stressfulness.
Numbers pertaining to Sex are biserial correlations.

included. We emphasize that this is a feasibility constraint rather than exclusion by design.[3] Limitations for generalizability are discussed later.

T1 took place on August 24th, 2023, lasting one day (N = 1202; determined by power analysis). At that assessment wave, we administered measures of depression and anxiety (i.e., the PHQ-4, see description below), as well as measures of political orientation unrelated to the present report.

T2 took place on January 15th, 2024, over five days (N = 928), reflecting 77.2% retention, consistent with prior studies using this platform (e.g., Israeli et al., 2018; Shahar et al., 2022, 2023). At that measurement occasion, we administered the above described M2D-ACTM. Also, we readministered the PHQ-4 (depression and anxiety), and brief measures of PTSD (PLC4–4 item version) and somatization (BSI somatization subscale). We also administered a measure of major stressful life events (see below).

Attrition analyses showed that dropouts and completers did not differ in T1 depression, anxiety (independent-sample t-tests), sex, or religiosity (contingency tables). Completers were older, Ms (SDs) = 49.21 (16.91) vs. 39.55 (17.11), $t(1200) = 8.28$, $p < .001$, Cohen's d = 0.56. Age-group analysis revealed small differences in the youngest group (18–24: 54.48% vs. 45.52%) that increased with age (25–34: 35.48% vs. 64.52%; 35–44: 20.80% vs. 79.20%; 45–54: 16.85% vs. 83.15%; 55–64: 11.90% vs. 88.10%; 65+: 13.92% vs. 86.08%), M-L $\chi^2(5) = 86.93$, $p < .001$).

In Table 1 we present the demographic profile of our sample (N = 928). It was identical to that evinced in previous studies using this platform (Israeli et al., 2018; Shahar et al., 2022, 2023).

4.2. Measures

Mass, Multidimensional Arched Conflict Trauma Measure (M2D-ACTM): was developed for the present study and is presented in **Online Supplementary Material #2.** It assesses "Actual" exposure – by self and SOs – and subjective stressfulness of the seven exposure domains (see **Online Supplementary Material #1)**. "Actual" exposure is assessed by participants' selection of one of five successively severe scenarios presented for each domain, or one of the middle points separating them. Importantly, the first scenario in every domain reflected no exposure. Subjective stressfulness is assessed through a single, 7-point item pertaining to each of the seven exposure domains. For the "media" domain, two stressfulness items were presented, one for the intensity of media consumption and the other for the presence of horrific video documentations. Importantly, the item tapping subjective stress requested participants to rate stressfulness that is unrelated to their actual exposure (see **Online Supplementary Material #2).**

For this study, the M2D-ACTM produced three indices. The first two reflect cumulative exposure across seven domains, defined as any scenario selection other than the first, including the midpoint but excluding "opting out." Sum scores (0–7) were computed for both SELF and SOs. Subjective stressfulness was the sum of eight "subjective" items (two "media" plus one for each of the other six domains).

Researchers have expressed concern over participants' adverse reactions to trauma assessment (Grubaugh et al., 2012; Labott et al., 2016), particularly distress from traumatic memories and confusion over complex events. Distress typically subsides within minutes–hours and rarely leads to adverse events (e.g., requests for survey-related consultation). To minimize these adverse reactions, participants could skip emotionally flooding questions, a practice recommended in the literature (Labott et al., 2016). Walker et al. (1997) found only 5% would have declined participation had they known in advance. We therefore adopted >5% opting-out as a tentative indicator of a distress-provoking domain.

To minimize confusion, we employed two integrated strategies. First, we inquire about each of the above-mentioned seven exposure domains by asking participants to select one of five scenarios that describe the level of exposure. The five scenarios, worded clearly and succinctly, were ordered linearly with respect to their presumed severity. Second, we allowed selection of mid-points between each pair of scenarios, i.e., participants who deliberated between the first two scenarios could select a midpoint between the two.

In **Online Supplementary Material #3** we provide evidence for the psychometric properties of the M2D-ACTM. As expected:

(1) Frequencies of exposure across all domains conformed to actual events, namely, most of the sample was exposed to missiles and traumatic media contents, whereas a minority, albeit substantial, was exposed to the other, more extreme exposure domains.
(2) The hierarchical order of the scenarios presented to participants largely "worked", in that the more extreme the scenario was, the lower the number of participants endorsing it (see important exceptions in the online supplementary material).
(3) The percentages of participants opting out were low across all domains for both SELF and SOs.

[3] Elsewhere, in our study on the Israeli population's reaction to COVID019 (Shahar et al., 2022), we noted that non-Jewish minorities (Arabs, Bedouins, Druze) have disproportionally low access to the internet, and some of these minorities (e.g., Bedouins) include citizens without permanent residence. Consequently, internet panels in Israel cannot guarantee representativeness of these populations. Like other Israeli researchers, we attempt to address this problem by sampling Israeli Jews via the MIDGAM (or other panels), and also sample Israeli minorities using other practices (e.g., snowball sampling). However, the difference in sampling methods renders the comparison between Jews and non-Jews very challenging.

Table 2
GLM results.

	ANX2		DEP2		PTSDT2		SOMT2	
	b	β 95%CI	b	β 95%CI	B	β 95%CI	b	β 95%CI
BLOCK 1								
Intercept	**1.67****		**1.83****		**3.14****		**0.38****	
DEPT1	**0.12****	**0.100 .03/−18**	**0.27****	**0.240 .16/31**	**0.32****	**0.140 .06/0.21**	**0.07****	**0.160 .09/0.24**
ANXT1	**0.30****	**0.280 .20/0.35**	**0.25****	**0.240 .16/0.31**	**0.38****	**0.170 .09/0.25**	**0.07****	**0.170 .09/0.25**
SEX (F)	0.23	0.07	0.16	0.05	−0.26	−0.03	−0.05	−0.08
AgeGroups (25–34)	−0.08	−0.02	−0.15	−0.03	−0.38	−0.03	**−0.22****	**−0.12− 0.20/−0.04**
AgeGroups (35–44)	−0.03	−0.00	−0.08	−0.02	−0.29	−0.03	**−0.20***	**−0.12− 0.21/−0.03**
AgeGroups (45–54)	−0.09	−0.02	−0.05	−0.01	−0.09	−0.90	**−0.20***	**−0.11− 0.19/−0.02**
AgeGroups (55–64)	−0.15	−0.03	0.07	0.02	−0.70	−0.07	**−0.21****	**−0.14− 0.20/−0.03**
AgeGroups (65+)	−0.22	−0.06	−0.24	−0.06	**−1.23****	**0.15− 0.24/−0.05**	**0.24****	**−0.15− 0.25/−0.06**
Religiosity (Traditional)	−0.03	−0.00	−0.03	−0.00	0.36	0.04	0.16	0.09
Religiosity (Religious)	−0.10	−0.02	0.00	0.00	−0.50	−0.05	0.05	0.03
Religiosity (UO)	−0.04	−0.02	−0.50	−0.06	−1.07	−0.06	0.01	0.00
SelfT2	0.11	0.06	0.04	0.02	0.13	0.04	**0.07****	**0.110 .03/0.19**
SOsT2	0.12	0.07	**0.23*****	**0.140 .07/0.19**	0.29	0.07	0.03	0.04
SUBJT2	**0.62*****	**0.350 .29/0.41**	**0.43*****	**0.250 .18/0.31**	**1.23*****	**0.330 .27/0.40**	**0.12*****	**0.180 .12/0.25**
$SELF^2T2$	0.01	0.01	−0.02	−0.02	**0.20*****	**0.110 .05/0.18**	**0.05*****	**0.170 .10/0.14**
SOs^2 T2	−0.04	−0.03	−0.07	−0.05	0.07	0.02	0.02	0.04
$SUBJ^2T2$	**0.13*****	**0.100 .05/16**	0.09	0.07	**0.30*****	**0.120 .06/0.18**	0.04	0.09
MLE: NvO	0.26	0.07	0.10	0.02	0.81	0.09	0.05	0.04
MLE: NvM	**0.49*****	**0.120 .06/18**	**0.45*****	**0.110 .05/0.16**	**1.94*****	**0.220 .17/0.28**	**0.26*****	**0.170 .11/0.23**
BLOCK 2								
Intercept	**1.72****		**1.85*****		**3.16*****		**0.38*****	
SELF x SOs	0.03	0.02	−0.00	−0.00	−0.12	−0.04	**−0.09****	**−0.16− 0.26/−0.06**
SELF x SUBJ	0.17	0.09	−0.00	0.00	0.33	0.09	0.05	0.08
SOs x SUBJ	0.02	0.02	0.04	0.05	0.01	0.01	0.00	0.03
SELF x SOs^2	−0.03	−0.04	0.00	0.00	0.03	0.01	0.04	0.09
SELF x $SUBJ^2$	0.05	0.05	0.04	0.04	**0.27***	**0.120 .02/0.21**	0.01	0.04
SOs x $SELF^2$	0.05	0.10	0.00	0.01	−0.04	−0.04	−0.01	−0.06
SOs x $SUBJ^2$	−0.04	−0.02	−0.05	−0.03	0.01	0.00	−0.02	−0.02
SUBxSELF^2	−0.04	−0.04	0.02	0.02	0.09	0.05	0.02	0.04
SUBJ x SOs^2	−0.03	−02	0.00	0.00	−0.01	0.00	−0.00	−0.00
BLOCK 3								
Intercept	**1.71*****		**1.86*****		**3.31*****		**0.42*****	
SELF x NvO	−0.27	−0.08	−0.13	−0.04	−0.38	−0.05	**−0.16***	**−0.13− 0.23/−/03**
SELF x NvM	0.08	0.03	−0.25	−0.08	**−0.80***	**−0.13− 0.25/−0.02**	−0.03	−0.03
SOs x NvO	−0.04	−0.04	−0.05	−0.05	−0.32	−0.13	0.01	0.03
SOs x NvM	−0.11	−0.03	−0.09	−0.05	0.63	0.09	−0.05	−0.04
SUBJ x NvO	−0.09	−0.08	0.10	0.09	**0.78****	**0.110 .12/0.55**	−0.04	−0.09
SUBJ x NvM	−0.09	−0.05	−0.02	−0.01	**0.73***	**0.200 .05/0.37**	−0.02	−0.03
$SELF^2$ x NvO	0.12	0.08	**0.17**	**0.12***	0.05	0.01	0.00	0.01
$SELF^2$ x NvM	0.03	0.02	0.13	0.12	0.16	0.07	−0.00	−0.01
SOs^2 x NvO	0.12	0.03	−0.02	−0.00	−6.31	0.00	0.02	0.01
SOs^2 x NvM	−0.09	−0.04	−0.20	−0.09	−0.18	−0.03	0.05	0.05
$SUBJ^2$ x NvO	−0.10	−0.10	0.09	0.03	0.19	0.02	−0.02	−0.05
$SUBJ^2$ x NvM	−0.12	−0.03	−0.07	−0.02	−0.01	0.02	0.04	0.03

Notes
DEP = Depression subscale of the PHQ-4; ANX = Anxiety subscale of the PHQ-4; PTSD – PCL5 – Four-item measure; SOM = Somatization subscale of the BSI; SELF = Participants' reports on their own exposures; SOs = Participants' reports on exposures of significant others; SUBJ = Subjective stressfulness; MLE = Major life events;

NvO = Dummy coded variable representing None vs. One major life event; NvM = Dummy-coded variable representing None vs. Many major life events. 95%CI = 95% Confidence Intervals of the standardized (beta) coefficient.

Table 4
Sensitivity analysis: Heckman's selection sensitivity check (age based).

	Anxiety	Depression	PTSD	Somatization
Block 1	SELF currently significant MLE (None vs. Many) no longer significant	SELF currently significant MLE (None vs. Many) no longer significant	No difference	No difference
Block 2	No difference	No difference	No difference	SELF by SUBJ currently significant
Block 3	No difference	SELF by MLE (None vs. None) currently significant.	SELF by NLE (None vs. Many), SUBJ by MLE (None vs. One) no longer significant. SUBJ by MLE (None vs. Many) marginally significant at = 0.057	SELF by MLE (None vs. One) no longer significant.

(4) a sizeable percentage of participants made use of the midpoints.
(5) The means of SUBJ dimensions were high, as expected.
(6) Satisfactory skewness and kurtosis values were obtained.
(7) Adequate internal consistent coefficients (Cronbach's alphas) were obtained for the SELF, SOs, and SUBJ indices (*α*s: 0.82–0.90).
(8) A unidimensional factor structure with high loadings was obtained for the SELF, SOs, and SUBJ indices.

Major Stressful Life Events Inventory: We administered a brief life events questionnaire (Israeli et al., 2018), asking participants whether they had experienced 12 major stressful events since October 7, 2023 (e.g., bereavement, romantic breakup, serious illness). Events were theory-driven (Brown and Harris, 1978) and designed to reduce ambiguity (Monroe, 2008). Internal consistency of the binary items was strong (α = 0.86, tetrachoric matrix). As in Israeli et al. (2018), most participants endorsed none or one event (zero-inflation), responses were recoded into three categories: None (*N* = 462), One (*N* = 248), and Many (*N* = 218).

Patient Health Questionnaire – 4 Items (PHQ-4; Kroenke et al., 2009***):*** The PHQ-4 is an abbreviated screener for symptoms of depression and anxiety (two items for each disorder) derived from the extensively used PHQ-9 and GAD-7. Items are rated on a 0–3 scale. Internal consistency was adequate-to-good for both assessment occasions: PHQ4-Anxiety (*α*s: $0.83_{[T1]}$ and $0.89_{[T2]}$), PHQ4-Depression: (*α*s: $0.71_{[T1]}$ and $0.86_{[T2]}$).

For both anxiety and depression subscales, scores ranged from 0 to 6, with a cutoff of 3 (Kroenke et al., 2009). 233 (25.10%) scored above cutoff of anxiety and 199 (21.44%) scored above the depression cutoff. Nevertheless, the present study focused on continuous scores of depression and anxiety.

The PTSD Checklist for DSM-5–4 Item version (Zuromski et al., 2019***):*** Administered at T2, this ultra-brief version of the PCL-5 assesses one symptom from each DSM-5 PTSD cluster (B3, C2, D6, E1). Internal consistency was good (α = 0.84); scores ranged from 0 to 16. While various cutoffs exist, Forkus et al. (2023) identified 6–7 as optimal. We conservatively used 7, finding that 162 participants (17.45%) scored above threshold. For our analysis, we treated PTSD as a continuous variable.

Somatization subscale of the Brief Symptoms Inventory (BSI; Derogatis and Melisaratos, 1983***):*** The BSI is a widely used psychiatric symptom inventory. We used its seven-item somatization subscale, assessing common psychosomatic symptoms (e.g., shortness of breath, weakness). Items were averaged into a mean score. Administered at T2, the subscale showed excellent internal consistency (α = 0.91).

4.3. Data analysis

All materials related to this submission are uploaded to the Open Science Forum: https://osf.io/fqbpd/

Analysis was conducted in three steps.

Step 1: We calculated means, standard deviations, and intercorrelations between the continuous study variables. Drawing from J. Cohen (1992), we deemed *r*s 0.10–0.23 as reflecting small effect sizes, *r*s 0.24–0.36 as reflecting medium effect sizes, and *r*s 0.37 or larger as reflecting high effect sizes. We expected that the correlations would reflect low to medium effect sizes.

Step 2: We examined the *unique main and interactive effects* of the three M2D-ACTM variables on the four clinical outcomes using

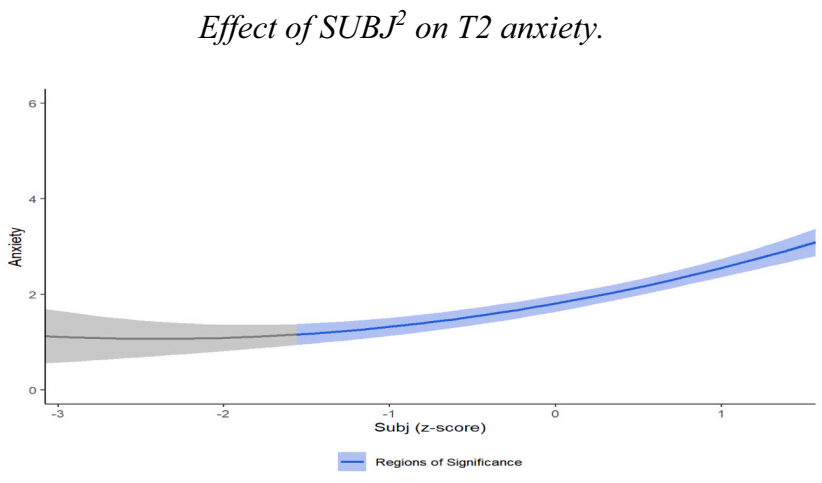

Fig. 1a. *Effect of SUBJ² on T2 anxiety.*

Fig. 1b. *Effect of SELF^2 on PTSD*

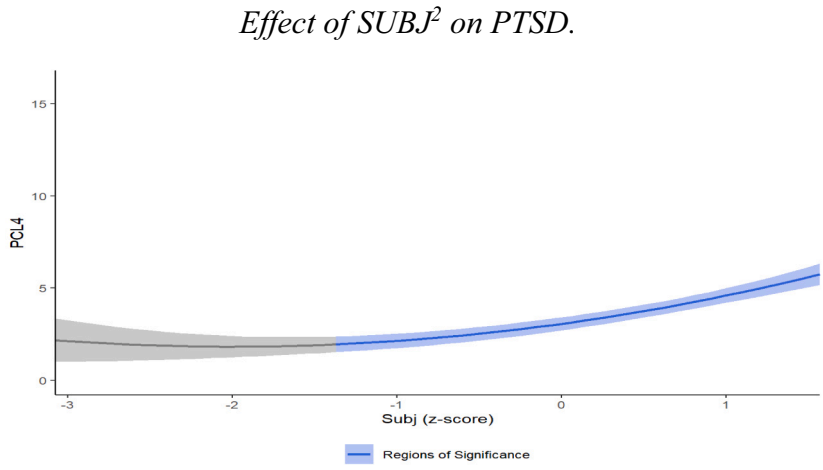

Fig. 1c. *Effect of SUBJ^2 on PTSD.*

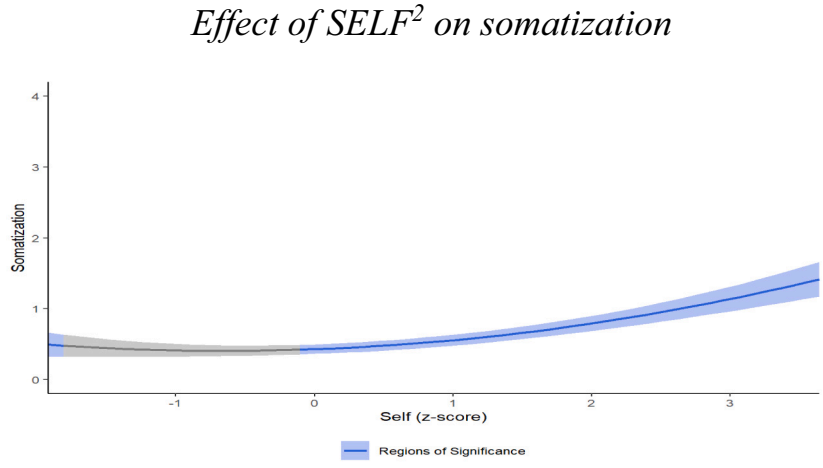

Fig. 1d. *Effect of SELF^2 on somatization*

Notes: SUBJ: Subjective stress related to the traumatic exposure. PTSD: Symptoms of post-traumatic stress disorders as measured by the PCL5–4 items.

multiple hierarchical regression analyses. We controlled for: (1) Pre-CM/TSM, i.e., T1, levels of depression and anxiety, (2) four dummy-

coded variables representing age groups (ages 18–24 constituted the reference group), (3) three dummy-coded variables representing religiosity (the secular constituted the reference group), (4) sex (females) and (4) major stressful life events.

In **Block 1,** we entered sex, age and religiosity, major stressful life events (as two dummy-coded variables: One vs. None; Many vs. None), T1 depression and anxiety, and the three M2D-ACTM variables. Also, this block included curvilinear terms of the CMT/SM variables (i.e., $SELF^2$, SOs^2, $SUBJ^2$). This block addresses **H1-H3.**

In **Block 2,** we entered three 2-way interactions between the linear terms of SELF, SOs and SUBJ, and six 2-way interactions between the linear term of each of the two M2D-ACTM dimensions and the curvilinear term of the other two. This block is an extension of **H3.**

Finally, in **Block 3** we entered 12 two-way interaction terms involving each of the major stressful life events dummies (None Vs. One and None Vs. Many) and the six linear and curvilinear terms of the M2D-ACTM variables. This block addresses H4.

Curvilinear and interaction effects were probed using the region of significance procedure (Johnson and Fay, 1950; Roisman et al., 2012). Regions of significance in interactions and curvilinear analysis refer to specific ranges of values for the moderator (M) or predictor (X) variable where the linear and/or curvilinear slopes of the focal predictor on the dependent variable are statistically significant. When a linear by curvilinear interactions were found, both the curvilinear and linear regions of significance in the predictor were identified.

In addition to conventional statistical significance, results were deemed meaningful only if they crossed the threshold of $|b| \geq 0.10$, thus contributing at least 1% to the variance of the outcome explained by the model (e.g., Shahar and Henrich, 2010). This practice should increase replicability and ensure clinical validity.

Step 3: We addressed the potential selection bias whereby completers were older than participants lost to follow-up. Specifically, we employed Heckman-style two-step selection models (Heckman, 1976). In the first step, a probit model estimated the probability of participation at Time 2 as a function of age group, yielding the Inverse Mills Ratio (IMR). In the second step, the IMR was included as an additional covariate in the outcome regression models, thereby correcting for potential non-random attrition.

Analyses were conducted by means of the STATISTICA G4 12 (StatSoft. Inc., 2014) statistical software and were further confirmed using R. We used R 4.4.1 (R Core Team, 2024). The Heckman selection sensitivity analysis was conducted in R using the *sampleSelection* package (Toomet and Henningsen, 2008). Plotting was done with the "emmeans" and "ggplot2" packages (Lenth, 2024; Wickham, 2016).

5. Results

5.1. Step 1: Means, standard deviations, and intercorrelations among the study variables

In Table 2 we present descriptive statistics. We found that (1) PHQ-4 depression and anxiety show sizeable autocorrelations; (2) SELF/SOs correlate minimally with SUBJ; (3) M2D-ACTM variables correlate substantially with clinical outcomes, especially SUBJ (large effects for depression, anxiety, PTSD; medium for somatization). SELF correlations were small (depression, anxiety) to medium (PTSD, somatization). SOs correlations were mostly small, with one medium (PTSD).

5.2. Step 2: Regression analyses

In **Table 3** we present results for the regression analyses.

In **Block 1,** adjusted R^2 for the outcomes were as follows: 0.39 for depression ($F_{[df=19,905]}$, 32.48, $p < .001$), 0.39 for anxiety ($F_{[df=19,905]}$, 32.53, $p < .001$), 0.40 for PTSD ($F_{[df=19,905]}$, 32.48, $p < .001$) and 0.35 for somatization ($F_{[df=19,905]}$, 27.58, $p < .001$).

Statistically significant ($p < .05$) and meaningful ($|b| \geq 0.10$) predictors of T2 anxiety were: T1 anxiety and depression, the Many vs. None major stressful life events dummy-coded variable, SUBJ, and $SUBJ^2$. The pattern of the latter effect, presented in Fig. 1a**,** evinced *an acceleration* of the effect of SUB on Anxiety commencing about −1.5SD below the standardized mean of SUBJ.

Statistically significant and meaningful predictors of T2 depression were: T1 anxiety and depression, the Many vs. None major stressful life events dummy coded-variable, SOs and SUBJ.

Statistically significant and meaningful predictors of T2 PTSD were: T1 anxiety and depression, the age group differentiating older adults (65+) and the young (18–24, more PTSD symptoms than older adults), the Many vs. None major stressful life events dummy-coded variable, SUBJ, $SUBJ^2$ (see **Fig. 1b**), and $SELF^2$ (see **Fig. 1c**). Similarly to anxiety, these figures show *an acceleration* of the effect of SUBJ and SELF on PTSD culminating about −1.5SD below the standardized mean, or at the mean, of SUBJ and SELF, respectively.

Finally, statistically significant and meaningful predictors of T2 somatization were: T1 anxiety and depression, all age groups contrasted with the young (the latter evincing more somatization), the Many vs. None major stressful life events dummy-coded variable, SUBJ, SELF, and $SELF^2$ (see **Fig. 1d**). *An acceleration* of the effect of SELF on somatization was evinced, commencing at the standardized mean. Also, there was *a very small*, negatively directed segment connecting SELF and somatization at the beginning of the distribution, which is consistent with *eustress/hormesis.*

Block 2 did not increase the explained variance of T2 depression and T2 anxiety, but did add 1% to the variance of PTSD explained by the model (*Adjusted* $R^2 = 0.40$, $F_{[df=25,896]} = 23.40$, $p < .001$; $\Delta F_{[9896]} = 2.93$, $p < .01$) and 1% for T2 somatization (*Adjusted* $R^2 = 0.36$, $F_{[df=28,896]} = 20.06$, $p < .001$; $\Delta F_{[9896]} = 3.01$, $p < .01$). There were no statistically significant and meaningful predictors of T2 depression or T2 anxiety.

T2 PTSD was predicted by a SELF by $SUBJ^2$ interaction. In Fig. 2a we present the pattern of this interaction with highlights for statistically significant curvilinear and linear patterns (upper and lower graphs, respectively). The Y axis pertains to PTSD symptoms as measured by the PCL-5 4 items. The X axis pertains to SELF. Three graphs are presented, from left to right, referring to low, mid, and high levels of SUBJ, respectively.

As shown in the upper figure, all curvilinear slopes were statistically significant, albeit assuming different shapes. Focusing on the lower figure, in low (-1SD), and high-level (i..e, +1SD) level of SUJ, the SELF - PTSD association is positively directed, except that it commences much earlier in high levels of SUBJ. The pattern is consistent with *acceleration.* Conversely, in mid-level (standardized mean) of SUBJ, starting from the left-hand side of the distribution, there is a weak, negatively directed segment connecting SELF and PTSD, which is consistent with *eustress/hormesis.* This is followed by a nonsignificant segment, in turn paving its way to a positively directed *acceleration.*

T2 somatization was predicted by a SELF by SOs interaction (Fig. 2b). Here, the Y axis pertains to somatization, as measured by the putative BSI subscale. The X axis pertains to SOs. Three graphs are presented, from left to right, referring to low, mid, and high levels of SELF, respectively.

There were clear differences between low (-1SD), mid (i.e., standardized mean) and high (+1SD) level of SELF in terms of the SOs - somatization association. Specifically, in low levels of SELF, the SOs, somatization association is largely nonsignificant (bearing a very small segment mid-way through the low SOs distribution). In mid-level SELF, there is a very small segment at the beginning of the distribution consistent with a negative-directed association, namely, consistent with *eustress/hormesis.* Then, a modest segment beginning at the mean and consistent with a positively directed association between SOs and

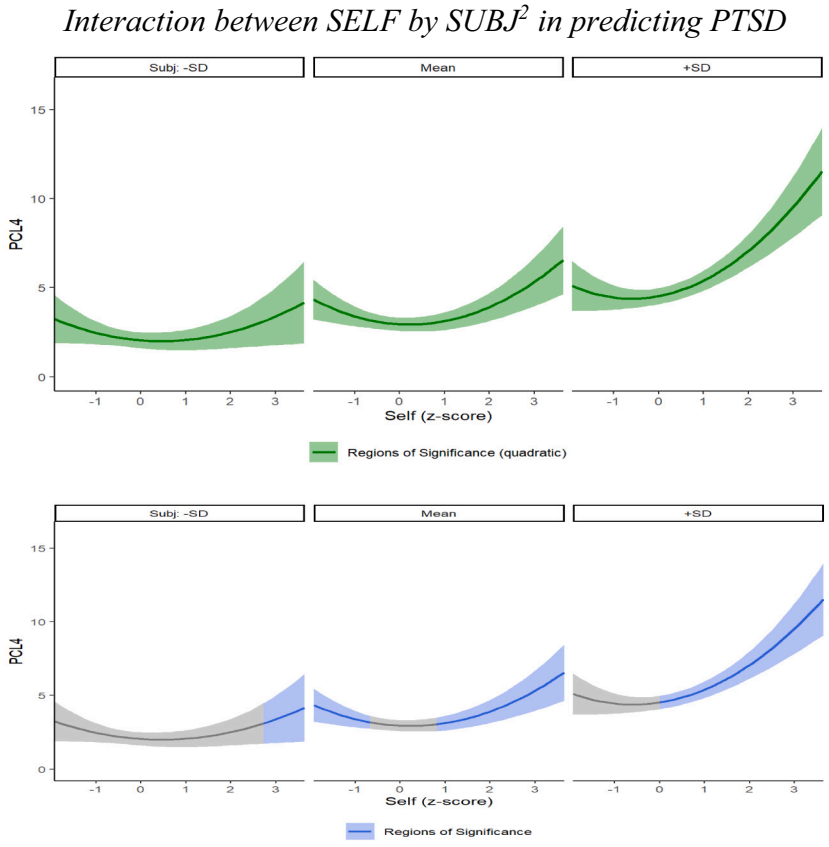

Fig. 2a. *Interaction between SELF by SUBJ² in predicting PTSD*

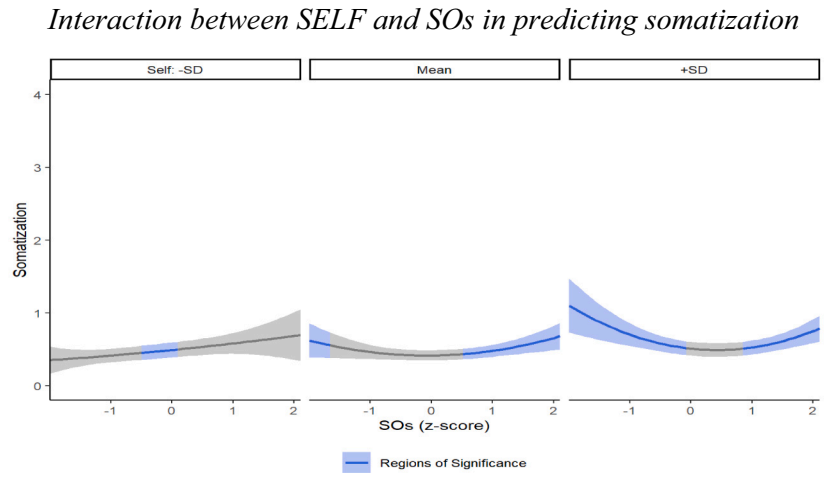

Fig. 2b. *Interaction between SELF and SOs in predicting somatization*
Notes: SUBJ: Subjective stress related to the traumatic exposure. PTSD: Symptoms of post-traumatic stress disorders as measured by the PCL5–4 items.

somatization. In high SELF, there is a sizeable negatively directed SOs-somatization association consistent with *eustress/hormesis,* replaced by a non-significant segment, paving its way to a relatively small, positively-directed association consistent with *acceleration.*

Block 3 added %1 for T2 PTSD ($F_{[df=40,884]} = 17.24$, $p < .001$; $\Delta F_{[9884]} = 2.07$, $p < .05$), but not to the other outcomes. T2 anxiety was not predicted by interactions in this block. T2 depression was predicted by an interaction between major stressful life events – One vs. None and Many vs. None – and SELF². However, no regions of significance were detected for this interaction, hence it was not interpreted.

T2 PTSD was predicted by interactions between major stressful life events, None vs. One and One vs. Many on the one had, and SUBJ on the other hand (see Fig. 3a). The positively directed slope connecting SUBJ and PTSD was stronger in One and in Many compared to None.

Also, PTSD was predicted by an interaction between major stressful life vents, Many vs. None, and SELF (**Fig. 3b**). While in None, One, and Many there was a positively directed slope connecting SELF and PTSD starting 1SD above the mean, in Many there was also a negatively directed slope connecting SELF and PTSD starting 3SDs below the mean, and consistent with *eustress/hormesis* (a smaller *eustress/hormesis*

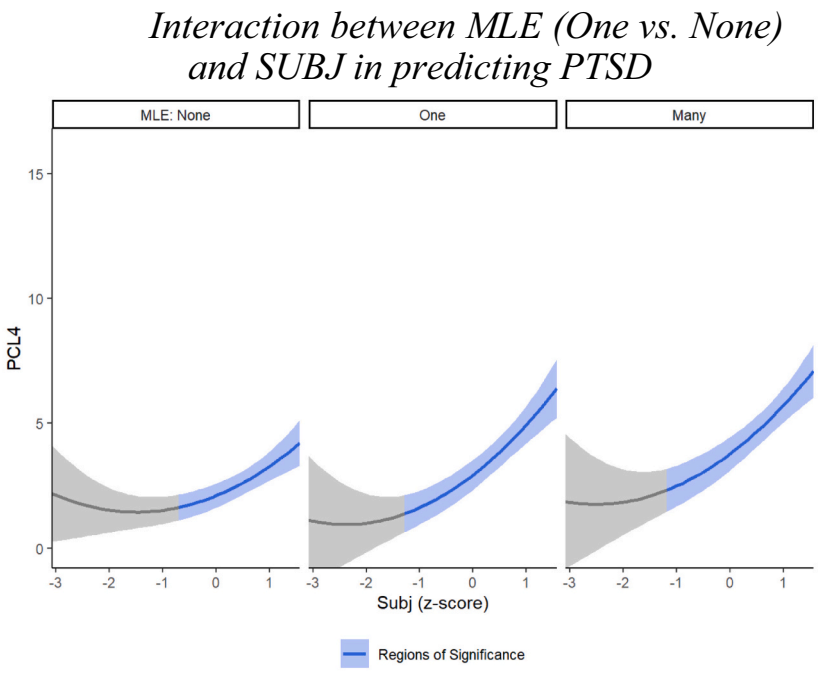

Fig. 3a. *Interaction between MLE (One vs. None) and SUBJ in predicting PTSD*

segment also appeared in One, but this was not part of the statistically significant interaction).

Finally, T2 somatization was predicted by an interaction between the major stressful life events – None vs. One – and SELF (see Fig. 3c). All three groups evince a *positively directed,* steep slope connecting SELF and somatization, and starting slightly after the mean of SELF. However, None and One also evinced a *negatively directed* slope connecting SELF and somatization, both starting from 1.5 SD below the mean of SELF. Notably, this negatively directed slope, which is consistent *with eustress/ hormesis,* was steeper in the One group (Fig. 3c).

5.3. Step 3: The Heckman selection sensitivity analysis

Results of the Heckman correction are presented in Table 4. As far as the exposure variables are concerned (i.e., SELF, SOs, and SUBJ), **Block 1** (main effects) and **Block 2** (interactions among exposure variables) were robust to correction for age-related differential attrition. In fact, the Heckman correction brought to significance the main effects of SELF on anxiety and depression and the interaction between SELF and SUBJ predicting somatization, although these "emerging" effects are not interpreted here. In contrast, the main effect of major stressful life events (None vs. Many) on anxiety and depression were no longer statistically significant.

Block 3, which consisted of interactions between exposure and major stressful life events, was substantially attenuated following Heckman correction: The SELF by Many and SUBJ by One interactions were no longer statistically significant, whereas the SUBJ by Many interaction remained marginally significant ($p = .057$).

These findings suggest that the main effects and interactions involving the exposure variables are not attributable to age-based

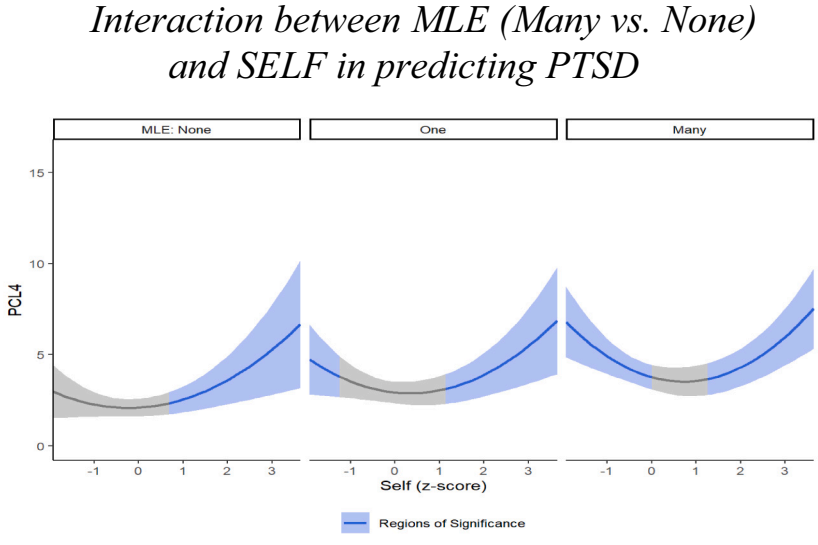

Fig. 3b. *Interaction between MLE (Many vs. None) and SELF in predicting PTSD*

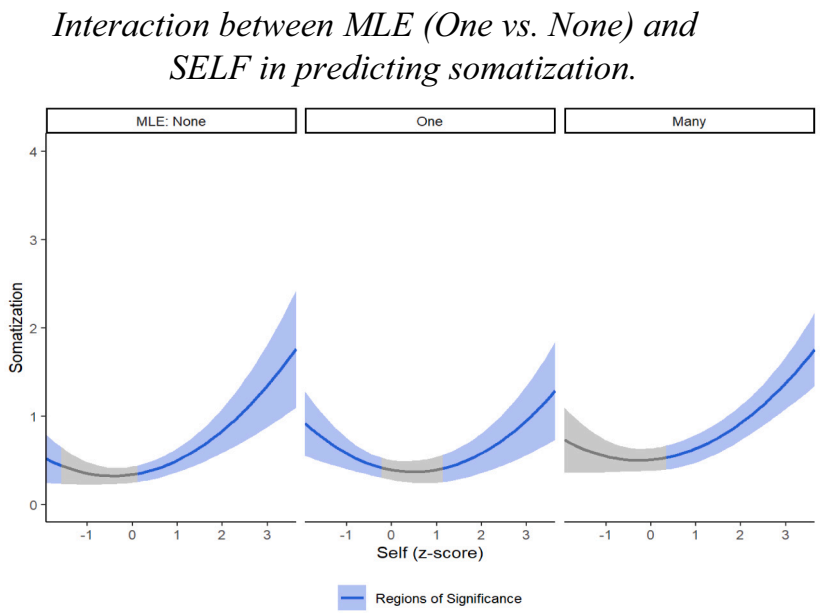

Fig. 3c. *Interaction between MLE (One vs. None) and SELF in predicting somatization.*
Notes: SUBJ: Subjective stress related to the traumatic exposure. PTSD: Symptoms of post-traumatic stress disorders as measured by the PCL5–4 items; SOs: Significant Others; MLE: Major Life Events.

selection, whereas the interactions involving exposure and major stressful life events should be interpreted with caution (see below).

6. Discussion

Events of the Oct 7th 2023 have stunned the world. They propelled a two-year armed conflict involving most of the Middle East (Israel, Gazza, Lebanon, Syria, Irak, Yaman, and Iran) as well as defensive measured launched by the USA army and numerous NATO allies (assisting in targeting missiles launched from Iran to Israel). On top of this, the USA launched an offensive strike against the nuclear facilities in Iran as a part of the 12-days war. These events took an unfathomable toll on peoples' lives, economies, and infrastructures and geographies on all sides involved. Serious ramifications have also been felt in Europe, North America, and even Australia and these reservations are felt even now, months after the war's cessation.

Cognizant of the enormous impact these eventualities are likely to have, we immediately sought to investigate them by espousing a stress/trauma – psychopathology framework. However, we discovered that no extant measure can encompass the multitude of parameters, exposure domains, and outcomes likely to be relevant to this complex trauma. We therefore had to develop the M2D-ACTM particularly for this study.

The M2D-ACTM evinced promising psychometrics properties, as reflected in the expected exposure frequency and means of subjective stress, high internal consistency, a unidimensional factor structure, and predictive validity. Moreover, the measure evidenced feasibility (relat6ive brevity of completion) and tolerability given the potentially triggering and confusing content (Labott et al., 2016), as reflected in low opting out and elevated endorsement of scenario midpoints. Although this report is restricted to exposure presence vs. absence (dose-response results will be reported in the near future), findings encourage further use of the M2D-ACTTM to understand the remifications of a complex, mass armed conflict on populations' mental health.

With respect to the relevance of our findings to understanding complex, mass armed conflict, below we will discuss (1) differences between the cumulative effects of actual exposure and subjective stress **(H1,H2),** (2) the presence of curvilinear effects (H3), (3) Role of major life stress in the link between exposure to the trauma and the outcomes (H4) and (4) the need to assess outcomes beyond PTSD (H1-H4).

6.1. Actual vs. subjective stress

Consistent with **H1,** all three M2D-ACTM indices (SELF, SOs, and SUB J) were correlated with all of the clinical outcomes in both T1 and T2. However, correlations involving SUBJ were markedly stronger than those involving SELF and SOs. Yet, results of the regression analyses evinced a more nuanced pattern: SELF only predicted somatization, SOs only predicted anxiety, and SUBJ predicted all the outcomes (curvilinear effects are discussed at the next section).

It should be mentioned that the two *actual* exposure indices – SELF and SOs – were moderately correlated, likely reflecting the fact that in Israel, families tend to dwell together. Moreover, correlations of SELF and subjective stress (SUBJ) and of SOs and SUBJ were weak, consistent with prior research (Cohen et al., 1983; Shahar et al., 2009). Low correlations may partly reflect the measure's wording, in that SUBJ ratings were given regardless of actual exposure. Nevertheless, greater subjective stress might be expected among the exposed, but this was not found.

This pattern of results, whereby SUBJ stands out from SELF and SOs both in terms of its weak correlation with them and its superior predicting validity, raises the question concerning the nature of "perceived stress". In the present context, we tentatively view as a cognitive–emotional "oven" amplifying responses to events regardless of personal impact. Related constructs include repetitive negative thinking (Ehring and Watkins, 2008), emotional intensity (Bachorowski and Braaten, 1994), impaired mentalizing (Luyten et al., 2020), and cognitive-affective features of a histrionic personality disorder (e.g., impressionability). Future research should investigate this construct further.

6.2. Curvilinearity

Consistent with **H3**, curvilinear effects of traumatic stress emerged for SELF in PTSD and somatization and for SUBJ in anxiety and PTSD. Almost all curvilinear effects were consistent with *acceleration* (Figs. 1a–1d), the only exception being *a very small*, arguably negligeable, *eustress/hormesis* pattern for somatization at the beginning of the SELF continuum.

A more nuanced pattern emerged when we allowed for interactions among linear and curvilinear components of SELF, SOs and SUBJ. Here, a single interaction between SELF and SUBJ predicting PTSD emerged, and it included segments of SELF-related acceleration – in low, mid, and high levels of SUBJ. Although the entire curvilinear association involving SELF and PTSD included regions consistent with eustress/hormesis, these regions were non-significant. Such regions, however, emerged in the linear SELF by SO interaction predicting somatization: relatively weakly in the SOs-somatization association under mid-level SELF, and quite strongly in the SOs-somatization association under high SELF, both regions appearing at the beginning of the SOs continuum. From a stress and coping theory, it is possible that for participants with elevated self exposure, mild forms of exposure of significant others might mobilize them to action, in turn reducing somatization. This adaptive coping strategy appears to collapse when exposure of significant others peaks (i.e., becomes intolerable). Such an interpretation is consistent with the very weak hermetic/eustress segment connecting SOs and somatization as a main effect (i.e., Fig. 1d).

Importantly, of the various notions charting an adaptive response to stress exposure, the hormesis model (Oshri, 2023) is the most specific: It commits to a certain region along the exposure continuum within which adaptation occurs, namely, the low end of this continuum. This is *exactly* what was found here for effects linking trauma exposure and reduced symptoms: They were invariably located at the low exposure region. Hence, our findings lend further credibility to this intriguing model.

Both patterns – acceleration and eustress/hormesis – have important clinical implications. Acceleration indicates a threshold that must be identified in clinical assessment so as to deliver preventing interventions (Wang et al., 2023). In contrast, eustress/hormesis suggests protective "hormetic zones" within which stress propels adaptation (Selye, 1975; Oshri, 2023). Understanding of the specific mechanisms of acceleration and eustress/hormesis in the context of mass and complex armed conflict appears premature at this stage. What *is clear* at this point, however, is that the assumption that the stress-distress link is solely or even most linear is no longer tenable.

6.3. Role of major stressful life events

Consistent with prior work (Horesh et al., 2014; Solomon et al., 2008), traumatic and major life stress – None vs. Many – had additive effects on all outcomes. Moreover, in accordance with **H4**, they also interacted in predicting PTSD and somatization. Nevertheless, when the Heckman correction was applied, the role of major stressful life events was substantially trimmed: Main effects on anxiety and depression disappeared, and so did most of the interactions with exposure predicting PTSD and somatization. The single exception was the interaction between SUBJ and major stressful life events (Many) predicting PTSD, which was marginally significant.

Considering these results, the role of major stressful life events in the link between trauma exposure and the outcomes should be interpreted with caution. We still encourage exploration of this effect in light on the main effect of major stressful life events on PTSD and somatization and the interaction between major stressful life events and SUBJ. Clarity concerning the exact role of non-traumatic stress in the trauma-distress link therefore awaits future studies.

6.4. Moving beyond PTSD

Consistent with **H1-H4**, findings shed an additional light on the transdiagnostic risk status of trauma vis-à-vis psychopathological symptoms (Hogg et al., 2023; Gerson and Heppell, 2018). Controlling for pre-October 7th symptoms, both actual and subjective war exposure predicted PTSD, depression, anxiety, and somatization. Subjective exposure predicted all four; SOs exposure predicted depression; actual self-exposure predicted PTSD (curvilinearly) and somatization (linearly and curvilinearly). SELF × SUBJ predicted PTSD; SELF × SOs predicted somatization.

Several implications of these findings to basic psychopathology research are noteworthy. First, that exposure – actual and/or subjective – predicted PTSD symptoms after controlling for baseline anxiety and depression suggests that PTSD cannot be explained by the convergence of depression and anxiety, further strengthening DSM-V's classification of this disorder as belonging to the stress disorder category. Second, that depressive symptoms were uniquely predicted by significant others' exposure to the trauma is highly consistent with the interpersonal nature of this clinical entity (Joiner, 20000; Joiner and Coyne, 1999; Shahar, 2024). Third, that somatization featured prominently as an outcome of trauma exposure in this study renders it a strong candidate for future research on trauma (Kratzer et al., 2022), as well as a variable bridging mental and physical health.

7. Limitations and strengths

Limitations of the present study should be noted. These include (1) Our reliance on self-report measures, which risk a shared method variance that inflates the associations obtained, (2) Use of symptom scales rather than diagnostic criteria, which precludes an estimation of the effects of exposure on binary psychiatric diagnosis, (3) Employment of only two data waves. Such a design does enable causal inference, albeit a limited one, and future research plans include following up on these participants for an extended period of time, employing multiple waves. Moreover (4) We only controlled for depression and anxiety at T1, so the analyses involving PTSD and somatization could be considered "prospective" (i.e., exposure happened prior to the outcome, although the measure of exposure was administered concurrently with the outcome measures) but not "longitudinal" (i.e., exposure predicts changes in the outcome over time). Again, we plan to employ subsequent waves that will address this limitation; (5) The effect of subjective stress on the outcome is always susceptible to criticism concerning content overlap with the outcomes (Cohen et al., 1983). In this study, however, we controlled for baseline levels of depression and anxiety, thus this criticism is not relevant to the effect of subjective stress on T2 levels of this outcome. Arguably, owing to such statistical control, this criticism's relevance to the effect of subjective stress on PTSD is limited, and in the case of effects on somatization it is negligible, because content overlap is minimal; (6) Employment of brief outcome measure, such as the PHQ-4, PCL-4, and BSI-somatization subscale. While these brief measures have excellent psychometric properties, we cannot rule out the possibility that additional findings could have emerged with the employment of longer measures. And (7) a sample restricted to Jewish-Israeli adults in a specific context, limiting generalizability. This is also the place to emphasize the importance of also investigating the suffering on the Palestinian side of this tragedy, as part of a broader scholarly responsibility to understand the mental health impact of conflict on all affected populations and to inform interventions that promote recovery across divides.

Despite these limitations, this study offers key strengths: (1) a novel measure of exposure to a complex armed conflict; (b) systematic mapping of exposure dimensions; (3) a nationally representative Jewish-Israeli sample; (4) assessment of multiple psychopathological outcomes, and (5) findings that bring the field closer to the development of preventive interventions. We hope it informs future research to understand and mitigate the human costs of such stress across societies.

CRediT authorship contribution statement

Golan Shahar: Writing – original draft, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Julia Elad-Strenger:** Writing – review & editing, Validation, Resources, Project administration, Investigation, Conceptualization. **Dana Lassri:** Writing – review & editing, Validation, Investigation, Conceptualization. **Sheera F. Lerman:**

Writing – review & editing, Validation, Investigation, Conceptualization. **Moran Schiller:** Writing – review & editing, Validation, Investigation, Conceptualization. **Roy Aloni:** Writing – review & editing, Validation, Investigation, Conceptualization. **Mattan S. Ben-Shachar:** Writing – review & editing, Visualization, Methodology, Formal analysis. **Leah Shelef:** Writing – review & editing, Validation, Investigation, Conceptualization.

Declaration of competing interest

The authors declare no conflict of interests.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2026.121565.

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