

Residential psychological support for Ukrainian children facing confirmed and ambiguous war-related loss during Russia's invasion of Ukraine

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Abstract

War-related family loss may involve confirmed death or unresolved absence, but little is known about symptom change during loss-adapted support. This observational pre–post study included 100 Ukrainian children and adolescents (7.1–17 years) attending a 21-day residential program after confirmed or ambiguous loss. The confirmed- and ambiguous-loss cohorts received 10- and 7-session program versions, respectively. Posttraumatic stress symptoms were assessed at entry and completion using the Child and Adolescent Trauma Screen 2 (CATS-2) and Children’s Revised Impact of Event Scale–8 (CRIES-8). Scores on both measures decreased significantly in both cohorts ($ps < .001$). In the confirmed-loss cohort, median CATS-2 scores decreased from 15 to 8 and median CRIES-8 scores from 14 to 4 (both matched-pairs rank-biserial correlations = .96). In the ambiguous-loss cohort, mean CATS-2 scores decreased from 18.06 to 10.62 ($d_z = 0.84$) and mean CRIES-8 scores from 15.80 to 11.88 ($d_z = 0.69$). CATS-2 change did not differ between cohorts, whereas CRIES-8 reductions were greater in the confirmed-loss cohort ($r_{rb} = .36$). Exploratory Bayesian ordinal regression examined structured self-portrait codes: an identifiable gaze was associated with lower CATS-2 self-blame, although the reference category included only four participants. These findings demonstrate short-term symptom reductions and the program’s potential effectiveness. The limitations of this study include the confounding of loss context with program content and the lack of randomization among participants. Controlled studies with equivalent exposure and longer follow-up are required.

Background

Systematic Violation of Human Rights and War-Related Trauma in Childhood

War commonly exposes children to several threats within the same developmental period. Direct experiences such as bombardment, injury, witnessing violence, and the death of others occur alongside displacement, family separation, disrupted education, and reduced access to health and social services. A systematic review of 155 studies documented consequences across child mortality, physical health, development, education, and social functioning, while also showing that research has often relied on cross-sectional data and has provided limited evidence on long-term developmental trajectories (Kadir et al., 2019). Among younger children, war exposure has been associated with posttraumatic stress symptoms, emotional and behavioral difficulties, sleep problems, disturbed play, and psychosomatic complaints. Parental psychological distress and family functioning influence the association between exposure and children’s symptoms (Slone & Mann, 2016). These findings support a socioecological view in which children’s adjustment is shaped by cumulative exposure and by conditions within the family, school, community, and health-care systems (Catani, 2018).

Russia’s full-scale invasion of Ukraine has precipitated a continued humanitarian crisis with severe consequences for children, including death and injury, mass displacement, disruption of education and

essential services, and sustained exposure to war-related stress (Office of the United Nations High Commissioner for Human Rights, 2026; UNICEF, 2026a). As of 2026, UNICEF reported that more than 3,200 children had been killed or injured since 24 February 2022, while approximately 2.59 million Ukrainian children remained displaced (UNICEF, 2026b). In March 2026 alone, 89 children were killed or injured in attacks across Ukraine, representing a 65% increase from the previous month (UNICEF, 2026c).

The scale and persistence of these adversities have been accompanied by a substantial mental health burden among Ukrainian children and adolescents. A recent scoping review of 37 studies found that exposure to war-related events, forced displacement, and separation from parents were associated with mental health problems among Ukrainian children and youth (Silwal et al., 2026). More specifically, a repeated cross-sectional study of 5,486 Ukrainian adolescents aged 11–17 years found elevated levels of posttraumatic stress disorder (PTSD) and depressive symptoms following the 2022 full-scale invasion. Among adolescents who had also lived in a highly war-affected region during the earlier phase of the conflict, 16% reported PTSD symptoms and 10.5% reported severe depressive symptoms, while war exposure was associated with suicidality across all study groups (Sourander et al., 2026). Loss is widespread within this broader pattern of exposure. In a UNICEF-led survey completed by more than 23,000 Ukrainian children and adolescents, one in five respondents reported that a close relative or friend had died since the escalation of the war. Almost one-third reported feeling sufficiently sad or hopeless to stop their usual activities (UNICEF, 2025).

Parental Loss

Loss or unresolved absence of a close family member or caregiver warrants specific attention within this wider pattern of adversity. Throughout our article, we interchangeably use the terms “parental loss” and “loss involving a close family member or caregiver”. The death of a parent can remove a primary source of care, emotional security, practical support, and continuity in daily life. The surviving family may also experience financial strain, relocation, changes in caregiving responsibilities, and deterioration in the mental health of other family members. In a seven-year prospective study, children and adolescents bereaved by sudden parental death had an increased incidence of depression, PTSD and greater functional impairment than their nonbereaved peers, even after adjustment for pre-existing risk factors. The incidence of depression was highest during the first two years after the death, particularly among children who were 12 years old or younger when the loss occurred (Pham et al., 2018). War-related bereavement may involve additional complications because death is often violent or sudden and occurs while threats to the child and other family members continue (Layne et al., 2025).

Children’s responses to bereavement vary with developmental stage and caregiving context. Cognitive understanding of death, emotional expression, coping strategies, and dependence on adults change throughout childhood and adolescence. Children also rely on caregivers to provide explanations, maintain routines, regulate distress, and support continuing connections with the deceased person. The surviving caregiver’s availability and psychological condition may therefore affect the child’s adjustment (Alvis et al., 2023). Bereavement also does not produce a single, uniform symptom profile. Research with bereaved children and adolescents has found that symptoms of prolonged grief, depression, and

posttraumatic stress form related but distinguishable dimensions, each associated with functional impairment (Spuij et al., 2012).

Type of Loss.

The circumstances surrounding a parent's absence may also shape the child's response. Confirmed death (loss) establishes that the separation is permanent, even when the circumstances remain traumatic and difficult to understand. Ambiguous loss occurs when a person is physically absent while remaining psychologically present because their fate has not been established (Boss, 2010). During armed conflict, this situation may arise when a parent is missing, held in captivity, living in occupied territory, or otherwise unreachable. The child and family may continue to anticipate the person's return while also confronting the possibility of death. This uncertainty is sustained by external circumstances and should not be treated as an individual failure to accept the loss. Qualitative research with young people separated from their parents during the Sudanese civil war described the continuing psychological presence of absent parents, the role of hope for reunification, and reliance on peers and community elders during prolonged uncertainty (Luster et al., 2009).

Meaning-reconstruction theory provides a related perspective. Neimeyer (2016) proposed that bereavement challenges an individual's assumptions about the world and requires reconstruction of a meaningful account of the loss and of life after it. Violent war-related death may make this process especially difficult, but confirmed death at least provides a factual endpoint around which a narrative can gradually be constructed. Ambiguous loss repeatedly destabilizes such reconstruction because new information—or the continuing absence of information—can alter the meaning of the event. The same symptom, such as intrusive thinking, may consequently have different psychological functions: it may represent recurrent trauma memories after confirmed death or continuing searching, imagining, and threat monitoring when a family member remains missing.

The Present Research Gap

Psychosocial interventions for war-affected children have produced promising findings, although the evidence base remains heterogeneous in intervention content, outcome measurement, study design, and follow-up duration. A systematic review found limited empirical testing of the mechanisms through which these interventions affect mental health and resilience, despite broad agreement on the possible value of safety, supportive relationships, family involvement, structured activities, and community resources (Bosqui & Marshoud, 2018). Recent work on war-related bereavement similarly calls for developmentally appropriate assessment and intervention while identifying substantial gaps in the evidence concerning different forms of loss (Layne et al., 2025). Large Ukrainian studies have documented the general prevalence of trauma-related symptoms, but less is known about short-term symptom trajectories among children receiving structured psychological support after parental death or disappearance.

The present study addresses this problem by examining changes in posttraumatic stress symptoms among Ukrainian children and adolescents participating in a 21-day residential psychological program following confirmed or ambiguous war-related loss. It also evaluates whether the magnitude of symptom change differed between the two loss contexts. This distinction is clinically relevant because programs developed for children bereaved by confirmed death may not fully address the continuing uncertainty experienced by children whose parent remains missing. Given the pre–post design and absence of an untreated comparison group, the study only evaluates symptom change during the program period and differences between the two participant cohorts.

Methods

Study Design and Setting

This study used a two-cohort pre–post observational design to examine short-term changes in posttraumatic stress symptoms among children and adolescents participating in a 21-day residential psychological support program. The cohorts were defined by the circumstances of the participants' loss. Confirmed loss referred to the death of a parent, relative, or caregiver established through documentation or unequivocal circumstances. Ambiguous loss referred to the unresolved physical absence of a close family member whose fate remained unknown because of disappearance, captivity, deportation, residence in occupied territory without communication, or other loss of contact.

Participants attended one of two residential programs conducted in the Carpathian region of Ukraine, with each program organized around one of the two loss contexts. The confirmed-loss cohort included 50 children and adolescents, and the ambiguous-loss cohort included 50. Participants were selected by psychologists from the implementing organization from a larger pool of applications for psychological rehabilitation. Recruitment was supported by organizations working in child protection and family-based care.

Baseline assessments were completed during the first three days of the program, with the exact timing adjusted to participants' psychological condition and group dynamics. Post-program assessments were conducted during the final three days. The broader clinical assessment included a structured interview with a parent or legal guardian, standardized child-report measures, and direct psychological observation. The present article reports only the quantitative data obtained from the standardized measures described below. Information from caregiver interviews and clinical observations was used for individual assessment and care planning and was not included as a study outcome. A separate qualitative study was conducted, but its methods and findings are outside the scope of the present article.

Participants

The study included 100 children and adolescents who attended one of two residential psychological rehabilitation programs, with 50 participants in the confirmed-loss cohort and 50 in the ambiguous-loss cohort. Participants ranged from 7.1 to 17.0 years of age. The mean age was 12.2 years (SD = 2.6) in the confirmed-loss cohort and 11.8 years (SD = 2.9) in the ambiguous-loss cohort. The confirmed-loss cohort included 26 girls and 24 boys, while the ambiguous-loss cohort included 25 girls and 25 boys. Participants were selected by psychologists from a larger pool of applications, with recruitment supported by organizations working in child protection and family-based care. An individual information form containing participant-level data was completed for each child.

As part of the admission process, a parent or legal guardian confirmed that the child's health permitted participation and provided information about relevant health conditions and individual needs. The implementing organization could decline admission when medical contraindications or health, behavioral, or other individual characteristics were considered incompatible with participation in therapeutic groups.

Consent and Ethical Approval Section Removed for the Review

Residential Psychological Program

The 21-day residential program included structured, age-adapted group psychological sessions supported by individual reflection and workbook activities. Across both cohorts, the intervention addressed psychological safety, emotional awareness and regulation, anxiety, coping with distressing thoughts, anger, fears, social support, and resilience. Techniques included psychoeducation, grounding and breathing exercises, cognitive restructuring, gradual exposure to feared situations, creative exercises, guided reflection, and identification of personal and interpersonal resources. As part of the program, children completed several structured drawing activities, including a self-portrait, drawings related to their future, goals, dreams, and fears, and a triptych depicting life before the war, the present, and the imagined future. These activities were integrated into the therapeutic program as age-appropriate forms of reflection and emotional expression.

The program content was tailored to address the circumstances of loss. The confirmed-loss program consisted of ten structured group sessions, each dedicated to specific areas such as traumatic experiences, grief and mourning, maintaining memories of the deceased, cognitive coping mechanisms, avoidance strategies, values, and future aspirations. The ambiguous-loss program, on the other hand, comprised seven structured group sessions and placed a greater emphasis on uncertainty, anxiety associated with the unknown, tolerance of uncertainty, cognitive distortions, sources of support, and strategies for maintaining memories while the loved one's fate remained unresolved. Its stated objectives were to normalize and validate emotional responses to loss, stabilize emotional functioning, and enhance tolerance of uncertainty. Both programs concluded with sessions focused on personal strengths, resilience, goal setting, and future orientation.

Procedure

Baseline assessment was conducted during the first three days of the residential program. Post-program assessment took place during the final three days. The exact assessment day was selected according to the participant's psychological condition and program logistics. Assessments were administered individually in a quiet and comfortable setting. A qualified child psychologist remained nearby and within the participant's field of vision throughout the assessment. The psychologist monitored the participant's condition, clarified procedural instructions where appropriate, and supported the participant if distress emerged.

The complete assessment procedure, including instructions, lasted approximately 30–40 minutes. When required because of fatigue, distress, or difficulty concentrating, the assessment was divided into two sessions. Participants were informed that they could decline to answer any item or discontinue the assessment at any time without adverse consequences. The assessors were the same in both instances and were directly involved in the delivery of the intervention.

Measures

Child and Adolescent Trauma Screen 2. Posttraumatic stress symptoms were assessed using the Child and Adolescent Trauma Screen 2 (CATS-2), a self-report screening instrument developed for children and adolescents aged 7–17 years (Sachser et al., 2022). The CATS-2 assesses exposure to potentially traumatic events and posttraumatic stress symptoms according to both DSM-5 and ICD-11 frameworks. The CATS-2 begins with 14 prespecified categories of potentially traumatic events and one open-ended “other stressful or frightening event” item, followed by 25 symptom items referring to the preceding four weeks. Symptom items are rated on a four-point scale ranging from 0 (never) to 3 (almost always). The instrument permits calculation of dimensional severity scores for DSM-5 PTSD and ICD-11 PTSD and complex PTSD; higher scores indicate greater posttraumatic stress symptom severity. CATS-2 total score was scored according to the official Ukrainian scoring sheet as the sum of Items 1–20, using the highest response for Items 9, 10, and 15. The Ukrainian version used in the study was obtained from the publicly available CATS-2 resources maintained by the Chair of Clinical Child and Adolescent Psychology at Otto-Friedrich University of Bamberg (Sachser et al., 2022). The psychometric properties of the Ukrainian-language CATS-2 have not yet been established in published validation studies. Previous psychometric work in Ukrainian has focused on the earlier version of the CATS. Accordingly, the present study will report internal consistency estimates for the CATS-2 scores obtained in this sample and examine concurrent validity through associations with CRIES-8 scores. A more comprehensive evaluation of the factor structure and other psychometric properties of the Ukrainian CATS-2 was beyond the scope of the present study.

In our combined sample, the CATS-2 showed good internal consistency in the overall sample at both assessments, with Cronbach's $\alpha = .873$ and McDonald's $\omega = .877$ at baseline and $\alpha = .888$ and $\omega = .892$ at the second assessment. Several items showed consistently high item–rest correlations across both

assessments, particularly difficulty calming down when upset (Item 15a; $r = .630$ at baseline and $.642$ at the second assessment), social detachment (Item 13; $r = .590$ and $.595$), physiological reactivity to trauma reminders (Item 5; $r = .608$ and $.577$), reduced positive affect (Item 14; $r = .584$ and $.552$), irritability or anger (Item 15b; $r = .578$ and $.523$), and difficulty trusting others (Item 9b; $r = .538$ and $.594$). Some item–rest correlations changed substantially across assessments. The largest decrease was observed for dangerous or potentially self-harming behavior (Item 16; $r = .437$ to $.027$), followed by self-blame (Item 10a; $r = .582$ to $.379$) and blaming others (Item 10b; $r = .440$ to $.261$). In contrast, correlations increased for sleep problems (Item 20; $r = .312$ to $.564$), exaggerated startle (Item 18; $r = .304$ to $.509$), concentration difficulties (Item 19; $r = .265$ to $.464$), avoidance of trauma reminders (Item 7; $r = .239$ to $.416$), and loss of interest or pleasure (Item 12; $r = .458$ to $.635$). These changes were descriptive and were not formally tested for statistical significance.

Children’s Revised Impact of Event Scale–8. Trauma-related intrusion and avoidance symptoms were assessed using the Children’s Revised Impact of Event Scale–8 (CRIES-8) (Perrin et al., 2005). The CRIES-8 is an eight-item self-report screening measure developed for children aged 8 years and older. Four items assess intrusion and four assess avoidance. Responses are rated as 0 (not at all), 1 (rarely), 3 (sometimes), or 5 (often), yielding a total score ranging from 0 to 40; higher scores reflect greater trauma-related symptom severity. The intrusion and avoidance subscale scores can also be calculated separately. Authors of the original version found that a total CRIES-8 score of 17 provided the most useful balance between sensitivity and specificity for identifying children at risk of PTSD. The CRIES-8 is a screening measure and does not establish a clinical diagnosis. The measure was administered as part of the standardized assessment protocol at both the beginning and end of the residential program. The Ukrainian version was developed through a decentered adaptation process by specialists affiliated with the Institute of Mental Health of the Ukrainian Catholic University and collaborating researchers and was obtained from the official Children and War Foundation repository (Perrin et al., 2005). Psychometric evaluation in a sample of 1,505 Ukrainian schoolchildren showed acceptable internal consistency for the total scale and its Intrusion and Avoidance subscales (Віталій Климчук, 2017).

In our combined sample, the CRIES-8 showed acceptable internal consistency at both assessments, with Cronbach’s $\alpha = .708$ and McDonald’s $\omega = .718$ at baseline and $\alpha = .760$ and $\omega = .767$ at the second assessment. Several items showed relatively high item–rest correlations across both assessments, particularly Item 8 ($r = .531$ at baseline and $.625$ at the second assessment), Item 4 ($r = .542$ and $.445$), Item 5 ($r = .426$ and $.511$), and Item 1 ($r = .401$ and $.518$). Some item–rest correlations changed substantially across assessments. The largest increase was observed for Item 7 ($r = .286$ to $.504$), followed by Item 2 ($r = .342$ to $.492$) and Item 1 ($r = .401$ to $.518$). In contrast, correlations decreased for Item 4 ($r = .542$ to $.445$) and Item 6 ($r = .319$ to $.226$). At the second assessment, Item 6 showed the weakest association with the remaining scale items. These changes were descriptive and were not formally tested for statistical significance.

Statistical Analysis

Descriptive statistics were used to summarize participant characteristics and baseline CATS-2 and CRIES-8 scores. Continuous variables were reported as means and standard deviations when their distributions were approximately normal and as medians and interquartile ranges when substantial departures from normality were observed. Categorical variables were summarized using frequencies and percentages.

Distributional assumptions were assessed using Shapiro–Wilk tests and visual inspection of quantile–quantile plots. For paired analyses, normality was evaluated for the distribution of pre–post difference scores. Associations between age and symptom scores were examined using Spearman’s rank correlation coefficients because some variables departed from normality.

Missing Data. One participant in the confirmed-loss cohort lacked post-program data. Consequently, paired outcome analyses included 49 confirmed-loss and 50 ambiguous-loss participants. The exploratory drawing analysis included 58 participants; drawings were unavailable or incomplete for the remaining 42 participants.

Baseline differences between the confirmed- and ambiguous-loss cohorts were examined using independent-samples t tests when the assumptions of the test were met. Mann–Whitney U tests were used when substantial departures from normality were identified. Baseline differences by sex were examined using the same decision rule. Within-cohort changes between baseline and post-program assessment were examined separately for each loss group. In the confirmed-loss cohort, pre–post difference scores departed from normality; therefore, changes were evaluated using Wilcoxon signed-rank tests. Rank-biserial correlations were calculated as effect-size estimates. In the ambiguous-loss cohort, the distributions of the relevant difference scores met the normality assumption and paired-samples t tests were used. Cohen’s d was calculated for parametric comparisons. Differences in the magnitude of change between the two cohorts were examined using Mann–Whitney U tests applied to individual pre–post change scores.

All tests were two-sided, and statistical significance was assessed at the commonly used alpha level of 0.05 in psychosocial research. Analyses were conducted on a macOS using R 4.6.1 (R Core Team, 2026) within RStudio Version 2026.07.1 + 147 and R packages retrieved from the CRAN. Data were imported from Microsoft Excel files using the readxl package (Wickham & Bryan, 2015). Data cleaning, variable recoding, missing-data handling, restructuring, and aggregation were performed using dplyr (Wickham, François, et al., 2014), tidyr (Wickham, Vaughan, et al., 2014), tibble (Müller & Wickham, 2016), and tidysselect (Henry & Wickham, 2017). The rstatix package (Kassambara, 2019) was used for distributional assessment, effectsize (Ben-Shachar et al., 2020) for effect sizes and confidence intervals, and correlation (Makowski et al., 2020) for Spearman correlations. Figures were created with ggplot2 (Wickham et al., 2007) and combined using patchwork (Pedersen, 2019). Inferential tests were conducted using base R.

Exploratory Self-Portrait Analysis. Participants were invited to create self-portraits during the first week of the program. Self-portraits were coded using a predefined coding scheme that captured

compositional, affective, and thematic characteristics of each drawing. Binary indicators were used to record the presence of written text, a contextual background, color, visible hands, war-related imagery, protective objects, fragmentation, and patriotic symbols. War-related imagery was defined as the presence of weapons, explosions, or other explicitly violent symbols, whereas protective objects included items such as helmets or shields. Fragmentation was coded when body parts were detached or visibly misaligned, or when parts of the body were deliberately crossed out.

Several characteristics were coded using ordinal or count-based categories. The proportion of the available drawing space occupied by the self-portrait was coded as 0.25, 0.50, 0.75, or 1.00. Figure type was classified as head only (1), head and neck (2), half-body (3), or full body (4). The number of colors used was recorded, and black dominance was coded when black or gray accounted for at least 50% of the drawing's line work or filled areas. Facial expression was operationalized through mouth valence, coded as smiling (+ 1), neutral (0), or frowning (– 1). Gaze direction was coded as directed toward the viewer (2), averted (1), or absent when the eyes were not depicted (0). Posture was coded as open (1) when the arms were uncrossed and the torso was not visually closed or defended, and as closed/defensive (0) otherwise.

The coding scheme was designed to capture two broad classes of drawing characteristics. First, formal and representational characteristics—including use of space, figure completeness, color use, facial expression, gaze, and posture—were selected because they could be defined as directly observable features and coded using structured categories with limited interpretive inference, consistent with formal-element approaches to art-product assessment (Crawford et al., 2012; Gantt & Anderson, 2009; Péntzes et al., 2020). Second, thematic characteristics—including war-related imagery, protection-themed objects, and patriotic symbols—were included because comparable content has been documented in studies of children's representations of war and, specifically, in drawings produced by Ukrainian children affected by the Russian invasion (Deguara, 2024; Konieczna & Kiriakova, 2023). The markers were treated as descriptive features of the drawings rather than as validated projective or diagnostic indicators. Because the psychological meaning of individual drawing characteristics is context-dependent and has limited established validity (Lilienfeld et al., 2000; Thomas & Jolley, 1998), their associations with self-reported self-blame were considered exploratory and hypothesis-generating. The coding scheme was established before coders examined the drawings and before the self-blame analyses were conducted.

Associations between coded self-portrait characteristics and responses to the CATS-2 self-blame item were examined using Bayesian cumulative ordinal regression models adjusted for age, sex, and program cohort implemented in brms package for R (Bürkner, 2025). Prediction datasets and model-derived summaries were prepared using dplyr (Wickham, François, et al., 2014) and tibble (Müller & Wickham, 2016). Predicted response probabilities by gaze characteristic and loss cohort were visualized using ggplot2.

Results

Baseline Symptom Levels and Cohort Comparisons. At baseline, symptom levels were broadly similar across the confirmed- and ambiguous-loss cohorts. Because CATS-2 total scores departed from normality in both cohorts, they were summarized using medians and interquartile ranges. Median CATS-2 scores were 15 (IQR = 9) in the confirmed-loss cohort and 14 (IQR = 8.75) in the ambiguous-loss cohort. CRIES-8 total scores were approximately normally distributed in both cohorts and were therefore summarized using means and standard deviations: $M = 15.12$, $SD = 9.03$ for confirmed loss and $M = 15.80$, $SD = 8.59$ for ambiguous loss. For the CRIES-8 subscales, intrusion scores were summarized using medians because the distribution departed substantially from normality in the ambiguous-loss cohort. Median intrusion scores were 7.50 (IQR = 6.50) for confirmed loss and 6 (IQR = 5.75) for ambiguous loss. Avoidance scores were non-normal in both cohorts, with median scores of 6.50 (IQR = 12) and 7 (IQR = 8.75), respectively.

CATS-2 total scores departed from normality in both the confirmed-loss, $W = .926$, $p = .004$, and ambiguous-loss cohorts, $W = .791$, $p < .001$. CRIES-8 total scores did not show substantial departures from normality in either cohort, confirmed loss: $W = .959$, $p = .082$; ambiguous loss: $W = .960$, $p = .087$. For CRIES-8 intrusion, the confirmed-loss distribution was approximately normal, $W = .958$, $p = .073$, whereas the ambiguous-loss distribution departed from normality, $W = .869$, $p < .001$. Avoidance scores departed from normality in both cohorts, confirmed loss: $W = .897$, $p < .001$; ambiguous loss: $W = .947$, $p = .026$. Visual inspection of the Q–Q plots was consistent with these results. No statistically significant baseline differences were detected between the confirmed- and ambiguous-loss cohorts on any of the symptom measures. CATS-2 total scores did not differ between cohorts, $U = 1281.50$, $p = .828$, $r_{rb} = .03$, 95% CI [– .20, .25]. The estimated between-cohort location shift was approximately 0 points, 95% CI [– 3, 3]. CRIES-8 total scores were also comparable between the confirmed-loss ($M = 15.12$, $SD = 9.03$) and ambiguous-loss ($M = 15.80$, $SD = 8.59$) cohorts, Welch's $t(97.76) = -0.39$, $p = .701$, Cohen's $d = -0.08$, 95% CI [– 0.47, 0.32]. The estimated mean difference was – 0.68 points, 95% CI [– 4.18, 2.82].

Similarly, no between-cohort differences were detected for the CRIES-8 subscales. Intrusion scores did not differ significantly, $U = 1346.50$, $p = .505$, $r_{rb} = .08$, 95% CI [– .15, .30], with an estimated location shift of 1 point, 95% CI [– 1, 3]. Avoidance scores also did not differ significantly, $U = 1105$, $p = .316$, $r_{rb} = -.12$, 95% CI [– .33, .11], with an estimated location shift of – 1 point, 95% CI [– 3, 1]. Across all four measures, effect-size estimates were small and their confidence intervals included zero (Table 1).

Table 1
Baseline CATS-2 and CRIES-8 Symptom Scores by Loss Cohort

Measure	Confirmed-loss cohort	Ambiguous-loss cohort	Test results	Effect size and 95% CI
CATS-2 total	<i>Mdn</i> = 15.00 [12.00, 21.00]	<i>Mdn</i> = 14.00 [11.25, 20.00]	$U = 1281.50, p = .828$	$r_{rb} = .03$ [– .20, .25]
CRIES-8 total	$M = 15.12$ ($SD = 9.03$)	$M = 15.80$ ($SD = 8.59$)	$t(97.76) = -0.39, p = .701$	$d = -0.08$ [– 0.47, 0.32]
CRIES-8 intrusion	<i>Mdn</i> = 7.50 [4.25, 10.75]	<i>Mdn</i> = 6.00 [4.00, 9.75]	$U = 1346.50, p = .505$	$r_{rb} = .08$ [– .15, .30]
CRIES-8 avoidance	<i>Mdn</i> = 6.50 [1.00, 13.00]	<i>Mdn</i> = 7.00 [3.25, 12.00]	$U = 1105.00, p = .316$	$r_{rb} = -.12$ [– .33, .11]
Note. Values for non-normally distributed measures are reported as median [Q1, Q3]; CRIES-8 total scores are reported as mean (SD). r_{rb} = rank-biserial correlation. CI = confidence interval.				

Baseline Differences by Sex. Baseline CATS-2 scores did not differ by sex in the confirmed-loss cohort. Girls had a median score of 17 [IQR: 10–21.75], compared with 14 [12–19.25] among boys, $U = 332, p = .697, r_{rb} = .06, 95\% \text{ CI } [-.25, .37]$. The estimated location shift was 1 point, $95\% \text{ CI } [-5, 6]$. In the ambiguous-loss cohort, girls had higher baseline CATS-2 scores, $Mdn = 16$ [13–29], than boys, $Mdn = 12$ [10–15], $U = 461, p = .004, r_{rb} = .48, 95\% \text{ CI } [.19, .69]$. The estimated location shift was 5 points, $95\% \text{ CI } [2, 10]$, indicating a moderate sex difference in baseline posttraumatic stress symptom severity.

CRIES-8 total scores did not differ significantly by sex in either cohort. In the confirmed-loss cohort, girls ($M = 14.42, SD = 8.18$) and boys ($M = 15.88, SD = 9.99$) had similar baseline scores, Welch's $t(44.58) = -0.56, p = .579, d = -0.16, 95\% \text{ CI } [-0.72, 0.4]$. The estimated mean difference was – 1.45 points, $95\% \text{ CI } [-6.68, 3.78]$. In the ambiguous-loss cohort, girls ($M = 17.40, SD = 9.97$) had somewhat higher scores than boys ($M = 14.2, SD = 6.79$), although the difference was not statistically significant, Welch's $t(42.33) = 1.33, p = .192, d = 0.38, 95\% \text{ CI } [-0.19, 0.93]$. The estimated mean difference was 3.20 points, $95\% \text{ CI } [-1.67, 8.07]$.

Associations With Age. Spearman's rank correlations were used to examine associations between age and baseline symptom severity separately within each loss cohort. In the confirmed-loss cohort ($n = 50$), age was positively associated with baseline CATS-2 scores, $r_s = .31, 95\% \text{ CI } [.03, .55], p = .027$, indicating that older participants tended to report higher posttraumatic stress symptom severity. The association between age and CRIES-8 scores was smaller and not statistically significant, $r_s = .15, 95\% \text{ CI } [-.15, .42], p = .309$. In the ambiguous-loss cohort ($n = 50$), age was not significantly associated with CATS-2 scores, $r_s = .19, 95\% \text{ CI } [-.10, .45], p = .192$. In contrast, age was positively associated with CRIES-8 scores, $r_s =$

.43, 95% CI [.16, .64], $p = .002$, indicating that older participants tended to report higher CRIES-8 symptom scores.

Concurrent Validity. CATS-2 and CRIES-8 total scores were positively associated at both assessments. In the overall sample, the correlation was moderate at baseline, $r_s = .56$, 95% CI [.40, .68], $n = 100$, and moderately strong at the post-program assessment, $r_s = .65$, 95% CI [.51, .75], $n = 99$.

Within the confirmed-loss cohort, the measures were positively correlated at baseline, $r_s = .49$, 95% CI [.24, .68], $n = 50$, and at the post-program assessment, $r_s = .57$, 95% CI [.33, .73], $n = 49$. Within the ambiguous-loss cohort, the corresponding correlations were $r_s = .63$, 95% CI [.42, .77], $n = 50$, at baseline and $r_s = .75$, 95% CI [.59, .85], $n = 50$, at the post-program assessment. All six correlations remained statistically significant after Holm adjustment, all adjusted p s < .001.

These moderate-to-strong positive associations provide evidence of convergence between CATS-2 and CRIES-8 scores. However, the measures should not be considered interchangeable because they assess partly different symptom domains. The cohort-specific coefficients were not formally compared; therefore, their numerical differences should not be interpreted as statistically significant differences between cohorts.

Trauma Exposure and Functional Interference. The most frequently endorsed potentially traumatic event was the sudden or violent death of someone close, reported by 60 participants (values of n and % are equal because the data is complete for 100 participants). Other commonly reported experiences included being near military operations (38), a serious accident or injury (36), a stressful or frightening medical procedure (34), and in-person bullying or intimidation (29). The most frequently affected domain was feeling happy, reported by 42 participants, followed by studying or schoolwork (29) and getting along with others (24). Interference with hobbies or recreation was reported by 16 participants, and interference with family relationships by 12 (Table 2).

Table 2
Potentially Traumatic Events and Functional Interference at Baseline

Domain	Item	<i>n</i>
Potentially traumatic events	Serious natural disaster	9
	Serious accident or injury	36
	Threats, beatings, or serious injury by a family member	15
	Threats, beatings, or serious injury at school or in the community	16
	Assault, stabbing, shooting, or robbery	9
	Witnessing a family member being threatened, beaten, or seriously injured	13
	Witnessing someone at school or in the community being threatened, beaten, or seriously injured	23
	Sexual acts or coercion when unable to say no	4
	Online sexual solicitation or pressure	7
	In-person bullying or intimidation	29
	Online bullying or intimidation	7
	Sudden or violent death of someone close	60
	Stressful or frightening medical procedure	34
	Being near military operations	38
Functional interference	Getting along with others	24
	Hobbies or recreation	16
	Studying or schoolwork	29
	Family relationships	12
	Feeling happy	42

Note. N = 100. There were no missing responses for these items. Participants could endorse more than one potentially traumatic event and more than one domain of functional interference.

Pre–Post Changes in Posttraumatic Stress Symptoms. Complete paired CATS-2 and CRIES-8 data were available for 49 participants in the confirmed-loss cohort and all 50 participants in the ambiguous-loss cohort. Pre–post change scores were calculated as baseline minus post-program scores, such that positive values indicated a reduction in symptom severity. The distributions of CATS-2 and CRIES-8 change scores departed from normality in the confirmed-loss cohort, CATS-2: $W = .901$, $p < .001$; CRIES-

8: $W = .952$, $p = .044$. Accordingly, pre–post changes in this cohort were evaluated using Wilcoxon signed-rank tests. In the ambiguous-loss cohort, change scores did not show substantial departures from normality for either CATS-2, $W = .962$, $p = .103$, or CRIES-8, $W = .976$, $p = .402$; therefore, paired-samples t tests were used.

In the confirmed-loss cohort, CATS-2 scores decreased from a median of 15 [IQR: 12–21] at baseline to 8 [4–10] at the post-program assessment. This reduction was statistically significant, $V = 1108$, $p < .001$, with an estimated location shift of 7.5 points, 95% CI [5.5, 10], and a large matched-pairs rank-biserial correlation, $r_{rb} = .96$, 95% CI [.93, .98]. CRIES-8 scores similarly decreased from a median of 14 [9–19] to 4 [2–10], $V = 970$, $p < .001$. The estimated location shift was 8.5 points, 95% CI [6, 11], with a large rank-biserial effect, $r_{rb} = .96$, 95% CI [.92, .98].

In the ambiguous-loss cohort, CATS-2 scores decreased from $M = 18.06$ ($SD = 11.53$) at baseline to $M = 10.62$ ($SD = 7.83$) at the post-program assessment. The mean reduction was 7.44 points, 95% CI [4.93, 9.95], and was statistically significant, $t(49) = 5.96$, $p < .001$, $d_z = 0.84$, 95% CI [0.52, 1.17]. CRIES-8 scores also decreased, from $M = 15.80$ ($SD = 8.59$) to $M = 11.88$ ($SD = 8.58$), with a mean reduction of 3.92 points, 95% CI [2.30, 5.54], $t(49) = 4.87$, $p < .001$, $d_z = 0.69$, 95% CI [0.38, 1.00]. Thus, both symptom measures showed statistically significant pre–post reductions in the ambiguous-loss cohort, with a large standardized change for CATS-2 and a moderate-to-large standardized change for CRIES-8.

Between-Cohort Differences in Symptom Change. The magnitude of pre–post change was compared between the confirmed- and ambiguous-loss cohorts using Mann–Whitney U tests, with positive change scores indicating reductions in symptom severity. For CATS-2, the confirmed-loss cohort showed a median reduction of 6 points [IQR: 3–12], compared with 7.5 points [2–11.75] in the ambiguous-loss cohort. There was no statistically significant difference in CATS-2 change between cohorts, $U = 1316.5$, $p = .521$, $r_{rb} = .07$, 95% CI [–.15, .29]. The estimated between-cohort location shift was 1 point, 95% CI [–2, 4].

For CRIES-8, the confirmed-loss cohort showed a median reduction of 7 points [3–14], whereas the ambiguous-loss cohort showed a median reduction of 3.5 points [0–7]. The reduction in CRIES-8 scores was significantly greater in the confirmed-loss cohort, $U = 1661.5$, $p = .002$, $r_{rb} = .36$, 95% CI [.14, .54]. The estimated between-cohort location shift was 4.51 point, 95% CI [2, 7]. To illustrate how changes in the two symptom measures co-occurred within individual participants, CATS-2 and CRIES-8 change scores were plotted jointly by loss cohort (Fig. 1). Positive values indicate lower symptom scores at the post-program assessment, such that participants in the upper-right quadrant showed reductions on both measures. Consistent with the between-cohort analyses, the cohorts overlapped considerably in CATS-2 change, whereas larger CRIES-8 reductions were more apparent in the confirmed-loss cohort.

Figure 1.

Joint Pre–Post Changes in CATS-2 and CRIES-8 Scores by Loss Cohort

Note

Change scores were calculated as baseline minus post-program scores; therefore, positive values indicate reductions in symptom scores and negative values indicate increases. Each point represents one participant with complete CATS-2 and CRIES-8 data at both assessments. The dashed horizontal and vertical lines indicate no change on CRIES-8 and CATS-2, respectively. Solid lines represent descriptive linear trends fitted separately for the confirmed- and ambiguous-loss cohorts.

Exploratory Associations Between Self-Portrait Characteristics and Self-Blame. The exploratory analysis included 58 participants with self-portraits and complete data on the variables included in the Bayesian ordinal regression model. Figure 2 presents an example of a coded self-portrait that incorporates features analyzed in the study, such as closed eyes and a fragmented face (absence of a mouth). Associations between the coded self-portrait characteristics and responses to the CATS-2 self-blame item were then examined using Bayesian cumulative ordinal regression.

Figure 2.

Example of a Self-Portrait Included in the Exploratory Analysis

Note

Upper-right part contained a name and therefore was blurred.

Gaze direction showed the clearest association with CATS-2 self-blame after adjustment for loss cohort, sex, age, presence of hands, and fragmentation. Relative to drawings in which the eyes were absent or crossed out, an averted gaze was associated with a lower probability of endorsing higher self-blame categories, $b = -2.58$, 95% CrI $[-4.45, -0.73]$, as was a direct gaze, $b = -2.00$, 95% CrI $[-3.76, -0.21]$. The posterior estimates for the ambiguous- versus confirmed-loss cohort, $b = 1.14$, 95% CrI $[-0.03, 2.37]$, presence of hands, $b = 1.13$, 95% CrI $[-0.11, 2.37]$, and fragmentation, $b = 1.10$, 95% CrI $[-0.16, 2.36]$, were positive, although their credible intervals included zero. The corresponding credible intervals also included zero for male versus female sex, $b = -0.81$, 95% CrI $[-2.16, 0.48]$, and age, $b = 0.07$, 95% CrI $[-0.18, 0.33]$. Model convergence was satisfactory, with for all regression coefficients and large effective sample sizes. Adjusted predicted probabilities further illustrated the gaze association (Fig. 3).

Figure 3.

Adjusted Predicted Probabilities of CATS-2 Self-Blame Responses by Gaze Characteristic and Loss Cohort

Note

Percentages represent posterior mean predicted probabilities from the Bayesian cumulative ordinal logistic regression model. Predictions are shown for a female participant at the mean age of the analytic sample (11.55 years), with hands absent and no fragmentation, while gaze characteristic and loss cohort are varied. The model additionally adjusted for age, sex, presence of hands, and fragmentation. The eyes-absent/crossed-out category was only $n = 4$.

For a female participant of the mean age of the analytic sample (11.55 years), with hands absent and no fragmentation, the predicted probability of reporting no self-blame in the confirmed-loss cohort was 51% when the eyes were absent or crossed out, compared with 91% for an averted gaze and 86% for a direct gaze. The corresponding probabilities of reporting self-blame almost always were 12%, 1%, and 2%, respectively. In the ambiguous-loss cohort, the predicted probability of reporting no self-blame was 30% when the eyes were absent or crossed out, 79% for an averted gaze, and 70% for a direct gaze; the corresponding probabilities of reporting self-blame almost always were 26%, 3%, and 5%. Thus, across both cohorts, drawings containing an identifiable gaze were associated with lower predicted self-blame than drawings in which the eyes were absent or crossed out. However, it is crucial to approach the finding with caution, as the “absent/crossed-out gaze” category was relatively small, comprising only four participants. Notably, all four individuals in this category endorsed the highest self-blame response category.

Discussion

Principal Findings. This two-cohort observational study found substantial short-term reductions in self-reported posttraumatic stress symptoms during the 21-day residential program period. CATS-2 and CRIES-8 scores decreased significantly in both the confirmed-loss and ambiguous-loss cohorts. The moderate-to-strong correlations between CATS-2 and CRIES-8 scores provide evidence that the measures capture overlapping aspects of posttraumatic stress. The magnitude of CATS-2 change did not differ significantly between cohorts, and the confidence interval included differences in either direction. In contrast, the reduction in CRIES-8 scores was greater in the confirmed-loss cohort, with an estimated between-cohort location shift of 4.51 point. Because this was a nonrandomized pre–post study without an untreated comparison group, our findings document the changes in symptoms during the program period, emphasizing the benefits of such psychological rehabilitation camps for children who lost their relatives. However, there is a lack of evidence to establish the specific mechanism or a single intervention that caused these changes.

The exploratory self-portrait analysis found that participants whose drawings included an identifiable gaze had a lower estimated probability of endorsing higher self-blame than participants whose eyes were absent or crossed out. This finding requires considerable caution. The absent/crossed-out category contained only four participants, all of whom endorsed the highest self-blame response, and the analysis was based on a subset of the full sample which included only the drawings that were available. The

result is therefore hypothesis-generating and should not be interpreted as evidence or serve as a clinical screening tool. Nevertheless, we establish a framework and recommend conducting further research in this direction to accurately quantify psychological states from art, an area characterized by high speculative interpretations.

Loss Certainty and the Organization of Adaptation. The theoretical contribution of the present study is not that one form of loss necessarily produces more severe symptoms than another. Rather, confirmed and ambiguous loss may organize psychological adaptation in different ways. Boss (2010) conceptualized ambiguous loss as a situation in which a person is physically absent but remains psychologically present because death or permanent separation has not been established. In confirmed loss, the child confronts a painful but relatively stable reality: the person has died and will not return. In ambiguous loss, the child must continue to accommodate mutually incompatible possibilities – that the absent person may return, may remain missing, or may have died. Uncertainty is therefore not merely an additional stressor; it affects the structure of the child’s relationship to the absent person and the psychological tasks that can realistically be undertaken.

This distinction qualifies established models of bereavement. In the dual process model, adaptation involves movement between loss-oriented coping, such as attending to grief and memories of the deceased, and restoration-oriented coping, such as re-engaging with daily life and future roles (Stroebe & Schut, 1999). This model applies relatively directly after confirmed death. The confirmed-loss program contained elements on mourning and maintaining memories alongside values, future aspirations, and coping, corresponding broadly to these two orientations. Its application to ambiguous loss is less straightforward. A child may oscillate not only between loss and restoration but also between searching and waiting, hope and fear, and psychological connection and provisional adaptation. Restoration-oriented activity may sometimes be experienced as abandoning the absent person, whereas treating the separation as permanent may contradict the available facts. From this perspective, the aim is not to impose acceptance of an unconfirmed death but to help the child function while holding uncertainty.

The absence of significant baseline differences indicates that ambiguous loss should not automatically be understood as producing greater overall posttraumatic stress severity. Instead, the different CATS-2 and CRIES-8 patterns may suggest that loss context is associated with the organization or short-term course of symptom domains rather than with a simple hierarchy of distress. If replicated under controlled conditions, the larger CRIES-8 reduction in the confirmed-loss cohort could indicate that intrusion and avoidance are especially responsive when the loss has a confirmed reality that can be addressed through grief-, memory-, and avoidance-focused work. However, loss context was confounded with program content and number of sessions, so the present results cannot distinguish this theoretical explanation from differences between the two programs.

Future Research. Future research should distinguish between program effects and loss context. However, it is challenging to do so because each program was designed to address the specific needs of its participants, making direct comparisons difficult. One potential solution is to randomize participants

within confirmed and ambiguous loss strata to a common-core program with or without loss-specific modules, while maintaining a constant number and duration of sessions. Where randomization is not feasible, prospective multisite studies could use matched comparison groups, standardized program delivery, independent fidelity assessment, and statistical adjustment for baseline symptoms, time since loss, cumulative trauma exposure, prior care, and relevant family characteristics. Relationship to the deceased or absent person, circumstances and duration of the loss, changes in information about missing relatives, program attendance, staff, and concurrent support should be recorded systematically. Follow-up at several points after discharge is necessary to examine the longevity of change.

Further psychometric work should examine the reliability, factor structure, measurement invariance, and sensitivity to change of the Ukrainian CATS-2 and CRIES-8, regarding the current change of circumstances caused by the war. Future outcome sets should extend beyond posttraumatic stress to include prolonged grief, depression, anxiety, daily functioning, caregiver reports, and adverse events. The exploratory self-portrait finding should be examined only in a preregistered study with blinded coders, interrater-reliability assessment, and substantially larger comparison categories.

Conclusion

Children in both cohorts reported lower posttraumatic stress symptoms at the end of the residential program than at entry. These changes provide a rationale for continued evaluation of structured, loss-adapted psychological support in Ukraine, but they do not establish program effectiveness. Controlled designs, equivalent program exposure, independent assessment, and longer-term follow-up are needed to determine which components are beneficial, for whom, and whether improvements persist after children return to their everyday environments.

Declarations

Ethics Approval

The research procedure was approved by an independent national professional ethics committee [blinded for peer review], with formal approval dated [blinded for peer review].

Consent to Participate

Because all participants were minors, written informed consent for participation in the rehabilitation program and associated psychological and diagnostic procedures was obtained from a parent or legal guardian before participation. Participants were informed that they could decline to answer individual questions or discontinue the assessment at any time.

Consent to Publish

Written consent to publish the de-identified drawing presented in Fig. 2 was obtained from the participant's parent or legal guardian and from the participant. No personally identifying information is

reported in the manuscript.

Competing Interests

The authors were compensated for conducting the research, but they assert that it did not influence the results. The funding body had no role in the analysis, interpretation, or manuscript preparation.

Author Contribution

A.S. led the study, conducted the statistical analyses, interpreted the results, and wrote the original manuscript draft. V.P. contributed to the conceptualization of the study and project administration and critically reviewed and edited the manuscript. Y.B. contributed to the investigation and development of the theoretical framework and reviewed and edited the manuscript. M.D.-K. contributed to project administration and edited the discussion section of the manuscript. All authors reviewed and approved the final manuscript and agree to be accountable for the integrity and accuracy of the work.

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Data Availability

The participant-level data are not publicly available because they contain sensitive information concerning minors affected by war-related parental loss, and public sharing was not included in the conditions of informed consent. De-identified data supporting the findings may be made available to qualified researchers upon reasonable request, subject to approval by the relevant ethics committee and data custodian and execution of an appropriate data-use agreement.

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Figures

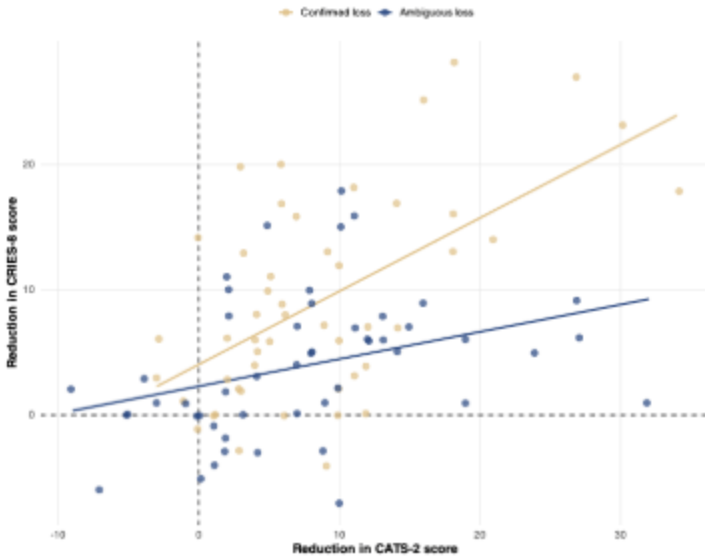


Figure 1

Joint Pre-Post Changes in CATS-2 and CRIES-8 Scores by Loss Cohort

Note. Change scores were calculated as baseline minus post-program scores; therefore, positive values indicate reductions in symptom scores and negative values indicate increases. Each point represents one participant with complete CATS-2 and CRIES-8 data at both assessments. The dashed horizontal and vertical lines indicate no change on CRIES-8 and CATS-2, respectively. Solid lines represent descriptive linear trends fitted separately for the confirmed- and ambiguous-loss cohorts.



Figure 2

Example of a Self-Portrait Included in the Exploratory Analysis

Note. Upper-right part contained a name and therefore was blurred.

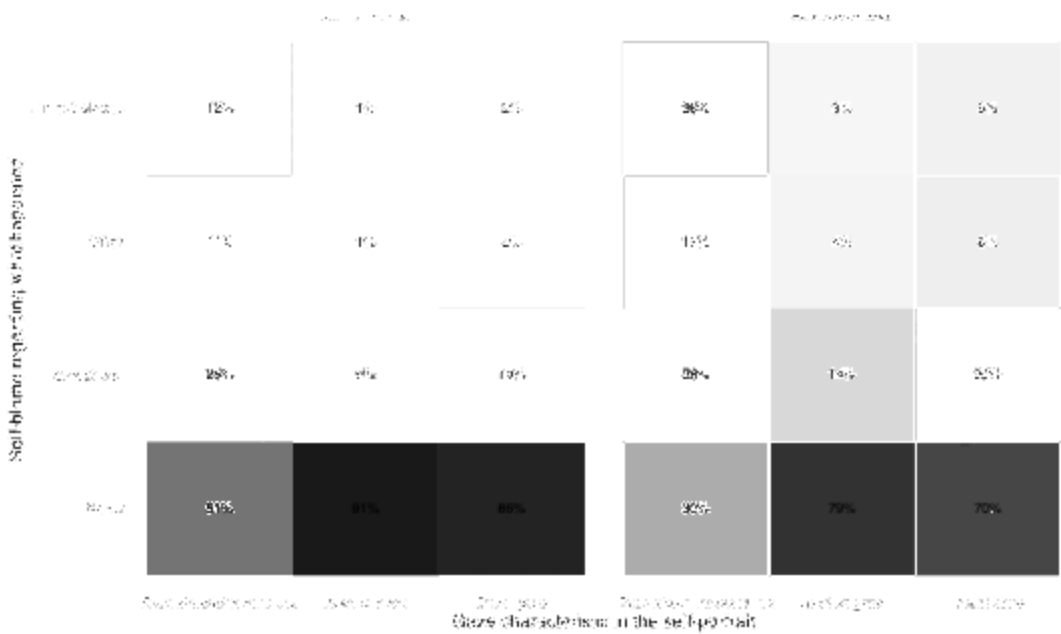


Figure 3

Adjusted Predicted Probabilities of CATS-2 Self-Blame Responses by Gaze Characteristic and Loss Cohort

Note. Percentages represent posterior mean predicted probabilities from the Bayesian cumulative ordinal logistic regression model. Predictions are shown for a female participant at the mean age of the analytic sample (11.55 years), with hands absent and no fragmentation, while gaze characteristic and loss cohort are varied. The model additionally adjusted for age, sex, presence of hands, and fragmentation. The eyes-absent/crossed-out category was only n = 4.