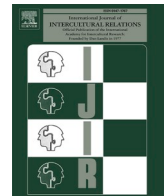




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Validating negative context of reception scale for Ukrainians in the US

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ABSTRACT

This study aimed to validate the Context of Reception (NCR) scale among Ukrainian immigrants in the United States, comparing those who arrived before and after the 2022 Russian invasion. NCR refers to some of the challenges immigrants face in their new environment, including lack of support and opportunities. The research involved 703 Ukrainian migrants who completed measures related to NCR, cultural and family-economic stressors, well-being, mental health issues, and alcohol misuse. Confirmatory Factor Analysis (CFA) supported a strong factor structure for the NCR scale. Measurement invariance tests had partial metric and scalar invariance between pre-invasion ($n = 477$) and post-invasion ($n = 217$) cohorts. Structural equation modeling (SEM) yielded significant correlations between NCR and various stressors and psychological outcomes. Post-invasion immigrants reported a significantly worse context of reception than their pre-invasion counterparts. NCR scores were positively linked to discrimination, language stress, depressive symptoms, anxiety, and alcohol misuse, whereas negatively correlated with life satisfaction and optimism. The NCR scale proved to be a reliable measure, strongly associated with mental health outcomes among Ukrainians.

History of Ukrainian conflict with Russia

Ukraine is the largest country in Europe and has been an independent state since the fall of the Soviet Union (WHO, 2020). Ukraine's independence, declared after the collapse of the Soviet Union in 1991, has been overshadowed by ongoing tensions with Russia. These challenges persist as Russia has been largely unwilling to recognize Ukraine as a separate nation from Russian identity (Kuzio, 2021). Such geopolitical tensions have evolved into hybrid warfare, as evidenced by the Maidan nationwide movement in 2013–2014 demanding human rights, political regime change, and an end to corruption; and the annexation of the Crimea and Donbas regions of Ukraine (Alpysbekova, Cisco, Ertanir, et al., 2024a; Whyte, 2021).

The Crimea and Donbas conflicts prompted significant migration both within and beyond Ukraine's borders, impacting millions directly affected by the conflict (Migration Outlook, 2023). By 2015, there was a notable increase in Ukrainian migration to the European Union, particularly in countries such as Poland (Jaroszewicz, 2015). This escalation reached a critical point with the

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large-scale invasion of Ukraine by the Russian Federation starting on February 24, 2022 (Seleznova et al., 2023). This event marked the Ukrainian refugee crisis as among the largest human displacement crisis in the world today and the most significant refugee crisis in Europe since the end of the Second World War (Migration Outlook, 2023). Within the first five days of the invasion alone, over 660,000 people, primarily women and children, fled Ukraine—an unprecedented wave of European migration since the Balkan migration of the 1990s (Pifer, 2020). As of January 2024, approximately 3.7 million people had been displaced within Ukraine, and an additional 7 million had fled the country altogether (UNHCR, 2024).

This study's focus on comparing pre- and post-invasion Ukrainian migration groups is crucial, as these two cohorts likely experienced distinct psychological and social challenges, shaped by both the evolving geopolitical context and the significant shift in global attitudes towards Ukraine and Russia. Although many Ukrainian war migrants have settled elsewhere in Europe, the United States has also served as a prime destination for these migrants. Specifically, more than 500,000 Ukrainians settled in the United States between February 2022 and March 2024 (Freitas-Tamura, 2023; Montoya-Galvez, 2023). More than 187,000 Ukrainians had sought refuge in the United States under the Uniting for Ukraine (U4U) program (temporary shelter to Ukrainian citizens and their families, permitting them to reside in the United States for a period of up to two years through a system known as parole), and 350,000 entered through other channels (Alpysbekova, Cisco, Ertanir, et al., 2024a).

Importantly, the historical evolution of U.S.-Russia relations has played a key role in shaping the broader migration context for Ukrainians. Over the past few decades, tensions between the U.S. and Russia have fluctuated, but recent geopolitical events—especially the Russian invasion of Ukraine—have significantly impacted U.S. attitudes toward post-Soviet immigration and global conflict, leading to increased scrutiny of Russian migrants and greater support for Ukrainian refugees. (Gutmann et al., 2023; Kuzemko et al., 2022). This shift in U.S. foreign policy could contribute to differential impacts on the mental health and well-being of Ukrainian migrants, with pre-invasion migrants potentially facing a different set of challenges compared to those arriving after the invasion. These distinctions are important for understanding how migration experiences differ depending on the broader political and social context.

Negative Context of Reception (NCR) among Ukrainian immigrants in the United States

The United States has been described as an ideal destination for immigrants because of the value placed on diligence, resilience, and capitalizing on opportunities (Huntington, 2004; Morales et al., 2011). Many immigrants perceive the U.S. as a “land of opportunity” and arrive with optimism (Guan et al., 2023). This optimism is particularly notable among European migrants, who are generally expected to be received favorably in the United States. This favorable reception is largely rooted in racial and ethnic biases that permeate U.S. society, where white European migrants are perceived as more “desirable” due to cultural similarities and racial hierarchies that privilege whiteness (Bonilla-Silva, 2019). However, the U.S., like other immigrant-receiving nations, is characterized by some degree of defensiveness in response to large migrant flows. This defensiveness stems from both perceived realistic threats (e.g., job and housing competition) and symbolic threats (e.g., cultural differences) (Stephan & Stephan, 2000). Further, more collectivist-oriented cultural groups – such as Ukrainians (Minkov et al., 2023) – may experience more difficulty settling in individualist countries such as the United States (Artan, 2013; Schwartz et al., 2014). U.S. citizens and residents therefore may harbor “mixed feelings” toward Ukrainian migrants. Focusing on Europe, De Coninck (2022) highlights the positive public reaction to Ukrainian refugees in contrast to the more apprehensive response towards Afghan refugees. At the same time, it is important to note that some U.S. conservatives do not support aiding Ukraine and may harbor resentment towards Ukrainian migrants in the United States. Indeed, public opinion polls have shown a decline in support for Ukraine among the broader electorate, particularly among Republicans (Smeltz, 2022).

In this context, it is crucial to assess the extent to which negative context of reception (NCR) applies to this specific migrant group. The Negative Context of Reception Scale was developed by Schwartz et al. (2014) and it assesses feelings of exclusion and marginalization from mainstream U.S. culture. The NCR scale has been used primarily with various age groups (adolescents versus adults), in different languages (English versus Spanish), in multiple countries (e.g., Colombia, United States), and with diverse Latin American (im)migrant samples such as Mexicans (Forster et al., 2015), Puerto Ricans (Schwartz et al., 2024), and Venezuelans (Salas-Wright, Maldonado-Molina, et al., 2021) in the United States. However, this scale has not been used with European immigrants in the United States. Given the unique cultural and historical context of Ukrainian migrants, it is important to assess the validity of NCR in this group to better understand their experiences of exclusion and marginalization in the United States.

Despite its history as an immigrant-receiving country, the United States has often viewed immigrants as a threat to national identity and cultural solidarity (Huntington, 2004; Schwartz et al., 2014). Sociologists (e.g., Portes & Rumbaut, 2005) and anthropologists (e.g., Stepick et al., 2011) define context of reception as the opportunity structure, degree of openness or hostility, and community acceptance directed toward a specific immigrant group. In negative contexts of reception, immigrants may face isolation, job difficulties, and exclusion (Schwartz et al., 2014). Although sociological accounts often treat context of reception as characteristic of countries or regions, individual experiences vary based on factors such as acculturation, English proficiency, and skin tone (Córdova & Cervantes, 2010).

NCR is closely related to acculturative stress, which encompasses the psychological strain that immigrants experience as they adjust to a new cultural environment (Berry, 1998; 2006). Acculturative stress typically includes stressors such as discrimination, isolation, language barriers, and economic hardship (Miller et al., 2011). Many of these stressors overlap with NCR, but NCR emphasizes broader societal exclusion and cultural rejection, which can manifest not only in direct discrimination but also in more subtle forms of social marginalization and invisibility (Schwartz et al., 2024). For instance, Ukrainian immigrants may experience discrimination based on nationality or political affiliations, which may not always fall within traditional racial or ethnic categories (Costello & Foster, 2022).

Furthermore, NCR is intertwined with other forms of stress, such as minority stress, which posits that discrimination and stigma exacerbate psychological distress among members of marginalized groups (Meyer, 2003). This stress can manifest in various ways for Ukrainian immigrants, including the internalization of negative stereotypes, discrimination in housing and employment, and the broader societal rejection. Indeed, such discrimination has been identified as a significant stressor for Ukrainian refugees, contributing to heightened feelings of psychological distress, including depression, anxiety, and PTSD (Bilewicz et al., 2024; Chudzicka-Czupala et al., 2023). Ukrainians report high rates of PTSD, with post-migration discrimination and loss of control serving as key predictors (Bilewicz et al., 2024). These discriminatory experiences, compounded by cultural rejection and the trauma of war, may exacerbate pre-existing mental health conditions and increase risk for conditions such as PTSD and depression (Harb et al., 2023).

Cultural stress theory

Cultural stress theory (Schwartz et al., 2018) posits that discrimination, a negative context of reception, and bicultural and language stress represent significant stressors for immigrants, with discrimination and a negative context of reception being the most impactful (Schwartz et al., 2024). For instance, Salas-Wright et al. (2020) found that both discrimination and NCR are associated with increased substance use risk including alcohol drinking among Venezuelan immigrant youth, with discrimination exerting a direct effect and NCR exerting an indirect effect through family communication. In addition to its direct effects, NCR may also act as a mediator, amplifying the impact of other stressors, such as economic hardship and cultural dislocation, on mental health outcomes. Immigrants experiencing discrimination or marginalization may turn to alcohol as a means of coping with the psychological strain of exclusion (Lee et al., 2021). For Ukrainian immigrants, NCR could be linked with other stressors such as economic hardship, cultural dislocation, and war trauma, which may contribute not only to unhealthy coping strategies such as substance use, but also to increased mental health symptoms such as depression, anxiety, and PTSD. Therefore, we hypothesize that NCR will be positively correlated with problem drinking behaviors among Ukrainian immigrants.

Similarly, Schwartz et al. (2022) found that cultural stressors, including discrimination and NCR, predicted symptoms of anxiety, depression, compromised family functioning, and low optimism and life satisfaction. In addition, Meca et al. (2023) identified distinct profiles of cultural stressors and acculturation among Hispanic college students, noting that those reporting low levels of cultural stress reported higher psychosocial functioning. Although cultural stress theory has been applied primarily to Latin American immigrants, its application to Ukrainian refugees—a group subject to both war trauma and cultural stress—remains underexplored. This study was designed to bridge this gap by extending the NCR construct to Ukrainian immigrants, examining how their experiences of reception in the U.S. shape their mental health and well-being. Importantly, Ukrainian immigrants who fled the conflict after the 2022 Russian invasion face additional stressors beyond those typically encountered by some Latin American immigrants. These include war-related trauma, temporary legal statuses (e.g., U4U program and Temporary Protected Status), and the uncertainty of their future in the United States.

It is also important to consider the role of language stress. Immigrant adults who do not speak English as a native language generally speak with a foreign accent, may experience trouble communicating, and might have difficulties understanding spoken English. Such language stress has been shown to covary significantly with NCR and with discrimination in several (im)migrant groups, such as Puerto Ricans (Schwartz et al., 2024), Venezuelans (Salas-Wright et al., 2020), Mexicans (Forster et al., 2015), and Cubans (Schwartz et al., 2015).

Survivor's guilt, which often arises when individuals survive traumatic events whereas others do not, is a common psychological experience among refugees and war survivors (Kip et al., 2022), where individuals may grapple with feelings of unworthiness or shame for their relative safety, leading to emotional distress and mental health challenges such as depression, anxiety, and PTSD. In the case of Ukrainian refugees, this guilt is likely compounded by the dissonance between their relative safety in the U.S. and the ongoing suffering of family and friends left behind. The experience of NCR may modify the way Ukrainian immigrants experience survivor's guilt. Specifically, those facing discrimination or exclusion in the U.S. may be less likely to feel entitled to the privileges of safety, leading to an intensification of guilt (Binder, 2022; Kip et al., 2022). Additionally, the tension between gratitude for escape and the pain of loss may be amplified by negative experiences in the host country, where Ukrainians may feel that their efforts to build a new life are met with skepticism or hostility. This dynamic creates a complex relationship between NCR and survivor's guilt, which we hypothesize will be inversely related to NCR—greater NCR will be associated with lower survivor's guilt as the challenges of migration may reduce the emotional weight of survival. This dynamic, however, has not been fully explored in previous research.

The relationship between NCR and PTSD among Ukrainian immigrants can be understood within the framework of the 'stress-diathesis model,' which suggests that pre-existing vulnerabilities, such as trauma from war or displacement, may interact with environmental stressors such as NCR to predict increased PTSD symptoms (Abela & D'Alessandro, 2002). Although NCR is unlikely to directly cause PTSD, it may be associated with heightened psychological distress already present due to war-related trauma. In the case of Ukrainian refugees, the combination of survivor's guilt and ongoing discrimination in the U.S. may heighten re-traumatization, potentially predisposing migrants to more severe PTSD symptoms (Harb et al., 2023). Moreover, the 'cumulative trauma' perspective posits that multiple layers of stress, including NCR, may compound existing psychological distress, especially for war refugees (Hinchey et al., 2023). Thus, we hypothesize that NCR would be positively correlated with PTSD symptoms in Ukrainian immigrants, acting as a stressor that can intensify pre-existing trauma.

Economic stress among immigrants is a well-established concept within cultural stress theory. The theory posits that the financial strain experienced in the migration context can be exacerbated by experiences of discrimination and exclusion in the host country (Alpyzbekova, Cisco, Ertanir, et al., 2024a; Salas-Wright, Maldonado-Molina, et al., 2021). Economic stress can manifest as difficulty finding stable employment, inadequate access to resources, or challenges in meeting basic needs, all of which are common among

marginalized immigrant groups (Fleming et al., 2017). For Ukrainian immigrants, especially those fleeing the war, NCR may serve as a key stressor that covaries with economic problems (Alpysbekova, Cisco, Ertanir, et al., 2024a). The frustration of trying to find work or secure housing, compounded by social exclusion or negative attitudes from the host society, could create a feedback loop of stress, depression, and diminished well-being.

We hypothesized that the experiences of negative reception in the U.S. are likely to exacerbate the psychological distress already present due to their traumatic migration experiences. However, despite the substantial body of research on NCR and cultural stress in Latin American populations, little attention has been given to how these frameworks apply to war-displaced refugees, such as Ukrainians. The present study fills this gap by testing the validity and applicability of the NCR construct among Ukrainian immigrants and comparing their experiences with those of previously studied Latin American immigrants.

Study purpose and hypotheses

The purpose of the present study was to investigate the properties of NCR scores among Ukrainian immigrants who arrived before and after the 2022 Russian invasion, focusing on factor structure, measurement invariance, and convergent/construct validity. The study employed a mixed approach, combining confirmatory analysis of the NCR scale's factor structure and measurement invariance with exploratory analysis of its relationship to new measures, such as survivor's guilt. We hypothesized that the factor structure of scores generated by the NCR scale would be supported in both subgroups and that partial or full measurement invariance would be established between pre- and post-invasion cohorts. Additionally, we tested the following hypotheses:

Hypothesis 1. NCR scores are positively associated with cultural and family-economic stressors among Ukrainian immigrants. This association may be both direct and indirect, where NCR amplifies the impact of stressors such as economic hardship and cultural dislocation, potentially contributing to unhealthy coping mechanisms such as alcohol misuse.

Hypothesis 2. NCR scores will be positively correlated with mental health symptoms (depression, anxiety, and PTSD), negatively correlated with indicators of well-being (life satisfaction, and optimism), and inversely correlated with survivor's guilt, among Ukrainian immigrants. Additionally, NCR will be positively associated with alcohol misuse, as it may increase stress levels, which could lead to unhealthy coping strategies.

Hypothesis 3. NCR scores will add incremental validity to the prediction of mental health symptoms (e.g., PTSD, depression, anxiety) over and above the effects of other stressors such as discrimination, language stress, and economic stress. Furthermore, NCR may mediate the effects of these stressors on mental health outcomes, amplifying the psychological strain caused by these additional stressors, and leading to increased alcohol misuse.

Table 1
Demographic characteristics.

Demographics (703 participants)	Percentage (%)	Demographics (703 participants)	Percentage (%)
Gender	53.6 %	Education Level	14 %
Women	46.7 %	- Graduate degree	55.9 %
Men		- Associate's/Undergraduate	17.2 %
		- Some college education	12.3 %
		- High school	
Age Distribution	40.1 %	Employment Status	76.4 %
- 18–30 years	41.1 %	- Employed	15.2 %
- 31–40 years	11.2 %	- Unemployed	5.3 %
- 41–50 years	3.3 %	- Students	2.4 %
- 51–60 years	2 %	- Never employed	
- Over 60 years			
Geographic Distribution (Participants from 27 regions)	11 %	Language Proficiency (mean score, range 1–5)	3.80
- Top 3 Regions:	7 %	- Speaking Ukrainian	3.14
- Kyivska oblast	6.9 %	- Speaking English	3.09
- Volyn's'ka oblast		- Speaking Russian	
- Vinnyts'ka oblast			
Marital Status	54.2 %	Geographic Location in the U.S. (Top States)	14.7 %
- Married	12.8 %	- Texas	14.1 %
- Divorced	18.6 %	- California	10.6 %
- Single	12.1 %	- Illinois	10.4 %
- In a relationship	2.3 %	- New York	8.7 %
- Widowed		- Florida	
Parental Status	64 %	Intention to Stay in the U.S.	87.9 %
- Have children	62 % (of parents)	- Strong desire to stay	8.6 %
- Have one child	95 % (of parents)	- Do not wish to stay	3.7 %
- Live with children		- Unsure about the future	

Methods

Sample

Our study included 703 Ukrainian migrants (53.6 % women; detailed demographic information is provided in [Table 1](#)). Nine cases were not included in this analysis due to missing data on the hypothesized correlates. [Little's \(1988\)](#) missing completely at random test indicated that these data were missing completely at random, $\chi^2(13) = 4.98, p = .98$. Participants originated from diverse Ukrainian regions such as Kyivska and Volyn's'ka. A majority of participants had resettled in Texas, California, Illinois, Florida, and New York, with 88 % expressing a desire to establish themselves in the United States. The sample was divided into pre-invasion ($n = 477$; 67.9 %) and post-invasion ($n = 217$; 30.8 %) subgroups. Recruitment was facilitated by the extensive outreach efforts on multiple social media platforms, combined with snowball sampling. The age distribution was skewed towards individuals between 18 and 40 years (80 % of the sample), whereas those aged over 60 years comprised only 4.3 %. Two thirds of participants had attained a bachelor's or associate degree as their highest level of education, with the remainder largely holding either a high school diploma or a graduate degree. More than half (54.2 %) were married, 12.8 % were divorced, and 18.6 % were single. The majority of the participants were parents, with most having one child. Employment rates were notably high, with 75 % of respondents reporting current employment. Proficiency in Russian, English, and Ukrainian was common. Among those arriving after the invasion, 81 % arrived in 2022, whereas among those arriving before the invasion, 84 % arrived between 2014 and 2021.

Acknowledgment of data overlap

The data used in the present study are part of a larger research project on the experiences of Ukrainian immigrants, and findings based on these data have been or will be published in multiple studies ([Alpysbekova, Cisco, Ertanir, et al., 2024b](#)). Although this article focuses on the specific relationship between NCR and mental health outcomes, other studies using the same data have explored different aspects of the Ukrainian immigrant experience.

Procedure

The study received approval from the Institutional Review Board at the University of Texas at Austin under protocol number STUDY00004306 on October 18, 2022. Data were collected between June and August 2023 following IRB approval. Respondents provided electronic written consent, with a checkbox acting as the signature, before starting the survey. Participant recruitment utilized multiple methods including phone, email, and social media platforms such as Telegram, Facebook, Instagram, WhatsApp, and LinkedIn. Potential participants were screened to confirm eligibility criteria: Ukrainian birth, 18 years or older, and living in the US. Eligible participants provided informed consent and completed a preliminary screening to access the study survey, which was available in English, Ukrainian, and Russian, and reviewed for accuracy by a trilingual (Ukrainian, Russian, and English) research team.¹ The recruitment approach involved snowball sampling, beginning with a core group of initial respondents (seeds). These seeds then referred other eligible individuals, expanding the participant pool until the desired sample size was reached. Although this method facilitated broad outreach, we implemented strict data validation measures to ensure participant authenticity. To ensure participants' safety, a mental health crisis hotline number was provided at the survey's outset. The survey took approximately 39 minutes to complete online.

Data were collected from June to August 2023. Rigorous data validation techniques were employed, including Qualtrics's data integrity features and Kickbox email verification, to verify response authenticity and eliminate duplicates, bot-generated, or fraudulent entries. Participant locations were cross verified against IP addresses for consistency, and CAPTCHA was used to prevent bot responses. We also employed measures such as preventing multiple submissions, continuous security monitoring, and RelevantID to protect participant anonymity and data security. Each participant received a unique Qualtrics ID to protect anonymity. Upon survey completion, participants were given a \$20 gift card.

Measures

Perceived Context of Reception. We used the 6-item Perceived Negative Context of Reception Scale ([Schwartz et al., 2014](#)) to evaluate individuals' perceptions of the opportunities and welcomeness they were provided in the United States. This scale utilizes a 5-point Likert scale ranging from 0 (*Strongly Disagree*) to 4 (*Strongly Agree*). Sample Items include "I don't have the same chances in life here as people from other countries." Cronbach's alpha was .88.

Discrimination. We used the 7-item Perceived Discrimination Scale (PDS-7) to assess perceived discrimination ([Phinney et al., 1998](#)). This scale assesses the degree to which individuals feel that they have been treated unfairly or negatively based on their nationality or ethnicity. Items specifically inquire about being viewed with suspicion because of one's background. One of the sample questions was: "Do people you do not know treat you unfairly or negatively because you are Ukrainian?" Response categories ranged from 0 (*not at all*) to 4 (*almost always*) on a 5-point Likert scale. Cronbach's alpha was .82 in the present sample.

¹ Russian and Ukrainian versions of the measures used in the present study can be obtained from the first author.

Language Stress. To gauge stress related to language proficiency and difficulties, we utilized the 7-item language stress subscale from the Hispanic Stress Inventory (Cervantes et al., 2012). Respondents were asked to indicate their agreement with each item on a 4-point Likert scale, with options ranging from 0 (*Strongly Disagree*) to 3 (*Strongly Agree*). Sample Items include “I don’t speak English or don’t speak it well.” Cronbach’s alpha was .84 in the present sample.

Family Economic Stress. To gauge family-economic stress, we employed the 13-item Family Economic Strain Scale (Hilton & Devall, 1997). Response options ranged from Never to Almost Always. Sample Items include “How hard is it now to live on your present income?” Cronbach’s alpha was .91.

Anxiety. The General Anxiety Disorder (GAD-7) scale (Spitzer et al., 2006) was used to assess anxiety symptoms. This scale consists of seven items designed to measure how often individuals experience symptoms of anxiety, such as feeling nervous, anxious, or on edge and not being able to stop or control worrying during the two weeks prior to the assessment. A sample item, answered on a scale of 0 (*not at all*) to 3 (*nearly every day*), is “worrying too much about different things.” Cronbach’s alpha in the present sample was .91.

Depressive Symptoms. To assess depressive symptoms, we used the Boston Short Form of the Center for Epidemiologic Studies Depression Scale (CESD-B; Kohout et al., 1993; Grzywacz et al., 2006). This 10-item scale was designed to measure how often individuals experienced symptoms of depression, such as sadness and lack of energy, in the week prior to assessment. An example item is “I felt like everything I did was an effort.” Cronbach’s alpha was .89.

Post-Traumatic Stress Symptoms. To evaluate the presence and severity of post-traumatic stress disorder (PTSD) symptoms, we utilized the 17-item Davidson Trauma Scale (Davidson et al., 1997). The scale queries an individual’s history of trauma and assesses both the frequency and severity of symptoms over time. Respondents rated each item on a 5-point scale ranging from 0 (*never*) to 4 (*5 or more times*). Example items include “You have had some images, memories, or painful thoughts about the traumatic event” and “You have been unable to recall important parts of the traumatic event.” We asked participants to focus on traumatic events occurring in Ukraine prior to migration. The Cronbach’s alpha was .96.

Satisfaction with Life. To evaluate life satisfaction, we employed the 5-item Satisfaction with Life Scale (Diener et al., 1985). Response options ranged from one (*Strongly Disagree*) to seven (*Strongly Agree*). Items included “In most ways, my life is close to my ideal” and “The conditions of my life are excellent.” Cronbach’s alpha was .89 in the present study.

Optimism. To assess the participants’ levels of optimism, we employed a 9-item version of the Revised Life Orientation Test (LOT-R; Scheier et al., 1994). The LOT-R is designed to measure an individuals’ degree of optimism or pessimism about the future. Respondents use a 5-point rating scale from 0 (*Strongly Disagree*) to 4 (*Strongly Agree*). The scale includes items such as “In uncertain times, I usually expect the best” and “I’m always optimistic about my future.” Cronbach’s alpha for the present sample was .66. Although the Cronbach’s alpha was .66, which is below the traditional cutoff of .70, this may be due to the variability in respondents’ experiences and linguistic differences. Given the exploratory nature of this study and the relevance of optimism, we opted to include it. However, we acknowledge that this lower alpha suggests limited internal consistency and should be interpreted with caution. Further refinement of the measure may be necessary in future studies.

Alcohol Misuse. We used the 10-item Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993). Items are scored on a 0–4 scale, with response scale endpoints varying according to the content of each item. Three items assess the quantity and frequency of alcohol use (e.g., “How many drinks containing alcohol do you have on a typical day when you are drinking?”), three evaluate the frequency of alcohol-dependent behaviors (e.g., “How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?”), and four gauge alcohol-related problems (e.g., “Have you or someone else been injured as a result of your drinking?”). Cronbach’s alpha was .93.

Survival Guilt. We developed a 9-item measure to assess people’s emotions of guilt as a result of leaving family and friends behind in Ukraine. This scale was created as a self-assessment instrument to capture immediate feelings of shame, guilt, and societal rejection from one’s nation of origin. The development of this measure was prompted by discussions with newly arrived Ukrainians in the United States, where several people expressed feelings of remorse as well as a desire to provide support to Ukraine from afar. During these interviews, participants expressed complex emotions of guilt, with some feeling a strong desire to support Ukraine from afar, whereas others reported facing criticism and negative feedback from their community for leaving, which further heightened feelings of societal rejection. Sample answers, on a five-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), include “I feel bad about leaving my country during this challenging time of war,” “Are you worried that other Ukrainians might be angry with you because you left the country” (societal rejection). Further psychometric testing (e.g., exploratory factor analysis) is necessary to evaluate its reliability and validity in other contexts. Cronbach’s alpha was .87. In the current manuscript, the Survival Guilt Scale was used as a comparison measure, and we plan to provide a comprehensive psychometric evaluation in future work.

Clinical Cutoff Values for Depression, Anxiety, and PTSD. The optimal cut-off value for identifying symptoms of depression using the CESD-B-10 has been specified as ≥ 10 (Fu et al., 2022). The cutoff suggests that individuals scoring greater than or equal to 10 on this scale are likely to be diagnosed with depression. To assess anxiety levels using the General Anxiety Disorder (GAD-7), specific cut-off points were established: scores of 5, 10, and 15 denote mild, moderate, and severe anxiety, respectively, based on the criteria outlined by Sapra et al. (2020). These cut-offs have been validated in numerous clinical settings, making them widely applicable. In the evaluation of post-traumatic stress disorder (PTSD) using the PTSD-17, a cut-off score exceeding 40 was identified. This threshold, as indicated by van der Mei et al. (2020), is associated with a higher-than-average likelihood (greater than 11 %) of developing chronic PTSD. A comprehensive approach has been employed to address alcohol misuse. Scores of 8 or above provide evidence of hazardous or harmful alcohol use. Scores of 15 or above suggest probable alcohol dependence, warranting appropriate follow-up with brief counseling and continued monitoring (Killgore et al., 2021).

Data analysis plan

The present analyses proceeded in three steps to validate the applicability of NCR for Ukrainian immigrants in the U.S. who arrived before ($n = 477$) and after ($n = 217$) the Russian invasion. To confirm the factor structure of the 6-item NCR scale for the full sample, we conducted a Confirmatory Factor Analysis (CFA) using the individual item responses. This step assesses how well the observed data fits the hypothesized measurement model. CFA was performed on the combined data from both the pre-invasion and post-invasion cohorts. We used the Root Mean Square Error of Approximation (RMSEA;.08 or below indicates adequate fit) and the Comparative Fit Index (CFI;.90 or above indicates adequate fit) (Kline, 2023).

Tests of Measurement Invariance Across Cohorts. To examine the extent to which the NCR scale measures the same construct in the same way across participants who arrived before and after the Russian invasion, we conducted configural, metric, and scalar invariance tests using a multi-group CFA approach. Configural invariance ascertains whether the pattern of factor loadings is the same across groups; metric invariance tests whether factor loadings are equal across groups; and scalar invariance examines whether item intercepts are identical across groups (Putnick & Bornstein, 2016). For each type of invariance, we followed recommendations from Chen et al. (2017) for evaluating differences in model fit across groups. Specifically, changes in CFI greater than .01 indicate lack of invariance, whereas changes in RMSEA should not exceed .015. Establishing these levels of invariance is crucial for comparing these two groups. Failure to achieve metric or scalar invariance might suggest that the scale functions at least somewhat differently across the two cohorts, potentially affecting the interpretability of NCR scores across groups.

Examination of Correlations with Other Variables. Our next step was to explore convergent validity, in terms of associations between the latent NCR variable and other cultural and family-economic stressors, as well as construct validity, in terms of associations with trauma, anxiety, depressive symptoms, PTSD symptoms, optimism, life satisfaction, and survivor's guilt. Using structural equation modeling (SEM), we computed the correlations between the latent NCR variable and these other variables. Strong and theoretically consistent correlations with these variables would support the utility of NCR, and of our scale assessing it, vis-à-vis key psychological outcomes among Ukrainian immigrants. If full invariance is not found, the loadings and intercepts that are not equal across groups must be allowed to vary between the two cohorts (Brown, 2015).

Aside from NCR, other variables – which were not the focus of our study – were entered into the correlations model as observed (summed) variables. We compared each of the correlations using the Fisher correlation comparison method, in which each correlation is converted to a Fisher Z value, and the two Fisher Z values are compared. The q effect size is used (Cohen, 1988), where .10 represents a small value, .30 represents a medium value, and .50 represents a large value. Only 2 of the 10 correlations involving NCR were significantly different across cohorts: (a) NCR with family economic stress, $z = 2.32$, $p = .02$, $q = .19$; and (b) NCR with guilt, $z = 3.98$, $p < .001$, $q = .33$. In both cases, the correlation was significant and positive for the cohort arriving before the invasion, but was negligible and nonsignificant for the cohort arriving after the invasion.

Results

Descriptive statistics

Descriptive statistics for study variables across arrival cohorts are provided in Tables 1, 2, and 3. Table 1 provides frequency distributions for categorical demographic variables for the sample as a whole; Table 2 provides means and standard deviations for continuous study variables across arrival cohorts; and Table 3 provides results of chi-square analyses for categorical demographic variables across arrival cohorts.

Table 2
Descriptive Statistics for Study Variables.

Variable	Arrived Before Invasion ($n = 477$)		Arrived After Invasion ($n = 217$)	
	Male M (SD)	Female M (SD)	Male M (SD)	Female M (SD)
<i>Internalizing Symptoms</i>				
Depressive Symptoms	22.24 (5.52)	22.75 (5.20)	26.26 (5.82)	26.35 (5.86)
Anxiety	8.51 (3.92)	9.12 (3.84)	11.32 (4.44)	10.68 (4.80)
Post-Traumatic Stress	28.67 (14.27)	28.67 (14.27)	36.42 (13.99)	35.70 (13.85)
<i>Cultural/Economic Stress</i>				
Discrimination	13.22 (5.56)	13.68 (5.10)	16.22 (4.93)	15.56 (5.55)
NCR	11.55 (4.90)	11.86 (4.75)	12.72 (3.74)	12.81 (4.25)
Language Stress	7.83 (2.82)	7.70 (2.30)	9.83 (3.60)	10.03 (3.55)
Family/Economic Stress	30.97 (9.45)	32.17 (8.41)	37.28 (9.19)	36.84 (9.08)
<i>Well-Being</i>				
Optimism	20.34 (4.48)	20.52 (4.05)	17.78 (3.88)	18.05 (4.47)
Life Satisfaction	17.48 (4.75)	17.06 (3.99)	16.31 (3.79)	16.57 (3.96)
<i>Hazardous Drinking</i>				
Guilt	12.91 (7.94)	9.15 (7.02)	17.66 (9.26)	12.35 (9.38)
	20.78 (7.37)	19.88 (7.00)	20.85 (4.86)	20.39 (5.99)

Table 3
Chi-Square Test of Independence for Time of Invasion and Key Demographic Variables.

Variable	Category	After Invasion (Count, %) (n = 217)	Before Invasion (Count, %) (n = 477)	Total (Count, %) (n = 694)	Chi-Square (DF)	p-value
Gender	Male	105 (48.4 %)	219 (45.9 %)	324 (46.7 %)	$\chi^2 = 0.367$ (1)	$p = .566$
	Female	112 (51.6 %)	258 (54.1 %)	370 (53.3 %)		
Age group	18–30	67 (31.2 %)	204 (43.4 %)	271 (39.6 %)	$\chi^2 = 65.579$ (4)	$p < .001$
	31–40	85 (39.5 %)	198 (42.1 %)	283 (41.3 %)		
	41–50	27 (12.6 %)	51 (10.9 %)	78 (11.4 %)		
	51–60	7 (3.3 %)	16 (3.4 %)	23 (3.4 %)		
	Over 60	29 (13.5 %)	1 (0.2 %)	30 (4.4 %)		
Education	High School Diploma	33 (15.2 %)	53 (11.1 %)	86 (12.4 %)	$\chi^2 = 7.422$ (6)	$p = .282$
	Undergraduate degree	64 (29.5 %)	179 (37.6 %)	243 (35.1 %)		
	Post graduate degree	7 (3.2 %)	22 (4.6 %)	29 (4.2 %)		
	Some college education	44 (20.3 %)	78 (16.4 %)	122 (17.6 %)		
	Graduate degree	20 (9.2 %)	48 (10.1 %)	68 (9.8 %)		
	College degree	48 (22.1 %)	93 (19.5 %)	141 (20.3 %)		
	Other	1 (0.5 %)	3 (0.6 %)	4 (0.6 %)		
Employment	Employed	139 (64.4 %)	387 (81.6 %)	526 (76.2 %)	$\chi^2 = 62.621$ (4)	$p < .001$
	Unemployed	61 (28.2 %)	44 (9.3 %)	105 (15.2 %)		
	Never worked	12 (5.6 %)	5 (1.1 %)	17 (2.5 %)		
	Student	3 (1.4 %)	34 (7.2 %)	37 (5.4 %)		
	Other	1 (0.5 %)	4 (0.8 %)	5 (0.7 %)		
English level	Intermediate level	5 (2.3 %)	8 (1.7 %)	13 (1.9 %)	$\chi^2 = 5.198$ (2)	$p = .074$
	Upper-Intermediate level	25 (11.6 %)	87 (18.4 %)	112 (16.2 %)		
	Advanced level	186 (86.1 %)	379 (80 %)	565 (81.9 %)		
Russian level	Intermediate level	58 (26.9 %)	59 (12.4 %)	117 (16.9 %)	$\chi^2 = 55.785$ (4)	$p < .001$
	Upper-Intermediate level	96 (44.4 %)	212 (44.6 %)	308 (44.6 %)		
	Advanced level	47 (21.8 %)	200 (42.1 %)	247 (35.7 %)		
Ukrainian level	Intermediate level	22 (10.3 %)	82 (17.3 %)	104 (15.1 %)	$\chi^2 = 6.253$ (3)	$p = .100$
	Upper-Intermediate level	78 (36.4 %)	169 (35.7 %)	247 (35.9 %)		
	Advanced level	96 (44.9 %)	183 (38.6 %)	279 (40.6 %)		
Do you ever plan to go back to Ukraine?	Yes	45 (23.1 %)	47 (11.9 %)	92 (15.6 %)	$\chi^2 = 12.408$ (2)	$p < .005$
	No	149 (76.4 %)	346 (87.6 %)	495 (83.9 %)		
	Other	1 (0.5 %)	2 (0.5 %)	3 (0.5 %)		
Do you have children?	Yes	138 (63.9 %)	306 (64.6 %)	444 (64.3 %)	$\chi^2 = .029$ (1)	$p = .865$
	No	78 (36.1 %)	168 (35.4 %)	246 (35.7 %)		
Region from Ukraine	Volynska oblast (western part)	6 (2.8 %)	42 (8.8 %)	48 (6.9 %)	$\chi^2 = 48.920$ (26)	$p < .005$
	Dnipropetrovska oblast (central)	11 (5.1 %)	30 (6.3 %)	41 (5.9 %)		
	Donetska oblast (South-East)	14 (6.5 %)	22 (4.6 %)	36 (5.2 %)		
	Zhytomyrska oblast (western)	16 (7.4 %)	31 (6.5 %)	47 (6.8 %)		
	Zakarpatska oblast	8 (3.7 %)	12 (2.5 %)	20 (2.9 %)		
	Zaporizka oblast (South-East)	12 (5.5 %)	28 (5.9 %)	40 (5.8 %)		
	Ivano-Frankivska oblast (western)	13 (6 %)	14 (2.9 %)	27 (3.9 %)		
	Vinnyska oblast (central)	9 (4.1 %)	39 (8.2 %)	48 (6.9 %)		
	Kyivska oblast (central)	32 (14.7 %)	44 (9.3 %)	76 (11 %)		
	Kirovohradska oblast (central)	6 (2.8 %)	26 (5.5 %)	32 (4.6 %)		
	Luhanska oblast (South-East)	10 (4.6 %)	31 (6.5 %)	41 (5.9 %)		
	Lvivska oblast (western)	6 (2.8 %)	21 (4.4 %)	27 (3.9 %)		
	Mykolaivska oblast (South-East)	7 (3.2 %)	18 (3.8 %)	25 (3.6 %)		

(continued on next page)

Table 3 (continued)

Variable	Category	After Invasion (Count, %) (n = 217)	Before Invasion (Count, %) (n = 477)	Total (Count, %) (n = 694)	Chi-Square (DF)	p-value
	Avtonomna Respublika Krym (Crimea)	14 (6.5 %)	17 (3.6 %)	31 (4.5 %)		
	Odeska oblast (South-East)	9 (4.1 %)	26 (5.5 %)	35 (5.1 %)		
	Poltavska oblast (central)	5 (2.3 %)	21 (4.4 %)	26 (3.8 %)		
	Rivnenska oblast (western)	9 (4.1 %)	11 (2.3 %)	20 (2.9 %)		
	Sumska oblast (central)	4 (1.8 %)	8 (1.7 %)	12 (1.7 %)		
	Ternopilska oblast (western)	5 (2.3 %)	6 (1.3 %)	11 (1.6 %)		
	Kharkivska oblast (central)	5 (2.3 %)	6 (1.3 %)	11 (1.6 %)		
	Khersonska oblast (South-East)	9 (4.1 %)	2 (0.4 %)	2 (0.3 %)		
	Khmelnyska oblast (central)	1 (0.5 %)	3 (0.6 %)	4 (0.6 %)		
	Cherkaska oblast (central)	1 (0.5 %)	4 (0.8 %)	5 (0.7 %)		
	Chernivetska oblast (western)	1 (0.5 %)	2 (0.4 %)	3 (0.4 %)		
	Chernihivska oblast (central)	3 (1.4 %)	7 (1.5 %)	10 (1.4 %)		
	Kyiv oblast (central)	1 (0.5 %)	2 (0.4 %)	3 (0.4 %)		
	Sevastopol oblast (Crimea)					

Confirmatory Factor Analysis (CFA)

When we estimated the structural model using the sample as a whole, the model fit the data well, $\chi^2(8) = 37.850$, $p < .001$; CFI = .973; RMSEA = .073 (90 % CI = .050 to .097), suggesting that the NCR scale serves as a reliable tool for measuring perceived context of reception among Ukrainian immigrants. All factor loadings were significant ($p < .001$), indicating strong relationships (see Table 2) between the items and the underlying latent NCR variable. There was a significant residual correlation between two items: “My family and I would be treated better if we were more like other immigrant groups” and “It is hard for me to succeed at work because I am Ukrainian”, $r = .305$, $p < .001$, suggesting that these items share common variance beyond their relationship with the latent NCR construct. This residual correlation likely indicates overlapping content or similar response patterns for these items among participants.

Invariance tests across arrival group

The configural model (see Table 4), in which no to factor loadings or intercepts were constrained across groups, provided a good fit to the data, $\chi^2(16) = 53.417$, $p < .001$; CFI = .971; RMSEA = .082 (90 % CI = .058 to .107). The metric model, which tests for equivalence of factor loadings across groups, provided a significantly less favorable fit, $\Delta\chi^2(5) = 37.248$, $p < .001$; Δ CFI = .023; Δ RMSEA = .015. This suggests that although the overall structure of the scale (configural invariance) is supported across the two cohorts, the factor loadings for some items do not fully align across groups (metric invariance). Follow-up invariance tests indicated that items 1 (“Ukrainians do not receive the same opportunities as other immigrant groups”) and 3 (“My family and I would be treated better if we were more like other immigrant groups”) were responsible for the lack of metric invariance between the pre-invasion and post-invasion arrival groups. Loadings for item 1 were $\lambda = .59$ for the post-invasion arrival group and $\lambda = .77$ for the pre-invasion arrival group; and loadings for item 3 were $\lambda = .09$ for the post-invasion arrival group and $\lambda = .69$ for the pre-invasion arrival group. Therefore, we concluded that responses to item 3 did not correlate with responses to the other items among the post-invasion arrivals – suggesting that these Ukrainians did not view their potentially disparate treatment as an indicator of negative context of

Table 4
Descriptive Statistics and Standardized Factor Loadings for Negative Context of Reception Items (Ukrainian Sample) (N = 694).

Item	Mean		Standard Deviation		Factor Loading	
	Before (N = 477)	After (N = 217)	Before (N = 477)	After (N = 217)	Before (N = 477)	After (N = 217)
1. Ukrainians do not receive the same opportunities as other immigrant groups.	1.96	2.29	.952	.979	.811	.642
2. Ukrainians are not welcome here.	1.98	2.20	.959	1.01	.847	.670
3. My family and I would be treated better if we were more like other immigrant groups.	1.86	1.90	.995	1.03	.650	.436
4. It is hard for me to succeed at work because I am Ukrainian.	1.86	2.12	.965	.985	.792	.633
5. Employers treat Ukrainians differently than they treat people from other countries.	1.98	2.12	.901	.912	.854	.671
6. People in the United States often criticize Ukrainians.	2.07	2.13	.972	1.02	.815	.691

Table 5
Model Fit.

Model Type	Chi-Square	DF	RMSEA	CFI	Chi-square	
					Before	After
Configural	53.417	16	.082	.971	40.235	13.181
Metric	89.010	21	.097	.948	47.847	41.163
Scalar	109.498	26	.096	.936	54.259	55.239

Note: DF = degrees of freedom; RMSEA = root mean square of approximation; CFI = comparative fit index.

reception. These two factor loadings were allowed to vary across groups in all subsequent analyses.

In the scalar model, which tests for equivalence of both loadings and intercepts, we found non-invariance, as indicated by, $\Delta\chi^2(5) = 21.020$, $p < .001$; $\Delta CFI = .012$; $\Delta RMSEA = .001$. However, follow-up invariance tests did not identify any specific items whose intercepts differed significantly across arrival groups. This partial scalar invariance suggests that although some intercepts may differ, the NCR scale remains sufficiently comparable across groups to allow for certain comparisons, such as the latent means, as discussed below. No intercepts were allowed to vary across groups in subsequent analyses.

Finally, we compared the latent negative context of reception means between the two cohorts, with the two non-equivalent factor loadings free to vary across cohorts. Individuals arriving after the invasion reported a significantly worse context of reception ($M = -0.17$, $SD = 0.81$) than those arriving before the invasion ($M = -0.38$, $SD = 0.94$), $t(692) = 2.837$, $p < .005$, Cohen's $d = .23$. The effect size for this difference was small (Cohen, 1988), but the comparison was facilitated by our finding of partial scalar invariance, which allows for latent mean comparisons despite some differences in intercepts across groups.

As a follow-up analysis, we examined the extent to which endorsement of each of the NCR items would differ significantly between the pre-invasion and post-invasion cohorts. We estimated a structural model in Mplus where cohort membership was allowed to predict mean endorsement for each of the six NCR items. Because the model was completely saturated – all possible paths were estimated – there were no degrees of freedom, and the model fit the data perfectly. Responses to four of the six items differed significantly (or nearly significantly) between the pre-invasion and post-invasion cohorts: (a) Ukrainians not receiving the same opportunities as other immigrant groups, $B = -0.33$, $p < .001$; (b) Ukrainians not being welcome in the United States, $B = -0.22$, $p < .01$; (c) hard to succeed at work because one is Ukrainian, $B = -0.27$, $p = .001$; and (d) employers treating Ukrainians differently than people from other countries, $B = -0.14$, $p = .053$. Responses to the other two items – (a) my family and I being treated better if we were more like other immigrant groups and (b) people in the US criticizing Ukrainians – did not differ significantly between cohorts.

Examination of correlations with other variables

Next, we examined the correlations between the latent NCR variable and various outcomes related to mental health and well-being, including trauma, anxiety, depressive symptoms, PTSD symptoms, optimism, life satisfaction, and survivor's guilt. NCR was parameterized as a latent variable, with the two non-equivalent NCR factor loadings allowed to vary across cohorts, and all other loadings and intercepts constrained equal across cohorts. We estimated these correlations in multigroup form, with factor loadings for Items 1 and 3 left unconstrained but all other loadings and intercepts constrained equally across arrival cohorts. Nine cases were not included in this analysis due to missing data on the hypothesized correlates. Little's (1988) missing completely at random test indicated that these data were missing completely at random, $\chi^2(13) = 4.98$, $p = .98$.

This correlation model fit the data adequately, $\chi^2(125) = 401.243$, $p < .001$; CFI = .954; RMSEA = .080 (90 % CI = .071 to .089). An invariance test indicated that these correlations were consistent across arrival groups, $\Delta\chi^2(5) = 28.756$, $p < .001$; $\Delta CFI = .004$; $\Delta RMSEA = .003$, allowing us to interpret the relationships between NCR and various outcomes as stable across both cohorts. As displayed in Table 6, the latent negative context of reception variable was positively correlated with discrimination, language stress, family-economic stress, depressive symptoms, post-traumatic stress, anxiety, problem drinking, life satisfaction, optimism, and survivor's guilt.

Table 6
Correlations between Negative Context of Reception and Other Study Variables.

Variable	<i>r</i>
Discrimination	.71 * **
Language Stress	.34 * **
Family-Economic Stress	.43 * **
Depressive Symptoms	.57 * **
Post-Traumatic Stress	.56 * **
Anxiety	.43 * **
Problem Drinking	.26 * *
Life Satisfaction	-.51 * **
Optimism	-.15 *
Survivor's Guilt	-.28 *

* $p < .05$. ** $p < .01$. *** $p < .001$.

and survivor's guilt.

We then examined whether the latent negative context of reception variable would predict whether or not participants met clinical screening criteria for elevated symptoms of depression, anxiety, and post-traumatic stress. Again, NCR was parameterized as a latent variable so that the non-invariant factor loadings could be free to vary across cohorts. Because these diagnostic variables are dichotomous, we used a weighted least squares means and variances estimator, where the likelihood of meeting the screening criteria is assumed to represent an underlying continuous latent variable (with the dichotomous variable serving as an indicator of this underlying latent variable). Doing so assumes that the likelihood of meeting diagnostic criteria represents an underlying continuous variable, and that the categorical screening diagnosis variables tap into this underlying variable. This approach focuses on likelihood rather than odds and allows for standardized regression coefficients to be reported. Results indicated that the latent negative context of the reception variable was positively associated with the likelihood of meeting the screening criteria for depression ($\beta = .33, p < .001$), anxiety ($\beta = .33, p < .001$), and post-traumatic stress disorder ($\beta = .48, p < .001$).

To compare the correlations (Table 7), we used the Fisher correlation comparison method. In terms of family economic stress (FES), we observed that the correlation with NCR was positive for immigrants who arrived before the Russian invasion (pre-war cohort), with a correlation of $r = .15$. However, after controlling for discrimination, this correlation became negative ($r = -.04$) for the pre-invasion group, with a small effect size for the effect of discrimination on this correlation ($q = .19, p = .02$). Similarly, survivor's guilt had a significant shift in correlation before and after controlling for NCR. For immigrants who arrived after the Russian invasion, survivor's guilt was positively correlated with NCR ($r = .28$), but after controlling for discrimination, the correlation turned negative ($r = -.04$), with a medium effect size for the effect of discrimination on this correlation ($q = .33, p < .001$).

Finally, to examine the extent to which NCR provides incremental validity over and above discrimination, language stress, and family-economic stress, we estimated a structural equation model where all four cultural stressors were entered as predictors of life satisfaction, optimism, depressive symptoms, anxiety, post-traumatic stress, alcohol misuse, and survivor's guilt. This model provided an adequate fit to the data, $\chi^2(126) = 425.96, p < .001$; CFI = .947; RMSEA = .083 (90 % CI = .074 to .092). NCR emerged as a negative predictor of life satisfaction, $\beta = -.43, p < .001$; and as a positive predictor of depressive symptoms, $\beta = .21, p = .027$; and post-traumatic stress, $\beta = .18, p = .016$. NCR was a marginally significant and positive predictor of optimism, $\beta = .19, p = .061$. NCR was not significantly associated with anxiety, alcohol misuse, or guilt once the other cultural stressors were statistically controlled.

Discussion

Our study was designed to extend the Negative Context of Reception (NCR) framework to a war-affected population, specifically Ukrainian immigrants displaced by the 2022 Russian invasion. By doing so, we sought to fill a gap in the literature regarding the applicability of the NCR construct to non-Latin American refugee populations. Previous research on Latin American immigrants has underscored the associations of NCR with mental health outcomes, particularly in contexts where exclusion and discrimination are prevalent (Schwartz et al., 2014; Schwartz et al., 2010). However, the lack of theoretical attention to war-displaced populations left open the question of whether the same dynamics apply to immigrants who carry the dual burden of acculturative stress and war trauma.

Our results support our primary hypothesis: the NCR scale is appropriate for assessing perceived negative reception among this population, as it demonstrates acceptable factor loadings and reliability in both pre- and post-invasion cohorts. Confirmatory factor analysis (CFA) was used to evaluate the factor structure of the 6-item NCR scale across the full sample, rather than separately for pre- and post-invasion cohorts. Although the NCR scale is characterized by good overall factor loadings, it is important to note that invariance across pre- and post-invasion groups was not fully achieved. Specifically, item 3 ("My family and I would be treated better if we were more like other immigrant groups") had very low factor loadings for the post-invasion group, indicating that the item did not function equivalently across these two cohorts. This finding suggests that, although NCR appears to operate similarly for the two cohorts of Ukrainians in the United States, some items may not be interpreted the same way by those who arrived before versus after the 2022 invasion. Future research should aim to refine the scale, considering potential variations in how certain items are perceived across different cohorts.

Cultural stress theory (Schwartz et al., 2015) posits that individuals migrating to a new cultural environment face stressors related

Table 7
Comparison of Correlations Before and After Migration for Key Variables.

Variable	r (Before)	R (After)	z	p	q
Discrimination	.60	.56	0.73	.46	.06
Language Stress	.03	.05	0.24	.81	.02
Family Economic Stress	.15	-.04	2.32 *	.02	.19
Depressive Symptoms	-.11	-.20	1.12	.26	.09
Post-Traumatic Stress	.39	.25	1.90	.06	.16
Anxiety	-.16	-.30	1.80	.07	.15
Alcohol Misuse	-.13	-.10	0.37	.71	.03
Life Satisfaction	-.14	-.28	1.78	.07	.15
Optimism	.17	.15	0.25	.80	.01
Guilt	.28	-.04	3.98 * **	< .001	.33

* $p < .05$. ** $p < .01$. *** $p < .001$.

to cultural differences, including discrimination, NCR, and language barriers. The present findings suggest these stressors indeed operate among Ukrainian immigrants in the United States. Strong correlations between NCR and negative psychological outcomes such as depression, anxiety, and PTSD suggest associations of NCR with mental health problems, as has been found in prior studies with Latin American (Forster et al., 2021; Salas-Wright, Maldonado-Molina, et al., 2021; Schwartz et al., 2014).

Findings indicate significant factor loadings for nearly all NCR items across both groups. Particularly strong loadings were observed in both cohorts for items such as "Ukrainians are not welcome here" and "People in the United States often criticize Ukrainians," suggesting that such exclusion is strongly reflective of NCR in this population. This finding is consistent with theorizing suggesting that migrants from conflict zones may face heightened stigmatization due to perceived security risks or cultural biases (Esses et al., 2013). The correlation between the items "It is hard for me to succeed at work because I am Ukrainian" and "Employers treat Ukrainians differently than they treat people from other countries" were notably strong. This correlation taps into perceived barriers to economic integration for Ukrainians, which may be attributed to explicit and implicit biases in the workplace (Kubiciel-Lodzińska & Solga, 2023).

Although it is not explicitly included within the NCR construct, the temporary nature of U4U and Temporary Protected Status might create a specific type of anxiety and uncertainty not experienced by other immigrant groups who are either permanent residents or on a pathway to citizenship. Indeed, research indicates that the impermanence inherent in these temporary statuses can lead to psychological distress (Giuntella et al., 2021). Additionally, the uncertainty and unpredictability linked to temporary immigration statuses have been shown to be negatively associated with emotional well-being (Daftary, 2019). This temporary and uncertain future could be related to increased feelings of instability and to the ways in which Ukrainian immigrants perceive their treatment in both social and professional contexts. Future studies should empirically assess this possibility.

Although we did not directly collect data on the reasons for migration, preliminary interviews with participants suggested some key motivations for migrating to the United States. Pre-invasion immigrants reported a range of reasons, including economic opportunities and political considerations. In contrast, post-invasion immigrants were more likely to mention concerns about the war spreading beyond Ukraine and the desire for better educational opportunities for their children. These differences in migration motivations may be linked with different ways in which immigrants from these two cohorts may experience and interpret their reception in the United States. Further research could explore how these migration motivations may shape Ukrainian immigrants' adjustment experiences.

Invariance testing results

Invariance testing across the pre- and post-invasion cohorts indicated inconsistencies in metric and scalar invariance, indicating variations in how the scale measured the construct across the two groups. Particularly, items regarding equal opportunities ("Ukrainians do not receive the same opportunities as other immigrant groups") and treatment ("My family and I would be treated better if we were more like other immigrant groups") loaded differentially across cohorts, suggesting that post-invasion arrivals (who arrived in 2022 or later) might not perceive these issues as part of their receiving context as strongly as might those who arrived earlier (cohort who arrived before 2022). Indeed, given their temporary status in the United States, post-invasion arrivals may not view themselves as immigrants.

The lack of metric and scalar invariance across pre- and post-invasion cohorts suggests that recent arrivals perceive NCR differently compared to those who arrived earlier. This variation can be understood through the lens of situational context, where the ongoing conflict in Ukraine, along with temporary (rather than permanent) presence in the U.S., may be linked with increased cultural stress experienced by post-invasion Ukrainian arrivals. The heightened salience of the war vis-à-vis their migration may be associated with greater perceptions of discrimination and marginalization. Salas-Wright, Maldonado-Molina, et al. (2021) also emphasized the cumulative impact of various stressors on immigrants, underscoring the compounded effects of migration-related challenges.

The cohort who arrived after the 2022 Russian invasion reported more negative perceptions for four of the six items (all except one's family being treated better if they were from another migrant group and U.S. residents criticizing Ukrainians). This increased negative perception may be due to the recency of their migration experience and the ongoing conflict, which might render current events more salient and affect their perceptions more strongly. Our findings related to clinical cutoffs for depression, anxiety, and PTSD suggest that higher rates of NCR among post-invasion arrivals co-occur with heightened distress that could influence migrants' psychological adjustment and socio-economic integration in the U.S. (Asanov et al., 2023). These findings suggest that post-invasion arrivals may need additional clinical services.

Additionally, there may be variations in traumatic experiences between the two cohorts. Pre-invasion arrivals (before the 2022 Russian invasion) may have faced less intense but more chronic exposure to conflict, such as the Maidan protests and the annexation of Crimea. These individuals may have experienced trauma related to political instability, regional violence, or displacement. In contrast, post-invasion arrivals (after the 2022 Russian invasion) likely faced more recent and acute trauma. These differences could help explain some of factor loading differences across the two arrival groups. Although Alpysbekova, Cisco, Vo, et al. (2024b) did not find significant differences in types of war trauma (e.g., exposure to bombings or dead bodies) between cohorts, the extent or severity of trauma may have been greater among post-invasion arrivals (the Harvard Trauma Questionnaire asks only whether respondents have experienced each trauma type, and not about the severity of these traumatic experiences). If such differences in trauma severity were present, it might help to account for factor structure differences in the NCR measure across cohorts.

Convergent and Construct Validity. We also found significant intercorrelations of NCR with well-being, mental health problems, and alcohol misuse, and these associations were consistent across arrival cohorts. For both groups, respondents who perceived a more negative context of reception reported lower life satisfaction and optimism, both of which were inversely related to feelings of guilt. Literature suggests that these kinds of negative perceptions are associated with lower life satisfaction and optimism, and that feelings of guilt may mediate this relationship (Gungor et al., 2021; Kealy et al., 2020; Lee et al., 2022).

Among the pre-invasion cohort, we found a negative relationship between NCR and life satisfaction, albeit less pronounced than among the post-invasion cohort. This finding indicates that even Ukrainians who potentially had more time to adjust still experience a dampening of life satisfaction in response to being received poorly. This finding aligns with previous studies reporting that prolonged adjustment periods do not necessarily mitigate the negative impact of hostile receiving environments on immigrants' well-being (Berry, 1997; Sam & Berry, 2010). The correlation between optimism and NCR was also negative for both cohorts, suggesting a consistent pattern regardless of time of arrival. This finding may reflect enduring effects of initial reception experiences, which can set the tone for long-term integration trajectories. Research by Carver and Scheier (2014) on optimism indicates that external stressors, such as discrimination and lack of support, can significantly diminish an individual's positive expectations for the future. A small but significant negative correlation emerged between guilt and NCR for both cohorts – suggesting that those who perceived a more negative reception in the United States were less likely to report feelings of survivor's guilt. This finding may initially seem counterintuitive, as one might expect that negative treatment in the host country would exacerbate overall emotional distress. However, upon closer examination, the finding aligns with existing theories on the psychological mechanisms underlying survivor's guilt. Survivor's guilt typically stems from a feeling of unfairness or an internal conflict over having escaped dangerous or life-threatening conditions (Brance et al., 2022; Lou & Noels, 2023). In the case of Ukrainian immigrants, many may feel guilty for leaving behind family members, friends, or even their homeland, which continues to face dire circumstances due to the ongoing conflict. However, the experience of cultural rejection and perceived discrimination in the receiving context may mitigate this guilt. When faced with exclusion, difficulties in workplace integration, or marginalization in their daily lives, Ukrainian immigrants may be more likely to view their survival not as a stroke of fortune, but as part of a continuing struggle — a hardship of a different kind. This could potentially lessen the emotional burden of guilt, as their new circumstances, marked by cultural stress and discrimination, may not feel as though they represent an escape from hardship.

Moreover, the negative correlations between NCR and well-being indicators such as life satisfaction and optimism indicate that, for both cohorts, negative reception experiences may significantly undermine immigrants' quality of life and outlook. Cultural stress can erode psychological resilience and life satisfaction, making it more difficult for immigrants to adapt to and thrive in their new environment (Phinney et al., 2002; Hill et al., 2024). This pattern is particularly evident among the post-invasion cohort, whose heightened cultural stress likely exacerbates feelings of uncertainty and pessimism about their future in the United States. Schwartz et al. (2018) reinforce these findings by highlighting the critical impact of perceived discrimination and cultural marginalization on immigrants' overall well-being and mental health.

In terms of the Fisher correlation comparison across cohorts, we observed that for family economic stress, the correlation with NCR was positive for immigrants who arrived before the Russian invasion. However, for those who arrived after the war, this correlation was negligible and negative. This pattern suggests that for pre-war immigrants, family economic stress was linked to a sense of exclusion. This pattern may suggest that, among recent war migrants, economic struggles may be an unfortunate reality and may not be linked with exclusion and with a lack of opportunities. However, among longer-term migrants who arrived prior to the invasion, continuing to face economic challenges may be associated with being marginalized and excluded.

A similar correlation difference emerged for survivor's guilt vis-à-vis NCR across cohorts. This shift is particularly striking and may suggest that, for pre-war arrivals, continuing to experience survivor's guilt may be linked with feeling excluded from opportunities and social ties in the United States. Survivor's guilt may have emerged for many post-invasion arrivals – especially because they migrated away from Ukraine in the middle of a war – and these guilt feelings may (or may not) occur regardless of marginalization and exclusion in the United States. Further, more recent war migrants may focus their emotional responses on the immediate challenges of cultural adaptation and establishing a new life in a foreign country.

As Schwartz et al. (2014) found with a sample of recently immigrated Hispanic parents and adolescents, NCR significantly predicted depressive symptoms above and beyond the predictive effects of other cultural stressors. Similar findings emerged for post-traumatic stress and life satisfaction and approached significance for optimism. Although the finding for optimism is in the opposite direction than we would have anticipated, these results suggest that NCR is important to assess among Ukrainian immigrants in the United States, including those fleeing the Russian invasion of their homeland.

Overall, our study not only validates the NCR scale as a measure for understanding the reception perceptions among Ukrainian immigrants, but it also suggests that these perceptions may vary depending on the timing of their arrival. Because the factor loadings and means for the pre- and post-invasion highlight potential differences between these cohorts, we refrain from making definitive claims about the need for targeted interventions based solely on these patterns. However, it may nonetheless be possible to conduct more work examining targets for intervention and policy development for pre- and post-invasion Ukrainian arrivals in the United States.

Limitations

The present study is characterized by at least ten limitations. First, our recruitment relied on snowball sampling, where participants referred other participants. This method may introduce self-selection bias, as those who participate and refer to others might possess distinctive characteristics or experiences not reflective of the broader U.S. Ukrainian population. This bias could affect the generalizability of the findings. Second, despite implementing data filtration techniques to ensure authenticity, the potential remains for false positives or negatives in identifying duplicate entries, automated responses, or fraudulent submissions, which could affect data quality. For example, a small number of participants might have submitted multiple entries unknowingly, or there may have been challenges in detecting automated responses that are highly similar but not identical. Such issues could reduce the accuracy of our findings, particularly for measures of psychological distress or experiences of discrimination, which rely on participants' truthful and consistent

responses. Third, we did not account for cultural and regional variations within Ukraine, thus overlooking distinct experiences and perspectives from people originating from different Ukrainian regions. Understanding where in Ukraine participants were from is likely important because individuals from different parts of the country may be culturally dissimilar (e.g., some Ukrainian provinces are closer to Russia and are Russian-speaking, whereas others are further from the Russian border and are Ukrainian-speaking). This oversight may limit the generalizability of our conclusions about the applicability of the NCR scale to all Ukrainians. Fourth, the cross-sectional nature of our study indicates that we can observe associations between NCR and mental health outcomes, but that causal relationships cannot be established. This limitation contraindicates any claims of directionality or causality regarding the directionality of the relationship between NCR and psychological outcomes. Fifth, our reliance on self-reported data, especially concerning personal histories and experiences, introduces the possibility of recall bias. This bias could influence how participants respond to questions about their experiences of discrimination or mental health prior to migration, potentially leading to under- or over-reporting of certain events and experiences. Sixth, retrospective questions about participants' thoughts before the invasion may not have yielded accurate responses. This potential recall bias could influence participants' interpretations of how they viewed their pre-invasion situation, potentially affecting pre- versus post-invasion comparisons in terms of NCR and related outcomes. Seventh, although online research offers anonymity, the absence of in-person interaction with participants may affect the accuracy of their responses. Non-verbal cues that would typically aid in understanding participants' emotional state or sincerity were not present, which could have influenced the quality of data. Eighth, our study is among the first to employ some of our measures in Russian or Ukrainian, and the lack of prior validity evidence in these languages suggests that our results should be viewed with caution. Ninth, we also acknowledge that measurement invariance was not fully achieved between the pre- and post-invasion cohorts, which suggests that the NCR scale may not measure the construct equivalently across groups. This limitation suggests that differences between groups may reflect variations in how individuals interpret the items, rather than true differences in NCR levels. Lastly, the significant residual correlation between the two items (*"My family and I would be treated better if we were more like other immigrant groups"* and *"It is hard for me to succeed at work because I am Ukrainian"*) suggests overlapping content or similar response patterns, which might affect the validity of the NCR scale. Future revisions of the scale should consider refining or separating these items to reduce redundancy.

Conclusion

Our findings underscore the strong associations between perceived negative context of reception (NCR) and the mental health and well-being of Ukrainian immigrants in the United States – regardless of time of arrival. These results not only validate the NCR scale as a reliable tool for measuring perceived negative reception among this group, but they also indicate significant differences based on the timing of arrival. Individuals who arrived after the 2022 Russian invasion report a more negative context of reception, which significantly correlates with adverse mental health outcomes such as depression, anxiety, and PTSD.

Moreover, the significant intercorrelations of NCR with life satisfaction, optimism, and guilt provide deeper insights into psychological functioning among Ukrainian immigrants. The negative correlations between NCR and well-being indicators highlight the detrimental impact of negative reception experiences on immigrants' quality of life and outlook. These findings suggest that cultural stressors can erode psychological resilience, rendering adaptation and integration more challenging for immigrants. The lack of metric and scalar invariance across pre- and post-invasion cohorts further suggests that post-invasion arrivals perceive cultural stressors at least somewhat differently compared to those who arrived earlier. This variation highlights the importance of situational context and the cumulative impact of migration-related stressors on immigrants' perceptions and experiences.

To address these challenges, targeted interventions may be necessary to support each arrival cohort. Enhancing support structures and resources can mitigate the adverse effects of negative reception and promote greater integration and well-being among Ukrainian immigrants. Future research should also involve longitudinal studies to establish directional relationships and explore the evolving perceptions of context of reception over time. Additionally, refining the NCR scale to ensure measurement invariance across different cohorts would enhance its validity and reliability as a tool for assessing cultural stressors among Ukrainian immigrants.

In conclusion, our study contributes valuable insights into the psychological impact of negative reception on Ukrainian immigrants in the U.S., emphasizing the need for comprehensive support mechanisms to foster their mental health and well-being. We hope that the present work will inspire additional work in this direction.

Ethical approval and informed consent statements

The study received approval from the Institutional Review Board at the University of Texas at Austin under protocol number STUDY00004306. All participants provided informed consent before taking part in the study.

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CRedit authorship contribution statement

Lee Tae Kyoung: Formal analysis. **Schwartz Seth J.:** Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization. **Alpysbekova Aigerim:** Writing – original draft, Resources, Methodology, Data curation, Conceptualization. **Scaramutti Carolina:** Writing – original draft. **Bartoszak Magdalena:** Writing – original draft.

Data availability

The present data are not presently available to people outside the research team.

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