HEALTH PSYCHOLOGY REPORT · 2026
ORIGINAL ARTICLE

*Berenika Sztandera*
1 · A,B,C,D,E,F
*Jan Cieciuch*
2 · A,D,E

# *The mediating role of coping styles in the relationship between temperament and stress-related variables*

BACKGROUND
Both temperament and coping are established predictors of stress-related outcomes. While these associations are well documented in classical frameworks, such as the Regulatory Theory of Temperament (RTT), research providing a comprehensive perspective on these relationships through modern integrative models remains limited. Using recently developed integrative models, this study examined the predictive power of temperament and coping for well-being, perceived stress, and PTSD symptoms. Furthermore, it evaluated the mediating role of coping in the relationship between temperament and these variables.

PARTICIPANTS AND PROCEDURE
To ensure the robustness of the results, two studies were conducted: one with a Polish sample during the COVID-19 pandemic ($N$ = 336, age range 17-65) and another with a sample of Ukrainian refugees affected by the war in Ukraine ($N$ = 329, age range 17-76). Temperament was assessed using the Temperament Metadimensions Questionnaire (TMQ), coping with the Coping Circumplex Inventory (CCI), stress with the 10-item Perceived Stress Scale (PSS-10), PTSD symptoms with the PTSD Checklist for DSM-5 (PCL-5), and well-being with the Mental Health Continuum – Short Form (MHC-SF).

RESULTS
We found that (1) both coping and temperament explain stress-related variables, but coping dimensions have greater predictive power than temperament; (2) Reactivity rather than Activity was the dimension of temperament that explained these outcomes; (3) Emotional coping and Optimistic acting mediated the relationship between Reactivity and stress-related variables.

CONCLUSIONS
Stress and well-being appear to depend more on coping styles, which are characterized by greater plasticity and can be actively modified throughout the lifespan, than on temperament, which is relatively stable and partly innate. Moreover, coping partially mediates the relationship between temperament and stress-related variables.

KEY WORDS
temperament; coping with stress; stress; well-being; PTSD symptoms

ORGANIZATION – 1: Cardinal Stefan Wyszyński University, Warsaw, Poland · 2: Vizja University, Warsaw, Poland
AUTHORS' CONTRIBUTIONS – A: Study design · B: Data collection · C: Statistical analysis · D: Data interpretation · E: Manuscript preparation · F: Literature search · G: Funds collection
CORRESPONDING AUTHOR – Berenika Sztandera, Cardinal Stefan Wyszyński University, 5 Dewajtis Str., 01-815 Warsaw, Poland, e-mail: sztanderaberenika@gmail.com
TO CITE THIS ARTICLE – Sztandera, B., & Cieciuch, J. (2026). The mediating role of coping styles in the relationship between temperament and stress-related variables. *Health Psychology Report*. https://doi.org/10.5114/hpr/221107
RECEIVED 04.08.2025 · REVIEWED 08.03.2026 · ACCEPTED 26.04.2026 · ONLINE PUBLICATION 22.07.2026

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0). License (http://creativecommons.org/licenses/by-nc-sa/4.0/)
Copyright © Institute of Psychology, University of Gdansk

## BACKGROUND

Temperamental traits and coping styles are widely recognized as key predictors of outcomes related to stress and well-being (Lazarus & Folkman, 1984; Strelau, 2008). According to transactional models of stress, coping strategies play a crucial role in shaping the outcome of stressful experiences – either mitigating stress or enhancing well-being (Lazarus & Folkman, 1984). Temperamental traits, in turn, serve as predictors for both the utilization and effectiveness of coping strategies, as well as for stress-related variables. Consequently, temperament and coping may independently explain variability in stress-related variables, while coping may also serve as a mediator in the relationship between temperament and stress or well-being.

In addition to individual characteristics (temperament traits and coping preferences), situational factors also influence stress and well-being. Recent studies have shown that the COVID-19 pandemic has become a stressor with psychological consequences (De Sousa et al., 2021; Ornell et al., 2021), and the war in Ukraine, due to its nature, can even lead to traumatic stress (Kurapov et al., 2023; Pavlova & Rogowska, 2023; Thabet et al., 2014). Examining the issue of coping in the context of the pandemic and warfare, as well as its mediating role, enables a deeper understanding of the mechanisms of stress reactions and their determinants in highly stressful situations of high ecological validity. In this article, we analyze the predictive power of temperament and coping in explaining stress-related variables (well-being, stress, PTSD symptoms) and examine the mediating role of coping in the relationship between temperament and these stress-related variables. In order to provide robust results, the mediating mechanisms were verified in two studies conducted in two different groups: Poles during the COVID-19 pandemic and Ukrainians who fled to Poland after Russia's invasion of Ukraine.

Temperament is defined as a relatively stable set of personality traits in humans from early childhood, with counterparts in the animal world (Strelau, 1985). Strus et al. (2022) developed a model of temperament that integrates several existing models by using the temperamental Big Two (Ponikiewska et al., 2022), Regulative Theory of Temperament (Strelau, 2008), and the Circumplex of Personality Metatraits (Strus & Cieciuch, 2017; Strus et al., 2014). According to this model, there are two basic dimensions of temperament, Reactivity and Activity, which are orthogonal, bipolar, and have both energetic and temporal aspects. Reactivity is responsible for the threshold and intensity of reactions to emotion-generating (particularly stressful) stimuli, as well as the duration and effectiveness of emotional arousal processing. In turn, Activity determines the level of endogenic drive and the ease with which it is mobilized, as well as the course of energy utilization (distribution) reflected in such action characteristics as variability and durability. This model of temperament (Strus et al., 2022) is presented in Figure 1, along with definitions of the energetic and temporal facets of Reactivity and Activity in Table 1.

The model of temperament proposed by Struss et al. (2022) corresponds to the Circumplex of Personality Metatraits (Strus & Cieciuch, 2017; Strus et al., 2014). In particular, (1) Reactivity corresponds to the Gamma dimension that is closely related to the General Factor of Personality on one pole and

**Figure 1**

*The temperament metadimensions model proposed by Strus et al. (2022)*

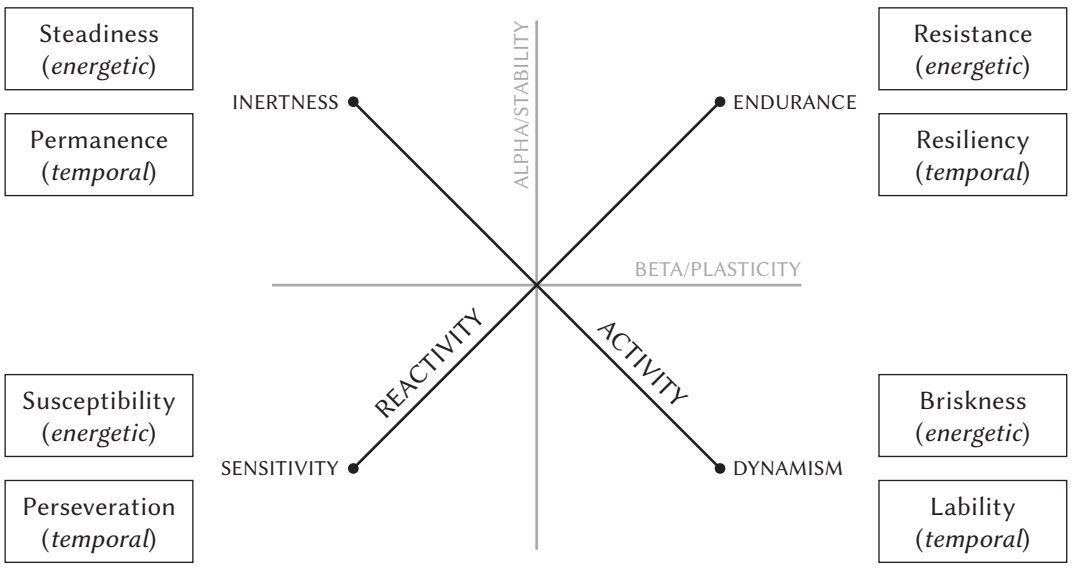


**Table 1**

*Definitions of the energetic and temporal facets of Reactivity and Activity from the temperament metadimensions model proposed by Strus et al. (2022)*

| Dimension | Trait (pole) | Energetic facet | Temporal facet |
|---|---|---|---|
| Reactivity | Sensitivity | *Susceptibility*<br>Tendency to react easily (low threshold) and intensively to stimuli generating negative emotions. | *Perseveration*<br>Tendency for negative emotional reactions to persist or recur despite the cessation of stimuli. |
| | Endurance | *Resistance*<br>Hardiness and tolerance to emotionally aggravating or stressful situations. | *Resiliency*<br>Quickness of recovery and return to initial balance after emotional stress. |
| Activity | Dynamism | *Briskness*<br>High level of endogenous drive (vigor) as well as action readiness and restlessness. | *Lability*<br>Tendency to frequently change the current action and rapidly start others on impulse. |
| | Inertness | *Steadiness*<br>Passivity related to slow and power-saving functioning, with mobilization drag. | *Permanence*<br>Tendency to continue the action that was started and sustain it to the end. |



the General Factor of Psychopathology on the other. (2) Activity corresponds to the Delta dimension that was found to be a kind of border between healthy and ill functioning.

According to previous research on the relationship between temperamental traits as conceptualized in Strelau's (2008) Regulative Theory of Temperament and perceived stress and well-being, Reactivity is negatively related to well-being and positively to stress, while Activity shows the opposite pattern of relations (Bojanowska & Piotrowski, 2021; Bojanowska & Zalewska, 2017; Strelau, 2008). However, in the model proposed by Strus et al. (2022), Activity was redefined as orthogonal to Reactivity. One would expect that high Reactivity, described by Sensitivity, predicts higher levels of stress and lower well-being, while low Reactivity, described by Endurance, predicts lower levels of stress and higher well-being. On the other hand, Activity, being orthogonal to Reactivity, is expected to have no relationship to stress and well-being.

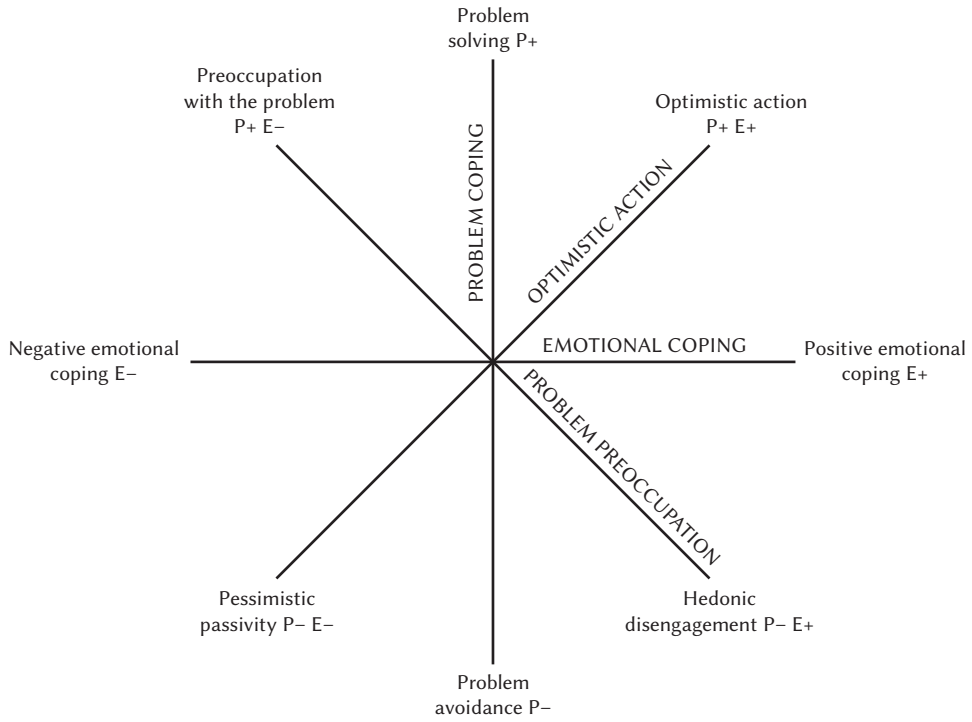
Temperament is also related to coping styles. Research shows that highly reactive individuals use coping styles focused on emotions and problem avoidance more often while highly active individuals are more likely to use styles focused on problems (Compas et al., 2004; Rzeszutek et al., 2012; Szrajda et al., 2017). The preferred coping style is therefore consistent with the individual's temperamental characteristics. Moreover, previous studies suggest that coping style may play a mediating role in the relationship between temperament and psychological outcomes (Aguirre et al., 2024; Connor-Smith & Flachsbart, 2007). This is because temperament determines one's typical emotional reactivity and behavioral tendencies, which in turn influence how people cope with stress. Thus, we tested coping both as a predictor for the stress-related variable and as a mediator in the relationship between temperament and these stress-related variables.

The Coping Circumplex Model (CCM; Stanisławski, 2019, 2022) draws inspiration from traditional coping models and enables the integration of coping constructs by describing them along two primary dimensions: Problem coping and Emotional coping. These are supplemented by two additional dimensions rotated by 45 degrees: Optimistic action and Preoccupation with the problem. The model (see Figure 2) comprises eight coping styles, each defining one of the two poles of a given dimension, inscribed within a circumplex (definitions are provided in Table 2).

The dimensions of coping, presented in Table 2 and Figure 2, are organized within the circumplex such that it can be divided into two halves: one representing adaptive and the other non-adaptive coping styles. Adaptive coping integrates positive problem-focused and emotion-focused strategies; consequently, each of the three dimensions – Problem coping, Emotional coping, and Optimistic action – features an adaptive pole (Problem solving, Positive emotional coping, and Optimistic action, respectively) and a maladaptive pole (Problem avoidance, Negative emotional coping, and Pessimistic passivity, respectively). The poles of the Problem preoccupation dimension (Preoccupation with the problem vs. Hedonic disengagement) are considered borderline in terms of adaptivity.

**Figure 2**

*The Coping Circumplex Model proposed by Stanisławski (2022)*




Earlier research, conducted prior to the development of the CCM and examining analogous constructs, provides empirical evidence supporting the adaptivity profiles of these dimensions. Numerous studies have shown that the use of problem-focused coping strategies is generally associated with lower levels of perceived stress and higher well-being, as these strategies involve active efforts to resolve stressful situations or mitigate their impact (Folkman & Moskowitz, 2004). In contrast, problem avoidance exhibits the opposite pattern, being associated with lower well-being and higher stress (Khamis, 2015; Zacher & Rudolph, 2021). Similarly, coping focused on emotions, which involves focusing on emotional reactions rather than addressing the stressor itself, is also associated with lower well-being and increased perceived stress (Khamis, 2015; Rzeszutek et al., 2012; Zacher & Rudolph, 2021). Thus, coping style not only reflects temperamental predispositions but is also related to how individuals experience and adapt to stress. Such a situation raises the question of coping's mediating role in the relationships between temperament and stress-related variables.

Few studies have examined the mediating role of coping. Earlier work within the Regulatory Theory of Temperament emphasized the role of temperamental traits in shaping individuals' responses to stressful and traumatic situations (Strelau, 2008). From this perspective, coping processes may constitute an important mechanism linking temperament with stress-related outcomes. This role has been confirmed in the relationship between temperament and emotions (Kroemeke & Kwissa-Gajewska, 2014), depression (Compas et al., 2004), and burnout (Więsyk & Płudowska, 2022). Additionally, the role of coping has been confirmed in the relationship between personality and a set of stress-related variables (Bolger & Zuckerman, 1995; Carver & Connor-Smith, 2010; Chung et al., 2005).

To summarize, according to the current state of research, both temperament (Bojanowska & Piotrowski, 2021; Strelau, 2008) and coping styles (Gustafsson et al., 2006; Saalwirth & Leipold, 2021) explain perceived stress and well-being, but there is a lack of studies comparing the predictive values of temperament and coping, so it is difficult to say which of these variables is more important for perceived stress and well-being. Moreover, coping with stress can be, to some extent, conditioned by temperamental traits and play a mediating role in the relationship between temperament and stress. However, research on this is limited, especially regarding the application of new models of temperament and coping, and the present study aims to fill this gap.

Recently, integrated models for coping (Stanisławski, 2019, 2022) and temperament (Strus et al., 2022) were proposed, which we utilized in our research. By employing both an integrative model of coping and an integrative model of temperament, we aim to offer a more systematic and theoretically grounded understanding of how these individual differences contribute to stress-related outcomes.

**Table 2**

*Definitions of coping strategies from the Coping Circumplex Model proposed by Stanisławski (2022)*

| Coping style | Problem coping | Emotional coping | Definition |
|---|---|---|---|
| Problem solving | High | | Active cognitive and behavioral efforts to deal with a problem. Consists of undertaking efforts to understand the situation, planning to solve the problem and implementing this plan as well as taking consistent action. |
| Problem avoidance | Low | | Avoidance of thinking about the problem (e.g., by engaging in substitute activities), reducing efforts to solve the problem, postponing a task, or giving up attempts to attain a goal. |
| Positive emotional coping | | High | Being kind to and understanding of oneself as one tries to solve a problem on one's own. |
| Negative emotional coping | | Low | Self-criticism when dealing with a problem, focusing attention on the negative aspects of stressful situations (e.g., rumination), and on negative emotions (e.g., feelings of tension, pressure, or anger). |
| Optimistic action | High | High | Finding new avenues of solving the problem and the elicitation of positive emotions as well as positive expectations about the possibility of solving the problem. |
| Pessimistic passivity | Low | Low | Not acknowledging the thoughts and feelings associated with the problem, using cognitive transformations, which elicit negative expectations and emotions as to the possibility of dealing with the problem. |
| Preoccupation with the problem | High | Low | High tendency to take action to solve the problem and a low tendency to maintain momentary well-being. |
| Hedonic disengagement | Low | High | Avoidance of information on the problem and a strong tendency to maintain momentary well-being. Feeling of control over the problem (a form of internalization) and decrease of its importance (problem devaluation). |

*Note.* Adopted from Stanisławski (2019, 2022), Creative Commons 4.0 license.



## CURRENT STUDY

There were two main objectives of this study: (1) to verify the predictive power of temperament dimensions distinguished in the model by Strus et al. (2022) and coping dimensions from the model by Stanisławski (2019, 2022) in explaining well-being, stress, PTSD symptoms and (2) to test the mediating role of coping styles in the relationship between temperament and well-being, stress, and PTSD symptoms. To ensure the robustness of the models, we conducted two studies in stressful situations: among a group of Poles during the COVID-19 pandemic and among a group of Ukrainians who had emigrated to Poland following the Russian invasion of Ukraine.

Poland and Ukraine share geographical proximity, historical ties, and similar socio-political influences related to the legacy of the Soviet sphere. However, they differ in their current socio-economic context: Poland has been a member of the European Union for over two decades, while Ukraine remains a candidate country. These differences are also reflected in educational, socio-cultural, and economic conditions, with Ukraine classified as a lower-middle-income country and Poland as a high-income country (Kuśnierz et al., 2020).

Importantly, the Polish and Ukrainian samples differ not only in cultural context but also in the situational conditions shaping stress exposure. While Poles primarily experienced stress related to the COVID-19 pandemic, Ukrainians were exposed to the combined effects of the pandemic, war, and forced resettlement, resulting in an accumulation of chronic stressors. According to Rizzi et al. (2022), Ukrainian refugees in Poland experience uncertainty about the future and multiple migration-related stressors, such as language barriers, housing difficulties, and financial insecurity. These factors may increase the risk of PTSD, anxiety, and depression. Protective factors supporting resilience among refugees in Poland include contact with family, social support from friends, vol-

unteers, and host communities, as well as religion, future planning, meaning-making, leisure activities, and a sense of safety. Consequently, the comparison of the predictive roles of temperament and coping, along with the mediation model, was conducted in two distinct groups experiencing different stress contexts. Nonetheless, we expected the underlying mechanism regarding the roles of coping and temperament to remain consistent across both samples.

We hypothesized (H1a) that coping dimensions, which are theoretically differentiated based on their adaptivity, would explain stress-related variables. Specifically, the adaptive poles of Problem coping, Emotional coping, and Optimistic action were expected to relate positively to well-being and negatively to stress and PTSD symptoms, while their maladaptive counterparts would exhibit the opposite pattern. Regarding temperament, we expected (H1b) the Reactivity dimension to predict stress-related variables, such that high Reactivity facets would associate positively with stress and PTSD symptoms and negatively with well-being, while low Reactivity facets would show the inverse relationship. Additionally, we aimed to determine which set of variables – temperament or coping – best predicts these stress-related variables. This analysis will allow us to assess the predictive power of these constructs and understand whether stable traits such as temperament or more flexible, situationally driven coping styles play a greater role in explaining well-being, stress, and PTSD symptoms.

Regarding the mediation model, based on the theoretical distinction between adaptive and maladaptive coping styles, we hypothesized that the dimensions of Problem coping, Emotional coping, and Optimistic action (calculated using indices from both poles) act as: (H2a) mediators in the relationship between Reactivity and both stress and PTSD symptoms in a negative direction (where higher Reactivity is associated with less adaptive coping, leading to higher stress), and (H2b) mediators in the relationship between Reactivity and well-being in a positive direction (where lower Reactivity is associated with more adaptive coping, leading to greater well-being). The general mediation model explaining stress, PTSD symptoms and well-being is presented in Figure 3.

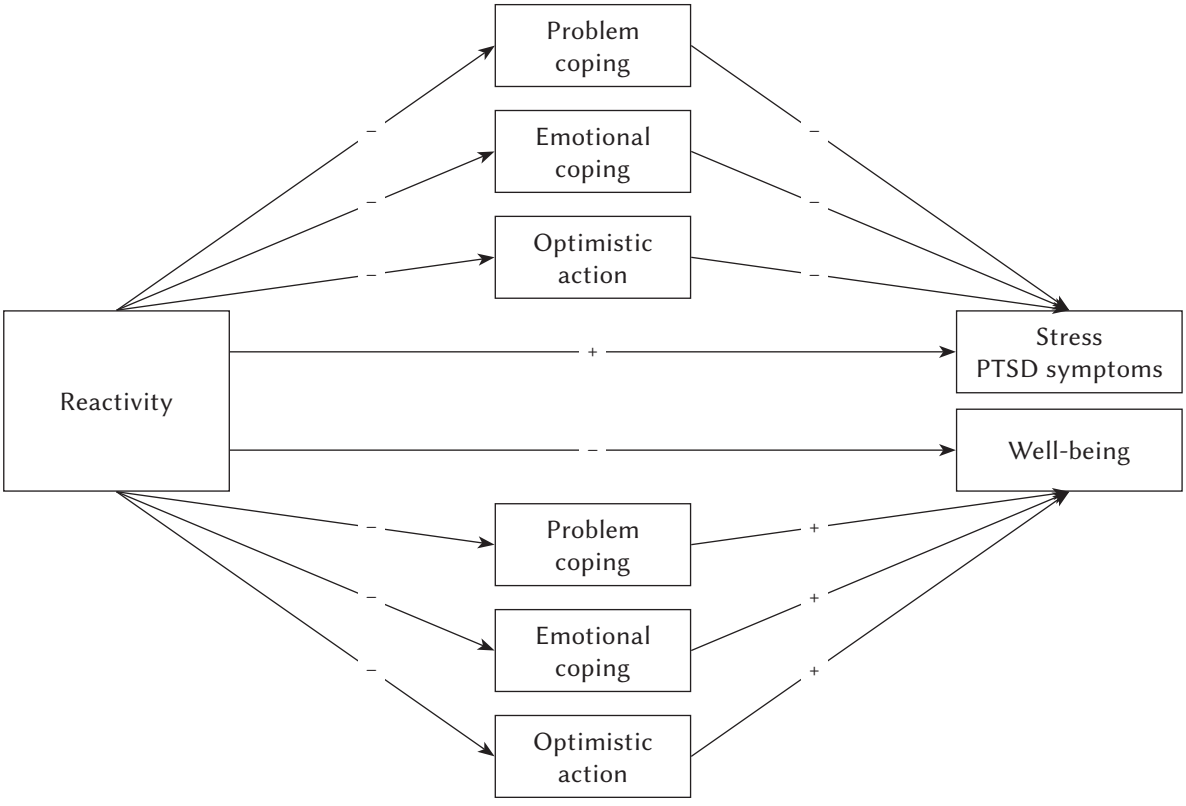
## PARTICIPANTS AND PROCEDURE

### PARTICIPANTS

The hypotheses were tested in two studies. The first study was conducted on a Polish sample ($N$ = 336, 56.3% female) aged 17 to 65 ($M_{age}$ = 28.39, $SD_{age}$ = 9.79) recruited through social media posts. Participants completed a battery of self-report questionnaires

**Figure 3**

*Mediation model of coping in the relationship between temperament and stress, PTSD symptoms, and well-being*



during the COVID-19 pandemic from February 11 to March 14, 2022. In the study sample, 51% of participants lived in a large city, 59% were in a relationship, 60% had completed higher education, and 44% were employed.

The second study was conducted on a sample of Ukrainian refugees ($N$ = 329, 82% women) aged 17 to 76 ($M_{age}$ = 39.39, $SD_{age}$ = 15.14) recruited from foundations and reception points. Participants completed a battery of self-report questionnaires from December 7, 2022, to February 28, 2023. In this sample, 86% of participants came to Poland after 24.02.2022, following Russia's invasion of Ukraine. Thirty-nine percent lived in a large city, 66% were in a relationship, 59% had completed higher education, and 64% were employed before leaving for Poland. In addition, 22% had lost a close person as a result of Russia's aggression against Ukraine.

The study was approved by the Ethical Board for Scientific Research of the Institute of Psychology at Cardinal Stefan Wyszynski University in Warsaw (approval no. 24/2022, covering both the Polish and Ukrainian samples). Before participating in the study, all participants received detailed information about the study and gave informed consent.

## MEASURES

### *Measures of temperament and coping with stress*

*The Temperament Metadimensions Questionnaire* (TMQ; Strus et al., 2022) was developed to measure the metadimensions of Reactivity and Activity, along with their four poles and eight facets, as outlined in Table 1. It consists of eight scales, with each scale containing from eight to ten items. To test the H1b we used these eight scales, while to test H2a and H2b we used the scores for basic dimensions of temperament. We obtained the dimensions by subtracting the feature representing a low level of a given dimension from the feature representing a high level of that same dimension. The Reactivity index was calculated by subtracting Endurance from Sensitivity, and the Activity index was calculated by subtracting Inertness from Dynamism. The inventory uses a 5-point Likert scale. In both studies, all subscales from this measure reached sufficient reliability. In the first study, Cronbach's α ranged from .68 to .88, and in the second study, it ranged from .76 to .85.

*The Coping Circumplex Inventory* (CCI; Stanisławski, 2022) was developed to measure variables identified in the CCM. The questionnaire contains 76 items with a 4-point response scale, allowing for the measurement of eight coping styles defined in Table 2: Problem solving, Optimistic action, Positive emotional coping, Hedonic disengagement, Problem avoidance, Pessimistic passivity, Negative emotional coping, and Preoccupation with the problem. To test the H1a, we used these eight scales, while to test H2a and H2b, we used the scores for basic dimensions of coping. We obtained the dimensions by subtracting the feature representing a low level of a given dimension from the feature representing a high level (Problem solving – Problem avoidance, Positive emotional coping – Negative emotional coping, Optimistic action – Pessimistic passivity, Preoccupation with the problem – Hedonistic disengagement). In the first study, Cronbach's α coefficients ranged from .72 to .86, and in the second study, they ranged from .73 to .84.

### *Measures of well-being, stress, PTSD symptoms*

*The Mental Health Continuum – Short Form* (MHC-SF; Karaś et al., 2014) enables the measurement of well-being and comprises three scales: Emotional, Psychological, and Social subjective well-being. These dimensions contribute to the total well-being score that was used in both studies. It consists of 14 items rated on a 6-point Likert scale. In the first study, Cronbach's α coefficients ranged from .79 to .85, and in the second study, they ranged from .80 to .89.

*The Perceived Stress Scale* (PSS-10; Cohen et al., 1983; Polish adaptation: Juczyński & Ogińska-Bulik, 2009) measures perceived stress and comprises 10 questions that assess subjective feelings related to personal problems and events, behaviors, and coping strategies. The responses were rated on a 5-point Likert scale. The Cronbach's α in the first study was .75, and in the second study .74.

*The PTSD Checklist for DSM-5* (PCL-5; Weathers et al., 2013; Polish adaptation: Ogińska-Bulik et al., 2018) consists of 20 statements assessed on a 5-point scale describing PTSD symptoms in accordance with the criteria described in DSM-5. It allows the number and intensity of symptoms to be measured, and the degree of PTSD to be quantified. In the first study, Cronbach's α coefficients ranged from .69 to .81, and in the second from .74 to .85.

## RESULTS

Descriptive statistics, multicollinearity diagnostics (variance inflation factor [VIF] and tolerance values), and the correlation matrix of all measured variables are presented in the Supplementary materials (Tables S1, S2, and S3, respectively). To verify the first hypothesis, we conducted a series of regression analyses. To ensure a valid comparison of the predictive power of temperament and coping, we introduced eight variables from both the temperament and coping models into the regression.

Table 3 summarizes the variance of well-being, stress, and PTSD symptoms explained by temperament and coping in two groups: Poles during the

**Table 3**

*Variance (adjusted $R^2$) of well-being, stress and PTSD symptoms explained by temperament (Strus et al., 2022) and coping dimensions (Stanisławski, 2019, 2022)*

| | Poles during COVID pandemic | | | Ukrainian refugees | | |
|---|---|---|---|---|---|---|
| | Well-being | Stress | PTSD symptoms | Well-being | Stress | PTSD symptoms |
| Temperament | .33*** | .26*** | .28*** | .18*** | .29*** | .28*** |
| Coping styles | .32*** | .35*** | .44*** | .27*** | .38*** | .31*** |

*Note.* $^{***}p < .001$.



**Table 4**

*Variance of well-being, stress and PTSD symptoms explained by the dimension of temperament (Strus et al., 2022)*

| | Polish population | | | Ukrainian refugees | | |
|---|---|---|---|---|---|---|
| | Well-being | Stress | PTSD symptoms | Well-being | Stress | PTSD symptoms |
| Step 1 | Adj. $R^2$ = .22*** | Adj. $R^2$ = .20*** | Adj. $R^2$ = .12*** | Adj. $R^2$ = .06*** | Adj. $R^2$ = .28*** | Adj. $R^2$ = .19*** |
| Reactivity | −.47*** | .45*** | .35*** | −.24*** | .54*** | .44*** |
| Step 2 | Adj. $R^2$ = .22<br>$\Delta R^2$ = .00 | Adj. $R^2$ = .21*<br>$\Delta R^2$ = .01* | Adj. $R^2$ = .19***<br>$\Delta R^2$ = 07*** | Adj. $R^2$ =.06<br>$\Delta R^2$ = .01 | Adj. $R^2$ = .29*<br>$\Delta R^2$ = .01* | Adj. $R^2$ = .21**<br>$\Delta R^2$ = .02** |
| Reactivity | −.47*** | .47*** | .40*** | −.23*** | .52*** | .42*** |
| Activity | .02 | .12* | .27*** | −.07 | .09* | .14** |

*Note.* $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

COVID-19 pandemic and Ukrainian refugees (detailed results of the regression analyses are provided in Tables S4 and S5 in the Supplementary materials). Both temperament and coping significantly explained the variances in perceived stress and well-being.

In the Polish group, temperament explained a substantial proportion of variance in well-being, stress, and PTSD symptoms. However, coping styles showed even greater predictive power for stress and PTSD, while their predictive power for well-being was comparable. In the Ukrainian group, coping consistently explained more variance in all three outcomes than temperament, with PTSD symptoms being quite comparable. The greatest differences between the two groups emerged in the proportion of variance in well-being and PTSD symptoms explained by temperament and coping. In particular, coping explained substantially more variance in well-being among Ukrainian refugees than temperament, whereas in the Polish group, coping was especially predictive of PTSD symptoms.

In the Polish group, temperament dimensions explained 33% of the variance in well-being, 26% in stress, and 28% in PTSD symptoms. The most important predictor was Resiliency, which significantly predicted well-being, stress, and PTSD symptoms. Other relevant aspects of Reactivity included Susceptibility, which was a significant predictor of stress and PTSD symptoms, and Perseveration, which contributed to the explanation of PTSD symptoms (see Table S4 in the Supplementary materials).

In the Ukrainian group, temperament explained 18% of the variance in well-being, 29% in stress, and 28% in PTSD symptoms. Susceptibility and Perseveration were the strongest predictors of stress and PTSD symptoms, while Resiliency emerged as a significant negative predictor of stress.

The facets of Activity rarely emerged as significant predictors of stress-related variables. To determine the role of Activity in predicting these outcomes, we conducted two-step hierarchical regression analyses, with Reactivity entered in the first step and Activity in the second. The results are presented in Table 4.

It was found that, except for PTSD symptoms in the Polish sample, the increase in explained variance was negligible; consequently, only Reactivity was included in the mediation models.

Regarding coping, in the Polish group, coping styles explained 32% of the variance in well-being, 35% in stress, and 44% in PTSD symptoms. Well-being was positively predicted by Positive emotional coping and negatively by Pessimistic passivity. Stress

was positively associated with Negative emotional coping and Hedonic disengagement, and negatively associated with Optimistic action and Positive emotional coping. PTSD symptoms were positively predicted by Negative emotional coping, Pessimistic passivity, and both Preoccupation with the problem and Hedonic disengagement, and negatively predicted by Optimistic action.

In the Ukrainian group, coping styles explained 27% of the variance in well-being, 38% in stress, and 31% in PTSD symptoms. Well-being was positively associated with Problem solving and Optimistic action and negatively associated with Pessimistic passivity. Both stress and PTSD symptoms were positively predicted by Negative emotional coping and Pessimistic passivity and negatively by Positive emotional coping. Additionally, stress was negatively predicted by Optimistic action.

Regarding the second hypothesis, we tested the mediating role of coping styles in the relationships between temperament dimensions and well-being, stress, and PTSD symptoms. Specifically, we examined three mediation models (for three outcome variables: well-being, stress, and PTSD symptoms), each of them including Reactivity as the predictor and coping dimensions as mediator. We included the dimensions of Problem coping, Emotional coping, and Optimistic action – regarding which hypothesis 2 was formulated – as well as Problem preoccupation, to encompass the entire CCM model. These dimensions were calculated using indices from both poles such that higher scores represent a greater intensity of the style from the positive pole (or, in the case of Problem preoccupation, the Preoccupation with the problem style), as described in the Participants and procedure section. The analyses were conducted in two groups: Poles and Ukrainian refugees. The mediation analysis was performed using the SPSS PROCESS macro. The mediation results are summarized in Table 5. Figures illustrating the tested mediation models are presented in the Supplementary materials (Figures S1-S3).

In relation to hypothesis 2a, Problem coping, Emotional coping, and Optimistic action were expected to act as negative mediators in the relationship between Reactivity and stress, as well as PTSD symptoms. The results indicated that in both the Polish and Ukrainian groups, Emotional coping (M2) mediated the relationship between Reactivity and stress in a negative direction. Furthermore, Optimistic action (M3) served as a significant mediator between Reactivity and PTSD symptoms in both groups. Specific to the Ukrainian sample, significant indirect effects were also found for Emotional coping (M2) in the relationship with PTSD symptoms, and for Optimistic action (M3) regarding stress. These findings suggest that these adaptive coping styles may attenuate the association between high Reactivity and intensified stress or PTSD symptoms.

Hypothesis 2b that Problem coping, Emotional coping, and Optimistic action would act as mediators in the relationship between Reactivity and well-being in a positive direction (lower Reactivity would be associated with more adaptive coping, leading to greater well-being) was partly confirmed. The results showed that Optimistic action (M3) was a significant mediator in the Polish and Ukrainian group. This indicates that lower Reactivity was associated with higher levels of Optimistic action, which in turn was associated with greater well-being. Problem coping (M1) and Emotional coping (M2) did not significantly mediate the relationship between Reactivity and well-being. These findings suggest that, among the three coping dimensions tested, Optimistic action played the most consistent role in explaining the beneficial effects of low Reactivity on well-being.

We did not expect Problem preoccupation to have a mediating role. Consistent with this expectation, the mediation analyses involving this variable turned out to be statistically non-significant.



## DISCUSSION

In this study, we tested the predictive values of temperament and coping styles explaining well-being, stress, and PTSD symptoms, and we tested the mediating role of coping in the relationship between temperament and stress. To enhance the high ecological validity and robustness of our results, we conducted two studies in highly stressful situations: the first among Poles during the COVID-19 pandemic and the second among Ukrainian refugees after the war broke out in Ukraine. To provide complex results, we used the relatively new models of temperament and coping that integrate several existing models of temperament and coping. The models we used were: the model of temperament proposed by Strus et al. (2022) and the model of coping proposed by Stanisławski (2019, 2022).

First, we verified the extent to which temperament and coping explain the variance in well-being, stress, and PTSD symptoms. As expected, both models significantly explained these variables. Generally, coping dimensions explain more variance of stress-related variables than temperament dimensions. These results support the conclusion that stress and well-being depend more on coping styles that are developed and shaped by people than on temperament, which is to some extent innate. The pattern of results was highly similar across the Polish and Ukrainian groups, suggesting cross-cultural consistency. Second, we tested the mediating role of coping styles in the relationship between temperamental Reactivity and stress-related variables. We focused on Reactivity as the main predictor of stress-related variables, as the temperament model and empirical results suggest

**Table 5**

*The mediation of coping in the relationship between Reactivity and well-being, stress, and PTSD symptoms*

| | Polish | | | | | Ukrainian | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pathway | B | BC 95% CI | *SE* | *p* | Pathway | B | BC 95% CI | *SE* | *p* |
| Well-being | | | Direct effects | | | | | Direct effects | | |
| | X → Y | **–.21** | **–.32; –.09** | **.06** | **< .001** | X → Y | –.02 | –.18; .13 | .08 | .777 |
| | X → M1 | **–.23** | **–.33; –.13** | **.05** | **< .001** | X → M1 | **–.18** | **–.29; –.07** | **.06** | **.001** |
| | X → M2 | **–.65** | **–.73; –.57** | **.04** | **< .001** | X → M2 | **–.68** | **–.75; –.61** | **.04** | **< .001** |
| | X → M3 | **–.62** | **–.70; –.54** | **.04** | **< .001** | X → M3 | **–.53** | **–.62; –.44** | **.05** | **< .001** |
| | X → M4 | **.31** | **.22; .39** | **.04** | **< .001** | X → M4 | **.23** | **.13; .32** | **.05** | **< .001** |
| | M1 → Y | .04 | –.11; .19 | .08 | .581 | M1 → Y | .10 | –.04; .24 | .07 | .158 |
| | M2 → Y | .13 | –.03; .28 | .08 | .116 | M2 → Y | .12 | –.05; .28 | .08 | .172 |
| | M3 → Y | **.21** | **.05; .37** | **.08** | **.009** | M3 → Y | **.25** | **.10; .40** | **.08** | **.001** |
| | M4 → Y | .04 | –.13; .20 | .08 | .667 | M4 → Y | .05 | –.10; .21 | .08 | .506 |
| | | | Direct effects | | | | | Direct effects | | |
| | X → M1 → Y | –.01 | –.05; .03 | .02 | ns | X → M1 → Y | –.02 | –.05; .01 | .02 | ns |
| | X → M2 → Y | –.08 | –.18; .01 | .05 | ns | X → M2 → Y | –.08 | –.21; .04 | .06 | ns |
| | **X → M3 → Y** | **–.13** | **–.23; –.02** | **.05** | **sig** | **X → M3 → Y** | **–.13** | **–.22; –.05** | **.04** | **sig** |
| | X → M4 → Y | .01 | –.04; .06 | .02 | ns | X → M4 → Y | .01 | –.02; .05 | .02 | ns |
| | Total effect | **–.42** | **–.50; –.33** | **.04** | **< .001** | Total effect | **–.24** | **–.34; –.13** | **.05** | **< .001** |

*Table 5 continues*

**Table 5**

*Table 5 continued*

| | Polish | | | | | Ukrainian | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pathway | B | BC 95% CI | *SE* | *p* | Pathway | B | BC 95% CI | *SE* | *p* |
| Stress | | | Direct effects | | | | | Direct effects | | |
| | X → Y | **.07** | **.00; .13** | **.03** | **.036** | X → Y | **.13** | **.05; .21** | **.04** | **.001** |
| | X → M1 | **−.23** | **−.33; −.13** | **.05** | **< .001** | X → M1 | **−.18** | **−.29; −.07** | **.06** | **.001** |
| | X → M2 | **−.65** | **−.73; −.57** | **.04** | **< .001** | X → M2 | **−.68** | **−.75; −.61** | **.04** | **< .001** |
| | X → M3 | **−.62** | **−.70; −.54** | **.04** | **< .001** | X → M3 | **−.53** | **−.62; −.44** | **.05** | **< .001** |
| | X → M4 | **.31** | **.22; .39** | **.04** | **< .001** | X → M4 | **.23** | **.13; .32** | **.05** | **< .001** |
| | M1 → Y | −.03 | −.12; .05 | .04 | .443 | M1 → Y | .01 | −.06; .08 | .04 | .861 |
| | M2 → Y | **−.17** | **−.26; −.08** | **.04** | **< .001** | M2 → Y | **−.16** | **−.24; −.08** | **.04** | **< .001** |
| | M3 → Y | **−.11** | **−.19; −.02** | **.04** | **.019** | M3 → Y | **−.18** | **−.25; −.10** | **.04** | **< .001** |
| | M4 → Y | −.08 | −.18; .01 | .05 | .072 | M4 → Y | −.06 | −.13; .02 | .04 | .162 |
| | | | Indirect effects | | | | | Indirect effects | | |
| | X → M1 → Y | .01 | −.02; .03 | .01 | ns | X → M1 → Y | −.00 | −.01; .01 | .01 | ns |
| | **X → M2 → Y** | **.11** | **.05; .18** | **.03** | **sig** | **X → M2 → Y** | **.11** | **.05; .17** | **.03** | **sig** |
| | **X → M3 → Y** | **.07** | **00; .13** | **.03** | **sig** | **X → M3 → Y** | **.09** | **.05; .14** | **.02** | **sig** |
| | X → M4 → Y | −.03 | −.06; .01 | .02 | ns | X → M4 → Y | −.01 | −.04; .01 | .01 | ns |
| | Total effect | **.23** | **.18; .28** | **.02** | **< .001** | Total effect | **.32** | **.26; .37** | **.03** | **< .001** |

*Table 5 continues*

**Table 5**

*Table 5 continued*

| | Polish | | | | | Ukrainian | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pathway | B | BC 95% CI | *SE* | *p* | Pathway | B | BC 95% CI | *SE* | *p* |
| PTSD | | | Direct effects | | | | | Direct effects | | |
| | X → Y | .07 | −.02; .16 | .04 | .106 | X → Y | **.16** | **.05; .27** | **.06** | **.005** |
| | X → M1 | **−.23** | **−.33; −.13** | **.05** | **< .001** | X → M1 | **−.18** | **−.29; −.07** | **.06** | **.001** |
| | X → M2 | **−.65** | **−.73; −.57** | **.04** | **< .001** | X → M2 | **−.68** | **−.75; −.61** | **.04** | **< .001** |
| | X → M3 | **−.62** | **−.70; −.54** | **.04** | **< .001** | X → M3 | **−.53** | **−.62; −.44** | **.05** | **< .001** |
| | X → M4 | **.31** | **.22; .39** | **.04** | **< .001** | X → M4 | **.23** | **.13; .32** | **.05** | **< .001** |
| | M1 → Y | −.08 | −.19; .04 | .06 | .181 | M1 → Y | −.04 | −.14; .06 | .05 | .417 |
| | M2 → Y | −.05 | −.17; .07 | .06 | .422 | M2 → Y | **−.19** | **−.31; −.07** | **.06** | **.001** |
| | M3 → Y | **−.24** | **−.35; −.12** | **.06** | **< .001** | M3 → Y | **−.12** | **−.22; −.01** | **.05** | **.034** |
| | M4 → Y | −.11 | −.24; .01 | .06 | .080 | M4 → Y | −.10 | −.21; .01 | .06 | .089 |
| | | | Indirect effects | | | | | Indirect effects | | |
| | X → M1 → Y | .02 | −.01; .06 | .02 | ns | X → M1 → Y | .01 | −.01; .03 | .01 | ns |
| | X → M2 → Y | .03 | −.06; .11 | .04 | ns | **X → M2 → Y** | **.13** | **.03; .22** | **.05** | **sig** |
| | **X → M3 → Y** | **.14** | **.06; .24** | **.05** | **sig** | **X → M3 → Y** | **.06** | **.00; .12** | **.03** | **sig** |
| | X → M4 → Y | −.03 | −.08; .01 | .02 | ns | X → M4 → Y | −.02 | −.06; .00 | .02 | ns |
| | Total effect | **.23** | **.16; .30** | **.03** | **< .001** | Total effect | **.33** | **.26; .41** | **.04** | **< .001** |

*Note.* X – Reactivity; M1 – Problem coping; M2 – Emotional coping; M3 – Optimistic action; M4 – Problem preoccupation.

that Activity does not show significant associations with most outcomes. We mostly confirmed our expectations. Specifically, two of the three tested coping dimensions – Optimistic action and Emotional coping – demonstrated the expected mediation effects, highlighting their relevance in buffering the negative impact of high Reactivity.

As hypothesized, Emotional coping mediated the relationship between Reactivity and Stress in both groups, as well as between Reactivity and PTSD symptoms in the Ukrainian sample. While high Reactivity is typically associated with emotion-focused coping reflecting distress (Szrajda et al., 2017), the CCM conceptualizes this as a bipolar dimension where higher Reactivity predicts lower levels of its adaptive pole. In our study, this deficit in the positive pole of Emotional coping was associated with intensified stress and PTSD symptoms. Given that approximately one-third of refugees meet the criteria for PTSD or depression (Mesa-Vieira et al., 2022), the adaptive role of this construct is particularly salient.

This distinction aligns with Austenfeld and Stanton (2004), who argue that traditional emotion-focused measures are often confounded with distress and self-criticism, leading to their typical positive associations with poorer functioning. In contrast, Positive emotional coping – defined within the CCM as being understanding toward oneself (Stanisławski, 2022) – exhibits clear adaptive qualities. Our findings confirm that this style served as a significant psychological resource in the context of both pandemic-related stress and war-related trauma.

Another dimension of the CCM, Optimistic action, mediated the relationship between Reactivity and PTSD symptoms in both groups, as well as stress in the Ukrainian sample. People with high Reactivity are more often self-critical and focus on the negative aspects of a stressful situation and on negative emotions because they experience higher levels of arousal, while low-reactive people are more optimistic and experience less stress. A similar pattern was observed for well-being. Optimistic action mediated the relationship between Reactivity and well-being in both the Polish and Ukrainian groups, with evidence of full mediation in the Ukrainian sample. This suggests that lower Reactivity is associated with higher levels of Optimistic action, which in turn contributes to greater well-being. This interpretation is consistent with studies by Peterson and colleagues (Peterson & Bossio, 1991; Peterson & Seligman, 1987), in which optimism was negatively associated with stress and PTSD symptoms and positively with well-being.

Further support comes from Hansen et al. (2015), who demonstrated that motivational coping, particularly flexible goal adjustment, mediates the relationship between dispositional optimism and well-being. In their models, individuals who adjusted goals flexibly and pursued them tenaciously maintained higher well-being under stress. These processes mirror Optimistic action in our CCM framework, reinforcing its adaptive significance in translating low Reactivity into better psychological adjustment. These mechanisms may be particularly important in contexts of prolonged adversity, such as war and forced displacement.

Consistent with these findings, optimistic, goal-directed coping may serve as a buffer against the detrimental effects of high temperamental Reactivity under conditions of extreme or prolonged stress. Previous studies show that, particularly in extreme, uncontrollable or ambiguous situations, Reactivity leads to increased avoidance and to development of PTSD symptoms (Strelau & Zawadzki, 2005). In a study by Oniszczenko and Laskowska (2014), the helplessness-hopelessness pattern was positively associated with trauma-related symptoms, supporting the notion that loss of perceived control intensifies psychological distress. Similarly, in the study by Puig-Perez et al. (2024), optimism was negatively associated with perceived stress and COVID-19 stress, highlighting its protective role in the face of widespread uncertainty. It is probable that higher Reactivity in a high-stress situation related to war and the COVID-19 pandemic, and the lack of control over the situation, may foster feelings of helplessness, reinforcing Pessimistic passivity which may cause stress and PTSD symptoms. This maladaptive coping style is characterized by beliefs such as: "The problem is beyond my control…"; "When faced with a problem, I get an impression that my efforts are futile"; "The situation is unclear and I am afraid of something" (Stanisławski, 2022). Such beliefs and behavioral patterns may contribute to elevated levels of stress and PTSD symptoms.

*Coping as a mediator between temperament and stress-related variables*

Importantly, these adaptive mechanisms operate within broader contextual conditions. In the present study, although a similar pattern of relationships was observed across the Polish and Ukrainian groups, the levels of stress and well-being may still be shaped by differences in life circumstances, including exposure to prolonged adversity.

Research conducted among students in Ukraine and Poland during the ongoing Russo-Ukrainian war suggests that a relatively favorable host-country context, along with access to social support, including the Ukrainian diaspora network, may play an important role in refugees' adaptation (Chudzicka-Czupała et al., 2025). At the same time, the refugee experience is associated with an accumulation of stressors, such as war, migration, and uncertainty about the future, which may lead to adaptation difficulties (Rizzi et al., 2022). These findings suggest that while certain mechanisms of psychological functioning may be similar across groups, the migration context and exposure to trauma may shape adaptation processes among refugees. Cultural factors may also play a role, as norms emphasizing social support and

community ties may foster resilience and adaptive coping resources, supporting more optimistic coping responses.

Problem coping, as distinguished within the CCM model, was not a significant mediator in our study. Previous studies show that temperament significantly determines Problem solving (Compas et al., 2004; Rzeszutek et al., 2012; Szrajda et al., 2017), which is related to experienced stress and well-being (Kavčič et al., 2022). The results obtained in our study may be related to the fact that in controlled situations, Problem coping is more often preferred, while in uncontrolled situations, Emotional coping is preferred (Lazarus & Folkman, 1984). The COVID-19 pandemic and the war in Ukraine are uncontrolled situations, which is probably why Problem coping was not significant in these situations. This may also be due to problems identified in classical coping models.

Another possible explanation is that although Problem coping is generally considered an adaptive strategy, its effectiveness depends on the degree of control a person has over the situation. In contexts such as war or a global pandemic, many stressors are unpredictable, external, and beyond one's personal control. In such circumstances, trying to solve the problem directly may not only be ineffective but may also increase frustration or helplessness. As suggested by Skinner et al. (2003), problem-focused strategies are most useful when the situation is changeable or manageable. When that is not the case, people may turn to coping strategies that help them emotionally adjust or come to terms with what is happening, rather than trying to change it.

These findings highlight the need to adapt psychological interventions to the type and context of stress. When stressors are manageable, encouraging active problem-solving can be very effective. But in situations that are overwhelming or traumatic, such as war or forced displacement, it may be more helpful to focus on strategies that support emotional regulation, self-compassion, or acceptance. It is also essential to consider individual differences in temperament, which can influence how people cope and which strategies are most accessible or effective for them in different cultural or life contexts.

In conclusion, our study demonstrates that coping styles – particularly Emotional coping and Optimistic action – play a key mediating role in the relationship between temperament and mental health outcomes. These findings emphasize the importance of tailoring psychological support not only to the type of stressor (controllable vs. uncontrollable), but also to individual temperament profiles. Future studies should aim to replicate these effects in longitudinal designs and gender-balanced samples, especially among trauma-exposed populations.

The conducted research has some limitations. The data were self-reported, and the sample of Ukrainian refugees was primarily women, as they constituted the overwhelming majority of refugees. Future studies should go beyond self-report, use a longitudinal design, and include more representative samples.

*Supplementary materials are available on the journal's website.*

## Disclosures

This research received no external funding.
The study was approved by the Ethical Board for Scientific Research at the Institute of Psychology, Cardinal Stefan Wyszyński University in Warsaw (Approval No. 24/2022).
The authors declare no conflict of interest.

## References

Aguirre, P., Michelini, Y., Bravo, A. J., Pautassi, R. M., & Pilatti, A. (2024). Association between personality traits and symptoms of depression and anxiety via emotional regulation and distress tolerance. *PLoS One, 19*, e0306146. https://doi.org/10.1371/journal.pone.0306146

Austenfeld, J. L., & Stanton, A. L. (2004). Coping through emotional approach: a new look at emotion, coping, and health-related outcomes. *Journal of Personality, 72*, 1335–1363. https://doi.org/10.1111/j.1467-6494.2004.00299.x

Bojanowska, A., & Piotrowski, K. (2021). Two levels of personality: Temperament and values and their effects on hedonic and eudaimonic well-being. *Current Psychology, 40*, 1185–1193. https://doi.org/10.1007/s12144-018-0043-0

Bojanowska, A., & Zalewska, A. M. (2017). Happy temperament? Four types of stimulation control linked to four types of subjective well-being. *Journal of Happiness Studies, 18*, 1403–1423. https://doi.org/10.1007/s10902-016-9777-2

Bolger, N., & Zuckerman, A. (1995). A framework for studying personality in the stress process. *Journal of Personality and Social Psychology, 69*, 890–902. https://doi.org/10.1037/0022-3514.69.5.890

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology, 61*, 679–704. https://doi.org/10.1146/annurev.psych.093008.100352

Chudzicka-Czupała, A., Hao, F., Hapon, N., Dubniak, Z., Różycka, W., Ostafińska-Molik, B., & Ho, R. (2025). Well-being of Ukrainian and Polish college students during the Russo-Ukrainian war and coping strategies as predictors of mental health disorders. *Critical Public Health, 35*, 2460996. https://doi.org/10.1080/09581596.2025.2460996

Chung, M. C., Dennis, I., Easthope, Y., Werrett, J., & Farmer, S. (2005). A multiple-indicator multiple-cause model for posttraumatic stress reactions: Personality, coping, and maladjustment. *Psychosomatic Medicine, 67*, 251–259. https://doi.org/10.1097/01.psy.0000155675.56550.5f

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385–396. https://doi.org/10.2307/2136404

Compas, B. E., Connor-Smith, J. K., & Jaser, S. S. (2004). Temperament, stress reactivity, and coping: Implications for depression in childhood and adolescence. *Journal of Clinical Child & Adolescent Psychology, 33*, 21–31. https://doi.org/10.1207/S15374424JCCP3301_3

Connor-Smith, J. K., & Flachsbart, C. (2007). Relations between personality and coping: a meta-analysis. *Journal of Personality and Social Psychology, 93*, 1080–1107. https://doi.org/10.1037/0022-3514.93.6.1080

De Sousa, G. M., Tavares, V. D. O., de Meiroz Grilo, M. L. P., Coelho, M. L. G., de Lima-Araújo, G. L., Schuch, F. B., & Galvão-Coelho, N. L. (2021). Mental health in COVID-19 pandemic: a meta-review of prevalence meta-analyses. *Frontiers in Psychology, 12*, 703838. https://doi.org/10.3389/fpsyg.2021.703838

Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology, 55*, 745–774. https://doi.org/10.1146/annurev.psych.55.090902.141456

Gustafsson, M., Edvardsson, T., & Ahlström, G. (2006). The relationship between function, quality of life and coping in patients with low-grade gliomas. *Supportive Care in Cancer, 14*, 1205–1212. https://doi.org/10.1007/s00520-006-0080-3

Hanssen, M. M., Vancleef, L. M. G., Vlaeyen, J. W. S., Hayes, A. F., Schouten, E. G. W., & Peters, M. L. (2015). Optimism, motivational coping and well-being: Evidence supporting the importance of flexible goal adjustment. Journal of Happiness Studies, 16, 1525–1537. https://doi.org/10.1007/s10902-014-9572-x

Juczyński, Z., & Ogińska-Bulik, N. (2009). *Narzędzia pomiaru stresu i radzenia sobie ze stresem* [Tools for measuring stress and coping with stress]. PracowniaTestów Psychologicznych PTP.

Kavčič, T., Avsec, A., & Zager Kocjan, G. (2022). Coping profiles and their association with psychological functioning: a latent profile analysis of coping strategies during the COVID-19 pandemic. *Personality and Individual Differences, 185*, 111287. https://doi.org/10.1016/j.paid.2021.111287

Karaś, D., Cieciuch, J., & Keyes, C. L. M. (2014). The Polish adaptation of the Mental Health Continuum-Short Form (MHC-SF). *Personality and Individual Differences, 69*, 104–109. https://doi.org/10.1016/j.paid.2014.05.011

Khamis, V. (2015). Coping with war trauma and psychological distress among school-age Palestinian children. *American Journal of Orthopsychiatry, 85*, 72–79. https://doi.org/10.1037/ort0000039

Kroemeke, A., & Kwissa-Gajewska, Z. (2014). The role of temperament in the changes of coping in Type 2 diabetes: Direct and indirect relationships. *Polish Psychological Bulletin, 45*, 240–248. https://doi.org/10.2478/ppb-2014-0029

Kurapov, A., Danyliuk, I., Loboda, A., Kalaitzaki, A., Kowatsch, T., Klimash, T., & Predko, V. (2023). Six months into the war: a first-wave study of stress, anxiety, and depression among in Ukraine. *Frontiers in Psychiatry, 14*, 1190465. https://doi.org/10.3389/fpsyt.2023.1190465

Kuśnierz, C., Rogowska, A. M., & Pavlova, I. (2020). Examining gender differences, personality traits, academic performance, and motivation in Ukrainian and Polish students of physical education: a cross-cultural study. *International Journal of Environmental Research and Public Health, 17*, 5729. https://doi.org/10.3390/ijerph17165729

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Mesa-Vieira, C., Haas, A. D., Buitrago-Garcia, D., Roa-Diaz, Z. M., Minder, B., Gamba, M., Salvador, D., Jr, Gomez, D., Lewis, M., Gonzalez-Jaramillo, W. C., Pahud de Mortanges, A., Buttia, C., Muka, T., Trujillo, N., & Franco, O. H. (2022). Mental health of migrants with pre-migration exposure to armed conflict: a systematic review and meta-analysis. *The Lancet Public Health, 7*, e469–e481. https://doi.org/10.1016/S2468-2667(22)00061-5

Ogińska-Bulik, N., Juczyński, Z., Lis-Turlejska, M., & Merecz-Kot, D. (2018). Polish adaptation of PTSD Checklist for DSM-5 – PCL-5. *Przegląd Psychologiczny, 61*, 287–291.

Oniszczenko, W., & Laskowska, A. (2014). Emotional reactivity, coping style and cancer trauma symptoms. *Archives of Medical Science, 10*, 110–116. https://doi.org/10.5114/aoms.2013.33069

Ornell, F., Borelli, W. V., Benzano, D., Schuch, J. B., Moura, H. F., Sordi, A. O., Kessler, F. H. P., Scherer, J. N., & von Diemen, L. (2021). The next pandemic: Impact of COVID-19 in mental healthcare assistance in a nationwide epidemiological study. *Lancet Regional Health – Americas, 4*, 100061. https://doi.org/10.1016/j.lana.2021.100061

Pavlova, I., & Rogowska, A. M. (2023). Exposure to war, war nightmares, insomnia, and war-related posttraumatic stress disorder: a network analysis among university students during the war in Ukraine. *Journal of Affective Disorders, 342,* 148–156. https://doi.org/10.1016/j.jad.2023.09.003

Peterson, C., & Bossio, L. M. (1991). *Health and optimism*. Free Press.

Peterson, C., & Seligman, M. E. P. (1987). Explanatory style and illness. *Journal of Personality, 55*,

237–265. https://doi.org/10.1111/j.1467-6494.1987.tb00436.x

Ponikiewska, K., Strus, W., & Cieciuch, J. (2022). Revealing the hierarchical structure of temperamental constructs distinguished in eight theories. *Acta Psychologica, 226*, 103557. https://doi.org/10.1016/j.actpsy.2022.103557

Puig-Perez, S., Cano-López, I., Martínez, P., Kozusznik, M. W., Alacreu-Crespo, A., Pulopulos, M. M., Duque, A., Almela, M., Aliño, M., Garcia-Rubio, M. J., Pollak, A., & Kożusznik, B. (2024). Optimism as a protective factor against the psychological impact of COVID-19 pandemic through its effects on perceived stress and infection stress anticipation. *Current Psychology, 43*, 8542–8556. https://doi.org/10.1007/s12144-022-02819-3

Rizzi, D., Ciuffo, G., Sandoli, G., Mangiagalli, M., de Angelis, P., Scavuzzo, G., Nych, M., Landoni, M., & Ionio, C. (2022). Running away from the war in Ukraine: The impact on mental health of internally displaced persons (IDPs) and refugees in transit in Poland. *International Journal of Environmental Research and Public Health, 19*, 16439. https://doi.org/10.3390/ijerph192416439

Rzeszutek, M., Oniszczenko, W., & Firląg-Burkacka, E. (2012). Temperament traits, coping style and trauma symptoms in HIV+ men and women. *AIDS Care, 24*, 1150–1154. https://doi.org/10.1080/09540121.2012.687819

Saalwirth, C., & Leipold, B. (2021). Well-being and sleep in stressful times of the COVID-19 pandemic: Relations to worrying and different coping strategies. *Stress and Health, 37*, 973–985. https://doi.org/10.1002/smi.3057

Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: a review and critique of category systems for classifying ways of coping. *Psychological Bulletin, 129*, 216–269. https://doi.org/10.1037/0033-2909.129.2.216

Stanisławski, K. (2019). The Coping Circumplex Model: an integrative model of the structure of coping with stress. *Frontiers in Psychology, 10,* 694. https://doi.org/10.3389/fpsyg.2019.00694

Stanisławski, K. (2022). *The Coping Circumplex Model: a theoretical synthesis of coping constructs and its empirical verification*. Wydawnictwo Naukowe UKSW.

Strelau, J. (1985). *Temperament, osobowość, działanie* [Temperament, personality, action]. Państwowe Wydawnictwo Naukowe.

Strus, W., Ponikiewska, K., & Cieciuch, J. (2022). Reactivity and Activity as dimensions capturing both energetic and temporal aspects of behavior: Towards a reconceptualization of Jan Strelau's basic temperament dimensions based on the Circumplex of Personality Metatraits. *Personality and Individual Differences, 188*, 111434. https://doi.org/10.1016/j.paid.2021.111434

Strus, W., Cieciuch, J., & Rowiński, T. (2014). The Circumplex of Personality Metatraits: a synthesizing model of personality based on the Big Five. *Review of General Psychology, 18*, 273–286. https://doi.org/10.1037/gpr0000017

Strus, W., & Cieciuch, J. (2017). Towards a synthesis of personality, temperament, motivation, emotion and mental health models within the Circumplex of Personality Metatraits. *Journal of Research in Personality, 66,* 70–95. https://doi.org/10.1016/j.jrp.2016.12.002

Strelau, J. (2008). *Temperament as a regulator of behaviour: After fifty years of research*. Eliot Werner Publications.

Strelau, J., & Zawadzki, B. (2005). Trauma and temperament as predictors of intensity of posttraumatic stress disorder symptoms after disaster. *European Psychologist, 10*, 124–135. https://doi.org/10.1027/1016-9040.10.2.124

Szrajda, J., Tudorowska, M., Kujawski, S., Weber-Rajek, M., Sygit-Kowalkowska, E., Kobos, Z., Słomko, J., Tafil-Klawe, M., & Zalewski, P. (2017). The Big Five personality and temperamental traits and its correlation with styles of coping with stress in the fire brigade officers. *Journal of Education Culture and Society, 8*, 163–173. https://doi.org/10.15503/jecs20172.163.173

Thabet, A., El-Buhaisi, O., & Vostanis, P. (2014). Trauma, PTSD, anxiety, and coping strategies among Palestinians adolescents exposed to War on Gaza. *The Arab Journal of Psychiatry, 25*, 71–82. https://doi.org/10.12816/0004117

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD Checklist for DSM-5 (PCL-5)*. National Center for PTSD.

Więsyk, S. M., & Płudowska, M. (2022). The mediating role of coping styles in the relations between temperament traits and occupational burnout in bank employees. *Medical Studies/Studia Medyczne, 38*, 59–67. https://doi.org/10.5114/ms.2022.115148

Zacher, H., & Rudolph, C. W. (2021). Individual differences and changes in subjective well-being during the early stages of the COVID-19 pandemic. *American Psychologist, 76*, 50–62. https://doi.org/10.1037/amp0000702