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The Brazilian Personal Social Capital Scale 10 (brPSCS-10): A Translated and Adapted Version of the Personal Social Capital Scale 8 (PSCS-8) tested in a sample of residents of a flood-affected area

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The Brazilian Personal Social Capital Scale 10 (brPSCS-10): A Translated and Adapted Version of the Personal Social Capital Scale 8 (PSCS-8) tested in a sample of residents of a flood-affected area

Running Title: The Brazilian Personal Social Capital Scale

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Abstract

Objective: In 2024, a catastrophic flood devastated Brazil's southernmost state, highlighting the need for tools to assess social capital. Yet, validated instruments for the Brazilian context are lacking. This study aimed to translate, culturally adapt, and validate the PSCS-8 for use in a Brazilian population after a climate event.

Methods: This validation study used a sample from a longitudinal project assessing the mental health of residents of a flood-affected area. Participants (n=1057) responded to an online survey comprising the brPSCS-10, the PTSD Checklist for DSM-5 (PCL-5), and items

on community resilience perception (CRP). The adaptation process involved expanding the scale to 10 items to enhance cultural relevance. Reliability was assessed using Cronbach's alpha, and a confirmatory factor analysis (CFA) tested the original two-factor structure.

Results: The brPSCS-10 demonstrated good internal consistency. The scoring model aligned with the original structure showed a good fit in the CFA. Social capital was higher among individuals with higher income and education levels, and associated with lower PTSD symptoms and higher CRP.

Conclusions: The brPSCS-10 is a reliable instrument for measuring perceived social capital in Brazilian Portuguese. Its brevity makes it suitable for large-scale surveys in post-disaster and public health research.

Keywords: Social Capital, psychometrics, flood, natural disasters, mental health.

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Introduction

In 2024, Brazil's southernmost state, Rio Grande do Sul (RS), experienced one of the most severe climate disasters in its history. A series of massive floods affected 478 cities and impacted approximately 22% of the state's population[1]. These events can have devastating consequences for affected populations, including long-lasting psychological problems, economic hardship, and the disruption of vital social ties. A real-time data collection that assessed mental health during and after the event showed that 42.3% of participants exhibited moderate to severe depressive symptoms, and 45.2% showed moderate to severe anxiety symptoms[2]. Notably, half of the individuals in both groups reported no prior history of these conditions[2]. In this context, social capital serves as a crucial protective factor for mental health and contributes significantly to effective disaster response and recovery[3,4].

Social Capital (SC) is a polysemic concept with no universally consensual definition. Generally, it refers to the degree of connectivity and the quality and quantity of social relationships within a given community[5]. Other definitions of social capital include "the

strength of a social network, community, reciprocity, and trust in people and institutions"[6] and "the social networks, norms, and values that facilitate collective action for mutual benefit"[7]. Even without a clear definition, researchers in general agree that SC can be measured by "a person's network connections, including size, trustworthiness, resource ownership and reciprocity"[8–12] and that it is an essential component of community resilience.

Over the years, several theoretical models have been proposed to conceptualize social capital. Brain and Hicks[13] proposed the division of social capital into two concepts: structural and cognitive. Structural social capital refers to an individual's actions in society, while cognitive capital encompasses subjective perceptions such as trust, support, and reciprocity within the community. Later, Woolcock and Narayan[14] expanded on this by introducing two additional constructs: bonding social capital, which refers to social cohesion within a specific group, and bridging social capital, which denotes the connections that link members of different groups[5]. Additionally, the concept of linking social capital was incorporated into the model originally composed of bonding and bridging social capital[5]. This dimension refers to the ties an individual establishes with people in positions of authority, such as representatives of public institutions. Its inclusion stems from the concern to recognize the existing heterogeneity in the significance these authority figures may hold for different individuals[15].

Given the complexity and variability of these dimensions, numerous instruments have been developed to measure social capital. Among the most recognized are the Name Generator[16,17], Position Generator[11,18–20], Resource Generator[5,20–23], Adapted Social Capital Assessment Tool (A-SCAT)[5,24] and the Personal Social Capital Scale (PSCS)[9]. However, these tools are often long and data-intensive, which limits their utility in large-scale studies[8].

To address this issue, De Silva et al. (2006)[10] developed a shortened version of A-SCAT: the Shortened Adapted Social Capital Assessment Tool (SASCAT), composed of only 12 items. Despite being more practical, the international application of such tools has revealed challenges, particularly in adapting culturally specific questions to different populations. In response, Wang, Chen, Gong, and Jacques-Tiura[8] proposed two abbreviated

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versions of the PSCS: the PSCS-16 and PSCS-8, with items equally divided between bonding and bridging domains. In a validation study with 259 participants in China, both scales demonstrated strong psychometric properties and high correlation with the original instrument. As a concise measure that retains the core bonding and bridging distinctions, the PSCS-8 is ideally suited for large-scale surveys. Its flexibility allows for necessary cultural adaptations, overcoming the shortcomings of previous tools and providing a scalable solution for social capital assessment.

Under the circumstances of natural disasters, there is a consensus that a high level of SC represents a protective factor that enables communities to cope and adapt collectively to threats[4]. The literature indicates that SC is a valuable resource during periods of stress[25], while low levels of SC are associated with poorer post-disaster recovery[26]. Furthermore, SC has been shown to mitigate the impacts of disasters and accelerate recovery processes globally[3].

Given the recognized role of social capital (SC) in post-disaster recovery and the lack of validated instruments for large-scale studies using questionnaires in Brazil, this study introduces a new scale: Brazilian Personal Social Capital Scale 10 (brPSCS-10). This instrument is based on the original PSCS-8[8], translated into Brazilian Portuguese and culturally adapted for the Brazilian context. It is intended for use in future studies assessing community resilience following the 2024 floods in Rio Grande do Sul. As climate change increases the frequency and severity of such events - especially in countries of the Global South - strengthening social capital will become ever more critical.

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Method

Sample and Procedures

The sample used in this study was derived from an ongoing longitudinal study that assesses individuals living in RS, Brazil, during and after an extreme weather event that resulted in a catastrophic flood in May 2024[2]. Since the data collection occurred during an

active emergency state, no a priori sample size calculation was performed. However, the final sample (n = 1,057) resulted in a subject-to-item ratio of approximately 105:1, which exceeds the desirable 20:1 ratio according to CFA literature recommendations[27], ensuring sufficient statistical power.

Participants were initially recruited via social media and local media platforms to respond to a survey that comprised questions regarding sociodemographic data, flood impact levels, and validated instruments to assess symptoms of depression, anxiety, and PTSD. Participants who had previously enrolled in data collection and left their contact information were invited via email to respond to a similar questionnaire with the addition of brPSCS-10, 6 months after the event. Invitation emails were sent weekly between November 6th and December 31st. The questionnaire was administered online through the SurveyMonkey platform (www.surveymonkey.com). The inclusion criteria were being over 18 years of age and living in Rio Grande do Sul during the floods. Participants who were under 18, who did not live in RS during the floods, or who did not fully respond to brPSCS-10 were excluded from the sample. To enroll in the study, participants were first required to review and agree to the informed consent form, which was located on the opening page of the questionnaire. The study protocol was approved by the ethical committee of Hospital de Clínicas de Porto Alegre (CAAE 80017124.7.0000.5327).

The Original PSCS-8 Scale

The original PSCS-8 scale is an 8-item 5-point Likert-type scale[8]. It was derived as a brief version of a 42-item scale[9] as an adequate measure for large-scale surveys, where the length of a questionnaire is a significant concern. It fits a 2-factor model, which divides social capital into Bonding and Bridging. Each item represents 1 of four components for each factor: network size, trustworthiness, resource ownership, and reciprocity. The reliability of the scale represented by Cronbach's alpha was .83 for the total scale and .64 and .85 for Bonding and Bridging subscales, respectively.

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Cultural Adaptation Process

For the cultural adaptation and translation into Brazilian Portuguese, the authors were divided into two groups: (1) SMD and MLH, and (2) AC, DPB and SH. Each group independently developed an adapted and translated version of the original scale[8]. These translated versions were then compared. Additionally, the Portuguese (Portugal) version of the PSCS-16[28] was used as a reference for comparison. None of the authors had read this Portuguese version prior to the adaptation and translation process. The authors then collaboratively discussed the phrasing of each item until a consensus was reached. SH was responsible for coordinating the translation and adaptation process, ensuring conceptual consistency and cultural adequacy, given her previous experience with cross-cultural adaptation[29,30, 31].

During this process, several adaptations were made to improve the clarity and relevance of the items, considering three key dimensions: (1) specific cultural nuances, (2) the context of climate-related disasters, and (3) aspects the authors considered crucial for evaluating disaster response. While departing from standard methodological protocols for scale translation, these adaptations are considerably frequent[32-35] and necessary in the field of social capital and community resilience, as these constructs can vary significantly depending on culture and context. As a result, instead of the original 8 items of the PSCS-8, 10 items were included in the brPSCS-10 (Supplementary Material 1). The changes were as follows:

- **Item 2**: The term “coworkers/fellows” was replaced with “friends” to assess trustworthiness. This change was made because literature findings suggest that support during disaster responses typically comes from closer individuals[3,36]. Additionally, Chen et al.[8] reported that trust in friends had a higher item-total correlation in the original 42-item scale[9].
- **Items 4 and 5**: Rather than using “coworkers/fellows”, the authors separated “friends” and “relatives” into two distinct questions to assess reciprocity. This was

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done because friends and relatives are usually the main sources of support during emergencies, and also to investigate which of these relationships is more strongly associated with social capital in post-disaster context.

- **Items 9 and 10**: While the PSCS-8 originally asked about the reciprocity of "governmental, political, economic, and social groups/organizations," the authors recognized that, in the Brazilian sociopolitical context, governmental aid can be perceived differently depending on one's political beliefs. Therefore, a similar item referring to "non-governmental, non-profit, or voluntary groups/organizations" was added to examine how these items would perform differently.

Additional Measures

Besides brPSCS-10, the questionnaire included demographic variables, such as age (in years), sex (male or female), family monthly income, and educational attainment. Flood impact variables were also assessed and used to describe our sample further. A binary categorical question about the perceived effectiveness of the support network was included and analyzed as convergent validity. Lifetime history of psychiatric diagnosis by a health professional and use of psychiatric medication were also assessed. The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) was used to assess PTSD symptomatology. Community resilience perception (CRP) was assessed through 4 5-point Likert-type items selected and adapted from a vast literature review of community resilience assessment[37-43]. Items for CRP were: "People in my community are willing to help each other", "There is a strong sense of belonging in my community", "I believe that together people in my community can solve major challenges", and "My community can handle and overcome difficult times". The Brazilian Portuguese CRP items are available at Supplementary Material 2. PCL-5 and CRP total scores were used to assess concurrent validity.

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Statistical Analysis

To comprehensively evaluate the adapted scale, two distinct scoring models were created and used in all subsequent analyses. The first score, Model A, was calculated by summing all 10 items of the adapted scale. The second score, Model B, was derived to align with the structure of the original 8-item instrument. To calculate this score, the mean of the paired Bonding reciprocity items (items 4 and 5) was treated as a single component, and the mean of the paired Bridging reciprocity items (items 9 and 10) was treated as another. These two averaged values were then summed with the remaining six items. This dual-scoring approach ensures that the reciprocity items, which were divided during the cultural adaptation process, do not outweigh the other components of SC in the total score of Model B. At the same time, it allows for a more detailed analysis of each item's contribution to SC in Model A.

Descriptive analysis of the sample and item responses was conducted according to the original PSCS-8 scale to draw comparisons. Reliability was assessed using Cronbach's alpha, McDonald's omega, item-total correlations, and item-drop Cronbach's alpha. Reliability within groups was also assessed, as well as correlations between all items. A confirmatory factor analysis (CFA) was conducted to assess the fit of the proposed two-factor structure in the original study[8]. To compare scores between items 4 and 5, and 9 and 10, a Wilcoxon signed-rank test was used, according to Shapiro-Wilk test of normality results ($p<.001$). T-tests and ANOVAs were performed to assess construct validity by comparing scores between different demographic groups, regarding sex, educational level, and age (higher or lower than 40 years old). Finally, Regression analyses were conducted between brPSCS-10, PCL-5, and CRP.

Cronbach's alpha and McDonald's omega were deemed acceptable when ≥ .75, very good when ≥.80, and excellent when ≥.90. In the CFA, a comparative fit index (CFI) ≥.90, a Tucker-Lewis Index (TLI) ≥ .90, a root mean square of error approximation (RMSEA) <.08, a

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Standardized Root Mean Square Residual (SRMR) <.08, and Chi square/degrees of freedom ration (χ^2/df) <2.0 were used as parameters of a good data-model fit. A 95% confidence interval was used whenever applicable. Statistical analyses were performed in JAMOVI version 2.6.26.

Results

Sample Characteristics

Women accounted for the vast majority of the sample (n = 899; 85.05%), as is usually the case for online surveys. Three-fourths of the sample had completed higher education. Over half of the individuals were personally affected by the flood. There were similar proportions of individuals who had and did not have material losses/damages. Sample characteristics are described in Table 1.

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Table 1: Characteristics of the study sample

Characteristic	Women	Men	Total
	899	158	1057
brPSCS-10 (Model A score), Mean (SD)	23.88 (6.66)	25.13 (6.08)	24.07 (6.58)
brPSCS-10 (Model B score), Mean (SD)	18.88 (5.32)	19.95 (4.98)	19.04 (5.28)
PCL-5, Mean (SD)	25.50 (18.22)	18.69 (16.52)	24.48 (18.14)
CRP, Mean (SD)	12.55 (3.27)	12.81 (3.36)	12.59 (3.28)
Age, n (%)			
≥40 years	582 (55.06)	102 (9.65)	684 (64.71)
<40 years	317 (29.99)	56 (5.30)	373 (35.29)
Mean (SD)	44.86 (11.90)	44.58 (12.52)	44.82 (11.99)
Monthly Family Income¶, n (%)			
Up to R$3,000	194 (18.73)	24 (2.32)	218 (21.04)
R$3,000 to R$ 5,000	221 (21.33)	27 (2.61)	248 (23.94)
R$5,000 to R$10,000	262 (25.29)	43 (4.15)	305 (29.44)
Above R$10,000	202 (19.50)	63 (6.08)	265 (25.58)
Education, n (%)			
Completed elementary school or less	21 (1.99)	1 (0.09)	22 (2.08)
Completed High School	202 (19.11)	37 (3.50)	239 (22.61)
Completed Higher Education	676 (63.95)	120 (11.35)	796 (75.31)
Lifetime history of psychiatric diagnosis by a health professional, n (%)	503 (55.95)	65 (41.14)	568 (53.74)

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Use of psychiatric medication, n (%)	448 (49.83)	57 (36.07)	505 (47.78)

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Reliability

Table 2 shows the mean scores for each item, item-total correlations, and Cronbach's alpha if the item was deleted. The Wilcoxon signed-rank test revealed no significant difference between item 4 and item 5 scores (W = 69263.0, p=0.117), which indicates no difference between reciprocity from family or friends. Conversely, there was a significant difference between items 9 and 10 scores (W = 10570.0, p<.001), indicating that participants reported higher reciprocity from non-governmental organizations than governmental organizations. Additionally, items 5 and 8 showed the highest item-total correlations, revealing an important role of "reciprocity from friends" and "organizations that represent your interests". All item-total correlations were positive and significant, and the removal of any single item resulted in a decrease in the overall Cronbach's alpha coefficient, suggesting all items are relevant to the reliability of the scale. Cronbach's Alpha for Model A was .85 (Bonding = .79; Bridging = .85), whereas for Model B it was .82 (Bonding = .75; Bridging = .82). McDonald's omega for Model A was .85 (Bonding = .81; Bridging = .86), whereas for Model B it was .8 (Bonding = .77; Bridging = .83). See supplementary material 3 for the Cronbach's alpha coefficients across different groups according to gender, age, educational level, monthly family income, lifetime history of psychiatric diagnosis, and use of psychiatric medication.

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Table 2. The Brazilian Personal Social Capital Scale-10 (brPSCS-10)

	Model A (alpha = .85)			Model B (alpha = .82)		
Items by Subscale	**M (SD)**	**r with total**	**Alpha if deleted**	**M (SD)**	**r with total**	**Alpha if deleted**
Bonding capital subscale (BO)						
1. How do you rate the number of friends you have?	2.17 (1.20)	.49	.84	-	.50	.81
2. Considering your friends, how many can you trust?	2.72 (1.03)	.54	.84	-	.52	.80
3. Considering all your family members, neighbors, friends, coworkers, and/or classmates, how many have a broad network of relationships or contacts?	3.01 (0.87)	.48	.84	-	.47	.81
4. How many of your family members would certainly help you upon your request?	3.02 (1.12)	.52	.84	3.00 (0.97)	.57	.80
5. How many of your friends would certainly help you upon your request?	2.98 (1.04)	.62	.83			
Bridging capital subscale (BR)						
1. How do you rate the number of cultural, recreational, and leisure groups or organizations in your community (such as sports, artistic, religious groups, and others)?	2.05 (1.09)	.51	.84	-	.52	.80
2. How many of these groups/organizations have social connections that could help	2.04 (0.93)	.63	.83	-	.63	.79

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you?						
3. How many of these groups/organizations represent your interests?	2.03 (0.95)	.57	.83	-	.57	.80
4. How many of these governmental, political, economic, and social groups/organizations in your community would certainly help you upon your request?	1.95 (0.88)	.59	.83	2.03 (0,85)	.58	.80
5. How many of these non-governmental, non-profit, or volunteer groups/organizations in your community would certainly help you upon your request?	2.10 (0.94)	.61	.83			

Items listed in Table 2 were back-translated into English. The Brazilian Portuguese items are available at Supplementary Material 1.

Confirmatory factor analysis

A two-factor model (Bonding and Bridging) was tested via CFA for both the brPSCS-10 scoring models. Figure 1 shows the path diagrams for both models. The results indicated that Model A did not fit the data well, with multiple indices failing to meet the pre-specified criteria ($\chi^2(34) = 486.03$, $p < .001$; CFI = 0.90; TLI = 0.86; RMSEA = 0.112; SRMR = 0.051). Conversely, Model B demonstrated an adequate fit, with most robust indices meeting the recommended thresholds ($\chi^2(19) = 140.55$, $p < .001$; CFI = 0.96; TLI = 0.94; RMSEA = 0.078; SRMR = 0.037). While the chi-square test was significant for both models, a known issue in large samples, the overall pattern of fit indices supports the factor structure of Model B. Correlations between all items are described in Supplementary Material 4.

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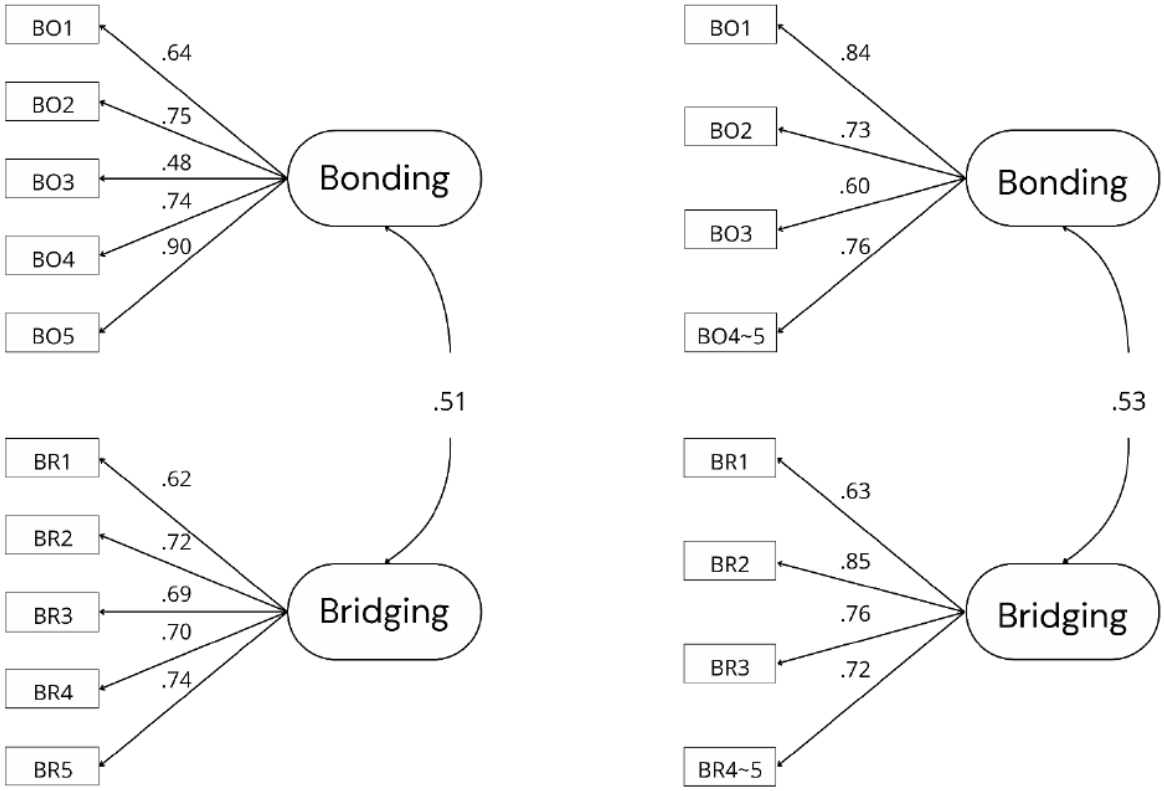


Figure 1. Confirmatory factor analysis for Model A (left) and Model B (right). Items are coded as **BO** for the Bonding factor and **BR** for the Bridging factor. For Model B, composite items **BO4-5** and **BR4-5** represent the averaged scores of their respective individual items, as specified in the Methods section. Standardized factor loadings are shown on the arrows, all of which were statistically significant (p<.001).

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Construct and Concurrent Validity

For construct validity, the difference between brPSCS-10 scores was tested between different groups according to age, sex, income, educational level, perceived efficacy of the support network, lifetime history of psychiatric diagnosis, and use of psychiatric medication. T-tests showed no statistically significant difference between the ≥40 and <40 age groups for both scoring methods (Model A: Student's t = 0.25, p = 0.80; Model B: Student's t = 0.34, p = 0.73). Regarding sex, men showed significantly higher scores than women (Model A:

Student's t = -2.20, p = 0.028; Model B: Student's t = -2.34, p = 0.19). SC scores were also higher in individuals who reported an effective support network (Model A: Welch's t = -9.03, p < .001; Model B: Welch's t = -8.56, p < .001). Individuals with a lifetime history of psychiatric diagnosis showed lower SC scores (Model A: Student's t = 2.80, p = 0.005; Model B: Student's t = 2.51, p = 0.012) while no statistical difference was found between individuals who did or did not use psychiatric medication (Model A: Student's t = 1,06, p = 0.287; Model B: Student's t = 0.96, p = 0.34)

The One-way ANOVA revealed significant differences in SC scores across income level groups (Model A: F(3, 562.1) = 34.58, p<.001; Model B: F(3, 562.4) = 34.64, p<.001), where higher income levels were associated with higher SC scores. Regarding educational levels, a significant difference was also found (Model A: F(2, 55.28) = 18.85, p<.001; Model B: F(2, 19.87) = 19.87, p<.001), as higher levels of SC were present in the higher educational level groups.

The regression analysis showed that both brPSCS-10 scoring models significantly predicted both PCL-5 and CRP scores (p<.001). Higher levels of SC predicted higher levels of CRP and lower levels of PTSD symptomatology, as measured by PCL-5. The mean score for both scoring methods, along with the 95% confidence intervals and the regression analyses standardized regression coefficients (b), are seen in Table 3.

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Table 3 Construct and concurrent validity of the brPSCS-10

Variable/category	Model A		Model B	
	M	95% CI	M	95%
Construct validity				
Sex				
Women	23.88	[23.45, 24.32]	18.88	[18.54, 19.23]
Men	25.13	[24.18, 26.09]	19.95	[19.17, 20.72]
Age				
≥ 40 years	24.03	[23.53, 24.54]	19.00	[18.60, 19.41]
<40 years	24.14	[23.49, 24.78]	19.12	[18.60, 19.64]
Effective support network				
No	21.55	[20.91, 22.19]	17.13	[16.62, 17.64]
Yes	25.21	[24.73, 25.69]	19.91	[19.52, 20.30]
Monthly family income¶				
Up to R$3.000	21.02	[20.25, 21.81]	16.6	[16.00, 17.23]
R$3.000 to R$5.000	23.72	[22.90, 24.53]	18.72	[18.08, 19.37]
R$5.000 to R$10.000	24.55	[23.82, 25.27]	19.4	[18.83, 19.99]
Above R$10.000	26.63	[25.86, 27.40]	21.12	[20.49, 21.75]
Education				
Completed elementary school or less	19.27	[16.27, 22.27]	15.11	[12.71, 17.52]
Completed High School	22.34	[21.57, 23.12]	17.62	[17.01, 18.24]
Completed Higher Education	24.72	[24.26, 25.18]	19.58	[19.21, 19.95]
Lifetime History of Psychiatric Diagnosis				
Yes	23.55	[23.01, 24.08]	18.66	[18.23, 19.10]

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No	24.68	[24.10, 25.27]	19.48	[19.01, 19.95]
Use of Psychiatric Medication				
Yes	23.84	[23.26, 24.43]	18.88	[18.41, 19.35]
No	24.28	[23.73, 24.82]	19.19	[18.76, 19.63]
	b	95% CI	b	95% CI
Concurrent validity				
PCL-5 Total	-0.83	[-0.99, -0.68]	-1.04	[-1.24, -0.85]
CRP Total	0.24	[0.21, 0.26]	0.29	[0.26, 0.32]

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Discussion

This study introduced and validated the brPSCS-10, an adapted and expanded version of the Personal Social Capital Scale (PSCS-8), culturally tailored for the Brazilian context and applied in the aftermath of one of the most severe natural disasters in the country's history. The results offer strong evidence of the scale's reliability, internal consistency, and construct and concurrent validity.

The brPSCS-10 demonstrated good internal consistency, according to Cronbach's alpha and McDonald's omega values. Reliability results were similar to the original PSCS-8, with the Bonding subscale presenting the lower indices. Model B, which corrects for the potential overweighting of reciprocity items by averaging them, provided a better fit to the original two-factor model (bonding and bridging social capital) than Model A. Therefore, we conclude that Model B is the recommended scoring method for the brPSCS-10, as it successfully integrates the specific Brazilian cultural nuances (by assessing distinct sources of reciprocity) without compromising the psychometric integrity of the original scale's structure.

The results also confirmed robust construct validity. While in the original PSCS-8, the authors point out a limitation in not finding significant correlations between SC and

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educational attainment, our results show higher SC scores in higher educational levels. SC scores were also significantly higher for men and for individuals with higher incomes. Additionally, participants who perceived their support network as effective also had significantly higher social capital scores. These findings align with prior studies that indicate social capital is not equally distributed across socioeconomic groups, often favoring those with greater access to resources, education, and civic engagement[3,36,42,44].

The decision to expand the scale from 8 to 10 items allowed for meaningful cultural adaptations that enhanced the instrument's contextual relevance. For example, separating reciprocity items into "family" and "friends" revealed similar average scores, though reciprocity from friends showed stronger correlations with total social capital scores. This nuance may reflect the relational dynamics in Brazilian society, particularly in times of crisis, and opens up space to further investigation.

In the same way, separating reciprocity from governmental and non-governmental organizations (NGOs) also yielded important insights. Participants reported significantly higher reciprocity from NGOs than from governmental ones. This reflects the sociopolitical context of distrust in state institutions, which may have been aggravated by the lack of preparedness, climate change skepticism, and inaction towards meteorological warnings[45,46]. This finding is consistent with broader literature on disaster preparedness, as it underlines the urgent need for public-sector engagement and proactivity in developing evidence-based public health strategies that promote resilience[47].

The scale's concurrent validity was demonstrated by its significant associations with both lower PTSD symptom severity and higher perceived community resilience. These findings reinforce existing evidence that social capital is a protective factor for mental health in post-disaster contexts[4] and further support the scale's utility for examining psychosocial outcomes in vulnerable populations.

Consequently, the brPSCS-10 facilitates a necessary shift from reactive recovery to proactive disaster preparedness[36]. Our results suggest that measuring social capital before catastrophes occur is essential not only to assess community vulnerability but also to

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evaluate the efficacy of preventive social interventions. In this dual framework, SC serves as a critical clinical indicator of individual vulnerability, highlighting patients that lack resilience resources beyond disaster context, while in public health, it signals areas requiring targeted policies to foster cohesion. Given the paucity of research on this topic in the Brazilian context, this validated tool is vital for expanding our understanding of the mechanisms by which SC influences mental health, ultimately guiding strategies to promote it as a protective factor against extreme weather events.

In this way, brPSCS-10 provides researchers, public health professionals, and policymakers with a brief yet valid tool to assess perceived social capital for Brazilian Portuguese. Its brevity makes it suitable for large-scale surveys, rapid assessments, and longitudinal tracking. Importantly, the scale captures both bonding and bridging dimensions, offering insights into internal community cohesion and external connections that may facilitate collective action and resource access.

Limitations

This study's findings warrant consideration in light of several limitations. Despite the large sample size, the sample was recruited online and is predominantly composed of women with high educational attainment, which may introduce selection bias and restrict the generalizability of the results. Future studies should aim to replicate these findings in more diverse populations. Also, although the adaptation aimed to reflect national rather than exclusively regional characteristics, cross-regional replications should be conducted to evaluate nationwide validity outside the Rio Grande do Sul state. Additionally, this was a cross-sectional validation study. Test–retest reliability was not assessed, nor was sensitivity to change over time. Longitudinal studies are needed to determine whether the scale can capture fluctuations in social capital following new crises or throughout the recovery process.

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Conclusion

This study presents a culturally adapted, psychometrically sound, and practically useful tool for measuring perceived social capital in Brazil. The brPSCS-10 fills an important gap in the literature and enables researchers and practitioners to better understand how social networks, trust, and reciprocity contribute to resilience in the face of climate-related disasters. As climate change continues to amplify the frequency and severity of such events, validated instruments like this are indispensable for designing effective, evidence-based responses grounded in community strengths.

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Disclosure

The authors declare no conflict of interest.

Data Availability

Data used in the present work is not publicly available.

Author Contributions

SMD was responsible for conceptualization, investigation, methodology, formal analysis, project administration, and writing - original draft, review & editing. ACM, AR, and MLH were responsible for conceptualization, investigation, and writing - original draft, review & editing. AC was responsible for conceptualization and investigation. DPB was responsible for

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conceptualization, investigation, methodology, supervision, writing - review & editing. SH was responsible for conceptualization, investigation, methodology, supervision, writing - review & editing. All authors have read and approved the final version submitted and take public responsibility for all aspects of the work.

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Supplementary Material 1.

VERSÃO BRASILEIRA DA ESCALA DE CAPITAL SOCIAL PESSOAL 10 (brPSCS-10)

Sobre suas relações sociais e sua comunidade:

1. Como você avalia o número de amigos que você tem?
   a. Poucos
   b. Menos que a média
   c. Na média
   d. Mais que a média
   e. Muitos

2. Considerando seus amigos, em quantos você pode confiar?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

3. Considerando todos os seus familiares, vizinhos, amigos, colegas de trabalho e/ou estudo, quantos têm uma rede ampla de relacionamentos ou de contatos?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

4. Quantos dos seus familiares certamente o ajudariam se você pedisse?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

5. Quantos dos seus amigos certamente o ajudariam se você pedisse?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

6. Como você avalia o número de grupos ou organizações culturais, recreativas e de lazer presentes em sua comunidade (como, por exemplo, grupos esportivos, artísticos, religiosos e outros)?
   a. Poucos
   b. Menos que a média
   c. Na média
   d. Mais que a média
   e. Muitos

7. Quantos desses grupos/organizações têm conexões sociais que possam lhe ajudar?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

8. Quantos desses grupos/organizações representam seus interesses?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

9. Quantos desses grupos/organizações governamentais, políticos, econômicos e sociais presentes na sua comunidade lhe ajudariam se você pedisse?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

10. Quantos desses grupos/organizações não-governamentais, sem fins lucrativos ou de voluntariado presentes na sua comunidade lhe ajudariam se você pedisse?
   a. Nenhum
   b. Poucos
   c. Alguns
   d. A maioria
   e. Todos

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Supplementary Material 2.

ITEMS SOBRE RESILIÊNCIA COMUNITÁRIA

1. As pessoas na minha comunidade estão dispostas a ajudar umas às outras.
    a. Discordo totalmente
    b. Discordo
    c. Nem concordo, nem discordo
    d. Concordo
    e. Concordo totalmente
2. Existe um forte senso de pertencimento (senso de fazer parte) na minha comunidade
    a. Discordo totalmente
    b. Discordo
    c. Nem concordo, nem discordo
    d. Concordo
    e. Concordo totalmente
3. Eu acredito que, juntas, as pessoas da minha comunidade posdem resolver grandes desafios
    a. Discordo totalmente
    b. Discordo
    c. Nem concordo, nem discordo
    d. Concordo
    e. Concordo totalmente
4. A minha comunidade consegue lidar com tempos difíceis e superá-los.
    a. Discordo totalmente
    b. Discordo
    c. Nem concordo, nem discordo
    d. Concordo
    e. Concordo totalmente

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Supplementary Material 3.

Table S1: brPSCS-10 reliability estimates by gender, age, education, and monthly family income.

Category	Model A			Model B		
	Total	Bonding	Bridging	Total	Bonding	Bridging
Total Sample (N = 1057)	.85	.79	.85	.82	.75	.82
By Gender						
Men (N = 158)	.83	.75	.80	.80	.70	.78
Women (N = 899)	.85	.80	.85	.82	.76	.83
By Age (years)						
≥ 40 (N = 684)	.86	.80	.86	.83	.76	.83
<40 (N = 373)	.83	.79	.83	.80	.75	.80
By Education Level						
Complete Middle School or Less (N = 22)	.91	.84	.89	.91	.82	.88
Complete High School (N = 239)	.82	.77	.81	.79	.73	.77
Complete Higher Education (N = 796)	.85	.79	.85	.82	.75	.83
By Monthly Family Income						
Up to R$3,000 (N = 218)	.82	.75	.84	.78	.71	.80
R$3,001 to R$5,000 (N = 248)	.84	.78	.87	.81	.74	.85
R$5,001 to R$10,000 (N = 305)	.84	.79	.82	.81	.75	.78
Above R$10,001 (N = 265)	.84	.76	.85	.82	.70	.83
By Lifetime History of Psychiatric Diagnosis						
Yes (N = 568)	.85	.78	.85	.82	.74	.83
No (N = 489)	.85	.81	.85	.82	.76	.81
By Use of Psychiatric Medication						
Yes (N = 505)	.85	.79	.86	.83	.76	.83
No (N = 552)	.85	.79	.84	.81	.75	.81

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Supplementary Material 4.

Table S2 Pearson correlations among items in brPSCS-10 (N = 1057)

	Bonding social capital					Bridging social capital				
	BO1	BO2	BO3	BO4	BO5	BR1	BR2	BR3	BR4	BR5
BO1	1									
BO2	.45*	1								
BO3	.37*	.42*	1							
BO4	.30*	.39*	.40*	1						
BO5	.41*	.65*	.44*	.61*	1					
BR1	.30*	.21*	.30*	.26*	.25*	1				
BR2	.30*	.27*	.25*	.30*	.33*	.55*	1			
BR3	.33*	.25*	.21*	.21*	.25*	.47*	.65*	1		
BR4	.23*	.26*	.19*	.31*	.32*	.40*	.57*	.54*	1	
BR5	.23*	.29*	.24*	.34*	.35*	.37*	.56*	.53*	.74*	
brPSCS-10 (Model A score)	.63*	.64*	.58*	.64*	.71*	.63*	.71*	.66*	.67*	.69*

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