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Military Families' Perceptions of Neighborhood Characteristics Affecting Reintegration: Development of an Aggregate Measure

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Abstract

This pilot study evaluated the validity and reliability of an Experience of Neighborhood (EON) measure developed to assess neighborhood characteristics that shape reintegration opportunities for returning service members and their families. A total of 91 post-9/11 veterans and spouses completed a survey administered at the Minnesota State Fair. Participants self-reported on their reintegration status (veterans), social functioning (spouses), social support, and mental health. EON factor structure, internal consistency reliability, and validity (discriminant, content, criterion) were analyzed. The EON measure showed adequate reliability, discriminant validity, and content validity. More work is needed to assess criterion validity because EON scores were not correlated with scores on a Census-based index used to measure quality of military neighborhoods. The EON may be useful in assessing broad local factors influencing health among returning veterans and spouses. More research is needed to understand geographic variation in neighborhood conditions and how those affect reintegration and mental health for military families.

Keywords

Veteran health; community reintegration; neighborhood studies; survey research; pilot study

Introduction

More than 2 million U.S. service members are returning after deployment to Iraq and/or Afghanistan, and there is increasing research attention to veteran reintegration as U.S. troops withdraw. Research shows that approximately half of these veterans experience difficulties readjusting (Pew Research Center, 2011; Sayer et al., 2015; Tanielian & Jaycox, 2008), and successful reintegration (i.e., resuming nonmilitary life roles) can prevent multiple adverse postdeployment events, including suicide, substance use, poor social/family functioning, legal problems, unemployment, and financial hardship (Sayer, Carlson, & Frazier, 2014).

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Consistent with multilevel social-ecological conceptualizations of veteran psychological health (Bowen, Martin, & Mancini, 2013; Institute of Medicine, 2014), research on reintegration has identified a number of individual-level, interpersonal, and community-level factors affecting veteran ability to resume participation in meaningful life roles (Resnik et al., 2012). Although there is general understanding that community contextual factors affect reintegration (Hoshmand & Hoshmand, 2007; Institute of Medicine, 2013; Wright, Foran, & Wood, 2014), research has primarily elucidated individual-level factors rather than aspects of community and social contexts that shape reintegration (Institute of Medicine, 2014; Sayer et al., 2014). Further research is needed to identify the local, community-level factors influencing reintegration along with their mechanisms of influence.

Reintegration has been defined as the process of service members resuming participation in important life roles and returning to developmentally and culturally appropriate role functions (Crocker, Powell-Cope, Brown, & Besterman-Dahan, 2014; Resnik et al., 2012). The process is multidimensional, dynamic, and culture-bound (Reistetter & Abreu, 2005), and reintegration difficulties may be difficult for healthcare providers to identify and address (Sayer et al., 2014). Given that formal healthcare settings are not well suited to addressing reintegration challenges, it may be beneficial to identify modifiable community and neighborhood conditions that increase pathways for successful reintegration.

Several aspects of neighborhood/community life may afford greater opportunities for reintegration. Direct and indirect neighborhood influences on health can be organized broadly into two categories: infrastructure (i.e., material and institutional resources and opportunity structures) and collective social functioning (i.e., shared relationships and social practices) (Macintyre, Ellaway, & Cummins, 2002). In each of these, it may be beneficial to consider what returning veterans need to measure specific pathways by which neighborhoods influence reintegration. Reintegration research shows that many returning veterans face challenges associated with housing and homelessness (Tsai, Pietrzak, & Rosenheck, 2013), education (Elliott, Gonzalez, & Larsen, 2011; Rudd, Goulding, & Bryan, 2011), employment/financial hardship (Adler et al., 2011; Hoge, Terhakopian, Castro, Messer, & Engel, 2007), and access to appropriate healthcare (Burnam, Meredith, Tanielian, & Jaycox, 2009; Cohen et al., 2010). Community structures and resources shape the nature of these challenges as well ways in which they may be overcome. Furthermore, local opportunities to participate in preferred religious and civic activities may be important for successful reintegration.

Despite mounting evidence that neighborhood characteristics shape opportunities for veteran reintegration, valid measures are needed to advance research on neighborhood characteristics influencing reintegration. In the only study to examine the relation between military neighborhoods (i.e., installations) and service member health (Meadows, Miller, Miles, Gonzalez, & Dues, 2013), a Military Neighborhood Ranking Index (MNRI) derived from 22 Census indicators was associated with Air Force member ratings of satisfaction with and safety of the civilian area, safety of Air residence and neighborhood cohesion but not with financial difficulties, depressive symptoms, self-rated health, or life satisfaction. The MNRI was not associated with any available Army outcomes (body mass index, attrition, separation from service). The mixed results of this study provide general support

for exploring the influence of neighborhoods and communities on service member health while raising several important questions about which aspects of local infrastructure and social functioning most influence reintegration opportunities. Given that the MNRI is an “objective” Census-based index of neighborhood quality, we aimed to assess perceived neighborhood characteristics that may predict self-reported reintegration and health.

This study aimed to pilot test a measure of perceived neighborhood characteristics that shape opportunities for reintegration. Informed by reintegration research as well as research on neighborhood health influences, we developed a general Experience of Neighborhood (EON) measure. We report on the factor structure, internal consistency reliability and validity (discriminant, criterion, construct) of the EON. Because we had spouses in the sample, we also examined the relation between EON and spouse social functioning.

Method

Participants

We analyzed data from 91 participants who completed a brief survey during four 6-hr shifts at the 2014 Minnesota State Fair. A new attendance record was set in 2014, with an average of 152,069 people attending each day. The research team was stationed in a tent outside the University of Minnesota Driven to Discover research building, which opened in 2014 to allow fair attendees to learn about and participate in university research. Because of its statewide popularity, we felt recruiting at the fair would give us good access to participants from varied geographic locations. Individuals were recruited through conversations as they passed by and through fliers distributed to military booths and locations at the fairgrounds. Participants could sit under the tent and complete the survey online (on an iPad) or on paper. Individuals were eligible to participate if they (a) were deployed overseas with the U.S. military after 2001 or were a cohabitating spouse/partner of an eligible veteran, (2) were 18 years or older, and (3) were fluent in English. Participants were compensated US\$5 for their time, and all had the opportunity to enter their name into a drawing to win a tablet computer worth US\$250. This protocol was approved by the University of Minnesota Institutional Review Board.

Table 1 shows the demographics of our survey participants. There were 58 veteran and 32 spouse respondents with 25 married couples (50 of 91 individuals) participating. About half of the participants were male ($n = 49$), and a majority of participants are White/non-Hispanic ($n = 77$). The mean age of participants was 36.8 (range = 20–62 years). Participants varied in military branch of service, with the majority (41 of 58; 71%) in the Army or Air Force ($n = 12$). Most served in the Reserve or National Guard ($n = 35$, with 5 serving on Active Duty), and the rest were regular Active Duty ($n = 23$). Most participants lived in urban areas ($n = 65$), with only 28% living in suburban ($n = 19$) or rural ($n = 6$) areas.

Measures

Data for this study were collected using a survey on social support, social capital, and reintegration among rural and urban veterans.

Experience of Neighborhood (EON)—The EON measure was developed by the study team to assess perceptions of neighborhood characteristics most likely to influence veteran reintegration and mental health. Twelve items were created to capture structural and social aspects of neighborhoods that shape opportunities for reintegration. Sample items include the following: “Housing is affordable,” “I feel I can trust the people in my area/community,” and “My family and I can easily get to places we want to go.” The EON was completed by all participants. Respondents rated how much they agreed with each statement on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). To assess neighborhood “exposure,” we also asked participants to provide their current zip code and the number of years they had resided there.

Military to Civilian Questionnaire (M2C-Q)—The M2C-Q (Sayer et al., 2011) is a 16-item self-report measure of postdeployment reintegration challenges. Veteran respondents were asked to report on the past 30 days and rate items on a 5-point scale ranging from 0 (*no difficulty*) to 4 (*extreme difficulty*); higher scores indicate greater reintegration challenges. Sample items include the following: “making new friends,” “finding or keeping a job,” and “taking care of your health.” The M2C-Q is highly internally consistent and has been associated with overall mental health, likely PTSD, problem substance use, Veterans Affairs user status, and other measures of readjustment difficulty (Sayer et al., 2011; Sayer et al., 2014). Cronbach’s α for veterans in this sample was .92. This measure was used to assess construct validity of the EON.

Social Functioning Questionnaire (SFQ)—The SFQ (Tyrer et al., 2005) is a brief eight-item measure of self-perceived social functioning. Spouse respondents were asked to rate their social functioning “in the past two weeks” on a 4-point scale that matched the item phrasing (e.g., most of the time—not at all, no problems at all—severe problems). Some items were reverse-coded and higher scores indicate greater impairment in social function. Higher SFQ scores are associated with greater psychopathology and personality disturbances (Tyrer et al., 2005). Sample items include the following: “I find my tasks at work and at home very stressful,” “I have difficulties in getting and keeping close relationships,” and “I get on well with my family and other relatives.” This measure was administered only to nonmilitary spouse respondents (Cronbach $\alpha = .77$) and used to assess construct validity of the EON for them.

MNRI—The MNRI is a measure of neighborhood quality that is based on 22 indicators (in six domains: household composition, employment, transportation, social, income/poverty, housing) from the U.S. Census (Meadows et al., 2013). We calculated the MNRI in two ways. First, a total score was calculated according to the procedure outlined by Meadows and colleagues (2013), which yields a final MNRI score calculated by averaging (and equally weighting) all indicator scores for each neighborhood. For each indicator, every neighborhood score in the sample is compared against the neighborhood with the “best” or most desirable score. For example, the neighborhood with the lowest percentage unemployed would be considered the “best” neighborhood on that indicator and all others would be ranked against it. Because of the relative ranking calculation method, MNRI scores for each neighborhood on each indicator can range from infinitely negative to 100 (see

Meadows et al., 2013, for more detailed scoring instructions). Second, neighborhoods were given a simple rank from 1 to 57 on the basis of their MNRI score. Each zip code was considered a neighborhood in these calculations. This is the only published measure designed to assess broader neighborhood characteristics that likely to influence military health and so was used here to assess criterion validity of the EON.

Geographic location—We designated participants as living in rural, suburban, or urban areas by aggregating Rural-Urban Commuting Areas codes (U.S. Department of Agriculture, 2013). We used the University of Washington’s ZIP code file (WWAMI, 2004), which approximates the Census tract-based Rural-Urban Commuting Area (RUCA) codes (version 2.0) for each zip code. Following a grouping used in previous research on veteran health (Weeks et al., 2004), participants were designated as urban (RUCA code 1), suburban (RUCA codes 2–6), or rural (RUCA codes 7–10).

Three additional questions were asked to gauge perceived neighborhood trajectory (“Since you’ve been living there, would you say the neighborhood/community is...” with the following response options: “improving,” “declining,” or “about the same”) and the extent to which participants felt a connection between where they lived and their physical (“Overall, I feel the place/community where I live impacts my physical health: negatively, not at all, or positively”) and mental health (“Overall, I feel the place/community where I live impacts my emotional or mental health: negatively, not at all, or positively”). Because we expect perceived reintegration opportunities to be associated with perceived neighborhood trajectory and effects on health, these items were used to assess discriminant validity of the EON.

Data analyses—We used SPSS 21 to conduct the analyses. We analyzed whether the EON differentiated between groups likely to score differently on it (discriminant validity), whether it correlated with other similar measures (criterion validity), and whether it correlated with measures of theoretically related constructs (construct validity). The data were not normally distributed, so nonparametric tests (correlations, Kruskal-Wallis H tests) were conducted. Kendall’s tau rank correlation coefficients were used throughout because of the relatively small sample size.

Distributional properties—Data were evaluated for normality and extreme values. According to the Shapiro-Wilk test, the EON scores were not normally distributed ($p < .05$), with skewness of -1.11 ($SE = 0.25$) and kurtosis of 3.80 ($SE = 0.50$). A histogram confirmed that the scores were skewed to the left, with an apparent outlier far to the left. A simple box plot and a Detrended Normal Q-Q Plot confirmed that that case was an outlier. It was almost 2.5 deviations below the mean. Grubb’s test further verified that the case was an outlier, and it was deleted from the sample leaving a total of 90 participants; all analyses were conducted after the outlier was deleted. The remaining data were still skewed slightly to the left, with skewness of -0.13 ($SE = 0.25$) and kurtosis of -0.75 ($SE = 0.50$).

Independence in the data—We assessed nonindependence of the data among the 25 married couples in our sample because the tests we used assume independent observations. Treating individual observations as independent if they are not threatens the validity of

results. Spouse responses to EON items 1 (“live in a safe area”), 6 (“access needed health care”), and 12 (“trust people in the community”) were all significantly positively correlated (12). However, the overall EON score was not correlated between partners ($r_t = .26$, *ns*). Nonindependence thus does not appear to threaten the validity of findings reported subsequently.

Results

EON factor structure

To assess the dimensionality of the EON, exploratory factor analysis was conducted, using the principal axis factoring extraction method. Kaiser’s measure of sampling adequacy was .88. With data from 87 participants who had complete values for all EON items, a one-factor structure explained 51.3% of the variance in EON items. While the eigenvalues for the second and third factors extracted were above 1, a Scree plot confirmed that only one factor should be retained. Table 2 lists the factor loadings for each of the items, which were all between .447 and .809. Because factor loadings varied but item-total correlations were generally strong, we concluded that items should be summed to yield a total score. Using this method, EON scores ranged from 26 to 48, with higher scores indicating more positive experience of neighborhood. In this sample, the mean EON score was 39.74 ($SD = 5.17$), indicating that participants rated their neighborhoods as high in opportunities for reintegration on average.

Internal consistency reliability

Internal consistency reliability, using Cronbach’s alpha, was .91 and subgroups were similarly high (veterans = .91, spouses = .91; urban = .91, suburban = .87, rural = .94). Values greater than .80 suggest that a measure is highly internally consistent (i.e., all items measure the same underlying construct). All items correlated positively with one another. Alpha value would improve by .001 by excluding one item, “My family and I have access to the employment opportunities we want.” However, because its corrected-item total correlation was .430, indicating that it was moderately correlated with the combined scores of the other items, the item was retained.

Construct validity

EON score was significantly, negatively correlated with the M2C-Q, $r_{(t)} = -.39$, $p < .01$, and the SFQ, $r_{(t)} = -.27$, $p < .05$, indicating that more positive neighborhood experiences were associated with greater levels of reintegration and spouse social functioning. Means and ranges for the measures used are presented in Table 3.

Discriminant validity

EON scores differed significantly by urban, suburban, or rural residence, $\chi^2(2) = 6.08$, $p < .05$. Suburban individuals ($M = 41.89$, $SD = 4.82$) had significantly higher EON scores than urban individuals ($M = 38.98$, $SD = 5.08$, $t[82] = -2.22$, $p < .01$). The six individuals in rural areas had average scores ($M = 41.17$, $SD = 5.78$) similar to the suburban individuals, although the difference between rural and urban scores was not significant. These

differences appear irrespective of socioeconomic status as there was no difference in reported individual annual income across rural, suburban and urban participants.

A Kruskal-Wallis H test was used to determine whether there were statistically significant differences among the means of three subgroups (those who viewed their neighborhoods as declining, improving, or staying the same). EON scores were significantly different between the groups, $\chi^2(2) = 9.61, p < .01$. Post-hoc *t* tests with a Bonferroni adjustment revealed significant differences between those who viewed their neighborhoods as improving ($M = 41.37, SD = 4.57$) and each other group: declining, $M = 36.36, SD = 3.96, t(39) = -3.21, p < .01$, and staying the same, $M = 38.98, SD = 5.29, t(73) = -2.02, p < .05$. There was no significant correlation between EON score and number of years participants reported living in the zip code.

There was also a significant difference in EON score on the basis of how individuals felt their neighborhood affected physical health, $\chi^2(2) = 10.07, p < .01$, and their mental/emotional health, $\chi^2(2) = 8.93, p < .05$. Post-hoc *t* tests with a Bonferroni adjustment revealed significant differences between all three groups. Those who viewed their neighborhood as negatively impacting their overall physical health ($M = 33.50, SD = 2.52$) had lower EON scores than other groups: positively, $M = 40.77, SD = 4.73, t(54) = -3.02, p < .01$; not at all, $M = 38.91, SD = 5.45, t(36) = -1.94, p < .05$. Participants who viewed their neighborhood as positively affecting their overall physical health had significantly higher EON scores than those who did not see a neighborhood connection with physical health, $t(84) = -1.68, p < .05$. Individuals who viewed their neighborhoods as positively affecting their mental/emotional health ($M = 40.85, SD = 4.65$) had significantly higher EON scores than did other groups: negatively, $M = 36.43, SD = 5.59, t(59) = -2.32, p < .01$; not at all, $M = 38.21, SD = 5.43, t(80) = -2.30, p < .01$. There was no difference between scores for those who rated their neighborhoods as negatively or not at all affecting mental health.

Criterion validity

EON was not correlated significantly with scores on the MNRI nor with a list of zip codes rank-ordered based on MNRI score.

Discussion

The findings from this pilot study support the reliability and validity of a brief self-report measure of neighborhood characteristics hypothesized to relate to veteran reintegration. The EON measure appears to be highly internally consistent with all items loading onto one factor. This suggests the measure taps into one underlying construct related to perceived opportunities for reintegration. Furthermore, EON scores were moderately to highly correlated with measures of veteran reintegration and spouse social functioning. Although it is not yet understood how neighborhood/community conditions affect reintegration over time, it is likely that factors at multiple levels influence different aspects of the process. For example, individual, family, and community-level factors were shown to predict suicide ideation in active duty U.S. Air Force members (Langhinrichsen-Rohling, Snarr, Slep, Heyman, & Foran, 2011). Employment opportunities, healthcare access, and other structural aspects of communities that affect mental health/reintegration are not distributed equally

across geographies. EON scores in this study suggest there may be better opportunities for reintegration in nonurban areas. It is critical to further explore geographic variation in reintegration and will be important to understand how these patterns affect mental health and other health outcomes over time.

EON scores also differentiated between individuals with different perceptions of neighborhood improvement and effects on physical and mental health. This suggests that neighborhood development/transition and resident awareness of neighborhood influences on health are likely to affect reintegration. Furthermore, suburban residents had higher EON scores than their urban counterparts. Future research with larger samples is needed to assess EON sensitivity to population variation in military characteristics and geographic variation in neighborhood characteristics. Consistent with others (West et al., 2010), we suggest the use of RUCA codes that can be flexibly aggregated to provide analyses at multiple levels. It is essential to assess exposure to local reintegration opportunities as thoroughly as possible. It is especially important to think carefully about what exposure to neighborhood conditions means in highly mobile military populations (Meadows et al., 2013).

The EON did not correlate with MNRI scores on the basis of zip-code level Census data, nor did it correlate with a ranked list of participant zip codes ordered by MNRI score. There are several possible reasons for this. First, we operationalized *neighborhood* as a single zip code, and the MNRI study defined *neighborhood* as a group that included the military base zip code plus all contiguous zip codes. This difference meant that zeroes in the Census data produced unusable values for some MNRI indicators in some zip codes. Furthermore, the MNRI study was focused exclusively on military installation neighborhoods, whereas ours included all neighborhoods listed by participants. We identified four military neighborhoods in our sample, which is too small a sample to conduct meaningful analyses. More research is needed to identify the levels of analysis most relevant for understanding military health. Second, we compared 2014 survey data with data from the 2000 U.S. Census because 2010 Census data on the MNRI indicators was not available. Although this is similar to the approach taken to develop the MNRI, a number of major social, economic, and political changes have occurred in the intervening years and it is likely that neighborhoods have changed in ways not captured by MNRI indicators. Third, there may be a mismatch between objective Census data on neighborhood quality and subjective data on perceived reintegration opportunities, suggesting key differences between the two concepts.

Findings should be interpreted with caution given the small sample size. We hoped to locate more rural residents than participated. More research with veterans who vary in location and tenure of residence is needed to understand geographic variation in perceived reintegration opportunity and its effect on veteran health and mental health. The relatively low factor loading of the employment item deserves further exploration. It is possible that having satisfactory employment opportunities within the neighborhood/community is unusual and, therefore, unlikely to be highly associated with neighborhood opportunities for reintegration. Two measures (SFQ, M2C-Q) were used to assess EON construct validity for spouses and veterans. Although they cover similar items, future research would benefit from using the same measures in both groups.

The EON measure showed adequate reliability and validity in this sample, supporting the connection between neighborhood characteristics and reintegration experiences for returning veterans. More research is needed to understand whether there are other important aspects of neighborhood that shape reintegration opportunities. Last, future research will benefit from identifying the unit of analysis (e.g., zip code, group of zip codes, veteran-defined community, county) that best explains variation in opportunities for reintegration.

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Table 1 Participant demographic characteristics ($n = 90$).

	<i>n</i>	%
Participant		
Veteran	58	64.4
Spouse	32	35.6
Gender ($n = 88^a$)		
Male	49	54.4
Female	39	43.3
Race/ethnicity ($n = 88^a$)		
White, non-Hispanic	77	85.6
African American or Black	2	2.2
Hispanic or Latino	3	3.3
Asian	1	1.1
American Indian	2	2.2
Multiracial	3	3.3
Marital status ($n = 84^a$)		
Married	34	37.8
Single/never married	42	46.7
Separated or divorced	7	7.8
Widowed	1	1.1
Highest level of education		
High school only	4	4.4
Some college or technical school	29	32.2
College graduate	41	45.6
Graduate school	16	17.8
Hours worked per week ($n = 89^a$)		
0	17	18.9
1–20	7	7.7
21–40	18	20.0
40+	47	52.2
Student status ($n = 86^a$)		
Student	25	27.8
Not a student	61	67.8
Military branch of service ($n = 58^b$)		
Army	29	50.0
Navy	8	13.8
Marine	7	12.1
Air Force	12	20.7
Coast Guard	1	1.7
Missing	1	1.7

	<i>n</i>	%
Component of military service (<i>n</i> = 58 ^b)		
Reserve/National Guard	35	60.3
Active Duty ^c	28	48.3
Rural Urban Commuting Area Codes		
Urban	65	72.2
Suburban	19	21.1
Rural	6	6.7
Neighborhood trajectory (<i>n</i> = 86 ^a)		
Improving	30	33.3
Declining	11	12.2
About the same	45	95.6
Neighborhood effect on physical health		
Positive	52	57.8
Negative	4	4.4
Not at all	34	37.8
Neighborhood effect on emotional or mental health (<i>n</i> = 89 ^a)		
Positive	54	60.0
Negative	7	7.8
Not at all	28	31.1

^aSample sizes of less than 90 reflect missing data unless otherwise marked.

^bPercentages shown for sample of 58 veterans.

^cFive Active Duty participants were Guard/Reservists.

Table 2

Experience of Neighborhood Measure Psychometric Indexes ($n = 87^a$).

	<i>M</i>	<i>SD</i>	Loading	Item-total <i>r</i>	α if item deleted
1. I live in a safe area.	3.53	0.63	.560	.544	.909
2. Housing is affordable.	3.20	0.59	.559	.533	.909
3. My family and I have access to the educational opportunities we want.	3.33	0.54	.694	.665	.903
4. My family and I have access to the employment opportunities we want.	3.03	0.49	.447	.430	.912
5. My family and I can access the foods we prefer to eat.	3.40	0.58	.714	.686	.902
6. My family and I can access the health care we need.	3.31	0.63	.765	.732	.899
7. I have access to the information I need (e.g., internet news, newspapers, libraries).	3.48	0.57	.809	.758	.898
8. My family and I can easily get to places we want to go.	3.43	0.60	.784	.732	.899
9. It is easy for my family and I to practice our religion/spirituality.	3.51	0.57	.733	.685	.902
10. It is easy for my family and I to be involved in the civic activities (political, social, economic) we prefer.	3.26	0.56	.710	.668	.903
11. My family and I have access to the recreational activities (social, cultural, physical) we enjoy.	3.32	0.54	.701	.672	.903
12. I feel I can trust the people in my area/community.	3.23	0.71	.677	.657	.904

^aThree participants had missing values for one or more Experience of Neighborhood items and were excluded for this analysis.

Table 3

Participant scores on measures analyzed.

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Range
Number of years living in the zip code	88	8.46	10.6	0 to 60
Experience of Neighborhood	90	39.74	5.2	26 to 48
Military Neighborhood Ranking Index	89	−1745.93	541.5	−2951.2 to −183.9
Military to Civilian Questionnaire	55	0.82	0.55	0 to 2.17
Social Functioning Questionnaire	32	5.03	3.1	0 to 16

Note. Sample sizes of less than 90 reflect missing data unless otherwise marked.