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Post-flood social support networks and morbidity in Jôsô City, Japan

Adam Lebowitz[a], Hirokazu Tachikawa[b,*], Miyuki Aiba[c], Yuta Okamoto[d], Sho Takahashi[e], Kiyotaka Nemoto[b], Tetsuaki Arai[b]

[a] School of Medicine, Jichi Medical University, Shimotsuke, Tochigi, Japan
[b] Department of Psychiatry, University of Tsukuba, Tsukuba, Ibaraki, Japan
[c] Faculty of Human Sciences, Toyo Gakuen University, Tokyo, Japan
[d] Usiku Aiwa Hospital, Ibaraki, Japan
[e] Department of Disaster Psychiatry, University of Tsukuba, Tsukuba, Ibaraki, Japan

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ABSTRACT

Social support networks are considered beneficial for post-disaster survivor mental health. However, there are family and non-family networks, and support can be received or provided. Therefore, their complex contribution to wellbeing requires analysis. Researching elderly residents of Jôsô City NE of Tokyo (N = 1182 [female: n = 618], Age M = 69.76y, SD = 6.10y) who experienced severe flooding in September 2015 investigated data for mental health outcomes of depression (K6), trauma (IES-R), and existence of recent worry from evacuation and house damage. An original instrument tapped support source and direction, controlled to examine mental health symptom changes. House damage was a higher mental health predictor (η_p^2 = .10–.16) than evacuation (η_p^2 = .033–.093). Results indicated family social support may buffer mental health outcomes, but non-family social support may burden them. Overall support network size also indicated burdening compared to social support receiving-providing imbalance.

1. Introduction

Research into social factors enhancing post-disaster community resilience identifies social networks beneficial for mental health since they are conduits for social support (Abramson et al., 2015; Kawachi and Subramanian, 2006; Norris et al., 2008; Wind and Komproe, 2012). Even the perception of received support, or its lack, can positively or negatively influence symptoms (Norris and Kaniasty, 1996). Earlier social support research proposed it strengthens individual capability to cope with stressors (Lin et al., 1979; Pearlin et al., 1981), but quantifying post-disaster dose-response remains challenging. Social support is a complex construct: There are material and emotional components (Kaniasty and Norris, 1995); it originates from inside or outside the family (Kaniasty et al., 1990; Norris et al., 2008); and can be either received or provided creating reciprocity issues (Lebowitz, 2017; Shakespeare-Finch and Green, 2013). Analyzing these aspects is necessary for understanding contribution to survivor wellbeing.

Severe Tropical Storm Etau deluged Jôsô City 50 km NE of Tokyo in early September 2015, causing the Kinugawa River bisecting the city to breach its banks. Over 40 km of this mainly residential and agricultural city was flooded, as mud hip-deep flowed through the City Hall and buildings were pushed from their foundations. Fatalities were minimal (two deaths); however, city authorities were late with evacuation orders. self-defense forces with police and fire services used helicopters and boats to rescue 4200 residents trapped on rooftops and other locations.

This paper has two aims. The first is establishing construct validity for social networks. Family and non-family networks, networks for receiving and providing support, and non-reciprocal support imbalance constructs are all tested for convergent validity. Next, this paper investigates effects of social support on depression, trauma, and general worry symptomology from house damage and evacuation experience. We examine whether support mitigates but also possibly aggravates symptoms.

2. Methods

2.1. Subjects

All subjects were Jôsô City residents who had general medical checkups performed by the Jôsô City Health Center during September to December in 2015 (30–90 days after flood event). To produce adequate mental health supports for flood victims, mental health screening was part of checkups. Trained psychiatrists or psychologists from the

* Corresponding author.
E-mail address: tachikawa@md.tsukuba.ac.jp (H. Tachikawa).

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Table 1
Descriptive data: predictor impact variable effect sizes on mental health outcomes (**p < .01).

		Evacuation			House damage		
		Yes	No	η_p^2 (*CI* .90)	Yes	No	η_p^2 (*CI*.90)
IES-R	*n*	444	665	.06** (0.0360–0.0795)	394	826	.14** (0.1071–0.1648)
	%	40	60		32	68	
	M (SD)	14.43 (14.17)	8.07 (11.62)		17 (14.97)	6.87 (10.26)	
K6	*n*	444	665	.03** (0.0170–0.0509)	394	826	.10** (0.0756–0.1278)
	%	40	60		32	68	
	M (SD)	9.6 (4.77)	8.06 (3.72)		10.41 (4.83)	7.47 (3.71)	
Recent worry	*n*	441	658	.10** (0.0698–0.1239)	389	798	.16** (0.1339–0.1957)
	%	40	60		34	66	
	M (SD)	2.51 (1.31)	1.83 (0.82)		2.7 (1.32)	1.77 (0.76)	

Table 2
Symptom-predictor spearman correlations (**p < .01).

	IES-R	K6	Monthly worry	Evacuation	House damage
IES-R	1				
K6	.61**	1			
Monthly worry	.47**	.47**	1		
Evacuation	.28**	.20**	.36**	1	
House damage	.40**	.34**	.46**	.50**	1

research group conducted semi-structured interviews including self-reported measures. At time of interview, participants were informed in writing and verbally their data could be used in published research, and provided with the option of not having their data included in research. Consent was obtained by signing a form permitting the use of their data. The data of non-consenting participants was not entered on the anonymized data spreadsheet. Data was provided to the research group for statistical analyses with permission of the Jôsô City government.

Initially, the sample comprised of valid data from $N = 1823$ individuals (female $n = 985$, 54%) age ranging from 19–91y ($M = 61.92$y, SD = 13.22y). However, although sex mean age appeared numerically close ($M_f = 60.17$y, $M_m = 63.83$y) it was statistically different $t = 5.95$, and unequally distributed $\chi^2 = 223.33$ (both $p < .001$). Moreover, the sample was unequally distributed and skewed towards higher ages, with $k = 105$ single-year age groups $n = \leq 5$. Therefore, age was cut-off at 60y with $n = 1182$ (female: $n = 618$, 52%) age mean = 69.76y with n/s age distribution differences and homogeneity of variance between genders.

2.2. Measures

Two impact variables as predictors were used: House Damage and Evacuation. The three outcome mental health variables were depression and trauma symptomology measured by K-6 and IES-R respectively, and a single-item question about past-month worry.

One-way ANOVA robust to unequal sample sizes and variances Boneau (1960) and Schmider et al. (2010) investigated how much morbidity could be explained by personal impact of the disaster from house damage and evacuation experience. Then, ANCOVA with social support variables controlled as covariates were performed for each mental health outcome to examine social support influence on morbidity symptoms. Effect size changes from social support indicated possible buffering if effect size increased, or burdening if effect size decreased. Prior to ANCOVA, to protect against Type I errors homogeneity of regression analyses were conducted to confirm different levels of the controlled support covariate do not regress significantly different with the outcome mental health variable (Glass et al., 1972; Keselman et al., 1998).

2.2.1. Impact variables

House Damage There were five house damage response options: full damage, partial damage, flooding over one meter, less than one meter, and underneath floor. These responses were recoded as dummy variables “house damage: yes” ($n = 552$, 31%) with non-responses as “house damage: no” ($n = 1234$, 69%). Differences for age and sex distribution between groups were n/s.

Evacuation This questionnaire item originally had five possible responses – no evacuation, independently, by helicopter, by boat, by other method – recoded as dummy variables “yes” ($n = 444$, 36%) or “no” ($n = 665$, 54%). Differences for age and sex distribution between groups were n/s.

2.2.2. Mental health variables

Depression Symptoms for depression were tapped with the self-evaluating Kessler 6 Psychological Distress Scale (K6) (Kessler et al., 2006). The Japanese-language version (Furukawa et al., 2008) has showed good psychometric properties, and has tapped distress in post-Great East Japan Earthquake populations (Dobashi et al., 2014; Kishi et al., 2015; Nagamine et al., 2016; Niitsu et al., 2014; Oe et al., 2017; Sakuma et al., 2015; Tanisho et al., 2017; Tsuchiya et al., 2015). Cronbach's alpha reliability for this sample was $\alpha = 0.83$.

Trauma Symptoms associated with Post-Traumatic Stress Syndrome (PTSD) were measured with the Japanese-language version (Asukai et al., 2002) of the Impact of Event Scale-Revised instrument (IES-R) (Weiss and Marmar, 1997). The IES-R-J showed good reliability and validity with non-disaster samples, Hanshin-Awaji Earthquake survivors, and in Great East Japan Earthquake studies (Harada et al., 2015; Momma et al., 2014; Takahashi et al., 2014; Tsujiuchi et al., 2016; Usui et al., 2013). The Jôsô city sample showed high reliability $\alpha = 0.95$.

Recent Worry One question “Have you had any worry or stress in the last month?” tapped recent worrying with a four-level Likert-response from 1 “not at all” to 4 “very much” with higher score representing higher levels of recent worry. Concurrent validity was confirmed from n/s differences between overlapping correlations with the other two mental health measures, Worry*IES-R ($r = 0.48$) vs Worry*K6 ($r = 0.50$, both $p < .01$): $z = -1.41$, $p = .16$.

2.2.3. Social support covariates

Covariates controlled to examine social support influence – buffering or burdening – on impact variable effect size for mental health outcomes were support source category (cohabitating family member,

Table 3
Spearman correlations between social support covariates and mental health outcome variables (*$p < .01$, **$p < .001$), †Absolute value.

	IES-R	K6	Worry	Rec'd. support network (Family)	Rec'd. support network (Non-family)	Prov. support network (Family)	Prov. support network (Non-family)	Full network	Rec'd & prov. network difference†
IES-R	1								
K6	.61**	1							
Worry	.47**	.47**	1						
Rec'd. support network (Family)	−0.002	.07*	−0.02	1					
Rec'd. support network (Non-family)	.29**	.29**	.24**	0.04	1				
Prov. support network (Family)	0.02	.10**	0.01	.69**	.13**	1			
Prov. support network (Non-Family)	.24**	.23**	.19**	.11**	.78**	0.05	1		
Full network	.23**	.27**	.18**	.48**	.82**	.49**	.81**	1	
Rec'd & prov. network difference†	.10**	.14**	.14**	.14**	.40**	.08**	.38**	.44**	1

relative, friend, neighbor, and colleague), support direction (providing and receiving), and support reciprocity imbalance. When a covariate was controlled, effect size increases possibly indicated buffering, and decreases indicated burdening. Social support networks were tapped by the Brief Inventory of Social Support Exchange Network (BISSEN) developed by Aiba and colleagues (Aiba et al., 2013; Aiba et al., 2017). Respondents answered eight questions: four per support direction, divided into two each for emotional and tangible support types (Appendix A). Respondents chose the necessary support source categories for each support type within each support direction. Confirmatory factor analysis showed a six-factor model for support source (Appendix B). Research on communities impacted by Great East Japan Earthquake has demonstrated this instrument's psychometric properties (Lebowitz, 2017, 2016). A Principle Components Analysis using all support sources is used to create a composite receiving/providing bidirectional Total Social Support Network component.

Family (cohabitant) vs. non-family (all other categories) support was examined as it is hypothesized providing and receiving help from within family – i.e., the family network – will have different effects on post-flood symptomology than from outside the family, i.e., the non-family network. This is based on “inter-group” and “intra-group” differentiation proposed by Granovetter (1973). First, Cronbach's α was examined for family network and non-family network for each support direction, receiving and providing support. Reliabilities were strong (Crombach's $\alpha = 0.84–0.88$) except for family network/receiving at 0.65. However, using this variable was considered defensible as removing one question item (Q2 “Currently is there someone who you can discuss things with or who can offer you opinions when you have to make a difficult decision?”) from four items identifying the construct increased reliability to 0.71, meeting the recommended threshold for new tests (Lance et al., 2006). Also, the true value could be higher as Cronbach's α calculates the reliability confidence interval lower bound (Zinbarg et al., 2005).

Concurrent validity of support category constructs was confirmed by comparing correlations between each category by direction with the entire combined categories social support network (Diedenhofen and Musch, 2015). Paired, non-overlapping correlation comparisons were non-significantly different at stringent 0.01 alpha levels, except for the neighbor support source category. A possible explanation is Jôsô was recently incorporated as a city. Therefore, neighbor social support network in the provided direction especially (i.e., providing support to neighbors) may not have solidified possibly due to low socialization. (All support-source category reliability and construct validity statistics are in Supplementary Table 1)

Total social support network by direction reliability was high: Total Received Network $\alpha = 0.87$, Total Provided Network $\alpha = 0.93$.There were high correlations between aggregated social support network by type – emotional and tangible – and direction ($r = 0.71–0.96$). Comparing correlation coefficients between IES-R and K6 scores confirmed convergent validity for social support network type by direction. (All support type and direction category reliability and construct validity statistics are in Supplementary Table 2)

Statistical analysis was done on SPSS software version 23 for Windows (IBM Japan Inc., Tokyo, Japan), except for effect size confidence intervals calculated with the Methods for the Behavioral, Educational, and Social Sciences (MBESS) (Kelley, 2007) package from R programming language, and correlational comparisons using the procedure developed by Hittner et al. (2003) through the cocor package for R programming language by Diedenhofen and Musch (2015).

3. Results

3.1. Predictors on outcome effect size

Looking at subject disaster experience in the descriptive data (Table 1), the impacted group was significantly smaller than the non-

Table 4
Impact predictor ES changes controlling for family vs. non-family SS Relational Satisfaction (** $p < .01$), amount of change in parenthesis,?: Did not pass homogeneity of regression test.

	η_p^2	Family network Controlling Rec'd. support	Controlling prov. support	Non-family network Controlling Rec'd. Support	Controlling Prov. Support
Evacuation					
IES-R	.05697**	.05706** (+0.00009)	.05649** (−0.00048)	.051** (−0.00597)	.054** (−0.00297)
K6	.03286**	.03287** (+0.00001)	.034** (+0.00114)	.028** (−0.00486)	.030** (−0.00286)
Worry	.09657**	.09657** (0)	.09682** (+0.00025)	.090** (−0.00657)	.093 (−0.00357)
House damage					
IES-R	.13535**	?	.13541** (+0.00006)	.125** (−0.01035)	.13425** (−0.0011)
K6	.10078**	?	.10149** (+0.00071)	.09057** (−0.01021)	.0992** (−0.00158)
Worry	.16444**	.16460** (−0.00004)	.16448** (+ 0.00004)	.15547** (−0.00897)	.16353** (−0.00091)

Table 5
Impact predictor effect size changes controlling for network imbalance, amount of change in parenthesis (** $p < .01$).

	η_p^2	Controlling network imbalance	Controlling total network
Evacuation			
IES-R	.05697**	.0552** (−0.00177)	.05381** (−0.00316)
K6	.03286**	.03102** (−0.00184)	.02996** (−0.0029)
Worry	.09657**	.09397** (−0.0026)	.09347** (−0.0031)
House damage			
IES-R	.13535**	.13262** (−0.00273)	.13074** (−0.00461)
K6	.10078**	.09705** (−0.00373)	.09596** (−0.00482)
Worry	.16444**	.16076** (−0.00368)	.16083** (−0.00361)

impacted group. Although analyses of variance tests are robust to different sample sizes and homogenies of variance (Boneau, 1960; Schmider et al., 2010), tests robust to these conditions were used to examine means and homogeneity of the data. For means, Brown and Forsythe's *t*-test (Brown and Forsythe, 1974) showed scores were different between groups across all factors. An enhanced Levene's test (Nordstokke and Zumbo, 2010) showed no significant homogeneity differences between impact factor groups for each outcome, except for trauma symptoms from house damage.

Table 1 also shows raw scores and effect size estimates for predictor impact variables on mental health outcome measurements. Overall, respondents who had experienced evacuation and house damage had higher numerical scores across all outcomes with significantly different mean scores. Effect size results were similar between predictors: Highest effect size for worry, followed by trauma and depression. Also, house damage effect size were higher, which compares with another Japanese cohort of similar age following the Great East Japan Earthquake (Lebowitz, 2016) indicating the importance of home for the elderly.

Spearman correlations in Table 2 shows associations were moderate to high among mental health outcomes, and strong between impact predictors. Similar rho values for Monthly Worry*IES-R and Monthly Worry*K-6 show concurrent validity for this measure. They were significant but lower rho = 0.20–0.36 between evacuation and mental health outcome, and slightly higher rho = 0.34–0.46 for house damage and mental health outcomes.

3.2. Controlling family network vs. non-family network social support

Table 3 shows Spearman correlational statistics between covariates and mental health variables were non-significant to low levels between family category social support in both directions, and low-moderate (rho = < 0.30) between non-family category social support. A combined received/provided full social support network support component was similarly correlated rho = 0.227, while an absolute value of total social support network imbalance (from negatively or positively imbalanced reciprocity) was low rho = 0.096, all $p < .001$.

Table 4 shows effect size changes in mental health symptoms for the evacuation predictor variable when family network and non-family network social support were controlled. Results show larger negative decreases from non-family network compared to family network in all symptom categories, with lesser decreases in providing support direction. In fact, worry symptoms reduced to n/s levels when non-family network/providing was controlled. In the IES-R and K6 measurements, controlling family network/receiving support increased ES, with no change in worry.

Table 4 also shows for house damage effect size on symptomology, controlling support resulted in similar patterns of increases and decreases: Controlling non-family network decreased levels, and controlling family network increased levels. Overall, controlled covariate effect size decreases were greater in non-family network/receiving than non-family network/providing.

3.3. Controlling support imbalance and total support social support network

Table 5 shows influence of perceived support reciprocity – operationalized as support imbalance – and total Social Support Network size on symptomology. An imbalance score was calculated arithmetically by subtracting total members in Social Support Network/receiving – i.e., number of individuals from whom subjects receive support – from total members in Social Support Network/providing. Absolute value scores ranged from 0 to 10. A Total Social Support Network score composite was extracted using PCA from the Total Received Social Support Network and Total Provided Social Support Network which were highly correlated rho = 0.52 and displayed high component loadings 0.96 with high reliability $\alpha = 0.91$.

Negative effect size changes across most symptomologies (except for Worry predicted by House Damage) are evidence social support network imbalance was a strong factor for both impact predictors. Larger effect size changes differed between predictors: evacuation Worry > K6 > IES-R; house damage K6 > Worry > IES-R. The latter is notable since depression symptom effect size was smallest among the three morbidity scores. Smallest effect size changes for both impact predictors appeared in trauma symptomology.

Controlling social support network size yielded larger effect size decreases between both predictors and across all morbidities. Since Total Social Support Network and Social Support Network Imbalance were moderately correlated (Spearman's rho = 0.44, $p < .01$) and moderately predictive at $b = 0.40$, $p < .001$ ($R^2 = 0.12$), perceived imbalance amplified by total social support network size was considered. To test this, an "imbalance factor" was created by multiplying the aggregated social support network size by the imbalance score, and controlled in the model. Minimal effect size decreases occurred in the fourth decimal place, indicating minimal influence from social support network size.

4. Discussion

Overall, study results here suggest the complexity of social support networks, as social support co-varies both positively and negatively with morbidity symptoms. Outcome effect size changes from covariance depend on source, direction, and type of support. However, whether social support truly moderates mental health symptoms – i.e., if effect size increases actually indicate buffering and decreases burdening – requires additional analysis. This include regressing multiple support-type factor combinations together for interaction (Baron and Kenny, 1986) while considering degree of exposure (Arnberg et al., 2012). The latter may require a "super-variable" based on a manifold of total disaster experience. These methods are future directions for investigating the moderating effect of support.

However, one aspect of our results coheres to network theory. Granovetter differentiated inter-group bonding and intra-group bridging (Granovetter, 1973), and results here suggest differences between an "inner-layer" family and "outer-layer" non-family social support network.

Several shortcomings regarding study design are important. Causality is always difficult to establish in cross-sectional research. Sampling was not randomized nor was there a control group. Gender was not considered since impact variables were the main focus. Significant differences in homogeneity of variance could influence p-values, especially if standard deviations are larger in smaller groups. Analysis was also limited: Morbidity levels at pre-flood or baseline was not considered nor socioeconomic status. However, we have confidence in results because homogeneity of regression tests prior to ANCOVA showed most independent variable groups were not regressing significantly differently against the controlled covariate. Finally, trauma results reflect respondent self-evaluation of symptoms and not clinical interviews; therefore, prevalence may be much lower than reported (Murray et al., 2011).

Finally concerning our results, controlling covariates produced measurably "small" effect size changes as suggested in the non-significant to low correlations between social support covariates and mental health symptoms (Table 5). However, Bonanno and colleagues emphasized aggregated small effects modulate disaster mental health impact resilience (Bonanno et al., 2007). Furthermore, statistical findings here are supported in principle by Abelson who asserted "…one should not necessarily be scornful of miniscule values for percentage variance explanation, provided there is statistical assurance that these values are significantly above zero, and that the degree of potential cumulation is substantial…" (Abelson, 1985:133). Therefore, we believe our investigation empirically validates approaches to understanding complexities of post-disaster network support.

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Conflict-of-interest statement

None to disclose

Appendix A

Questionnaire based on Brief Inventory of Social Support Exchange Network (BISSEN) (Aiba et al., 2013, 2017) tapping support source, emotional or tangible support type, and providing or receiving support direction

Is there currently **someone supporting you,** or, is there currently **someone you support** in your daily life? Please circle any specific individuals who come to mind. (Circle as many as necessary).

		cohabitating family or relative	other relative	friend	neighbor	colleague	none
	someone supporting you						
Q1	Currently is there someone who helps you feel better and listens to your complaints when you are feeling down?	1	2	3	4	5	6
Q2	Currently is there someone who you can discuss things with or who can offer you opinions when you have to make a difficult decision?	1	2	3	4	5	6
Q3	Currently is there someone who will take up something on your behalf?	1	2	3	4	5	6
Q4	Currently is there someone who would care for you or a family member when physically ill?	1	2	3	4	5	6
	someone you support						
Q5	Currently is there someone whom you help feel better and listen to when they are feeling down?	1	2	3	4	5	6
Q6	Currently is there someone who can discuss things with you or to whom you offer opinions when they have to make a difficult decision?	1	2	3	4	5	6
Q7	Currently is there someone for whom you will take up something on their behalf?	1	2	3	4	5	6
Q8	Currently is there someone or their family you would care for if they were physically ill?	1	2	3	4	5	6

Q1 + Q2 = Received emotional network, Q3 + Q4 = Received tangible network, Q1 + Q2 + Q3 + Q4 = Received total, Q5 + Q6 = Provided emotional network, Q7 + Q8 = Provided tangible network, Q5 + Q6 + Q7 + Q8 = Provided total.

Appendix B

Support source structural model factor loadings.

	1	2	3	4	5
Friend Q6	**0.816**	−0.072	0.184	−0.253	0.353
Friend Q7	**0.794**	0.001	0.211	−0.264	0.362
Friend Q5	**0.762**	−0.043	0.215	−0.28	0.356
Friend Q2	**0.686**	0.029	0.238	−0.28	0.382
Friend Q1	**0.675**	0.043	0.195	−0.332	0.378
Friend Q3	**0.663**	0.018	0.298	−0.278	0.446
Friend Q8	**0.644**	0.04	0.276	−0.309	0.423
Friend Q4	**0.494**	0.034	0.305	−0.266	0.43
Family Q6	−0.021	**0.867**	0.076	−0.106	0.029
Family Q7	0	**0.823**	0.069	−0.107	−0.003
Family Q5	−0.041	**0.762**	0.051	−0.066	0.003
Family Q8	0.039	**0.719**	0.048	−0.047	0.03
Family Q3	0.001	**0.597**	0.011	−0.016	−0.025
Family Q1	−0.013	**0.565**	−0.007	−0.04	0.053
Family Q4	0.026	**0.535**	−0.001	0.063	0.035
Family Q2	−0.023	**0.39**	−0.018	−0.059	0.022
Colleague Q6	0.223	0.028	**0.787**	−0.126	0.234
Colleague Q7	0.254	0.024	**0.763**	−0.148	0.254
Colleague Q5	0.189	−0.007	**0.761**	−0.141	0.233
Colleague Q2	0.225	0.006	**0.716**	−0.188	0.271
Colleague Q3	0.199	0.022	**0.694**	−0.142	0.251
Colleague Q8	0.215	0.017	**0.672**	−0.147	0.295
Colleague Q1	0.257	0.058	**0.629**	−0.237	0.283
Colleague Q4	0.163	0.049	**0.543**	−0.128	0.241
Relative Q6	0.237	0.068	0.186	**−0.793**	0.241
Relative Q7	0.312	0.058	0.152	**−0.792**	0.25
Relative Q5	0.234	0.075	0.176	**−0.79**	0.253
Relative Q8	0.34	0.009	0.153	**−0.738**	0.291
Relative Q2	0.282	0.072	0.16	**−0.701**	0.307
Relative Q4	0.306	−0.019	0.194	**−0.683**	0.294
Relative Q3	0.293	0.049	0.168	**−0.682**	0.314
Relative Q1	0.271	0.095	0.15	**−0.653**	0.293
Neighbor Q7	0.397	0	0.238	−0.281	**0.756**
Neighbor Q5	0.353	0.017	0.265	−0.279	**0.721**
Neighbor Q4	0.334	−0.011	0.213	−0.226	**0.715**
Neighbor Q3	0.357	0.031	0.288	−0.246	**0.683**
Neighbor Q8	0.382	0.009	0.255	−0.25	**0.682**
Neighbor Q2	0.321	0.024	0.262	−0.254	**0.623**
Neighbor Q1	0.398	0.085	0.243	−0.343	**0.616**
Neighbor Q6	0.328	0.05	0.284	−0.229	**0.592**

Extraction method: maximum likelihood.
Rotation method: Oblimin with Kaiser normalization.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.11.073.

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