

Supplementary materials for the manuscript 'XYZ'

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Statistical analyses

In all the following analyses, dummy coding was applied to code the independent variable **group** (rescue-workers vs. community/students sample), with the rescue-workers sample as the reference level. Therefore, positive values of the β coefficients in the regression models indicate larger mean values of the dependent variable in the community/students sample as compared to the rescue-workers sample; negative β coefficients values indicate the opposite (a smaller mean value of the dependent variable in the community/students sample as compared to the rescue-workers sample).

A statistically credible group difference was defined as a 95% posterior credibility interval not including zero.

Group comparisons for the SCS scale

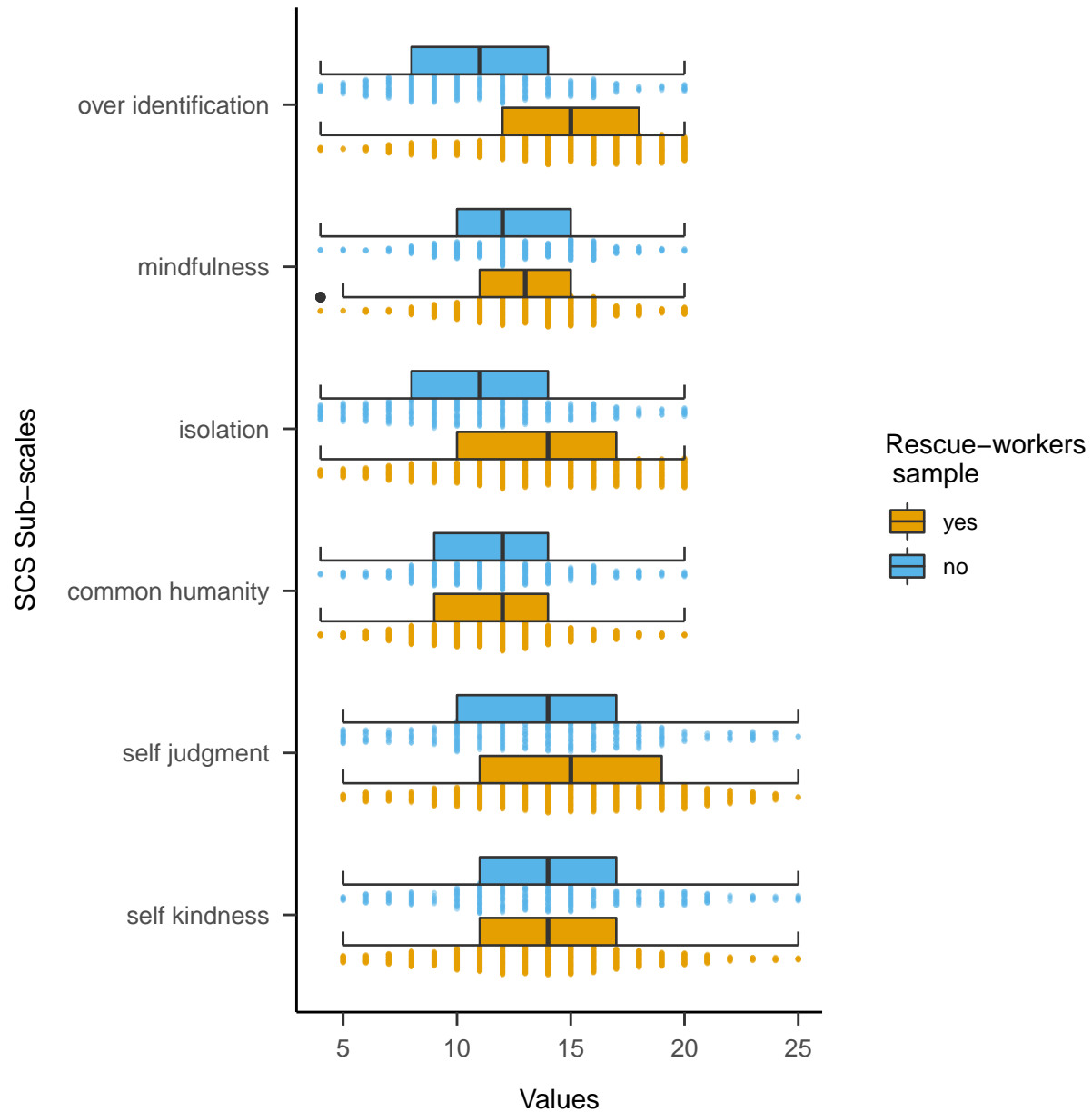


Figure 1. Half-boxplots and score distributions by group (rescue-worker sample vs. community/student sample) for the six SCS subscales.

Group comparisons for the NEO-FFI-60 scale

The score distributions of the NEO-FFI-60 subscales for the two groups (rescue-worker sample vs. community/student sample) are shown in Figure 2. The five subscales of the NEO-FFI-60 were included in a multivariate Bayesian model to test for group differences

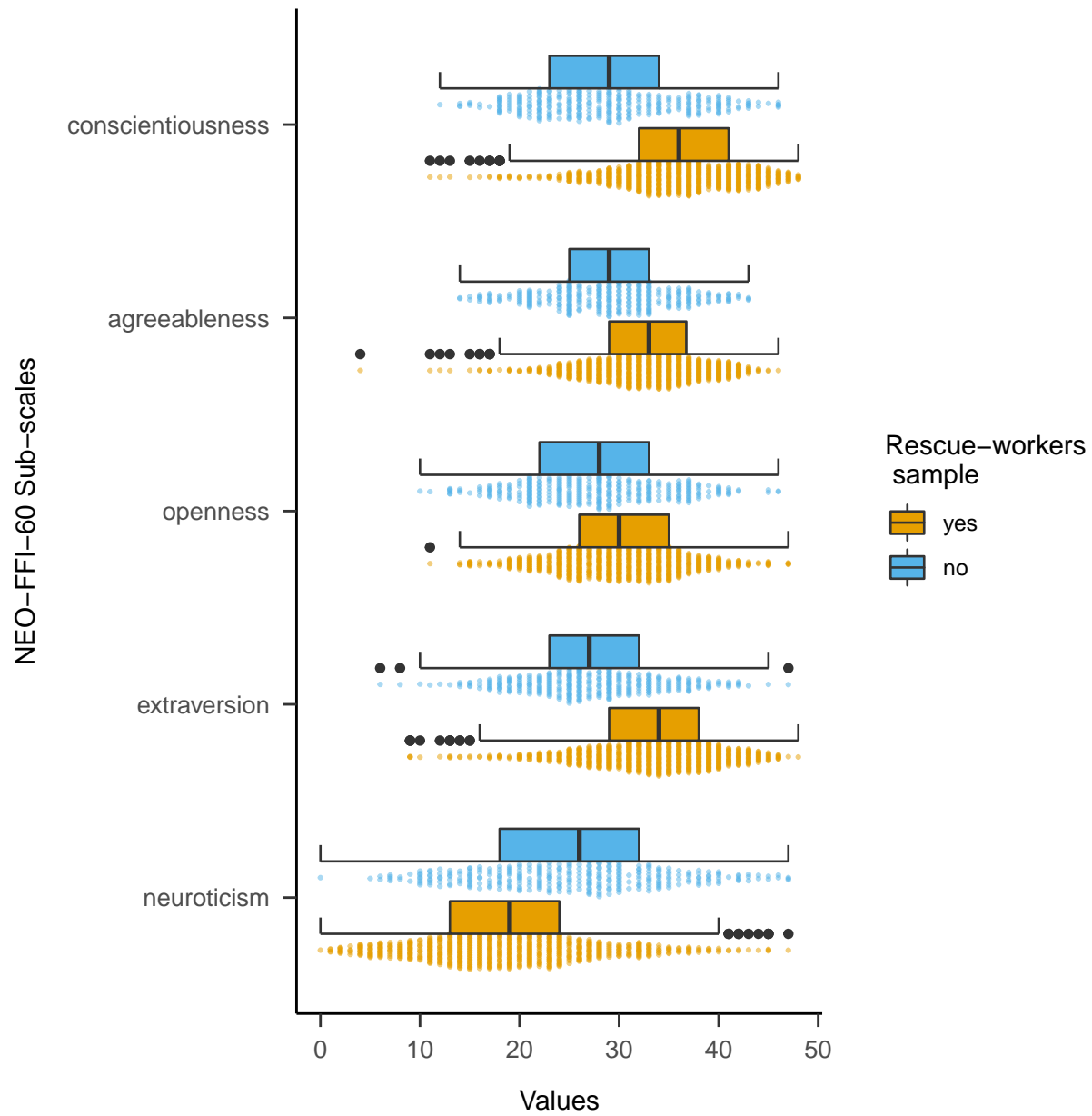


Figure 2. Half-boxplots and score distributions by group (rescue-worker sample vs. community/student sample) for the five NEO-FFI-60 subscales.

Table 1

*Posterior mean, standard error, 95% credible interval and \hat{R} statistic for the parameters of the *bmod6* model based on the normal distribution.*

parameter	mean	SE	lower bound	upper bound	Rhat
Intercept Self Kindness	13.731	0.165	13.407	14.059	1.000
Intercept Self Judgment	14.946	0.171	14.614	15.281	1.000
Intercept Common Humanity	11.594	0.121	11.350	11.822	1.002
Intercept Isolation	13.500	0.165	13.188	13.822	1.004
Intercept Mindfulness	13.260	0.116	13.036	13.481	1.003
Intercept Overidentification	14.355	0.143	14.070	14.641	1.000
β Self Kindness	0.306	0.299	-0.280	0.881	1.004
β Self Judgment	-1.215	0.314	-1.827	-0.596	1.003
β Common Humanity	0.351	0.230	-0.102	0.796	1.003
β Isolation	-2.593	0.293	-3.161	-2.015	1.001
β Mindfulness	-0.621	0.207	-1.024	-0.213	1.001
β Overidentification	-3.268	0.259	-3.764	-2.749	1.003
σ Self Kindness	4.465	0.096	4.285	4.660	1.001
σ Self Judgment	4.746	0.107	4.543	4.958	1.002
σ Common Humanity	3.401	0.072	3.263	3.542	1.002
σ Isolation	4.343	0.097	4.161	4.538	1.001
σ Mindfulness	3.180	0.070	3.043	3.322	1.004
σ Overidentification	3.929	0.085	3.772	4.099	1.002

between rescue-worker and community/student samples (model **bmod1**). Bayesian posterior estimates for group differences are presented in Table 2. Effect size for group differences on the six NEO-FFI-60 scales were the following: Neuroticism, Cohen's $d = 0.68$, 95% credibility interval [0.55, 0.82]; Extraversion, Cohen's $d = -0.84$, 95% credibility interval [-0.98, -0.71]; Openness, Cohen's $d = -0.35$, 95% credibility interval [-0.49, -0.22]; Agreeableness, Cohen's $d = -0.35$, 95% credibility interval [-0.49, -0.22]; Conscientiousness, Cohen's $d = -0.98$, 95% credibility interval [-1.12, -0.85].

Table 2

Posterior mean, standard error, 95% credible interval and \hat{R} statistic for the parameters of the bmod1 model.

parameter	mean	SE	lower bound	upper bound	Rhat
α Neuroticism	19.111	0.333	18.453	19.761	1.000
α Extraversion	33.107	0.254	32.609	33.607	1.000
α Openness	30.065	0.243	29.589	30.543	1.000
α Agreeableness	32.484	0.217	32.057	32.910	1.000
α Conscientiousness	35.717	0.250	35.226	36.209	1.000
β Neuroticism	6.195	0.608	5.002	7.387	1.000
β Extraversion	-5.850	0.462	-6.761	-4.952	1.000
β Openness	-2.349	0.443	-3.220	-1.475	1.000
β Agreeableness	-3.324	0.398	-4.109	-2.534	1.000
β Conscientiousness	-6.725	0.459	-7.624	-5.827	1.000
σ_e Neuroticism	9.098	0.198	8.720	9.497	1.000
σ_e Extraversion	6.917	0.149	6.635	7.218	1.000
σ_e Openness	6.701	0.146	6.422	6.993	1.000
σ_e Agreeableness	6.000	0.130	5.752	6.261	1.000
σ_e Conscientiousness	6.869	0.149	6.585	7.171	1.000

Group comparisons for the COPE-NVI scale

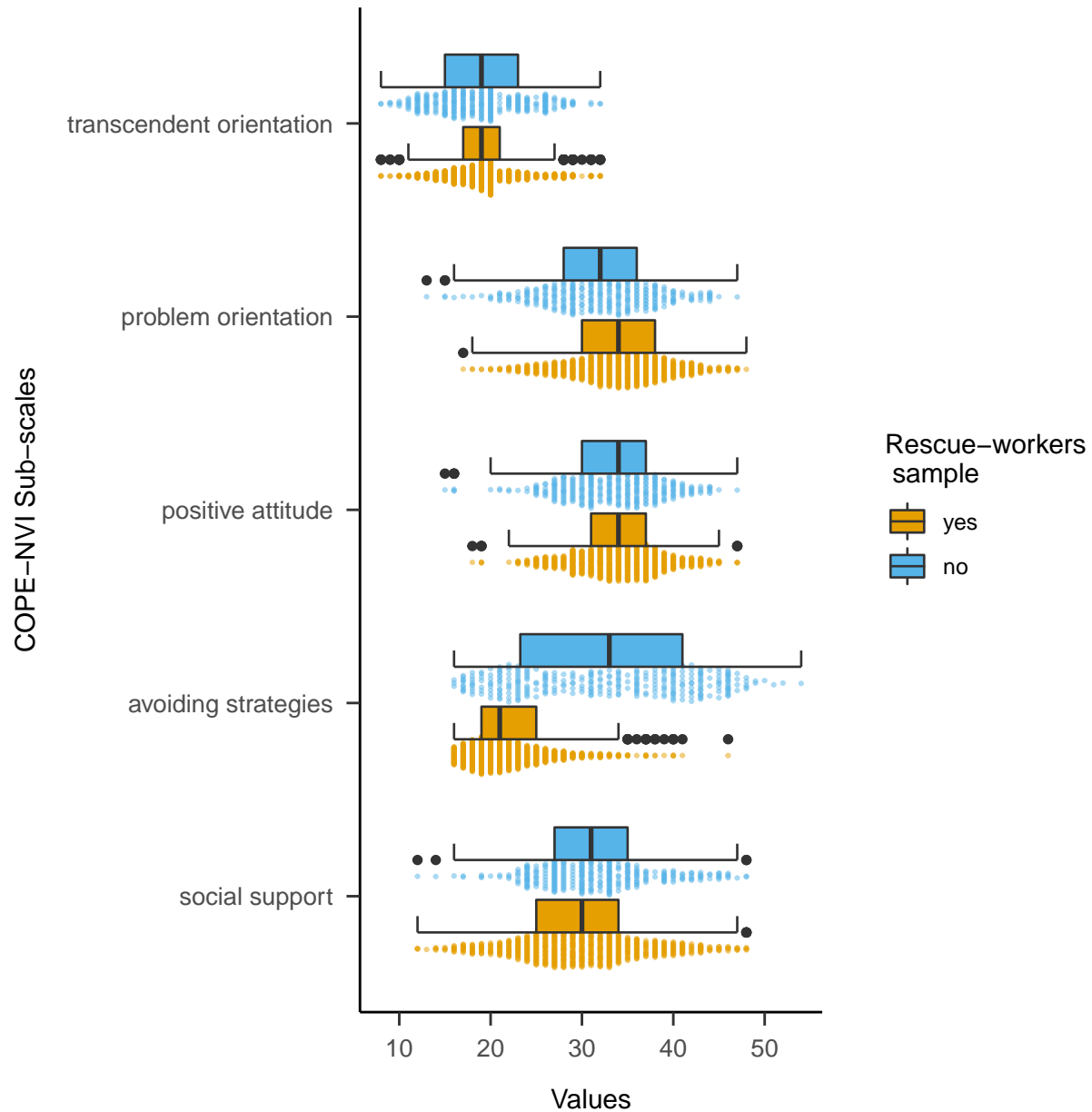


Figure 3. Half-boxplots and score distributions by group (rescue-worker sample vs. community/student sample) for the five COPE-NVI subscales.

The score distributions of the COPE-NVI subscales for the two groups (rescue-worker sample vs. community/student sample) are shown in Figure 3. The five subscales of the COPE-NVI were included in a multivariate Bayesian analysis to test for group differences between rescue-worker and the community/student samples (model `bmod2`). Bayesian

Table 3

Posterior mean, standard error, 95% credible interval and \hat{R} statistic for the parameters of the bmod2 model.

parameter	mean	SE	lower bound	upper bound	Rhat
α Social support	29.972	0.254	29.476	30.471	1.000
α Avoiding strategies	15.994	0.014	15.959	16.016	1.000
α Positive attitude	33.967	0.186	33.602	34.331	1.000
α Problem orientation	33.875	0.211	33.458	34.292	1.000
α Transcendental orientation	19.185	0.163	18.867	19.504	1.000
β Social support	1.589	0.466	0.681	2.505	1.000
β Avoiding strategies	0.969	0.088	0.777	1.083	1.000
β Positive attitude	-0.671	0.336	-1.333	-0.004	1.000
β Problem orientation	-2.021	0.384	-2.775	-1.273	1.000
β Transcendental orientation	-0.383	0.301	-0.976	0.207	1.000
σ_e Social support	6.904	0.151	6.616	7.207	1.000
σ_e Avoiding strategies	0.172	0.031	0.119	0.238	1.000
σ_e Positive attitude	5.052	0.109	4.844	5.271	1.000
σ_e Problem orientation	5.732	0.125	5.494	5.981	1.000
σ_e Transcendental orientation	4.278	0.134	4.001	4.523	1.000
q Avoiding strategies	0.019	0.003	0.013	0.026	1.000
ν Transcendental orientation	25.852	12.680	10.027	58.368	1.000

posterior estimates for group differences are presented in Table 3. Effect size of group differences on the six NEO-FFI-60 scales were the following. Social support: Cohen's $d = 0.23$, 95% credibility interval [0.10, 0.36]; Avoiding strategies: Cohen's $d = 1.58$, 95% credibility interval [1.44, 1.74]; Positive attitude: Cohen's $d = -0.13$, 95% credibility interval [-0.26, 0.00]; Problem Orientation: Cohen's $d = -0.36$, 95% credibility interval [-0.49, -0.23]; Transcendent orientation: Cohen's $d = -0.08$, 95% credibility interval [-0.22, 0.04].

Group comparisons for the PTGI scale

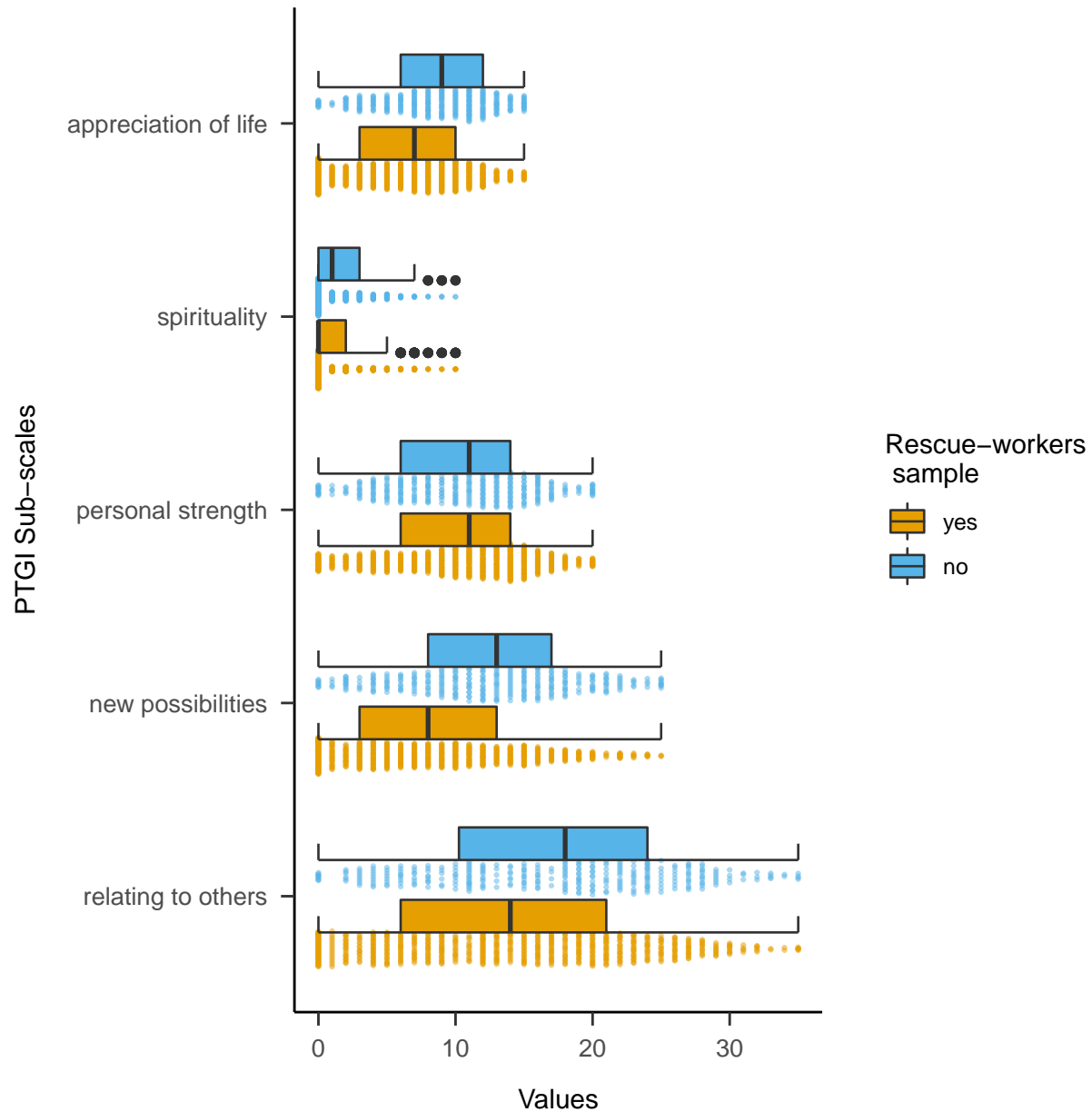


Figure 4. Half-boxplots and score distributions by group (rescue-worker sample vs. community/student sample) for the five PTGI subscales.

The score distributions of the PTGI subscales for the two groups (rescue-worker sample vs. community/student sample) are shown in Figure 4. The five subscales of the PTGI were included in a multivariate Bayesian analysis to test for group differences between rescue-worker and the community/student samples (model `bmod3`). Bayesian posterior

Table 4

Posterior mean, standard error, 95% credible interval and \hat{R} statistic for the parameters of the bmod3 model based on the skew-normal distribution.

parameter	mean	SE	lower bound	upper bound	Rhat
α Appreciation of life	6.656	0.153	6.355	6.944	1.002
α Spiritual change	1.892	0.046	1.802	1.983	1.001
α Personal strength	10.252	0.194	9.863	10.619	1.000
α New possibilities	8.728	0.236	8.267	9.183	1.001
α Relating to others	14.034	0.334	13.391	14.690	1.000
β Appreciation of life	1.914	0.279	1.387	2.471	1.003
β Spiritual change	0.025	0.029	-0.035	0.081	1.000
β Personal strength	0.131	0.316	-0.483	0.766	1.001
β New possibilities	2.037	0.584	1.171	3.471	1.001
β Relating to others	3.076	0.619	1.897	4.245	1.000
σ_e Appreciation of life	4.141	0.092	3.965	4.331	1.001
σ_e Spiritual change	1.597	0.035	1.530	1.667	1.001
σ_e Personal strength	5.386	0.130	5.139	5.647	1.000
σ_e New possibilities	7.034	0.208	6.579	7.406	1.002
σ_e Relating to others	9.095	0.197	8.726	9.496	1.003
α_e Appreciation of life	-0.570	0.664	-1.862	0.559	1.002
α_e Spiritual change	28.174	2.374	23.627	32.932	1.000
α_e Personal strength	-2.674	0.390	-3.496	-1.939	1.001
α_e New possibilities	12.206	3.915	4.109	19.440	1.001
α_e Relating to others	0.222	0.496	-0.636	1.188	1.002

estimates for group differences are presented in Table 4. Effect size of group differences on the five PTGI scales were the following: Relating to others, Cohen's $d = 0.34$, 95% credibility interval [0.21, 0.47]; New Possibilities, Cohen's $d = 0.63$, 95% credibility interval [0.50, 0.76]; Personal Strength, Cohen's $d = 0.04$, 95% credibility interval [-0.10, 0.16]; Spiritual Change, Cohen's $d = 0.25$, 95% credibility interval [0.12, 0.38]; Appreciation of Life: Cohen's $d = 0.47$, 95% credibility interval [0.34, 0.60]. The posterior probability that the mean PTGI TS is larger for the community/student group than for the RW sample is $p(\beta_{\text{diff}} > 0) \approx 1$, Evid.Ratio > 999, Cohen's $d = 0.42$, 95% credibility interval [0.28, 0.54].

Group comparisons for the IES-R scale

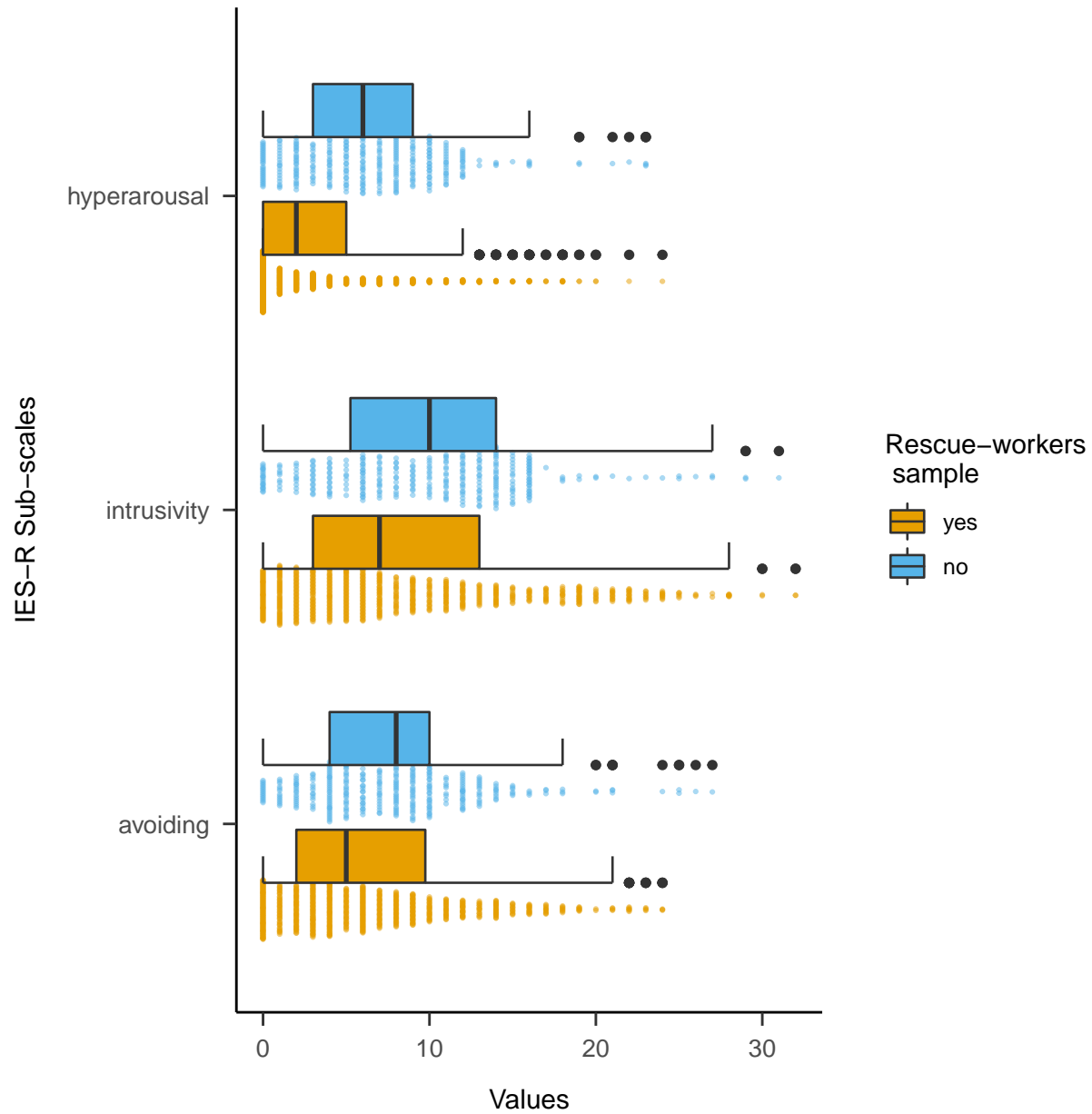


Figure 5. Half-boxplots and score distributions by group (rescue-worker sample vs. community/student sample) for the five IES-R subscales.

The score distributions of the IES-R subscales for the two groups (rescue-worker sample vs. community/student sample) are shown in Figure 5. The three IES-R subscales were included in a multivariate Bayesian analysis to test for group differences between rescue-worker and the community/student samples (model `bmod4`). Bayesian posterior

Table 5

*Posterior mean, standard error, 95% credible interval and \hat{R} statistic for the parameters of the *bmod4* model based on the skew-normal distribution.*

parameter	mean	SE	lower bound	upper bound	Rhat
Intercept Avoiding	6.609	0.160	6.305	6.931	1.001
Intercept Intrusivity	8.660	0.203	8.273	9.069	1.001
Intercept Hyperarousal	4.658	0.113	4.444	4.882	1.001
β Avoiding	0.483	0.159	0.173	0.811	1.000
β Intrusivity	0.278	0.186	-0.081	0.649	1.004
β Hyperarousal	0.331	0.093	0.157	0.521	1.001
σ Avoiding	5.340	0.121	5.112	5.579	1.002
σ Intrusivity	6.864	0.150	6.584	7.166	1.001
σ Hyperarousal	3.902	0.085	3.746	4.072	1.002
α Avoiding	20.996	2.837	15.484	26.600	1.002
α Intrusivity	20.120	2.752	15.018	25.701	1.000
α Hyperarousal	25.699	2.497	20.973	30.761	1.000

estimates for group differences are presented in Table 5. Effect size of group differences on the three PTGI scales were the following: Avoiding, Cohen's $d = 0.25$, 95% credibility interval [0.12, 0.38]; Intrusivity, Cohen's $d = 0.19$, 95% credibility interval [0.06, 0.32]; Hyperarousal, Cohen's $d = 0.69$, 95% credibility interval [0.55, 0.82]. The posterior probability that the mean IES-R TS is larger for the community/student group than for the RW sample is $p(\beta_{\text{diff}} > 0) \approx 1$, Evid.Ratio > 999, Cohen's $d = 0.38$, 95% credibility interval [0.25, 0.51].

Group comparisons for the MSPSS scale

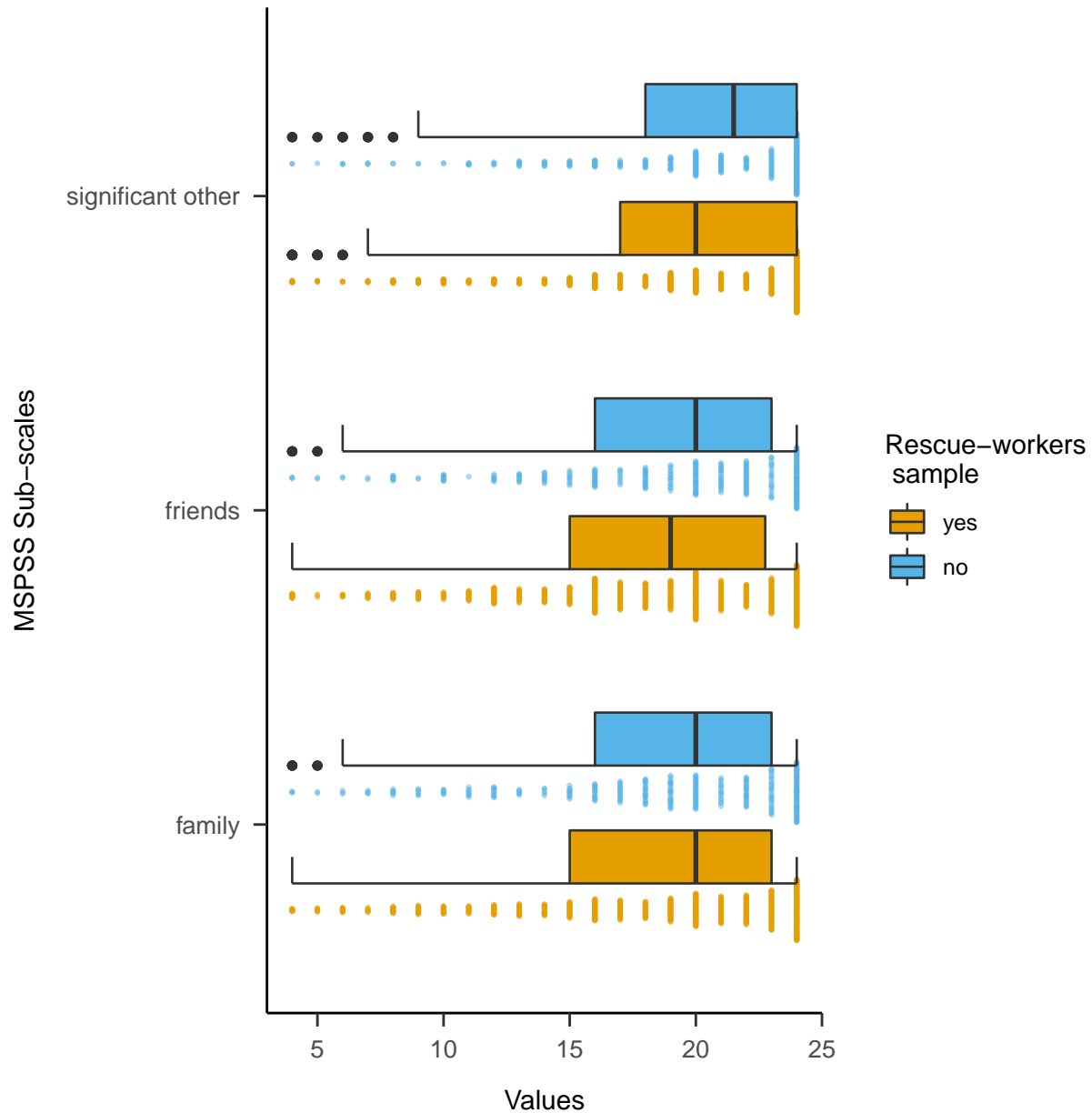


Figure 6. Half-boxplots and score distributions by group (rescue-worker sample vs. community/student sample) for the three MSPSS subscales.

The score distributions of the MSPSS subscales for the two groups (rescue-worker sample vs. community/student sample) are shown in Figure 6. The three MSPSS subscales were included in a multivariate Bayesian analysis to test for group differences between rescue-worker and the community/student samples (model `bmod5`). Bayesian posterior

Table 6

Posterior mean, standard error, 95% credible interval and \hat{R} statistic for the parameters of the bmod5 model based on the Asymmetric Laplace distribution.

parameter	mean	SE	lower bound	upper bound	Rhat
Intercept Family	24.007	0.008	24.000	24.030	1.013
Intercept Friends	24.006	0.007	24.000	24.026	1.172
Intercept Significant Other	22.867	1.973	19.321	24.019	1.596
β Family	0.011	0.016	-0.019	0.044	1.136
β Friends	0.008	0.020	-0.018	0.059	1.123
β Significant Other	0.237	0.396	-0.012	0.929	1.578
σ Family	0.006	0.007	0.001	0.026	1.820
σ Friends	0.009	0.006	0.002	0.026	1.252
σ Significant Other	0.486	0.827	0.002	1.936	1.609
q Family	0.999	0.001	0.995	1.000	1.841
q Friends	0.998	0.001	0.995	1.000	1.258
q Significant Other	0.876	0.211	0.509	1.000	1.573

estimates for group differences are presented in Table 6. We found no credible differences between the two groups. The posterior probability that the mean MSPSS TS is smaller for the community/student group than for the RW sample is $p(\beta_{\text{diff}} < 0) = 0.22$, Evid.Ratio = 0.29, Cohen's $d = 0.19$, 95% credibility interval [0.06, 0.32].

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Data accessibility. All data is generated in the simulation. Code is publicly available on Github:

https://github.com/simeonqs/Using_relative_brain_size_as_predictor_variable-_serious_pitfalls_and_solutions. It is also available on Edmond:

<https://doi.org/10.17617/3.PXZF2T>.

Competing interests. I declare I have no competing interests.

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References