

Psychological General Well-Being Index (PGWBI) as the instrument for evaluation of the level of emotional well-being.

Task 1. Selection of valid players' responses for subsequent analysis.

6573 successions of responses (patterns) to GWBS questionnaire items were obtained. To evaluate the level of players' emotional well-being in connection with other variables it is necessary at first to determine whether it is possible to use the set of questionnaire items as a psychodiagnostics method. For this, the players' responses should be subjected to psychometric analysis, and it should be determined whether it is possible to build a measuring scale for evaluation of emotional well-being level on the basis of the obtained responses. When building a scale, we should be sure that the players' responses to the questionnaire items really reflected those emotional peculiarities that corresponded to the contents of the items, i.e. the responses to the items should be valid from the point of view of a player's behavior in relation to the items. This parameter is called "procedure validity". In other words, only procedure valid responses should be subject to psychometrical processing for the purpose of building of an emotional well-being scale. Procedure valid answers are the answers not determined by psychological peculiarities of a player corresponding to the contents of the items. So, the first task was to select procedure valid answers. It can be done manually by comparing the responses to 22 items of each player out of 6573 and detecting the inconsistent responses in the response patterns. This task is too time and resource consuming. That's why the process of selection of valid patterns was automated on the basis of the index of quality of players' responses. For this Rasch metric system was applied. All the items were evaluated as one general scale of emotional well-being. In MCP the index of the quality of answers was calculated for each player. It is formed based on the difference between the predicted and the actual probability of responses to the questionnaire items, i. e. on so called remainders. The smaller is the remainder, the more qualitative and valid is the pattern of the players' responses. The range of values of the quality index varies from 0 to 4. The less is the index value, the more predictable and homogeneous is the response pattern, and the less is the dispersion in the players' answers. From the point of view of meaningful validity of the questionnaire items the scale of emotional well-being is rather homogenous. That's why the procedure valid responses should have low index values and be rather homogenous. The upper noise boundary is 1.3. Too predictable answers are also invalid. During the selection process 100 highly predictable patterns were removed, including null, identical and low-dispersive answers as well as 1739 responses with the high noise level, while the part of relatively "noisy" patterns were left in the sample. 4735 patterns of responses were remained for subsequent analysis, i.e. 70% of the data from the total sample.

Task 2. Building of a scale of emotional well-being measurement and psychometrical parameters evaluation.

The selected relatively valid players' responses further were subject to psychometrical processing with building of emotional well-being measurement scale. During the process of scale building the validity of each questionnaire item was evaluated. All the items showed acceptable validity. The two items (No.2 and 15) had the worst validity indicators. The item No. 2 refers to concern about serious physical disease, the item No.15 describes the state of cheerfulness and vivacity. The scale of emotional well-being has excellent reliability (0,95). The structural validity is characterized by moderate heterogeneity. Two components can be distinguished in it. The first component was formed by the items 1, 4, 6, 9, 10, 12, 15, 16, 19 and 21. These items meaningfully describe the state of well-being from the positive side and characterize the state of enthusiasm, activity and vigor. The second component includes the items 3, 5, 8, 11, 13, 14, 17, 18 and 22. These items describe the symptoms of tension, anxiety, depressiveness, stress and nervousness.

Scale calibration was made. The scale evaluates 12 levels of expressiveness of emotional well-being. This is a good indicator of discriminative characteristics of the method. The table below shows the total scores and interim measures in logits with standard errors. The levels of expressiveness were calculated with the help of logits and errors. The levels interpretation in also presented in the table. Now interpretation can be presented to the players on the basis of the new criteria of interpretation.

Total score in points	Measure in logits	Standard error	Level of expressiveness	Interpretation
0	-6.5067	1.83	0	absent
1	-5.2895	1.01	0	absent
2	-4.5782	0.72	0	absent
3	-4.1552	0.59	0	absent
4	-3.8505	0.52	0	absent
5	-3.6107	0.47	0	absent
6	-3.4122	0.43	0	absent

7	-3.2421	0.4	1	significantly decreased
8	-3.0929	0.37	1	significantly decreased
9	-2.9597	0.36	1	significantly decreased
10	-2.8391	0.34	1	significantly decreased
11	-2.7288	0.33	1	significantly decreased
12	-2.6269	0.31	1	significantly decreased
13	-2.5323	0.3	1	significantly decreased
14	-2.4437	0.29	1	significantly decreased
15	-2.3604	0.28	1	significantly decreased
16	-2.2817	0.28	2	low level
17	-2.207	0.27	2	low level
18	-2.136	0.26	2	low level
19	-2.0681	0.26	2	low level
20	-2.0031	0.25	2	low level
21	-1.9407	0.25	2	low level
22	-1.8805	0.24	2	low level
23	-1.8225	0.24	2	low level
24	-1.7665	0.23	2	low level
25	-1.7121	0.23	2	low level
26	-1.6593	0.23	3	low level

27	-1.608	0.23	3	low level
28	-1.558	0.22	3	low level
29	-1.5093	0.22	3	low level
30	-1.4616	0.22	3	low level
31	-1.415	0.21	3	low level
32	-1.3693	0.21	3	low level
33	-1.3244	0.21	3	low level
34	-1.2803	0.21	3	low level
35	-1.237	0.21	3	low level
36	-1.1943	0.21	3	low level
37	-1.1522	0.2	4	moderately decreased
38	-1.1106	0.2	4	moderately decreased
39	-1.0695	0.2	4	moderately decreased
40	-1.0288	0.2	4	moderately decreased
41	-0.9886	0.2	4	moderately decreased
42	-0.9486	0.2	4	moderately decreased
43	-0.909	0.2	4	moderately decreased
44	-0.8696	0.2	4	moderately decreased
45	-0.8305	0.2	4	moderately decreased
46	-0.7915	0.2	4	moderately decreased

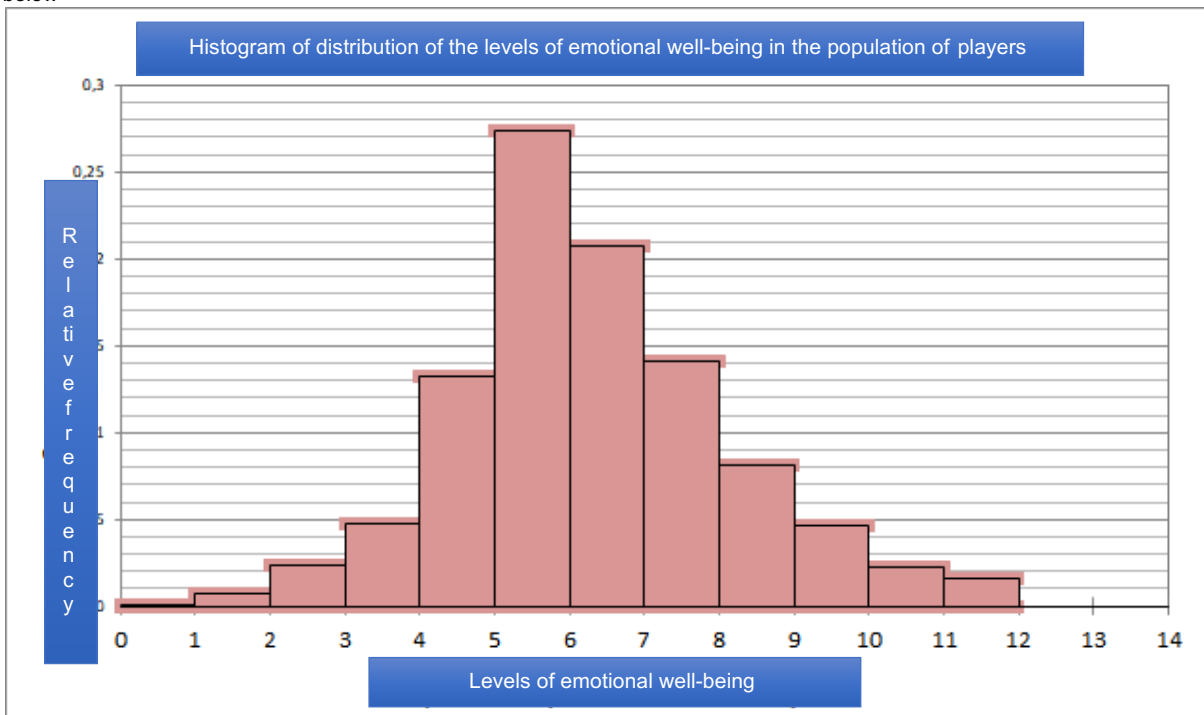
47	-0.7526	0.2	4	moderately decreased
48	-0.7139	0.2	4	moderately decreased
49	-0.6752	0.2	5	average
50	-0.6365	0.2	5	average
51	-0.5978	0.2	5	average
52	-0.5591	0.2	5	average
53	-0.5203	0.2	5	average
54	-0.4813	0.2	5	average
55	-0.4422	0.2	5	average
56	-0.403	0.2	5	average
57	-0.3635	0.2	5	average
58	-0.3237	0.2	5	average
59	-0.2837	0.2	5	average
60	-0.2433	0.2	5	average
61	-0.2026	0.2	6	average
62	-0.1615	0.2	6	average
63	-0.12	0.2	6	average
64	-0.078	0.21	6	average
65	-0.0356	0.21	6	average
66	0.0074	0.21	6	average

67	0.0509	0.21	6	average
68	0.0949	0.21	6	average
69	0.1396	0.21	6	average
70	0.1849	0.21	6	average
71	0.2309	0.22	6	average
72	0.2775	0.22	6	average
73	0.3249	0.22	7	average
74	0.3731	0.22	7	average
75	0.4221	0.22	7	average
76	0.4719	0.22	7	average
77	0.5225	0.23	7	average
78	0.5741	0.23	7	average
79	0.6267	0.23	7	average
80	0.6803	0.23	7	average
81	0.7351	0.24	7	average
82	0.791	0.24	7	average
83	0.8482	0.24	7	average
84	0.9067	0.24	8	moderately increased
85	0.9668	0.25	8	moderately increased
86	1.0284	0.25	8	moderately increased

87	1.0919	0.25	8	moderately increased
88	1.1573	0.26	8	moderately increased
89	1.2249	0.26	8	moderately increased
90	1.2949	0.27	8	moderately increased
91	1.3676	0.27	8	moderately increased
92	1.4432	0.28	8	moderately increased
93	1.5223	0.28	9	high
94	1.6052	0.29	9	high
95	1.6925	0.3	9	high
96	1.7847	0.31	9	high
97	1.8828	0.32	9	high
98	1.9876	0.33	9	high
99	2.1004	0.34	9	high
100	2.2226	0.36	9	high
101	2.3562	0.37	10	significantly increased
102	2.5039	0.39	10	significantly increased
103	2.6691	0.42	10	significantly increased
104	2.8572	0.45	10	significantly increased

105	3.0759	0.49	10	significantly increased
106	3.3382	0.54	10	significantly increased
107	3.6684	0.61	11	extremely high
108	4.12	0.74	11	extremely high
109	4.8634	1.03	11	extremely high
110	6.1051	1.84	11	extremely high

The histogram of distribution of the levels of expressiveness of emotional well-being in the population of players is presented below



The evaluation of correspondence to normal distribution showed the absence of meaningful correspondence. But the visual evaluation of histogram shows the prevalence of average and increased levels of emotional well-being in the sample of players. Less than 25% of players have low levels of emotional well-being. The analysis of the difference between the players did not show significant differences between the levels of emotional well-being.

No.	Country	Number of players	Minimum	Maximum	Mean	Std. deviation
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1	Australia	264	0.000	11.000	5.678	1.804
2	Belarus	191	1.000	10.000	5.576	1.366
3	Canada	322	1.000	11.000	5.960	1.821
4	India	111	3.000	11.000	5.712	1.371
5	New Zealand	58	3.000	11.000	5.845	1.814
6	Philippines	25	2.000	11.000	5.360	1.977
7	Singapore	60	3.000	10.000	5.867	1.599
8	USA	3454	0.000	11.000	5.796	1.895

Kruskal-Wallis test values:

K (Observed value) 7.604

K (Critical value) 14.067

DF 7

p-value (Two-tailed) 0.369

alpha 0.05

p-values for
all the
countries

Country	1	2	3	4	5	6	7	8
1	1	1.000	0.569	1.000	1.000	0.982	0.996	0.996
2	1.000	1	0.336	1.000	0.996	0.983	0.972	0.974
3	0.569	0.336	1	0.670	0.999	0.708	1.000	0.593
4	1.000	1.000	0.670	1	0.997	0.987	0.975	0.999
5	1.000	0.996	0.999	0.997	1	0.953	1.000	1.000
6	0.982	0.983	0.708	0.987	0.953	1	0.906	0.933
7	0.996	0.972	1.000	0.975	1.000	0.906	1	1.000
8	0.996	0.974	0.593	0.999	1.000	0.933	1.000	1

Scale of depression

The scale includes only three items. The scores of the items were inverted, i.e. calculated backwards. It was caused by the fact that the lower is the score the greater is depression. Such a layout contradicts to the principles of psychodiagnostics, because zero score corresponds to the maximum expressiveness of depression, while it should correspond to the minimal expressiveness of construct. The validity of items is acceptable. The scale reliability is moderate (0,81). It differentiates 6 levels of expressiveness of depressive feelings.

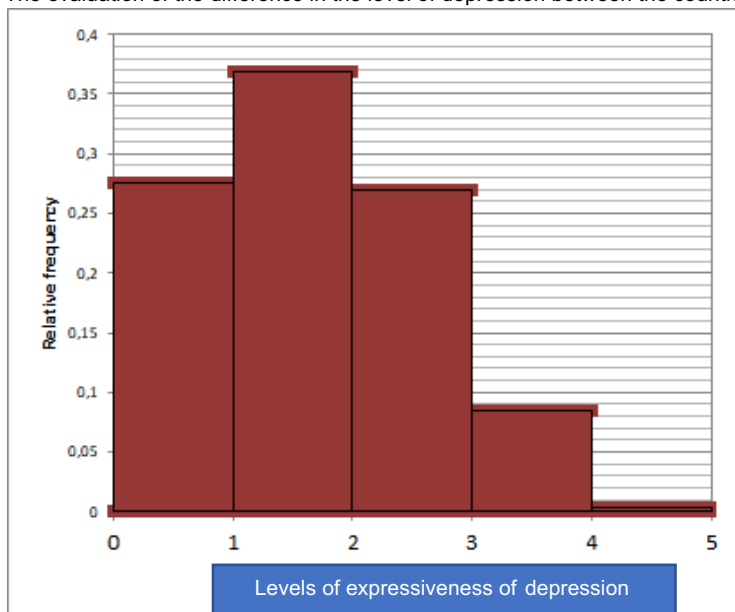
Scores and levels are presented in the table.

Score	Logits	Error	Level	Interpretation
0	-5.2074	1.93	0	absent
1	-3.7029	1.21	0	absent
2	-2.5094	1.01	0	absent
3	-1.5909	0.91	1	moderately decreased
4	-0.8527	0.81	1	moderately decreased
5	-0.2674	0.72	1	average

6	0.2046	0.66	1	average
7	0.6083	0.62	2	moderately decreased
8	0.9803	0.6	2	moderately decreased
9	1.348	0.61	2	moderately decreased
10	1.7344	0.64	2	moderately decreased
11	2.1631	0.68	3	high
12	2.6651	0.74	3	high
13	3.2976	0.86	3	high
14	4.2252	1.11	3	high
15	5.5906	1.89	4	extremely high

The picture below shows the histogram of distribution of the levels of expressiveness of depression among the players. As it can be seen from the histogram, the level of absence of depression, low and moderately increased levels prevail.

The evaluation of the difference in the level of depression between the countries showed meaningful statistical difference.



The table below presents the descriptive statistics of the level of depression in different countries. At first by scores, then by levels.

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Australia	264	0	264	0.000	15.000	5.511	3.747
Belarus	191	0	191	0.000	15.000	5.199	3.049
Canada	322	0	322	0.000	14.000	4.789	3.500
India	111	0	111	0.000	11.000	6.414	3.091
New Zealand	58	0	58	0.000	13.000	4.828	3.455
Philippines	25	0	25	0.000	15.000	6.680	3.902
Singapore	60	0	60	0.000	12.000	4.967	3.324
USA	3454	0	3454	0.000	15.000	5.159	3.632
Australia	264	0	264	0.000	4.000	1.235	0.997
Belarus	191	0	191	0.000	4.000	1.188	0.825
Canada	322	0	322	0.000	3.000	1.047	0.904
India	111	0	111	0.000	3.000	1.423	0.781
New Zealand	58	0	58	0.000	3.000	1.052	0.926
Philippines	25	0	25	0.000	4.000	1.680	0.988
Singapore	60	0	60	0.000	3.000	1.150	0.880
USA	3454	0	3454	0.000	4.000	1.170	0.946

As the table has it, the average level of the majority of countries corresponds to the 1 level of expressiveness of depression, i.e. moderately decreased.

Data on difference

Kruskal-Wallis test (deprur):

K (Observed value)	25.850
K (Critical value)	14.067
DF	7
p-value (Two-tailed)	0.001
alpha	0.05

Country	Frequency	Sum of ranks	Mean of ranks	Groups
Canada	322	669174.000	2078.180	A
New Zealand	58	120928.000	2084.966	A
Singapore	60	133677.000	2227.950	A
USA	3454	7724687.500	2236.447	A
Belarus	191	437929.000	2292.822	A B
Australia	264	608497.000	2304.913	A B
India	111	292999.500	2639.635	B
Philippines	25	71963.000	2878.520	B

All the countries divided into two groups according to the level of depressiveness. The group A has statistically lower level of depressiveness, the group B – statistically higher one. It should be pointed out that the samples are small yet, except for the USA.

Anxiety scale

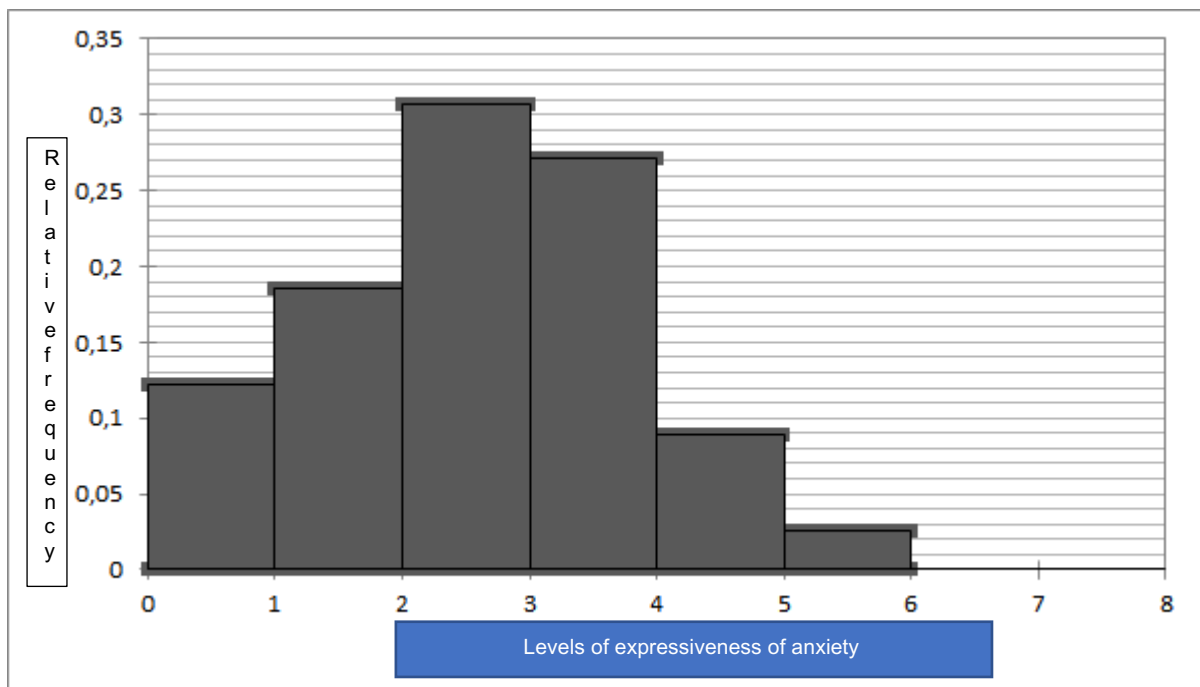
Includes 5 items. All the items are valid. Reliability is good - 0.87. It differentiates 6 levels of expressiveness of anxiety. The table of scores and levels is presented below.

Scores	Logits	Error	Level	Interpretation
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0	-5.7388	1.9	0	absent
1	-4.331	1.13	0	absent
2	-3.3628	0.87	0	absent
3	-2.7024	0.76	0	absent
4	-2.1751	0.7	1	low
5	-1.7243	0.65	1	low
6	-1.3269	0.61	1	low
7	-0.9728	0.58	1	low
8	-0.6563	0.55	2	средний
9	-0.3725	0.52	2	average
10	-0.1152	0.5	2	average
11	0.1218	0.48	2	average
12	0.3449	0.47	2	average
13	0.5602	0.46	3	moderately increased
14	0.7733	0.46	3	moderately increased
15	0.9902	0.47	3	moderately increased
16	1.2171	0.48	3	moderately increased
17	1.4609	0.5	3	moderately increased
18	1.7295	0.53	4	high
19	2.0317	0.57	4	high

20	2.3769	0.61	4	high
21	2.7761	0.66	4	high
22	3.2481	0.72	5	extremely high
23	3.8378	0.83	5	extremely high
24	4.7089	1.08	5	extremely high
25	6.0316	1.87	5	extremely high

The histogram of distribution of the levels of expressiveness of anxiety in the population of players is presented below.



As the histogram has it, the average and the moderately increased levels of anxiety are the most common among the players (more than half of players have these levels). Only 13% of players do not have anxiety. Also 13% of players have high levels of anxiety.

There are no substantial statistical difference in the level of anxiety in different countries. The table below presents the descriptive data first by total scores, then by countries.

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Australia	264	0	264	0.000	23.000	10.284	5.602

Belarus	191	0	191	0.000	23.000	11.141	4.522
Canada	322	0	322	0.000	23.000	9.835	5.578
India	111	0	111	0.000	21.000	11.658	4.218
New Zealand	58	0	58	0.000	21.000	9.672	5.236
Philippines	25	0	25	0.000	23.000	12.120	5.797
Singapore	60	0	60	0.000	21.000	10.483	5.037
USA	3454	0	3454	0.000	25.000	10.703	5.709
Australia	264	0	264	0.000	5.000	2.038	1.248
Belarus	191	0	191	0.000	5.000	2.199	1.037
Canada	322	0	322	0.000	5.000	1.916	1.229
India	111	0	111	0.000	4.000	2.279	0.886
New Zealand	58	0	58	0.000	4.000	1.862	1.115
Philippines	25	0	25	0.000	5.000	2.480	1.327
Singapore	60	0	60	0.000	4.000	2.083	1.062
USA	3454	0	3454	0.000	5.000	2.114	1.252

K (Observed value) 18.098

K
(Critical value) 14.067

DF 7

p-value
(Two-tailed) 0.012

alpha 0.05

Sample	Frequency	Sum of ranks	Mean of ranks	Groups
5	58	116640.500	2011.043	A
3	322	662615.000	2057.811	A
1	264	566577.000	2146.125	A
7	60	132103.000	2201.717	A
8	3454	7788479.000	2254.916	A
2	191	450914.500	2360.809	A
4	111	278543.000	2509.396	A
6	25	63983.000	2559.320	A

In fact, statistically, only one group stood out.

p-values:

	1	2	3	4	5	6	7	8
1	1	0.551	0.991	0.144	0.997	0.790	1.000	0.901
2	0.551	1	0.105	0.950	0.458	0.994	0.982	0.964
3	0.991	0.105	1	0.020	1.000	0.574	0.989	0.163

4	0.144	0.950	0.020	1	0.158	1.000	0.660	0.490
5	0.997	0.458	1.000	0.158	1	0.620	0.990	0.854
6	0.790	0.994	0.574	1.000	0.620	1	0.915	0.943
7	1.000	0.982	0.989	0.660	0.990	0.915	1	1.000
8	0.901	0.964	0.163	0.490	0.854	0.943	1.000	1

Only India and Canada have insignificant statistical difference in the level of anxiety. In India it is higher.

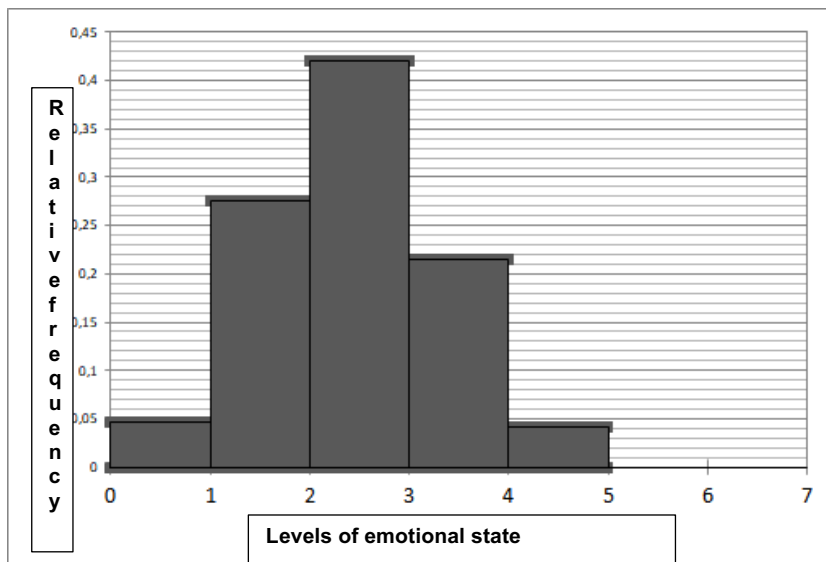
Emotional state

The scale includes 4 items. All the items are valid. Reliability is moderate (0.81). The scale differentiates 5 levels of expressiveness of positive emotional state. The table below shows the indicators by levels.

Score	Logits	Error	Level	Interpretation
0	-5.9668	1.86	0	absent
1	-4.6712	1.07	0	absent
2	-3.8257	0.82	0	absent
3	-3.2392	0.73	0	absent
4	-2.7375	0.69	0	absent
5	-2.2628	0.69	1	decreased
6	-1.7888	0.69	1	decreased
7	-1.3066	0.7	1	decreased
8	-0.8229	0.69	1	decreased
9	-0.357	0.67	2	average
10	0.0711	0.64	2	average

11	0.4548	0.6	2	average
12	0.8018	0.58	2	average
13	1.1271	0.57	3	average
14	1.4473	0.57	3	average
15	1.7811	0.59	3	average
16	2.1537	0.64	3	average
17	2.6048	0.71	3	average
18	3.2086	0.85	4	significantly increased
19	4.1515	1.13	4	significantly increased
20	5.5554	1.9	4	significantly increased

The distribution is shown on the histogram below. As it can be seen, the most common is the average level of expressiveness of positive emotional state. About 32% of respondents have low and unsatisfactory level of positive emotional state.



The difference between the level of positive emotional state in different countries. Below you can find the descriptive data first by total scores, then by the levels of expressiveness.

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
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By total scores

Australia	264	0	264	1.000	20.000	10.322	3.399
Belarus	191	0	191	1.000	17.000	9.188	3.052
Canada	322	0	322	2.000	20.000	10.649	3.665
India	111	0	111	4.000	19.000	11.171	3.066
New Zealand	58	0	58	3.000	19.000	10.414	3.690
Philippines	25	0	25	3.000	19.000	10.040	3.623
Singapore	60	0	60	2.000	20.000	10.700	3.446
USA	3454	0	3454	0.000	20.000	10.352	3.756

By levels of expressiveness

Australia	264	0	264	0.000	4.000	1.898	0.850
Belarus	191	0	191	0.000	3.000	1.670	0.762
Canada	322	0	322	0.000	4.000	1.991	0.932
India	111	0	111	0.000	4.000	2.108	0.790

New Zealand	58	0	58	0.000	4.000	1.948	0.926
Philippines	25	0	25	0.000	4.000	1.840	0.850
Singapore	60	0	60	0.000	4.000	2.050	0.832
USA	3454	0	3454	0.000	4.000	1.932	0.931

Evaluation of the difference between the countries

Kruskal-Wallis test (emnastrur):

K (Observed value) 23.570

K (Critical value) 14.067

DF 7

p-value (Two-tailed) 0.001

alpha 0.05

Multiple pairwise comparisons using the Steel-Dwass-Critchlow-Fligner procedure / Two-tailed test:

Multiple pairwise comparisons using the Steel-Dwass-Critchlow-Fligner procedure / Two-tailed test:

Sample	Frequency	Sum of ranks	Mean of ranks	Groups
2	191	364950.000	1910.733	A

6	25	52783.000	2111.320	A	B
1	264	580824.000	2200.091	A	B
8	3454	7752468.000	2244.490		B
5	58	131547.000	2268.052		B
3	322	752551.500	2337.116		B
7	60	144599.500	2409.992		B
4	111	280132.000	2523.712		B

p-values:

	1	2	3	4	5	6	7	8
1	1	0.167	0.869	0.211	1.000	1.000	0.918	0.999
2	0.167	1	0.003	< 0.0001	0.469	0.992	0.060	0.007
3	0.869	0.003	1	0.902	1.000	0.985	1.000	0.907
4	0.211	< 0.0001	0.902	1	0.879	0.660	0.999	0.274
5	1.000	0.469	1.000	0.879	1	0.999	0.998	1.000
6	1.000	0.992	0.985	0.660	0.999	1	0.957	0.999
7	0.918	0.060	1.000	0.999	0.998	0.957	1	0.970
8	0.999	0.007	0.907	0.274	1.000	0.999	0.970	1

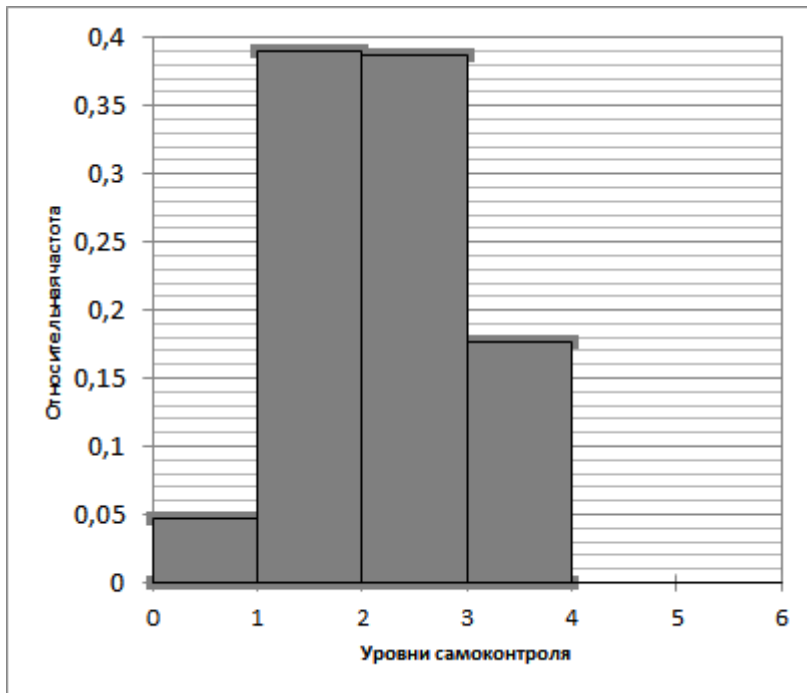
As this data shows, the level of positive state of Belarusian players lags behind the level of players from some other countries.

Self-control scale

The scale includes three items with normal validity. Reliability is rather low, which is expressed by small number of items (0.71). Nevertheless, the scale differentiates three levels of expressiveness of self-control. The histogram below shows the distribution of levels in the sample of players. The table below presents the scores, logits and levels.

Score	Logits	Error	Level	Interpretation
0	-5.133	1.87	0	absent
1	-3.8105	1.08	0	absent
2	-2.9435	0.82	0	absent
3	-2.3581	0.72	0	absent
4	-1.8854	0.66	0	absent
5	-1.4749	0.62	1	low, moderately decreased, average
6	-1.1048	0.6	1	low, moderately decreased, average
7	-0.7614	0.58	1	low, moderately decreased, average
8	-0.4327	0.57	1	low, moderately decreased, average
9	-0.1065	0.57	1	low, moderately decreased, average
10	0.2315	0.59	2	low, moderately decreased, average
11	0.6031	0.63	2	low, moderately decreased, average
12	1.0523	0.72	2	low, moderately decreased, average
13	1.6994	0.92	2	low, moderately decreased, average
14	3.0044	1.41	3	significantly increased
15	4.9429	2.07	3	significantly increased

The histogram of distribution of the levels of self-control in the population of players is presented below.



Unfortunately, due to low discriminatory power, a conclusion can be made that the levels within the range from low to high control, and most probably within the range from moderately reduced to moderately increased control dominate in the population of gamers.

The Difference between the self-control level in different countries. Summarized statistics is presented below.

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
By scores							
Australia	264	0	264	0.000	15.000	9.576	3.109
Belarus	191	0	191	3.000	15.000	9.874	2.398
Canada	322	0	322	1.000	15.000	10.273	3.189
India	111	0	111	4.000	15.000	9.486	2.511
New Zealand	58	0	58	1.000	15.000	9.448	3.304

Philippines	25	0	25	2.000	15.000	7.880	3.528
Singapore	60	0	60	3.000	15.000	9.183	3.105
USA	3454	0	3454	0.000	15.000	10.102	3.246

By levels of expressiveness

Australia	264	0	264	0.000	3.000	1.595	0.779
Belarus	191	0	191	0.000	3.000	1.571	0.627
Canada	322	0	322	0.000	3.000	1.758	0.819
India	111	0	111	0.000	3.000	1.532	0.672
New Zealand	58	0	58	0.000	3.000	1.517	0.800
Philippines	25	0	25	0.000	3.000	1.200	0.866
Singapore	60	0	60	0.000	3.000	1.483	0.792
USA	3454	0	3454	0.000	3.000	1.714	0.824

Kruskal-Wallis test (ursamkontr):

K (Observed value) 32.617

K (Critical value) 14.067

DF	7
p-value (Two-tailed)	< 0.0001
alpha	0.05

Multiple pairwise comparisons using the Steel-Dwass-Critchlow-Fligner procedure / Two-tailed test:

Sample	Frequency	Sum of ranks	Mean of ranks	Groups	
6	25	38736.500	1549.460	A	
7	60	115437.000	1923.950	A	B
5	58	115005.500	1982.853	A	B
4	111	220664.000	1987.964	A	B
2	191	398277.500	2085.223	A	B
1	264	551144.000	2087.667	A	B
8	3454	7864248.000	2276.852	A	B
3	322	756342.500	2348.890		B

p-values:

	1	2	3	4	5	6	7	8
1	1	1.000	0.152	0.998	0.999	0.313	0.976	0.231
2	1.000	1	0.175	0.984	0.995	0.203	0.938	0.378
3	0.152	0.175	1	0.101	0.412	0.042	0.206	0.974
4	0.998	0.984	0.101	1	1.000	0.491	1.000	0.212
5	0.999	0.995	0.412	1.000	1	0.749	1.000	0.613
6	0.313	0.203	0.042	0.491	0.749	1	0.838	0.065
7	0.976	0.938	0.206	1.000	1.000	0.838	1	0.347
8	0.231	0.378	0.974	0.212	0.613	0.065	0.347	1

Significant difference between the self-control level of players from different countries were not revealed.

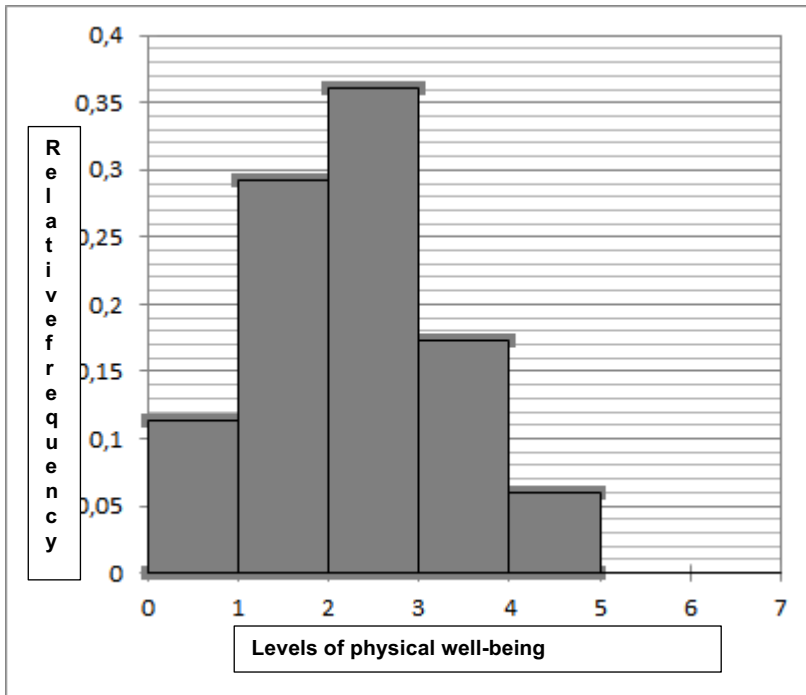
The scale of physical state

Includes 4 items. The validity of the items is acceptable. The reliability of the scale is moderate. It differentiates 5 levels of positive physical state. The scores and levels are presented in the table.

scores	logits	error	level	interpretation
0	-5.558	1.86	0	absent
1	-4.2545	1.07	0	absent
2	-3.414	0.81	0	absent
3	-2.8496	0.71	0	absent
4	-2.3852	0.66	0	absent
5	-1.9609	0.64	1	low, moderately decreased
6	-1.5468	0.65	1	low, moderately decreased
7	-1.1239	0.66	1	low, moderately decreased

8	-0.6823	0.67	1	low, moderately decreased
9	-0.2265	0.68	2	average
10	0.2223	0.66	2	average
11	0.642	0.63	2	average
12	1.0295	0.61	2	average, moderately increased
13	1.3978	0.6	3	high
14	1.7662	0.61	3	high
15	2.1559	0.64	3	high
16	2.5891	0.68	3	high
17	3.0943	0.75	4	significantly increased
18	3.726	0.85	4	significantly increased
19	4.6543	1.11	4	significantly increased
20	6.028	1.89	4	significantly increased

The distribution of the levels of physical well-being among the players is presented on the histogram.



As it appears from the data analysis rather large part of players (more than 40%) (11%) and low (30%) levels of physical well-being. Low and average levels dominate in the population of players. Only 23% characterize their physical state as completely good.

The difference between the countries
Descriptive statistics

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
by scores							
Australia	264	0	264	0.000	20.000	9.053	4.262
Belarus	191	0	191	0.000	19.000	8.864	3.481
Canada	322	0	322	0.000	20.000	9.907	4.085
India	111	0	111	3.000	20.000	11.649	2.928
New Zealand	58	0	58	1.000	20.000	9.276	4.146
Philippines	25	0	25	3.000	20.000	10.360	3.315

Singapore	60	0	60	3.000	18.000	10.700	3.285
USA	3454	0	3454	0,000	20,000	9,502	4,280
by levels							
Australia	264	0	264	0.000	4.000	1.636	1.077
Belarus	191	0	191	0.000	4.000	1.586	0.901
Canada	322	0	322	0.000	4.000	1.876	1.019
India	111	0	111	0.000	4.000	2.261	0.783
New Zealand	58	0	58	0.000	4.000	1.655	1.018
Philippines	25	0	25	0.000	4.000	2.040	0.841
Singapore	60	0	60	0.000	4.000	2.083	0.889
USA	3454	0	3454	0.000	4.000	1.754	1.069

Kruskal-Wallis test (fizsost):

K (Observed value) 57.788

K (Critical value) 14.067

DF 7

p-value (Two-tailed) < 0.0001

alpha 0.05

Multiple pairwise comparisons using the Steel-Dwass-Critchlow-Fligner procedure / Two-tailed test:

Sample	Frequency	Sum of ranks	Mean of ranks	Groups		
fizsost 2	191	389366.500	2038.568	A		
fizsost 1	264	550688.000	2085.939	A	B	
fizsost 5	58	124760.000	2151.034	A	B	
fizsost 8	3454	7678567.000	2223.094	A	B	
fizsost 3	322	761241.500	2364.104	A	B	
fizsost 6	25	63469.000	2538.760	A	B	C
fizsost 7	60	159165.500	2652.758		B	C
fizsost 4	111	332597.500	2996.374			C

p-values:

	Australia	Belarus	Canada	India	New Zealand	Philippines	Singapore	USA
Australia	1	1,000	0.159	< 0.0001	1.000	0.631	0.051	0.714
Belarus	1,000	1	0.075	< 0.0001	0.999	0.444	0.011	0.568

Canada	0.159	0.075	1	0.000	0.942	0.999	0.779	0.580
India	< 0.0001	< 0.0001	0.000	1	0.001	0.317	0.763	< 0.0001
New Zealand	1.000	0.999	0.942	0.001	1	0.932	0.369	1.000
Philippines	0.631	0.444	0.999	0.317	0.932	1	0.999	0.923
Singapore	0.051	0.011	0.779	0.763	0.369	0.999	1	0.180
USA	0.714	0.568	0.580	< 0.0001	1.000	0.923	0.180	1

The players of India showed the highest level of physical well-being.

Relations between the scales

The values of correlation coefficients are presented below.

Correlation matrix
(Pearson):

Variab les	scale_ 1	urobsh	depr	deprur	trev	tgrevur	emnas tr	emnas trur	samok ontr	ursamk ontr	fizsost	fizur
scale_1	1	0.984	-0.864	-0.826	-0.902	-0.880	0.840	0.799	0.811	0.767	0.819	0.784
urobsh	0.984	1	-0.839	-0.801	-0.883	-0.861	0.836	0.793	0.793	0.754	0.816	0.778
depr	-0.864	-0.839	1	0.958	0.799	0.777	-0.643	-0.613	-0.695	-0.658	-0.573	-0.545
deprur	-0.826	-0.801	0.958	1	0.764	0.743	-0.614	-0.584	-0.670	-0.634	-0.542	-0.517
trev	-0.902	-0.883	0.799	0.764	1	0.973	-0.669	-0.635	-0.693	-0.658	-0.621	-0.592
tgrevur	-0.880	-0.861	0.777	0.743	0.973	1	-0.652	-0.617	-0.676	-0.643	-0.610	-0.580
emnas r	0.840	0.836	-0.643	-0.614	-0.669	-0.652	1	0.952	0.621	0.594	0.746	0.716

emnast rur	0.799	0.793	-0.613	-0.584	-0.635	-0.617	0.952	1	0.590	0.562	0.710	0.681
samok ontr	0.811	0.793	-0.695	-0.670	-0.693	-0.676	0.621	0.590	1	0.934	0.571	0.546
ursamk ontr	0.767	0.754	-0.658	-0.634	-0.658	-0.643	0.594	0.562	0.934	1	0.537	0.514
fizsost	0.819	0.816	-0.573	-0.542	-0.621	-0.610	0.746	0.710	0.571	0.537	1	0.961
fizur	0.784	0.778	-0.545	-0.517	-0.592	-0.580	0.716	0.681	0.546	0.514	0.961	1

Values in bold are different from 0 with a significance level
alpha=0,05

As it was expected, all the scales correlate with each other. The values of correlation coefficients are rather high. Unfortunately, there are no any meaningful relations with game indicators.