Home exam: Exploratory Factor analysis
Methods II
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Note: I added several tables and additional visualisations in the appendix, that have been recommended by Henson & Roberts (2006) – as mandatory to allow for a replication of the analysis. They form the appendix as I didn't consider them to be as essential to be part of the limitation of six pages. However, as we were asked to use the information provided by the provided papers, I decided to attach these data outputs. In case that they are completely unnecessary, please ignore the appendix.

I interpreted the recommended use of Osborne & Fitzpatrick (2012) as an invitation to attempt an internal replicability analysis as a part of the reliability testing.

Methods

Descriptive statistics:

The analysed set of data consists of 23 variables and a total number of N = 515 participants. Values for each variable range from 0 ("extremely uncharacteristic for myself") to 4 ("extremely characteristic of myself"). No data is missing, as all items have been answered by all subjects. The distribution of each variable was observed with focus on skewness and kurtosis, to examine the normality of the data. Across all variables, the skewness ranged from -.753 to 1.064 whereas the kurtosis ranged from -1.047 to .866. According to the recommendations by Fabrigar et al. (1999), these values indicate a near enough approximation of normality to conduct an EFA (skewness < +-2; kurtosis < +-7). However, 3 variables ("Generally, I am not very aware of myself", "It's hard for me to work when someone is watching me", "I never take a hard look at myself") were excluded following the recommendation of Field (2017) to exclude items that have no correlation of >.3 with any other variable. Therefore, 20 of 23 variables were included in the analysis without transformations. The subject to variable ratio equals 25.75 subjects per variable.

Exploratory factor analysis:

In lack of a specific theory or hypothesis regarding the structure within the analysed data, an exploratory factor analysis (EFA) was performed to investigate its underlying factor structure. The EFA was based on the correlation matrix of the 20 included variables (see app. 3). To test the appropriateness of an EFA based on this matrix, Bartlett's test was performed and KMO of sampling adequacy was computed. Bartlett's test X^2 (190) = 3039, p < .001 was statistically significant, indicating a sufficient correlation of items, whereas KMO = 8.35 indicates a sufficient ("meritorious") sampling adequacy according to Kaiser (1974). The determinant of the correlation matrix is >.002, which lies above the threshold of >.00001 suggested by Fields (2017), indicates an acceptable collinearity. As a method for factor structure, principal axis factoring was used. The chosen rotation method was "direct oblimin" (delta = 0), to allow factors to correlate as recommended by Fabrigar et al. (1999) as a first analysis.

Selection of number of factors:

Multiple criteria were used to assess the number of factors. No theory-based number of expected factors existed. According to Kaiser's criterium, which includes factors with an eigenvalue >1, a number of 5 factors were to be selected. A subjective assessment of a scree-plot (see app. 4) resulted in a number of 4 or 5 factors to exclude. A parallel analysis based on simulated data using a web-based parallel analysis engine (Patil et al., 2017) resulted in a number of 4 factors, whose eigenvalues were higher or equal to their randomly generated equivalents (see app. 5). Given these results, the low number of 20 variables and the fact that the fifth factor barely passes Kaiser's criterium with an eigenvalue of 1.02, the fifth factor was excluded from the analysis. Thus, a 4-factor solution was adopted.

Results

Factor structure:

The four extracted factors explain a total variance of 41.25%. The initial eigenvalues and the variance explained by each factor after rotation are shown in table 1.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.754	23.768	23.768	4.191	20.957	20.957
2	2.754	13.769	37.537	2.234	11.172	32.129
3	1.773	8.866	46.403	1.214	6.071	38.200
4	1.250	6.251	52.654	.610	3.049	41.249

Table 1: Total variance

The correlations between factors are shown in table 2. The values of the correlation coefficients clearly indicate that the factors have a small to medium correlation. Thus, an oblique rotation as has been applied is a proper solution for the analysed dataset. All factors are correlated positively.

Factor	1	2	3	4
1	1.000	.119	.253	.410
2	.119	1.000	.119	.009
3	.253	.119	1.000	.359
4	.410	.009	.359	1.000

Table 2: Factor correlation matrix

Table 3 shows the loadings in the pattern matrix of the items on the extracted factors with an applied threshold of 0.4 to cut off small factor loadings (for a complete pattern matrix see app). As we can see, 6 items load on factor 1, 5 items on factor 2, 3 on factor 3 and 5 on factor 5. Two items have no loadings >.40 on any of the extracted factors. Each variable (with exception of those that have no loadings >.40) unambiguously loads on only one factor with >.40, which results in a clear simple structure.

	Factor			
	1	2	3	4
I'm self-conscious about the way I look	.779			
I'm usually aware of my appearance	.721			
Before I leave my house, I check how I look	.663			
I'm concerned about what other people think of me	.481			
I usually worry about making a good impression	.455			
I care a lot about how I present myself to others	.442			
It takes me time to get over my shyness in new situations		.761		
I feel nervous when I speak in front of a group		.726		
Large groups make me nervous		.711		
I get embarrassed very easily		.637		
It's easy for me to talk to strangers		.493		
I think about myself a lot			.667	
I'm always trying to figure myself out			.531	
I often daydream about myself			.528	
I sometimes step back (in my mind) in order to examine myself from a distance				
I'm quick to notice changes in my mood				.592
I'm constantly thinking about my reasons for doing things				.483
I know the way my mind works when I work through a problem				.472
I generally pay attention to my inner feelings				.420
I'm concerned about my style of doing things				

Table 3: Pattern matrix

In the appendix, the factor structure matrix (app. 6) and the pattern matrix including all loadings (app. 7) is added. Also, a table depicting the communalities of each variable is attached (app. 8).

Internal reliability of factors:

For each factor, Cronbach's alpha was computed to assess the internal reliability of the extracted factors. Only variables with a loading of >.40 were included in the analysis.

Factor	Number of Items	Cronbach's alpha
1	6	.801
2	5	.794
3	3	.661
4	4	.648

Table 4: Internal reliability of factors

Naming of factors:

A qualitative naming and description of the factors should be attempted in this section. Variables with high loadings on factor 1 specifically address how much a person cares about how others perceive him or her in terms of looks, appearance and impression. Therefore, a label such as "caring about impression of others" could be applied. Variables that load on factor 2 address shyness and nervousness, thus "timidity" is an appropriate label. Variables loading on factor 3 address self-referential thinking, dreaming and perception, labelled as "self-referential cognition". Variables loading on factor 4 mainly address the detection of inner emotional states, motivations and cognitive processes, of which "awareness of inner states" might be an appropriate label.

Factor	Label
1	Caring about impressions of others
2	Timidity
3	Self-referential cognition
4	Awareness of inner states

Table 5: Labelling of factors

Internal replicability:

An analysis of internal replicability was performed as described in Osborne & Fitzpatrick (2012). For this purpose, the sample was randomly divided into two smaller samples of N=258 and N=257 subjects. In these subsamples, after excluding the same variables as in the whole sample (due to the same criterium), the same factor analysis was performed (principal axis factoring, direct oblimin rotation, set number of four factors, loading cut-off value of .40). In the first subsample, the factor structure resembles the one of the large sample (see appendix 9 for the pattern matrix). The factors are highly similar, even though factors 3 and 4 are reversed. Also, the order of variables ranked by factor loadings varies slightly, while factor 4 consists

only of variables that load negatively. However, the second subsample displayed a highly different factor structure (see appendix 10). Here, factor 1 of the other samples is divided into two separate factors (factor 1 and 4), whereas a number of variables loading on factor 3 and 4 of the other samples form a combined factor. Only factor 2 resembles the corresponding factors in the other samples. As suggested by Osborne & Fitzgerald (2012), a table which displays all factor loadings across both subsamples is added in the appendix (app. 11).

Conclusion & Discussion:

In this record, an exploratory factor analysis was performed on a set of data including 23 variables. After the exclusion of 3 items, a factor analysis based on principal axis factoring and oblique rotation (direct oblimin) resulted in an extraction of four latent factors, that account for 18 of the included variables. These factors have small to medium intercorrelations, which justifies the application of an oblique rotation method. Especially factors 1 ("caring about impression of others") and 4 ("awareness of inner states") have a medium correlation of $r = .410$. The internal reliability of all factors is Cronbach's alpha $>.6$, which can be considered as sufficient. Especially factors 1 and 2, labelled as "caring about impression of others" and "timidity", have a high internal reliability around 0.8, while factors 3 ("self-referential cognition") and 4 ("awareness of inner states") exhibit a lower internal reliability (see table 4). However, an analysis of internal replicability, in which the same analysis was independently performed on two distinct subsamples randomly sampled from the data, revealed problems in structural replicability. Anyways, these differing factor structures should be interpreted with caution, as the error rate increases strongly with the lower number of answers per item (Osborne, 2014, p.49). Also, the factor structure presented in the main analysis makes substantially sense in terms of groupings of items and common labels. To further investigate this issue, the same procedure could be repeated several times to identify and revise problematic items. Also, a follow-up study with a large and independent sample should be conducted, to further investigate the underlying factor structure of the set of variables with another EFA or by performing a confirmatory factor analysis (CFA) based on the exploratory analysis presented in this record. For this purpose, the three items that have been excluded from this analysis due to lack of correlation with other variables should also be revised.

References

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Appendix

Appendix 1: Descriptive statistics of all variables

|	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
I'm always trying to figure myself out	515	.00	4.00	1.5961	1.20633	.407	.108	-.703	.215
I'm concerned about my style of doing things	515	.00	4.00	2.5883	1.05559	-.503	.108	-.417	.215
Generally, I'm not very aware of myself	515	.00	4.00	2.5320	.99436	-.327	.108	-.376	.215
It takes me time to get over my shyness in new situations	515	.00	4.00	1.7146	1.14939	.312	.108	-.701	.215
I think about myself a lot	515	.00	4.00	1.6913	1.17522	.228	.108	-.832	.215
I care a lot about how I present myself to others	515	.00	4.00	2.5379	1.07683	-.577	.108	-.235	.215
I often daydream about myself	515	.00	4.00	.9417	1.06615	1.064	.108	.468	.215
It's hard for me to work when someone is watching me	515	.00	4.00	1.9845	1.23019	.004	.108	-.988	.215
I never take a hard look at myself	515	.00	4.00	2.9068	1.10493	-.753	.108	-.264	.215
I get embarrassed very easily	515	.00	4.00	1.7262	1.09863	.276	.108	-.642	.215
I'm self-conscious about the way I look	515	.00	4.00	2.2330	.97442	-.316	.108	-.286	.215
It's easy for me to talk to strangers	515	.00	4.00	1.7029	1.15824	.175	.108	-.809	.215
I generally pay attention to my inner feelings	515	.00	4.00	2.3709	1.00791	-.336	.108	-.352	.215
I usually worry about making a good impression	515	.00	4.00	3.0155	.79624	-.724	.108	.866	.215
I'm constantly thinking about my reasons for doing things	515	.00	4.00	1.6718	1.04894	.118	.108	-.511	.215
I feel nervous when I speak in front of a group	515	.00	4.00	1.9262	1.19922	.122	.108	-.922	.215
Before I leave my house, I check how I look	515	.00	4.00	1.7437	1.27698	.207	.108	-1.047	.215
I sometimes step back (in my mind) in order to examine myself from a distance	515	.00	4.00	.8680	.99905	1.008	.108	.270	.215
I'm concerned about what other people think of me	515	.00	4.00	2.2350	1.06095	-.244	.108	-.553	.215
I'm quick to notice changes in my mood	515	.00	4.00	1.6680	.95647	.117	.108	-.386	.215
I'm usually aware of my appearance	515	.00	4.00	2.0485	.95602	-.137	.108	-.340	.215
I know the way my mind works when I work through a problem	515	.00	4.00	2.0175	1.01816	-.146	.108	-.494	.215
Large groups make me nervous	515	.00	4.00	1.4350	1.12676	.478	.108	-.549	.215
Valid N (listwise)	515								

Appendix 2: Correlation matrix of all variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 I'm always trying to figure myself out	1.000	.207	-.072	.119	.551	.127	.240	.168	.141	.062	.098	-.072	.119	.126	.256	.060	.094	.230	.200	.337	.201	.134	.132
2 I'm concerned about my style of doing things	.207	1.000	.113	.075	.203	.409	.120	.036	.057	.084	.296	-.121	.166	.348	.324	.102	.191	.179	.265	.254	.344	.206	.113
3 Generally, I'm not very aware of myself	-.072	.113	1.000	-.105	.004	.170	-.031	-.132	.217	-.048	.022	.051	.045	.031	.028	-.001	.025	-.086	.044	.086	.100	-.021	-.016
4 It takes me time to get over my shyness in new situations	.119	.075	-.105	1.000	.203	.157	.064	.210	-.035	.559	.061	.394	-.073	-.027	.061	.507	.040	.042	.132	.082	.110	-.017	.533
5 I think about myself a lot	.551	.203	.004	.203	1.000	.216	.380	.229	.216	.127	.194	-.079	.176	.144	.273	.137	.142	.297	.255	.369	.252	.191	.190
6 I care a lot about how I present myself to others	.127	.409	.170	.157	.216	1.000	.078	.112	.086	.176	.366	-.093	.169	.446	.198	.204	.267	.137	.466	.208	.356	.091	.204
7 I often daydream about myself	.240	.120	-.031	.064	.380	.078	1.000	.204	-.006	.079	.142	-.098	.062	.123	.181	-.008	.192	.312	.100	.128	.197	.110	.102
8 It's hard for me to work when someone is watching me	.168	.036	-.132	.210	.229	.112	.204	1.000	-.044	.250	.130	.049	-.027	.108	.052	.252	.113	.166	.234	.161	.153	-.045	.273
9 I never take a hard look at myself	.141	.057	.217	-.035	.216	.086	-.006	-.044	1.000	-.016	.036	.024	.103	.008	.061	-.033	.046	-.039	.017	.103	.034	-.019	-.063
10 I get embarrassed very easily	.062	.084	-.048	.559	.127	.176	.079	.250	-.016	1.000	.094	.285	-.031	.069	.023	.473	.090	.116	.175	.060	.128	-.036	.433
11 I'm self-conscious about the way I look	.098	.296	.022	.061	.194	.366	.142	.130	.036	.094	1.000	-.149	.167	.356	.223	.111	.487	.180	.416	.140	.656	.133	.090
12 It's easy for me to talk to strangers	-.072	-.121	.051	.394	-.079	-.093	-.098	.049	.024	.285	-.149	1.000	-.194	-.221	-.186	.271	-.170	-.103	-.079	-.126	-.128	-.147	.283
13 I generally pay attention to my inner feelings	.119	.166	.045	-.073	.176	.169	.062	-.027	.103	-.031	.167	-.194	1.000	.320	.259	-.047	.133	.109	.138	.273	.191	.242	-.009
14 I usually worry about making a good impression	.126	.348	.031	-.027	.144	.446	.123	.108	.008	.069	.356	-.221	.320	1.000	.227	.054	.279	.164	.383	.152	.380	.182	.025
15 I'm constantly thinking about my reasons for doing things	.256	.324	.028	.061	.273	.198	.181	.052	.061	.023	.223	-.186	.259	.227	1.000	.084	.193	.287	.192	.413	.278	.330	.124
16 I feel nervous when I speak in front of a group	.060	.102	-.001	.507	.137	.204	-.008	.252	-.033	.473	.111	.271	-.047	.054	.084	1.000	.146	.052	.183	.113	.156	-.031	.626
17 Before I leave my house, I check how I look	.094	.191	.025	.040	.142	.267	.192	.113	.046	.090	.487	-.170	.133	.279	.193	.146	1.000	.210	.326	.110	.547	.075	.157
18 I sometimes step back (in my mind) in order to examine myself from a distance	.230	.179	-.086	.042	.297	.137	.312	.166	-.039	.116	.180	-.103	.109	.164	.287	.052	.210	1.000	.127	.261	.241	.167	.157
19 I'm concerned about what other people think of me	.200	.265	.044	.132	.255	.466	.100	.234	.017	.175	.416	-.079	.138	.383	.192	.183	.326	.127	1.000	.292	.472	.131	.209
20 I'm quick to notice changes in my mood	.337	.254	.086	.082	.369	.208	.128	.161	.103	.060	.140	-.126	.273	.152	.413	.113	.110	.261	.292	1.000	.313	.384	.163
21 I'm usually aware of my appearance	.201	.344	.100	.110	.252	.356	.197	.153	.034	.128	.656	-.128	.191	.380	.278	.156	.547	.241	.472	.313	1.000	.251	.181
22 I know the way my mind works when I work through a problem	.134	.206	-.021	-.017	.191	.091	.110	-.045	-.019	-.036	.133	-.147	.242	.182	.330	-.031	.075	.167	.131	.384	.251	1.000	.036
23 Large groups make me nervous	.132	.113	-.016	.533	.190	.204	.102	.273	-.063	.433	.090	.283	-.009	.025	.124	.626	.157	.157	.209	.163	.181	.036	1.000

Appendix 3: Correlation matrix of variables included in the factor analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 I'm always trying to figure myself out	1.000	.207	.119	.551	.127	.240	.062	.098	-.072	.119	.126	.256	.060	.094	.230	.200	.337	.201	.134	.132
2 I'm concerned about my style of doing things	.207	1.000	.075	.203	.409	.120	.084	.296	-.121	.166	.348	.324	.102	.191	.179	.265	.254	.344	.206	.113
3 It takes me time to get over my shyness in new situations	.119	.075	1.000	.203	.157	.064	.559	.061	.394	-.073	-.027	.061	.507	.040	.042	.132	.082	.110	-.017	.533
4 I think about myself a lot	.551	.203	.203	1.000	.216	.380	.127	.194	-.079	.176	.144	.273	.137	.142	.297	.255	.369	.252	.191	.190
5 I care a lot about how I present myself to others	.127	.409	.157	.216	1.000	.078	.176	.366	-.093	.169	.446	.198	.204	.267	.137	.466	.208	.356	.091	.204
6 I often daydream about myself	.240	.120	.064	.380	.078	1.000	.079	.142	-.098	.062	.123	.181	-.008	.192	.312	.100	.128	.197	.110	.102
7 I get embarrassed very easily	.062	.084	.559	.127	.176	.079	1.000	.094	.285	-.031	.069	.023	.473	.090	.116	.175	.060	.128	-.036	.433
8 I'm self-conscious about the way I look	.098	.296	.061	.194	.366	.142	.094	1.000	-.149	.167	.356	.223	.111	.487	.180	.416	.140	.656	.133	.090
9 It's easy for me to talk to strangers	-.072	-.121	.394	-.079	-.093	-.098	.285	-.149	1.000	-.194	-.221	-.186	.271	-.170	-.103	-.079	-.126	-.128	-.147	.283
10 I generally pay attention to my inner feelings	.119	.166	-.073	.176	.169	.062	-.031	.167	-.194	1.000	.320	.259	-.047	.133	.109	.138	.273	.191	.242	-.009
11 I usually worry about making a good impression	.126	.348	-.027	.144	.446	.123	.069	.356	-.221	.320	1.000	.227	.054	.279	.164	.383	.152	.380	.182	.025
12 I'm constantly thinking about my reasons for doing things	.256	.324	.061	.273	.198	.181	.023	.223	-.186	.259	.227	1.000	.084	.193	.287	.192	.413	.278	.330	.124
13 I feel nervous when I speak in front of a group	.060	.102	.507	.137	.204	-.008	.473	.111	.271	-.047	.054	.084	1.000	.146	.052	.183	.113	.156	-.031	.626
14 Before I leave my house, I check how I look	.094	.191	.040	.142	.267	.192	.090	.487	-.170	.133	.279	.193	.146	1.000	.210	.326	.110	.547	.075	.157
15 I sometimes step back (in my mind) in order to examine myself from a distance	.230	.179	.042	.297	.137	.312	.116	.180	-.103	.109	.164	.287	.052	.210	1.000	.127	.261	.241	.167	.157
16 I'm concerned about what other people think of me	.200	.265	.132	.255	.466	.100	.175	.416	-.079	.138	.383	.192	.183	.326	.127	1.000	.292	.472	.131	.209
17 I'm quick to notice changes in my mood	.337	.254	.082	.369	.208	.128	.060	.140	-.126	.273	.152	.413	.113	.110	.261	.292	1.000	.313	.384	.163
18 I'm usually aware of my appearance	.201	.344	.110	.252	.356	.197	.128	.656	-.128	.191	.380	.278	.156	.547	.241	.472	.313	1.000	.251	.181
19 I know the way my mind works when I work through a problem	.134	.206	-.017	.191	.091	.110	-.036	.133	-.147	.242	.182	.330	-.031	.075	.167	.131	.384	.251	1.000	.036
20 Large groups make me nervous	.132	.113	.533	.190	.204	.102	.433	.090	.283	-.009	.025	.124	.626	.157	.157	.209	.163	.181	.036	1.000

Appendix 4: Scree-Plot of main analysis
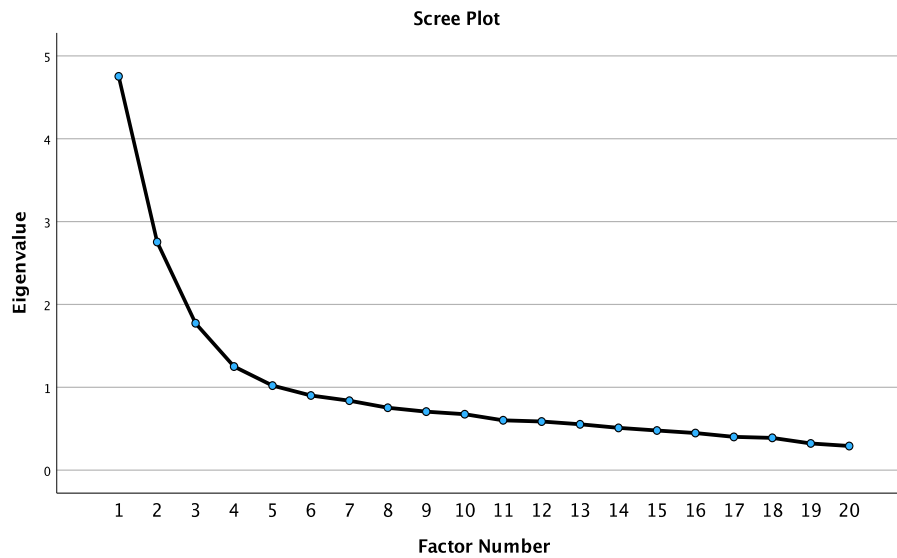
Appendix 5: Parallel test. Values simulated by use of Patil et al. (2017). Settings: Number of variables = 20, Sample size = 515, Type of analysis = Factors, Number of random correlation matrices = 500, Percentile of Eigenvalues = 95, Seed = 1000. Bold values indicate selected factors.

Factor	Eigenvalue	Simulated value
1	**4.754**	**1.441**
2	**2.754**	**1.339**
3	**1.773**	**1.281**
4	**1.250**	**1.226**
5	1.020	1.190
6	.900	1.163

Appendix 6: Factor structure matrix

	Factor			
	1	2	3	4
I'm usually aware of my appearance	.777	.133	.343	.387
I'm self-conscious about the way I look	.757	.066	.223	.260
Before I leave my house, I check how I look	.633	.077	.248	.167
I'm concerned about what other people think of me	.576	.210	.207	.388
I usually worry about making a good impression	.551	-.009	.106	.463
I care a lot about how I present myself to others	.549	.222	.111	.423

It takes me time to get over my shyness in new situations	.072	.767	.158	.001
I feel nervous when I speak in front of a group	.180	.730	.066	.066
Large groups make me nervous	.174	.727	.198	.114
I get embarrassed very easily	.152	.650	.109	.011
It's easy for me to talk to strangers	-.218	.461	-.126	-.283
I think about myself a lot	.224	.185	.730	.387
I'm always trying to figure myself out	.144	.107	.586	.350
I often daydream about myself	.200	.035	.517	.138
I sometimes step back (in my mind) in order to examine myself from a distance	.245	.073	.449	.283
I'm quick to notice changes in my mood	.218	.107	.420	.635
I'm constantly thinking about my reasons for doing things	.285	.042	.370	.566
I know the way my mind works when I work through a problem	.173	-.053	.238	.488
I'm concerned about my style of doing things	.420	.097	.202	.476
I generally pay attention to my inner feelings	.237	-.098	.146	.448

Appendix 7: Factor pattern matrix

	Factor			
	1	2	3	4
I'm self-conscious about the way I look	.779	-.033	.059	-.080
I'm usually aware of my appearance	.721	.030	.143	.039
Before I leave my house, I check how I look	.663	-.017	.138	-.154
I'm concerned about what other people think of me	.481	.151	.000	.189
I usually worry about making a good impression	.455	-.052	-.117	.319
I care a lot about how I present myself to others	.442	.182	-.124	.284
It takes me time to get over my shyness in new situations	-.030	.761	.084	-.023
I feel nervous when I speak in front of a group	.091	.726	-.059	.044
Large groups make me nervous	.044	.711	.080	.061
I get embarrassed very easily	.086	.637	.026	-.039
It's easy for me to talk to strangers	-.182	.493	-.071	-.187
I think about myself a lot	-.020	.107	.667	.155
I'm always trying to figure myself out	-.074	.052	.531	.189

I often daydream about myself	.111	-.040	.528	-.096
I sometimes step back (in my mind) in order to examine myself from a distance	.104	.014	.384	.103
I'm quick to notice changes in my mood	-.091	.086	.221	.592
I'm constantly thinking about my reasons for doing things	.039	.011	.185	.483
I know the way my mind works when I work through a problem	-.034	-.063	.084	.472
I generally pay attention to my inner feelings	.080	-.110	-.012	.420
I'm concerned about my style of doing things	.262	.063	-.005	.370

Appendix 8: Communalities

	Initial	Extraction
I'm always trying to figure myself out	.345	.372
I'm concerned about my style of doing things	.281	.291
It takes me time to get over my shyness in new situations	.486	.595
I think about myself a lot	.442	.562
I care a lot about how I present myself to others	.386	.390
I often daydream about myself	.222	.280
I get embarrassed very easily	.387	.430
I'm self-conscious about the way I look	.495	.580
It's easy for me to talk to strangers	.285	.329
I generally pay attention to my inner feelings	.196	.216
I usually worry about making a good impression	.364	.387
I'm constantly thinking about my reasons for doing things	.307	.353
I feel nervous when I speak in front of a group	.479	.545
Before I leave my house, I check how I look	.373	.427
I sometimes step back (in my mind) in order to examine myself from a distance	.220	.228
I'm concerned about what other people think of me	.382	.382
I'm quick to notice changes in my mood	.380	.458
I'm usually aware of my appearance	.582	.629
I know the way my mind works when I work through a problem	.229	.248
Large groups make me nervous	.493	.548

Appendix 9: Pattern matrix subsample 1 (internal replicability analysis), N = 258

	Factor			
	1	2	3	4
I'm usually aware of my appearance	.755			
I'm self-conscious about the way I look	.720			
Before I leave my house, I check how I look	.702			
I usually worry about making a good impression	.561			
I care a lot about how I present myself to others	.539			
I'm concerned about what other people think of me	.512			
It takes me time to get over my shyness in new situations		.753		
Large groups make me nervous		.709		
I feel nervous when I speak in front of a group		.706		
I get embarrassed very easily		.563		
It's easy for me to talk to strangers		.504		
I'm quick to notice changes in my mood			.720	
I'm constantly thinking about my reasons for doing things			.574	
I know the way my mind works when I work through a problem			.550	
I'm concerned about my style of doing things				
I generally pay attention to my inner feelings				
I think about myself a lot				-.718
I often daydream about myself				-.597
I'm always trying to figure myself out				-.521
I sometimes step back (in my mind) in order to examine myself from a distance				

Appendix 10: Pattern matrix subsample 2 (internal replicability analysis), N = 257

	Factor			
	1	2	3	4
I'm self-conscious about the way I look	.847			
I'm usually aware of my appearance	.812			
Before I leave my house, I check how I look	.562			
I'm concerned about what other people think of me				
It takes me time to get over my shyness in new situations		.763		
I feel nervous when I speak in front of a group		.756		
Large groups make me nervous		.717		
I get embarrassed very easily		.695		
It's easy for me to talk to strangers		.495		
I think about myself a lot			.760	
I'm always trying to figure myself out			.640	
I'm quick to notice changes in my mood			.571	
I'm constantly thinking about my reasons for doing things			.514	
I sometimes step back (in my mind) in order to examine myself from a distance			.417	
I often daydream about myself			.417	
I generally pay attention to my inner feelings				
I know the way my mind works when I work through a problem				
I usually worry about making a good impression				.677
I care a lot about how I present myself to others				.568
I'm concerned about my style of doing things				.453

Appendix 11: Combined pattern matrices of subsamples 1 and 2 for the replication analysis. Loadings over > +-.40 are highlighted in bold print.

	Factors subsample 1				Factors subsample 2			
	1	2	3	4	1	2	3	4
I'm always trying to figure myself out	-.091	.049	.205	**-.521**	.015	.021	**.640**	-.088
I'm concerned about my style of doing things	.305	.035	.361	-.083	.059	.066	.067	**.453**
It takes me time to get over my shyness in new situations	-.051	.753	.008	-.140	-.006	**.763**	.049	.012
I think about myself a lot	-.009	.130	.134	**-.718**	.001	.042	**.760**	-.082
I care a lot about how I present myself to others	**.539**	.159	.182	.085	.127	.172	-.041	**.568**
I often daydream about myself	.099	-.094	-.126	**-.597**	.047	.005	**.417**	-.039
I get embarrassed very easily	.116	**.563**	-.099	-.135	-.001	**.695**	-.034	.126
I'm self-conscious about the way I look	**.755**	.004	-.052	-.013	**.847**	-.050	-.076	-.003
It's easy for me to talk to strangers	-.180	**.504**	-.117	.066	-.105	**.495**	-.146	-.206
I generally pay attention to my inner feelings	.183	-.151	.341	.080	-.079	-.096	.301	.301
I usually worry about making a good impression	**.561**	-.086	.188	.038	.082	-.063	-.067	**.677**
I'm constantly thinking about my reasons for doing things	.101	-.024	**.550**	-.050	.037	.027	**.514**	.111
I feel nervous when I speak in front of a group	.145	**.706**	.073	.134	.081	**.756**	.023	.026
Before I leave my house, I check how I look	**.720**	-.004	-.201	-.066	.562	-.021	.092	-.018
I sometimes step back (in my mind) in order to examine myself from a distance	.110	.059	.160	-.335	.073	-.020	**.417**	.006
I'm concerned about what other people think of me	**.512**	.131	.114	-.041	.386	.132	.044	.278
I'm quick to notice changes in my mood	-.045	.047	**.720**	-.130	-.025	.102	**.571**	.076
I'm usually aware of my appearance	**.702**	.001	.016	-.168	**.812**	.041	.070	.028
I know the way my mind works when I work through a problem	-.082	-.016	**.574**	-.067	.040	-.122	.283	.177
Large groups make me nervous	.087	**.709**	.058	-.001	.008	**.717**	.211	.046