

Evaluations and recommendations for TalEction

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Introduction

An analysis of TalEction's IPIP-based Big Five test is presented, assessing the extent to which it satisfies the validity requirements set by the EFPA (European Federation of Psychologists' Associations).

Methods

A dataset with 364 respondents has been reviewed. The tools used were R (R Core Team 2023) and the psych package (Revelle 2024). Formatting was done using xtable (Dahl et al. 2019).

Results

Internal Consistency Analyses

These are the overall responses:

raw_alpha	std.alpha	G6(sm)	average_r	S/N	ase	mean	sd	median_r
0.92	0.82	0.92	0.04	4.41	0.01	1.13	0.31	0.04

High Alpha Value:

The `raw_alpha` value of 0.92 is excellent, significantly above the generally accepted minimum level of 0.7 for reliability. This indicates high internal consistency, indicating that items within each scale consistently measure the same concept or trait.

Standard Error of Measurement (ASE): The ASE value of 0.0056 is low, suggesting that the scale has a high degree of precision.

Signal-to-Noise Ratio (S/N): A S/N ratio of 4.4 indicates that there is a significant amount of “signal” (real variation) relative to “noise” (random error), which is positive for a psychological test.

Confidence Interval: The confidence intervals for the alpha value are tight (0.91 to 0.93), indicating that the true reliability of the test lies within this range.

These results suggest that the test has very high internal consistency and is well structured.

	agree	conscientious	extraversion	neuroticism	openness
alpha	0.81	0.86	0.85	0.89	0.80

Cronbach's alpha, which is a measure of internal consistency, should be between approximately 0.8 and 0.9 (Streiner 2003; Clark and Watson 1995). The results here appear to be satisfactory.

Factor analyses

	RC ₅	RC ₃	RC ₄	RC ₂	RC ₁
agree	0.04	0.96	0.21	0.12	0.13
conscientious	0.14	0.22	0.94	0.04	0.20
extraversion	0.93	0.04	0.14	0.11	0.31
neuroticism	0.36	0.15	0.23	0.00	0.89
openness	0.09	0.11	0.04	0.99	0.01

Even though some items seem to have loadings on more than one factor, the overall factor structure seems quite satisfactory.

	RC ₁	RC ₂	RC ₃	RC ₄	RC ₅
Anxiety	-0.82	-0.07	0.14	-0.14	-0.15
Hostility	-0.70	-0.22	-0.18	0.03	0.02
Depression	-0.77	-0.22	0.14	-0.24	-0.17
SelfConsciousness	-0.56	-0.07	-0.05	-0.18	-0.49
Impulsiveness	-0.12	-0.61	0.01	-0.08	0.14
Vulnerability	-0.77	-0.16	-0.01	-0.33	-0.15
Warmth	0.62	0.02	0.12	0.03	0.61
Gregariousness	0.39	-0.04	0.01	0.01	0.71
Assertiveness	0.29	0.12	0.03	0.64	0.27
Activity	0.13	-0.01	0.03	0.30	0.49
ExcitementSeeking	0.10	-0.58	0.02	0.35	0.18
PositiveEmotions	0.72	0.02	0.12	0.09	0.45
Fantasy	-0.19	-0.50	0.40	0.36	-0.09
Aesthetics	-0.06	0.04	0.61	0.34	-0.03
Feelings	-0.18	0.04	0.69	0.14	0.06
Actions	0.32	-0.14	0.26	0.45	0.21
Ideas	0.08	0.11	0.48	0.58	-0.14
Values	0.18	-0.40	0.31	0.22	-0.33
Trust	0.63	-0.06	0.38	-0.16	-0.02
Compliance	0.18	0.52	0.46	-0.14	-0.10
Altruism	0.19	0.27	0.66	-0.08	0.27
Straightforwardness	0.19	0.27	0.50	-0.12	-0.19
Modesty	0.11	0.33	0.24	-0.57	-0.05
TenderMindedness	0.14	0.05	0.65	0.00	0.13
Competence	0.32	0.34	0.18	0.59	0.11
Order	-0.00	0.62	0.22	0.03	0.25
Dutifulness	0.05	0.69	0.29	-0.02	0.21
AchievementStriving	0.11	0.54	0.25	0.25	0.39
SelfDiscipline	0.24	0.57	0.02	0.38	0.37
Deliberation	0.18	0.66	0.07	0.12	-0.17

This also applies to the structure at the facet level, where, however, there seems to be some room for improvement.

Item Analyses

Based on the list of questions and their corresponding Big Five dimensions, we can analyze whether the questions can be assumed to match the specified dimensions. I will evaluate each set of questions under each Big Five dimension:

Neuroticism:

Questions dealing with worries, fears, stress, anger, irritability, temperament, and melancholy fit well with the Neuroticism dimension. These questions reflect emotional instability and negative emotional states, which are core components of Neuroticism. Questions about self-satisfaction, self-control, and resistance to temptations (such as “Often spoil myself,” “Rarely overindulge,” “Easily resist temptations,” “Am able to control my cravings”) may be less directly related to Neuroticism and may overlap with other dimensions such as Conscientiousness.

Extraversion:

Questions about social comfort, party participation, leadership qualities, activity level, and enjoyment of life fit well with Extraversion. These questions reflect sociability, energy, and positive emotional orientation, which are central aspects of Extraversion.

Openness:

Questions dealing with imagination, aesthetic sensitivity, emotional intensity, openness to new experiences, and liberal versus conservative value orientation fit well with Openness. This dimension reflects an interest in varied experiences, curiosity, and a broader spectrum of values and beliefs.

Agreeableness:

Questions related to trust, cooperation, empathy, and politeness fit well with Agreeableness. These questions mirror a general altruistic orientation and a tendency to be compassionate and cooperative towards others. Questions like “Love a good fight,” “Yell at people,” “Insult people,” and “Get back at others” may seem counterintuitive for Agreeableness, as they suggest a confrontational or antagonistic attitude, which is usually not associated with this dimension.

Conscientiousness:

Questions dealing with organization, honesty, work ethic, preparation, and decisiveness fit well with Conscientiousness. This dimension reflects a tendency to be disciplined, responsible, and goal-oriented. Generally, it appears that most questions fit well with the specified Big Five dimensions. However, there are some questions, especially in Neuroticism and Agreeableness, that may require further thought or clarification to ensure they fully reflect the intended dimension.

Item Statistics

The individual items show various correlations with the total score. These correlations (both raw and adjusted) can be used to identify which items contribute most to the scale’s reliability.

Items such as O₃, O₄, O₉, O₂₂, and A₁₈: These items have significantly lower raw correlations compared to the other items. It may be useful to examine these items further to understand why they stand out.

Items with High Variance: Some items show higher variance in responses (indicated by a higher standard deviation), such as C₂₂ and O₂₃. These may also be worth a closer look.

Facets

Here are some observations and facets that, based on the rotation component matrix (RC₁, RC₂, etc.), show how different facets load on different components and may require closer examination:

- Impulsiveness: This facet loads negatively on RC₁ and strongly on RC₂ (-0.605), suggesting that it has a different dimensionality than other facets associated with neuroticism. It may be more related to another psychological dimension such as impulsive behavior or risk-taking.

- **SelfConsciousness:** This facet has a high negative load on RC₄ (-0.495), distinguishing it from other neuroticism facets. This could indicate that self-awareness or social anxiety may be different from general anxiety or depression.
- **Gregariousness:** This has a very high positive load on RC₅ (0.710), significantly distinguishing it from other extraversion facets. This could suggest that the desire to be social or comfortable in groups is a distinct quality from other aspects of extraversion.
- **Fantasy:** This shows a unique loading profile with a significant load on RC₃ (0.404) and a negative load on RC₂ (-0.503), suggesting that imaginative or daydreaming traits may be different from other openness aspects.
- **Values and Modesty:** These facets load negatively on several components, possibly indicating a distinctiveness from other facets they are meant to represent. “Values” shows a negative correlation with RC₂ (-0.397) and a positive load on RC₃, while “Modesty” has a high negative load on RC₄ (-0.567).
- **Order and Dutifulness:** These facets show a strong positive load on RC₂, which may indicate that they have more in common with each other than with other facets of conscientiousness.

Reliability if Item Deleted

The adjusted alpha values if individual items are deleted remain consistent and high, suggesting that there is no single item that significantly weakens the scale

Discussion

Interpretation of Results

Comparison with Psychometric Standards

The aspects that can be measured seem to meet the EFPA standards’ requirements. There is a need for essential validation studies with other tests to prove that the test measures the concepts it’s supposed to measure (primarily the Big Five factors), and predictive studies if the test is to be proven reliable in recruitment scenarios. Based on what has been shown so far, it is highly probable that this test will satisfy these criteria.

Primarily, we recommend that more questions are added. It is an unwritten rule that at least six questions are needed to ensure sufficient test quality.

Recommendations

Based on factor loadings, it’s worth examining the following questions:

- N₁₇ (“Often spoil myself”):

This question had a low loading on Neuroticism and higher loadings on other factors, suggesting it might not directly measure Neuroticism as other questions do. Instead, it might reflect aspects of self-discipline or impulsivity, which are typically more related to Conscientiousness.

- N₈ (“Am not easily annoyed”):

This question appears to have a lower loading on Neuroticism compared to other questions in the same category. It might be beneficial to consider whether this question truly captures the emotional instability represented by Neuroticism, or if it is more related to patience or anger, which can overlap with Agreeableness.

- E₉ (“Take charge”) and E₁₀ (“Try to lead others”):

These questions may seem like they measure aspects of leadership and dominance, which can be related to Extraversion, but they might also cross into territories of Conscientiousness (organization, responsibility) or

even Agreeableness (interaction in group situations). It is worth considering whether these questions focus more on the social or the energy-driven side of Extraversion.

- E19 (“Act wild and crazy”):

This question may capture aspects of spontaneity or impulsivity, which could be confused with Extraversion, but also may belong to Neuroticism (in terms of lack of emotional control) or even Openness (in terms of seeking new and different experiences).

- C22 (“Am always prepared”) and C23 (“Carry out my plans”):

While these questions seem to align well with Conscientiousness, if they show unexpected loadings or interactions with other dimensions, it might be worth examining more closely. They should clearly reflect organization and planning.

It is important to note that the context of each question and how it is understood by respondents can vary, so it may be valuable to consider gathering feedback from test participants or conducting qualitative studies to gain insights into how these questions are perceived. Furthermore, statistical analyses like exploratory and confirmatory factor analysis can provide further evidence on how these questions fit into the overall factor structure.

Standardization

A representative from TalEction has been interviewed about standardization. He has demonstrated sufficient expertise to assume that he understands how to perform standardization to convert to standardized scores.

Conclusion

TalEction, represented by Hans Petter Dramstad, has presented empirical data and statistical calculations regarding BIG-5 Details as implemented on the TalEction platform which, in my judgment, meet reasonable requirements for test quality based on best practices as formulated in EFPA’s Test Review Model (TRM) (Psychologists’ Associations (EFPA) 2023).

Attachments

Internal item codes

Intern Item Code	Text
N1	Worry about things
N2	Fear for the worst
N3	Am afraid of many things
N4	Get stressed out easily
N5	Get angry easily
N6	Get irritated easily
N7	Lose my temper
N8	Am not easily annoyed
N9	Often feel melancholic
N10	I feel unhappy with myself
N11	Am often down in the dumps
N12	Feel comfortable with myself
N13	Find it difficult to approach others
N14	Am afraid to draw attention to myself
N15	Only feel comfortable with friends
N16	Am not bothered by difficult social situations
N17	Often spoil myself
N18	Rarely overindulge
N19	Easily resist temptations
N20	Am able to control my cravings
N21	Panic easily
N22	Become overwhelmed by events
N23	Feel that I'm unable to deal with things
N24	Remain calm under pressure

Intern Item Code	Text
E1	Make friends easily
E2	Feel comfortable around people
E3	Avoid contacts with others
E4	Keep others at a distance
E5	Love large parties
E6	Talk to a lot of different people at parties
E7	Prefer to be alone
E8	Avoid crowds
E9	Take charge
E10	Try to lead others
E11	Take control of things
E12	Wait for others to lead the way
E13	Am always busy
E14	Am always on the go
E15	Do a lot in my spare time
E16	Like to take it easy
E17	Love excitement
E18	Seek adventure
E19	Enjoy being reckless
E20	Act wild and crazy
E21	Radiate joy
E22	Have a lot of fun
E23	Love life
E24	Look at the bright side of life

Intern Item Code	Text
O1	Have a vivid imagination
O2	Enjoy wild flights of fantasy
O3	Love to daydream
O4	Like to get lost in thought
O5	Believe in the importance of art
O6	See beauty in things that others might not notice
O7	Do not like poetry
O8	Do not enjoy going to art museums
O9	Experience my emotions intensely
O10	Feel others' emotions
O11	Rarely notice my emotional reactions
O12	Don't understand people who get emotional
O13	Prefer variety to routine
O14	Prefer to stick with things that I know
O15	Dislike changes
O16	Am attached to conventional ways
O17	Love to read challenging material
O18	Avoid philosophical discussions
O19	Have difficulty understanding abstract ideas
O20	Am not interested in theoretical discussions
O21	Tend to choose a liberal approach (values)
O22	Believe that there is no absolute right and wrong
O23	Tend to choose a conservative approach (values)
O24	Believe that we should be tough on crime

Intern Item Code	Text
A1	Trust others
A2	Believe that others have good intentions
A3	Trust what people say
A4	Distrust people
A5	Use others for my own ends
A6	Cheat to get ahead
A7	Take advantage of others
A8	Obstruct others' plans
A9	Am concerned about others
A10	Love to help others
A11	Am indifferent to the feelings of others
A12	Take no time for others
A13	Love a good fight
A14	Yell at people
A15	Insult people
A16	Get back at others
A17	Believe that I am better than others
A18	Think highly of myself
A19	Have a high opinion of myself
A20	Boast about my virtues
A21	Sympathize with the homeless
A22	Feel sympathy for those who are worse off than myself
A23	Am not interested in other people's problems
A24	Try not to think about the needy

Intern Item Code	Text
C1	Complete tasks successfully
C2	Excel in what I do
C3	Handle tasks smoothly
C4	Know how to get things done
C5	Like to tidy up
C6	Often forget to put things back in their proper place
C7	Leave a mess in my room
C8	Leave my belongings around
C9	Keep my promises
C10	Tell the truth
C11	Break rules
C12	Break my promises
C13	Do more than what's expected of me
C14	Work hard
C15	Put little time and effort into my work
C16	Do just enough work to get by
C17	Am always prepared
C18	Carry out my plans
C19	Waste my time
C20	Have difficulty starting tasks
C21	Jump into things without thinking
C22	Make to fast decisions
C23	Rush into things
C24	Act without thinking

References

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