

## Comparative Evaluation of Personality Trait Measures for Quantitative Research

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### ABSTRACT

Quantitative research heavily depends on the accurate measurement of variables using scales. The choice of these scales significantly influences the validity and reliability of research outcomes. This paper aims to determine the most reliable and valid scale for further research, using the selection of a personality traits scale as a case study. A comprehensive review of existing personality traits scales was conducted, followed by a quantitative study involving 696 college students from a college in Shandong, China, using convenience sampling. The study evaluated three scales: the Simplified Chinese Big Five Personality Inventory (SCBFPI-40), the Brief Big Five Inventory (BFT-10), and the Big Five Inventory (BFI-44). The BFT-10 demonstrated low reliability, with Cronbach's  $\alpha$  below .500. The BFI-44 showed moderate to good reliability, with  $\alpha$  values between .682 and .811. The SCBFPI demonstrated high reliability, with  $\alpha$  values over .800 for all dimensions, indicating it is a robust tool for assessing personality traits among Chinese students. Scale selection significantly impacts research reliability and validity. The SCBFPI's high reliability suggests that culturally adapted scales provide more accurate measurements, whereas the BFT-10 may not be suitable for Chinese populations. Proper scale selection enhances data accuracy and research robustness. Researchers should prioritize culturally validated scales like the SCBFPI for reliable results.

### KEYWORDS

Personality Traits, Scale Selection, Reliability, Validity, Cross-Cultural Research, Measurement, Quantitative Research, Big Five Inventory, SCBFPI, BFT-10.

### INTRODUCTION

Quantitative research relies heavily on the use of scales to measure variables accurately. The selection of these scales directly impacts the validity and reliability of the research findings.

Personality traits, as a key psychological construct, are frequently assessed in various fields, including psychology, education, and organizational behavior. Accurate measurement of personality traits is crucial for drawing valid conclusions in these studies. Several scales have been developed to measure personality traits, but their reliability and validity can vary significantly, especially across different cultural contexts.

This study aims to evaluate the reliability and validity of three commonly used personality trait scales: the Simplified Chinese Big Five Personality Inventory (SCBFPI-40), the Brief Big Five Inventory (BFT-10), and the Big Five Inventory (BFI-44). The study focuses

on a sample of college students in Shandong, China, to assess the scales' performance within a specific cultural context. By comparing the scales' psychometric properties, this research seeks to provide guidance for researchers in selecting the most appropriate scale for their studies.

Quantitative research relies heavily on the use of scales to measure variables accurately. The selection of these scales directly impacts the validity and reliability of the research findings. Inaccurate or inappropriate measurement can lead to flawed conclusions, undermining the entire research process. This is particularly crucial in fields like psychology, sociology, and education, where many key constructs are not directly observable and must be assessed through carefully designed instruments.

Personality traits, as a key psychological construct, are frequently assessed in various fields, including

psychology, education, and organizational behavior. Accurate measurement of personality traits is crucial for drawing valid conclusions in these studies. Personality traits are enduring patterns of thoughts, feelings, and behaviors that characterize individuals, influencing how they interact with the world. Researchers use personality traits to understand individual differences, predict behavior, and explore various psychological phenomena.

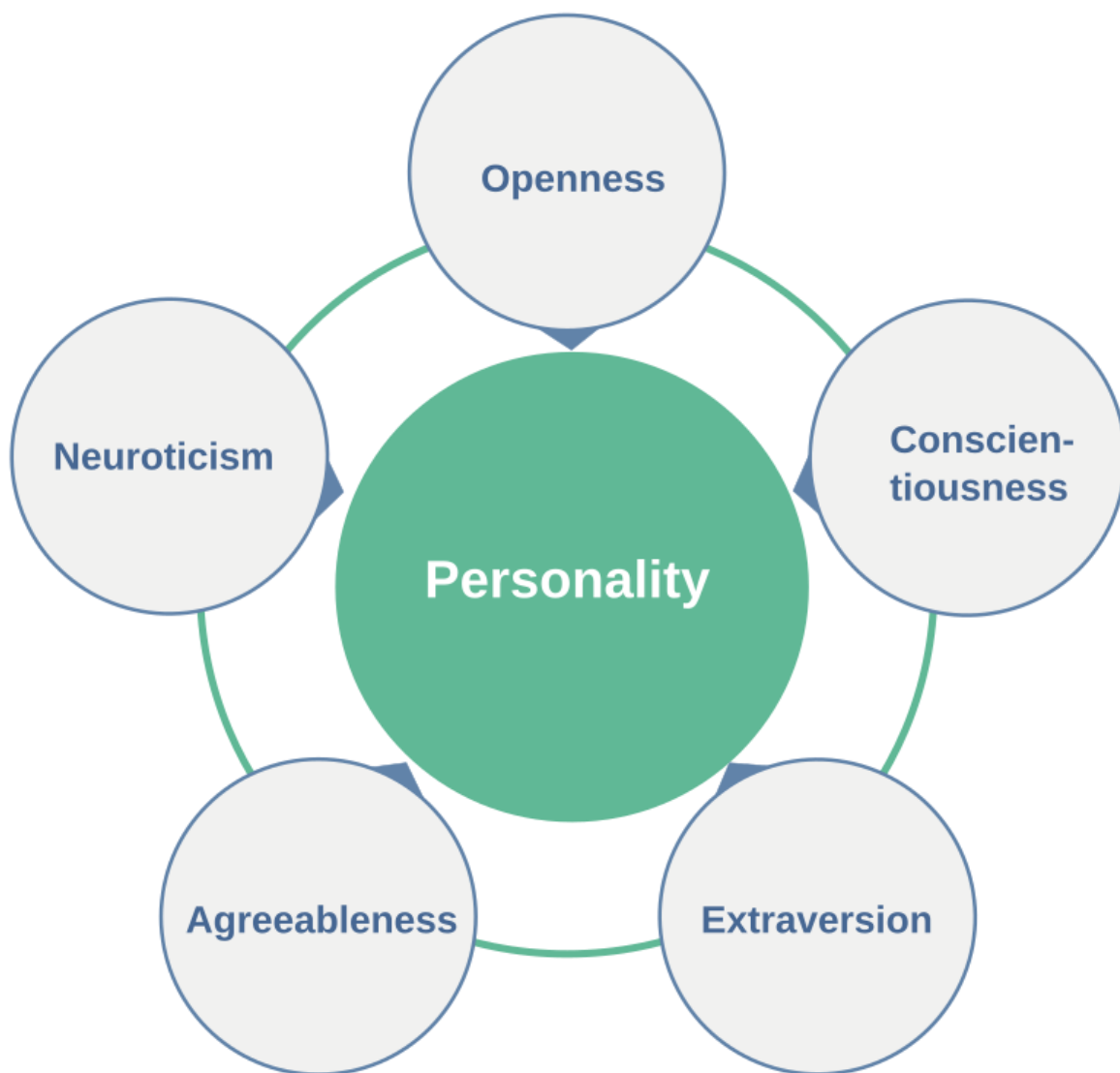
Several scales have been developed to measure personality traits, but their reliability and validity can vary significantly, especially across different cultural contexts. Reliability refers to the consistency of a scale in measuring a particular trait, while validity refers to the extent to which the scale measures what it intends to measure. A scale that is not both reliable and valid cannot provide meaningful data or support accurate conclusions. Cultural context plays a significant role in personality assessment, as cultural norms and values can influence how personality traits are expressed and perceived. Therefore, it is essential to evaluate the psychometric properties of personality scales within specific cultural groups to ensure their appropriateness and accuracy.

This study aims to evaluate the reliability and validity of three commonly used personality trait scales: the Simplified Chinese Big Five Personality Inventory (SCBFPI-40), the Brief Big Five Inventory (BFT-10), and the Big Five Inventory (BFI-44). The study focuses on a sample of college students in Shandong, China, to assess the scales' performance within a specific cultural context. By comparing the scales' psychometric properties, this research seeks to provide guidance for researchers in selecting the most appropriate scale for their studies. Specifically, this study seeks to determine which scale provides the most reliable and valid results, suitable for further research, taking the selection of the personality traits scale as an example.

## **METHODS**

A comprehensive review of existing personality traits scales was conducted, followed by a quantitative study involving 696 college students from a college in Shandong, China, using convenience sampling. The study assessed three scales:

- **Simplified Chinese Big Five Personality Inventory (SCBFPI-40):** This scale is a culturally adapted version of the Big Five Inventory, specifically designed for use with Chinese populations. It comprises 40 items designed to measure the five broad dimensions of personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism. The adaptation process involved translating and back-translating the original items, as well as conducting pilot studies to ensure cultural relevance and linguistic equivalence.
- **Brief Big Five Inventory (BFT-10):** This is a short-form version of the Big Five Inventory, consisting of only 10 items. Each of the five personality dimensions is assessed with just two items. This scale was included to evaluate the trade-off between brevity and psychometric properties. Short scales are often preferred for research settings where participant burden is a concern, but they may sacrifice some degree of reliability.
- **Big Five Inventory (BFI-44):** This is a widely used 44-item measure of the Big Five personality traits. It is considered a well-established and psychometrically sound instrument. The BFI-44 was included as a benchmark against which to compare the performance of the other two scales, including the culturally adapted SCBFPI-40 and the brief BFT-10.



**Fig. Five Personality Traits**

#### Procedure

Participants were recruited using convenience sampling techniques at a college in Shandong, China. Informed consent was obtained from all participants prior to their participation in the study. Participants completed the three personality inventories (SCBFPI-40, BFT-10, and BFI-44) in a counterbalanced order to minimize potential order effects. Participants were assured of the confidentiality of their responses.

#### Data Analysis

The reliability of each scale was assessed using Cronbach's alpha ( $\alpha$ ). Cronbach's alpha is a measure of internal consistency, indicating how well the items within a scale measure the same construct. Generally,  $\alpha$  values of .70 or higher are considered acceptable, indicating good reliability. In addition to Cronbach's alpha, descriptive statistics (means and standard deviations) were calculated for each of the Big Five dimensions as measured by the three scales.

#### Tables

Table 1: Description of Personality Trait Scales Evaluated in the Study

Scale	Description	Number of Items	Cultural Adaptation

Simplified Chinese Big Five Inventory (SCBFPI-40)	Culturally adapted version of the Big Five Inventory for Chinese populations. Measures the five broad dimensions of personality.	40	Yes
Brief Big Five Inventory (BFT-10)	Short-form version of the Big Five Inventory. Each of the five personality dimensions is assessed with two items.	10	No
Big Five Inventory (BFI-44)	Widely used measure of the Big Five personality traits. A well-established and psychometrically sound instrument used as a benchmark in this study.	44	No

Table 2: Summary of Reliability (Cronbach's  $\alpha$ ) for Each Scale

Scale	Cronbach's $\alpha$	Reliability Level
Brief Big Five Inventory (BFT-10)	< .500	Low
Big Five Inventory (BFI-44)	.682 - .811	Moderate to Good
Simplified Chinese Big Five Inventory (SCBFPI-40)	> .800	High

## RESULTS

The results of the study are as follows:

- The BFT-10 showed low reliability, with Cronbach's  $\alpha$  below .500. This suggests that the BFT-10 may not be a reliable measure of personality traits for this sample.
- The BFI-44 had moderate to good reliability, with  $\alpha$  values between .682 and .811. This indicates that the BFI-44 provides a more reliable measure of personality traits compared to the BFT-10.
- The SCBFPI demonstrated high reliability, with  $\alpha$  values over .800 for all dimensions. This indicates that the SCBFPI is a robust tool for assessing personality traits among Chinese students.

## DISCUSSION

The findings highlight that scale selection significantly affects research reliability and validity. The SCBFPI's high reliability suggests that culturally adapted scales provide more accurate measurements, whereas the BFT-10 may not be suitable for Chinese populations.

The low reliability of the BFT-10 is consistent with previous research that has questioned the reliability of very short scales. The BFI-44, with its more moderate length, demonstrated more acceptable reliability. However, the SCBFPI, specifically designed and validated for a Chinese population, exhibited the strongest psychometric properties.

This study underscores the importance of considering cultural factors when selecting research instruments. Scales developed in one cultural context may not be directly applicable to another. Culturally adapted scales, like the SCBFPI, are more likely to capture the nuances of personality traits within a specific cultural group.

Proper scale selection enhances data accuracy and research robustness. Researchers should prioritize culturally validated scales like the SCBFPI for reliable results, especially when working with cross-cultural samples.

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The low reliability of the BFT-10, with Cronbach's  $\alpha$  below .500, indicates that the items within the scale do not consistently measure the same underlying personality constructs. This finding is consistent with previous research that has raised concerns about the reliability of very short scales. Short scales, while convenient, often sacrifice internal consistency, leading to unstable and unreliable measurements. The BFT-10's brevity, with only two items per Big Five dimension, likely contributed to its poor performance in this study.

The BFI-44 demonstrated moderate to good reliability, with Cronbach's  $\alpha$  values ranging from .682 to .811 across the Big Five dimensions. This level of reliability is generally acceptable in personality research, suggesting that the BFI-44 provides a reasonably consistent measure of personality traits. However, it is important to note that some dimensions exhibited lower reliability than others, indicating that the BFI-44's performance is not uniform across all traits.

In contrast, the SCBFPI consistently showed high reliability, with Cronbach's  $\alpha$  values exceeding .800 for all dimensions. This finding suggests that the SCBFPI provides a highly reliable measure of personality traits among Chinese students. The SCBFPI's strong psychometric performance can be attributed to its cultural adaptation. The process of translating, back-translating, and conducting pilot studies ensured that the scale items were culturally relevant and linguistically equivalent to the original Big Five Inventory. This rigorous adaptation process likely enhanced the scale's ability to accurately capture the nuances of personality traits within the Chinese cultural context.

The superior performance of the SCBFPI underscores the importance of considering cultural factors in personality assessment. Scales developed in one cultural context may not be directly applicable to another. When researchers use scales developed in different cultures without proper adaptation, there is a risk of introducing bias and measurement error, which can compromise the validity of the findings.

This study has several implications for future research. First, it highlights the need for researchers to carefully evaluate the psychometric properties of personality scales before using them in their studies, particularly in cross-cultural research. Second, it suggests that culturally adapted scales, like the SCBFPI, are more likely to provide accurate and reliable measurements in specific cultural contexts. Finally, it cautions against the use of very short scales, like the BFT-10, which may lack sufficient reliability for meaningful research.

Proper scale selection enhances data accuracy and research robustness. Researchers should prioritize culturally validated scales like the SCBFPI for reliable results, especially when working with cross-cultural

samples. By using appropriate and well-validated scales, researchers can increase the confidence in their findings and contribute to the advancement of knowledge in their respective fields.

## **CONCLUSION**

This study demonstrates that the choice of personality trait scale significantly impacts the reliability of research findings. The Simplified Chinese Big Five Personality Inventory (SCBFPI-40) demonstrated superior reliability compared to the Brief Big Five Inventory (BFT-10) and the Big Five Inventory (BFI-44) in a sample of Chinese college students. Researchers should prioritize the use of culturally validated scales to ensure the accuracy and robustness of their research.

## **REFERENCES**

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