

The Development and Validity of the Interpersonal Intelligence Inventory (2022)

James Christian Espayos¹, Jecily Juliana E. Escorpiso², Ralph Randel R. Rivera³

¹ christianespayos@gmail.com

¹Laguna College of Business and Arts, Calamba City, Laguna, 4027, Philippines

²Laguna College of Business and Arts, Calamba City, Laguna, 4027, Philippines

³Laguna State Polytechnic University, Santa Cruz, Laguna, 4009, Philippines

Abstract

This study aims to investigate and develop a self-report inventory that will measure a person's tendency to develop interpersonal intelligence based on Howard Gardner. The said inventory consisted of a 16-item, four-point forced choice Likert scale with a verbal interpretation that ranged from "Describes me very well" (4) to "Describes me extremely poorly" (1). The inventory was administered to a total of 133 respondents for pilot testing and 375 as the normative sample. The majority of the respondents were in the age range of 18–24 years old (54%), had bachelor's degrees (61%), were female (66%), and had single status (77%). Based on the results, it was found that the self-reported inventory is reliable with a Cronbach's alpha of .89 and an inter-item correlation ranging from .37-.69, which both are acceptable. In terms of validity, the self-reported inventory underwent content and construct validity. The construct validity was assessed through Principal Component Analysis using promax rotation. The KMO index was .90, which is said to be in an acceptable range. Likewise, with the Bartlett's Test of Sphericity, it is statistically significant to conduct principal component analysis $X^2(120) = 2112.92, p < 0.001$. Confirmatory factor analysis was also found to be acceptable, giving the idea that the inventory is suitable for the model. Using a content validity index, the 16 items showed an S-CVI/UA index of "1", which is suggested to be excellent. Data was also observed to have a normal distribution. Recommendations were made to further improve the self-report inventory.

Keywords: Multiple Intelligences; Interpersonal Intelligence; Self-report inventory

1. Introduction

From the singular measure of IQ of Alfred Binet and Spearman to the multiple factors or components of Thurstone's (1960) and Guildford's (1967) theories (Tirri & Nokelainen, 2011), defining intelligence has been in flux. In *Frames of Mind* (Gardner, 1993), Howard Gardner posits his own theory in the same plural vein: Multiple Intelligences. However, his theory was not merely based on psychometrics. Gardner drew from researchers from fields outside psychology (i.e., anthropology and sociology) (Gardner, 1993 as cited in Tirri & Nokelainen, 2011; Gardner, 2020). This is not to say that his theory is not backed by psychometrics. In fact, statistical analysis of intelligence shows that it is actually not just a single factor (Gardner, 1999 as cited in Gardner, 2020).

He believes that intelligence is the "biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (Gardner, 1999). He further discusses that the products created must lay the foundations for producing new knowledge (Gardner, 1993 as cited in Gardner, 2020).

Gardner further explains his idea of intelligence. He believes that all humans have all these intelligences and that each combination of these intelligences is unique to every individual. This is not to say that all individuals will see the growth of all their intelligence. Again, the environment of the individual determines which intelligence he or she has the chance to hone (Gardner, 2020).

1.1. *Howard Gardner's Theory of Multiple Intelligences*

These multiple intelligences that Gardner considered were analyzed through four different lenses, each lens having two criteria (Gardner, 1999). From the biological science lens, the criteria are (1) the potential for isolation by brain damage and (2) an evolutionary history and evolutionary plausibility. From the logical analysis lens, there is (3) an identifiable core operation or set of operations and (4) a susceptibility to encoding in a symbol system. From the lens of developmental psychology, we see (5) a distinct developmental history, along with a definable set of expert "end-state" performances, and (6) the existence of prodigies and other exceptional people. Finally, from the lens of traditional psychological research, there is (7) support from experimental psychology tasks and (8) support from psychometric findings (Gardner, 1999; Davis, Christodoulou, Seider, & Gardner, n.d.).

The different intelligences that met Gardner's criteria are as follows: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal (Gardner, 1993 as cited in Tirri & Nokelainen, 2011).

1.2. *Howard Gardner's Interpersonal Intelligence*

In *Frames of Mind* (1993), Gardner dedicated one chapter called "Personal Intelligence," wherein he discusses interpersonal intelligence and intrapersonal intelligence. Interpersonal intelligence is defined by the capacity to identify and understand another person's moods, motivations, intentions, and desires (Davis, Christodoulou, Seider, & Gardner, n.d.).

After the publication of *Frames of Mind* (1993) by Howard Gardner and *Emotional Intelligence* (1995) by Daniel Goleman, many other definitions of interpersonal intelligence were made. These were mostly operationalized in the context of informing education policies and teaching techniques. In these cases, they do not necessarily subscribe to Gardner's or Goleman's theories on intelligence, interpersonal intelligence, and emotional intelligence.

Some of these definitions are "ability to understand and make differences in moods, intentions, motivations, and feelings towards others" (Sjioni & Sujiono, 2010 as cited in Dien & Wustqa, 2018), being able to "relate to other people, express and capture the mood, goals, motivation, and feelings of others" (Sudarsana, 2018 as cited in Dien & Wustqa, 2018), the ability to "understand and communicate with others, see differences in mood, temperament, motivation, and abilities (Oviyanti, 2017 as cited in Dien & Wustqa, 2018).

The above definitions are conceptually very similar to Howard Gardner's definition of interpersonal intelligence. However, perhaps by the nature of the studies, they do not have a wider theoretical basis that could describe interpersonal intelligence outside of the educational context.

2. **Methodology**

2.1 *Development of the Interpersonal Intelligence Inventory*

The researchers wanted to create a self-report inventory that could evaluate Howard Gardner's interpersonal intelligence. Taking into account the nature of this intelligence, the researchers generated 60 items, which were then validated by two experts. The 53 items with the rating of "essential" were used in a pilot study of 133 respondents. The items that obtained an inter-item correlation of above .40 were included in the final scale that were subject to further evaluation. Eventually, the 16 items with the highest inter-item correlations were used to create the scale.

Each item is a sentence that intends to measure the individual's interpersonal intelligence. The respondents must indicate their responses using a four-point forced choice Likert scale with a verbal description from "Describes me very poorly" (1) to "Describe me very well" (4).

2.2 *Participants*

A total of 508 respondents participated in the study. A total of 133 respondents were part of the pilot sample, while 375 respondents were part of the normative sample. The 375 participants were between 18 and 24 years old (54%); 25–34 years old (29%); 35–44 years old (12%); and 45–54 years old (5%). The educational attainment of the respondents was high school diploma, including SHS students (26%);

associate's degree (3%); bachelor's degree (61%); and postgraduate degree (10%). In terms of gender, the respondents were composed of males (32%), females (66%), and those who preferred not to say (2%). In terms of marital status, it was composed of single (77%), married (22%), and separated (1%).

2.3 Procedure

The researchers used a variety of strategies to gather sample data for the study. The scale was mainly published through Google Forms and spread online through different social media. The most common method was sending the Google Form to friends and colleagues. The scale was also posted on different Facebook groups and Reddit boards. To gather enough respondents for the study, the collection of data happened between May 23rd and June 30th, 2022. The total number of respondents in the normative sample group was 375.

3. Results and Discussion

3.1 Reliability of Interpersonal Intelligence Scale-2022

The researcher used Cronbach's Alpha (α) to analyze the internal consistency of the IIS-2022. According to Kaplan and Saccuzzo (2009, p. 115), it is the most general method of finding estimates of reliability through internal consistency. Based on the result, the total alpha value of the scale is 0.89. The item-rest correlation was also analyzed by the researchers. Items in the IIS-2022 showed values that ranged from .37 to .69. According to Hair and his colleagues (2003), the idea that inter-item correlation should be between 0.3 and 0.9. (see Table 1).

Table 1. Item-Rest Correlation

Item	Correlation Coefficient
Q1	.37
Q2	.40
Q3	.60
Q4	.66
Q5	.50
Q6	.46
Q7	.55
Q8	.58
Q9	.61
Q10	.62
Q11	.65
Q12	.69
Q13	.37
Q14	.52
Q15	.38
Q16	.64

3.2 Validity of Interpersonal Intelligence Scale-2022

Validity was systematically assessed and maintained during the development of the research instrument. The construct validity was assessed through Principal Component Analysis using promax rotation. The Kaiser-Meyer-Olkin Test of Sampling Adequacy was applied to the fitness of data for factor analysis. Based on the result, the KMO index was .90. To further validate the result, according to Kaiser and Rice (1974), an index with a value of .90 and above is considered "marvelous." As for the Bartlett's Test of

Sphericity, it also shows that it is statistically significant to conduct principal component analysis $X^2(120) = 2112.92, p < 0.001$.

Confirmatory Factor Analysis was used to assess the construct validity of the scale and verify the factors extracted initially. Based on the analysis, it was found that the Comparative-Fit Index (CFI) value is 0.85. The CFI produces values ranging from 0 to 1, with high values indicating a good fit (Schermelleh-Engel and Moosbrugger, 2003).

The Tucker-Lewis Index (TLI) showed a value of .82. The larger the value of TLI, the better fit for the factor. TLI is not required to be between 0 and 1 because it is non-standard. The main benefit of this fit index is that it is unaffected by sample size (Schermelleh-Engel and Moosbrugger, 2003; Ding et al., 1995; Gerbing & Anderson, 1992).

The Standardized Root Mean Square Residual (SRMR) showed a value of .06. The SRMR (standardized root mean square residual) showed a value of .06 which is close to the cutoff value to indicate good model fit (Hu and Bentler, 1999). The Root Mean Square Error of Approximation (RMSEA) showed a value of .09. According to Fabrigar, Wegener, MacCallum, and Strahan (1999), values that are between .08 and 0.1 can be considered marginal.

Using a content validity index, the 16 items showed an S-CVI/UA index of "1." According to Shi, et. al. (2012), a S-CVI/UA value of 0.8 and 0.9 or higher is considered excellent.

3.3 Normality of Interpersonal Intelligence Scale-2022

The Shapiro-Wilk test was used by the researchers to analyze whether the data from the normative sample was normally distributed. Based on the analysis, at 0.05 alpha level, the scores were indeed normally distributed, $W(375) = 0.992, p = 0.051$. According to Mishra et al. (2019), the null hypothesis stating that the data were normally distributed must be accepted if the p value is greater than 0.050.

4. Recommendations

Given the preceding data, findings and analysis, the researchers propose the following recommendation:

- Generate other tools to measure Gardner's interpersonal intelligence. E.g. simulation activities, behavior observation forms, among others.
- Test convergent validity of the tool by comparing it to other standardized tests that measure the same construct.
- Improve the model fit indices by deleting items that have poor factor loading.
- Explore the possible personality manifestations based on the results of the test-takers.

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