

Research Article

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“Ascertaining Concurrent Validity & Reliability of ‘Multiple Intelligence Level Scale’ to trace Multiple Intelligence Level of subjects”

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Abstract

Keywords

- * Multiple Intelligence Level
- *Dominant Thinking Pattern
- *Scale

Educational planning is the examination of many feasible alternatives, then making a choice among them according to an objective. Education is an essential tool for everyone to get success in life and earn respect and recognition. Education plays great role in everyone's life as it brings positive effects on the human life. A sound education system equipped with innovative techniques and methods of teaching, learning and research as well as having all-encompassing knowledge centers, learned and energetic academicians and adequate infrastructure is a pre requisite for the overall development of any nation. The in-hand survey was conducted with an objective to re-confirm and re-establish the concurrent validity and reliability of the numerical value of Multiple Intelligences as assessed through the standardized Multiple Intelligence Level Scale (MILS) purely based on the Howard Gardner's theory of Multiple Intelligences. Gardner argues that a contrasting set of assumptions is more likely to be educationally effective. Students learn in ways that are identifiably distinctive. The broad spectrum of students - and perhaps the society as a whole - would be better served if disciplines could be presented. The research was conducted in and around Chandigarh. The sample consisted of 120 school going students between 7-16 years of age from different schools. Random sampling was followed. It was established through results that the Scale is valid and reliable measure to find out the multiple intelligence levels and dominant thinking pattern of the subjects.

1. Introduction

Howard Gardner's Multiple Intelligence Theory was first published in Howard Gardner's book, *Frames Of Mind* (1983), and quickly became established as a classical model by which to understand and teach many aspects of human intelligence, learning style, personality and behaviour - in education and industry. Howard Gardner initially developed his ideas and theory on multiple

intelligences as a contribution to psychology, however Gardner's theory was soon embraced by education, teaching and training communities, for whom the appeal was immediate and irresistible - a sure sign that Gardner had created a classic reference work and learning model. Howard Gardner was born in Scranton, Pennsylvania USA in 1943 to German Jewish immigrant parents, and

entered Harvard in 1961, where, after Gardner's shift from history into social relations (which included psychology, sociology, and anthropology) he met his early mentor Erik Erikson. Later Gardner was also influenced by psychologists Jeane Piaget, Jerome Bruner, and philosopher Nelson Goodman, with whom Gardner co-founded 'Project Zero' in 1967 (focusing on studies of artistic thought and creativity). Project Zero's 1970's 'Project on Human Potential', whose heady aim was to address 'the state of scientific knowledge concerning human potential and its realization', seems to have been the platform from which Gardner's multiple intelligences ideas grew, and were subsequently published in Gardner's *Frames Of Mind* 1983 book. A wonderful example of 'thinking big' if ever there was one. Gardner's theory of multiple intelligences builds on a concept of an "intelligence", which he defines as "the ability to solve problems, or to create products, that are valued within one or more cultural settings" (Gardner, 1993, p. x). In his latest work *Howard Gardner* (2006, p.50) also views the intelligences as "raw, biological potentials, which can be seen in pure form only in individuals who are, in the technical sense, freaks". He lists seven intelligences (IQ) that meet his criteria for intelligence. These intelligences are (1) Linguistic, (2) Logical mathematical, (3) Musical, (4) Spatial, (5), Bodily-kinesthetic, (6) Interpersonal and (7) Intrapersonal (Gardner, 1983, p. xi). The first version of MIPQ operationalized these seven intelligences and validated their psychometric properties with an empirical sample of Finnish University students (Tirri et al., 2002, 2003). Tirri and Komulainen (2002) operationalized Linguistic intelligence dimension to include both verbal and written expressions. It was assumed that people whose intelligence profile includes a strong linguistic component would give themselves high ratings on learning and entertaining themselves with words and verbal games. The factor scores weights revealed that linguistic intelligence consists of two different components. The first one, "Academic verbalness", measured self-perception on verbal learning ("Metaphors and vivid verbal expressions help me learn efficiently" and "At school studies in native language or social studies were easier for me than mathematics, physics and chemistry"). The other component of linguistic intelligence consisted of items that measured "Everyday verbalness". The highest loading variables included the following items "I am good at entertaining myself and others with wordplay and jokes" and "It is easy for me to play with word games, for example crossword puzzles"). The reliability of the scale was reasonable ($\alpha = .64$). Logical-mathematical intelligence consisted of items that measured both persons' perceptions on their mathematical ability and

on logical thinking skills (Tirri & Komulainen, 2002). This intelligence had two components as well. The highest loading items, "At school I was good at mathematics, physics or chemistry", "Mental arithmetic is easy for me", and "I am good at games and problem-solving which require logical thinking", measured problem solving in academic contexts. The component was named "Academic problem-solving". The other component, "Systematic and logical thinking", included items that measured analytical, logical and systematic thinking in general. The highest loading variables included the following items: "I tend to look for consistency, models and logical series in things", "I can easily measure, classify, analyze or calculate things", "I want to present things as logically as possible and give reasons for them" and "I easily notice lapses of logic in other people's everyday speech or actions". The reliability of the scale was good ($\alpha = .76$). (Tirri & Komulainen, 2002; Tirri et al., 2002, 2003.) According to Tirri and her colleagues (2002, 2003), Musical intelligence was the most reliable and homogeneous of all the Gardnerian scales ($\alpha = .93$). The ten items of the scale measured musical ability of hearing and producing music. The highest loading variables were the items "When listening to music, I am able to discern instruments or recognize melodies" and "I notice immediately if a melody is out of tune". Spatial intelligence measured persons' views on his/her abilities to visualize and work with multidimensional objects. This intelligence consisted of two components. One of them dealt with visual imaging and the other with spatial perception. The highest factor score weights on the component measuring visual imaging included the following items: "When I think, I can see clear visual images in my mind", "I am able to see objects or events that I would like to document on camera or video", and "I'm good at drawing and designing various kinds of figures". The highest factor score weights measuring spatial perception included the items: "It is easy for me to conceptualize complex and multidimensional patterns", "I can easily imagine how a landscape looks from a bird's-eye view", and "At school, geometry and various kinds of assignments involving spatial perception were easier for me than solving equations". The reliability of the scale was good ($\alpha = .73$). (Tirri & Komulainen, 2002.)

Bodily-kinesthetic intelligence was operationalized to include items measuring persons' views on their abilities related to working with hands and coordinating their bodies. This scale consisted of two components, as well. The "Handyman" component included the following items: "I am handy", "I was good at handicrafts at school", and "I can easily do something concrete with my

hands (e.g. knitting and woodwork). The other component was named “Body coordination”, because it included items related to coordination skills. The following items had high scores in this component: “I am very good at tasks that require good coordination” and “I have good coordination”. The reliability of the scale was good(= .74). (Tirri & Komulainen, 2002.) Interpersonal intelligence was the second most homogeneous of the Gardnerian scales (Alpha .82). The items measured persons’ perceptions of his/her abilities to social relations. The highest factor weights were on the items “I make contact easily with other people” and “I get along easily with different types of people”. (Tirri & Komulainen, 2002.) Intrapersonal intelligence consisted of two components. The “Self-reflection” component measured persons’ views on their ability to reflect on important issues in life and deep psychological and philosophical issues. The highest scoring factor weights were on items “I spend time regularly reflecting on the important issues in life”, “I like to read psychological or philosophical literature to increase my self-knowledge”, and “I keep a diary or note down happenings of my inner life”. The other component “Self-knowledge”, dealt with issues concerning individuals’ ability to analyze themselves and the courage to express their own opinions. The highest scoring items were, “I am able to analyze my own motives and ways of action”, “I have opinions of my own and dare to disagree with others”, and “I can handle the emotions caused by serious setbacks”. The reliability of the scale was good(= .70). (Tirri & Komulainen, 2002.) Gardner bases his MI theory upon neurological, evolutionary, and cross-cultural evidence (Gardner, 1983, p. xii). In the first edition of his MI theory, over twenty years ago, Gardner adopted a very individualistic point of view in exploring various intelligences(Gardner, 1983). In his newest edition of the MI theory, Gardner emphasizes more cultural and contextual factors in the development of seven intelligences (Gardner, 1999). Gardner has retained the original seven intelligences presented earlier, but he acknowledges the possibility of adding new intelligences to the list. He has worked on naturalistic, spiritual and existential intelligences to be included in his list of multiple intelligences. The second version, MIPQ II, included Spiritual intelligence as its eighth dimension.

2. Method

The research was conducted in and around Chandigarh. The sample for the pilot study consisted

of 120 school going students between 7-16 years of age from different schools. The MILS was developed after thorough research and collecting data from over 500 respondents. The initial format of the Scale contained 135 items, with 15 items in each of the nine categories. As the study advanced, the final format of the MILS contains 90 items, with 15 items in each of the nine categories. Each category consists of the statements related to a specific intelligence. The respondents had to tick the statement/statements that they feel or think is appropriate to their personality/character/behavior. The current MILS as developed by the researcher was termed as Test-1. The Test-2 refers to an already developed and widely used scale containing 9 intelligences, the Multiple Intelligence Scale at www.achieve-goal-setting-success.com The tests were administered on all the respondents as per the set schedule. The MILS-Test-1 was re-administered after 30 days. The results were then compared and analyzed.

2.1 Participants

Random sampling was undertaken to select subjects both males as well as females from different schools aging between 7-16 years. The sample was divided into four groups.

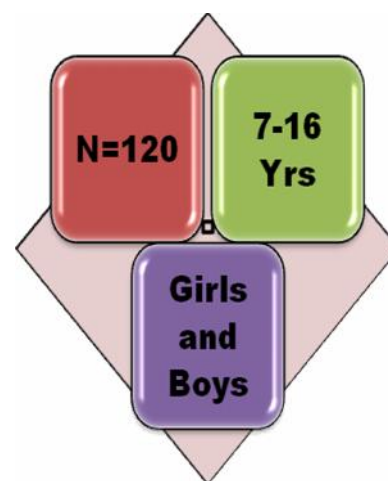


Fig.1 Sampling

2.2 Stages of study

Rapport was built with the subjects. The study was conducted in four stages.

(Day-1) Multiple Intelligence Level –Scale 1 (Test-T-1) was administered.

(Day-5) Multiple Intelligence Level –Scale 2 (Test-T-2) was administered.

(Day-31) Multiple Intelligence Level –Scale 1 (Test-T-1) was re-administered.

2.3 Phases of analysis

Phase-1 Results of Test-1 and Test-2 were analysed.

Phase-2 Results of Test-1(Day-1) and Re-Test-1(Day-31) were analysed.

2.3 Statistical analysis

Once the data was obtained, it was coded, tabulated and analyzed, keeping in mind the objectives of the study. Appropriate statistical tools were used to draw meaningful inferences.

3. Results

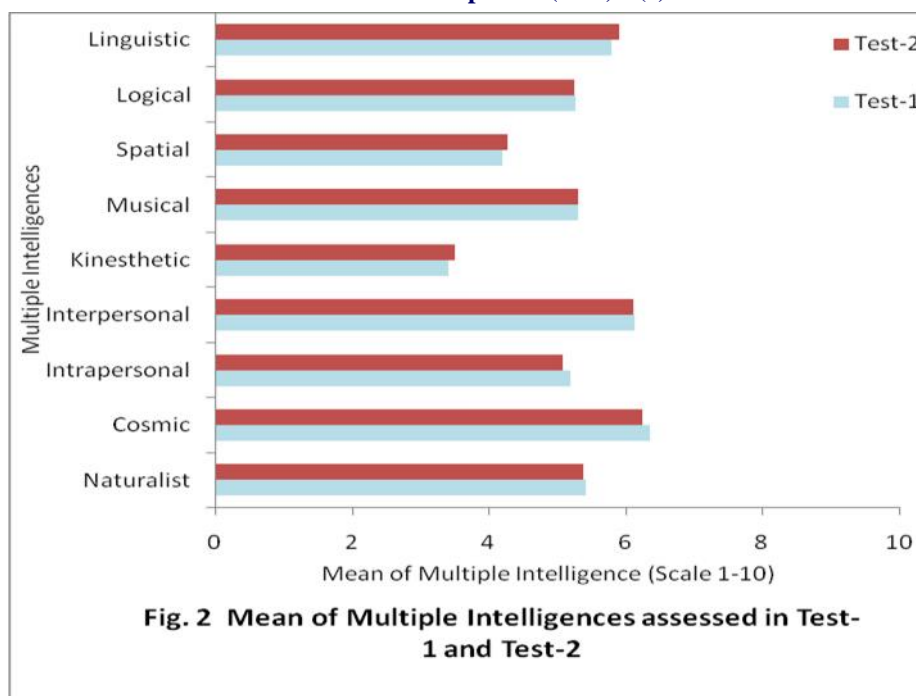
Comparing results of Test-1 and Test-2

Table 1: Mean of Multiple Intelligences assessed in Test-1 and Test-2

	Naturalist	Cosmic	Intrapersonal	Interpersonal	Kinesthetic	Musical	Spatial	Logical	Linguistic
Test-1	5.42	5.46	5.2	6.14	3.41	5.3	4.2	6.27	6.38
Test-2	5.38	6.24	5.09	6.12	3.5	5.3	4.28	6.26	6.54

Table 2: Mean, Standard deviation, standard error and t-values of MIL assessed in Test-1 and Test-2

		Mean	SD	SEM	t-value	Lev of Sig.
Naturalist	Test-1	5.42	1.25	0.11	0.2632	Not statistically significant
	Test-2	5.38	1.10	0.10		
Cosmic	Test-1	5.46	1.45	0.132	1.2718	Not statistically significant
	Test-2	5.24	1.22	0.111		
Intrapersonal	Test-1	5.2	0.65	0.059	1.5352	Not statistically significant
	Test-2	5.09	0.44	0.04		
Interpersonal	Test-1	6.14	1.10	0.1	0.1755	Not statistically significant
	Test-2	6.12	0.59	0.05		
Kinesthetic	Test-1	3.41	0.58	0.052	0.573	Not statistically significant
	Test-2	3.5	1.62	0.147		
Musical	Test-1	5.3	1.03	0.094	0.5848	Not statistically significant
	Test-2	5.24	0.45	0.041		
Spatial	Test-1	4.2	0.84	0.07	0.8251	Not statistically significant
	Test-2	4.28	0.65	0.059		
Logical	Test-1	6.27	0.41	0.037	0.23	Not statistically significant
	Test-2	6.26	0.24	0.02		
Linguistic	Test-1	6.38	0.65	0.059	1.3557	Not statistically significant
	Test-2	6.48	0.48	0.043		



It is evident that there was an insignificant difference found in the Naturalist, Cosmic, Intrapersonal, Interpersonal, Kinesthetic, Musical, Spatial, Logical

and Linguistic Intelligence of respondents as assessed through Test-1 and Test-2.

Comparing results of Test-1(Day-1) and Re-Test-1(Day-31)

Table 3: Mean of Multiple Intelligences assessed in Test-1 on Day-1 and Day-31

	Naturalist	Cosmic	Intrapersonal	Interpersonal	Kinesthetic	Musical	Spatial	Logical	Linguistic
Day-1	5.42	5.46	5.2	6.14	3.41	5.3	4.2	6.27	6.38
Day-31	5.43	5.36	5.095	6.32	3.34	5.29	4.21	5.27	5.75

Table 4: Mean, Standard deviation, standard error and t-values of MILin Test-1 on Day-1 and Day-31

		Mean	SD	SEM	t-value	Lev of Sig.
Naturalist	Day-1	5.42	1.25	0.11	0.0622	Not statistically significant
	Day-31	5.43	1.24	0.113		
Cosmic	Day-1	5.46	1.45	0.132	0.54	Not statistically significant
	Day-31	5.36	1.41	0.126		
Intrapersonal	Day-1	5.2	0.65	0.059	0.105	Not statistically significant
	Day-31	5.095	0.69	0.06		
Interpersonal	Day-1	6.14	1.10	0.1	1.356	Not statistically significant
	Day-31	6.32	0.95	0.086		
Kinesthetic	Day-1	3.41	0.58	0.052	1.088	Not statistically significant
	Day-31	3.34	0.40	0.036		
Musical	Day-1	5.3	1.03	0.094	0.078	Not statistically significant
	Day-31	5.29	0.95	0.086		
Spatial	Day-1	4.2	0.84	0.07	0.09	Not statistically significant
	Day-31	4.21	0.85	0.077		
Logical	Day-1	6.27	0.41	0.037	0.533	Not statistically significant
	Day-31	6.24	0.46	0.042		
Linguistic	Day-1	6.38	0.65	0.059	0.349	Not statistically significant
	Day-31	6.35	0.68	0.062		

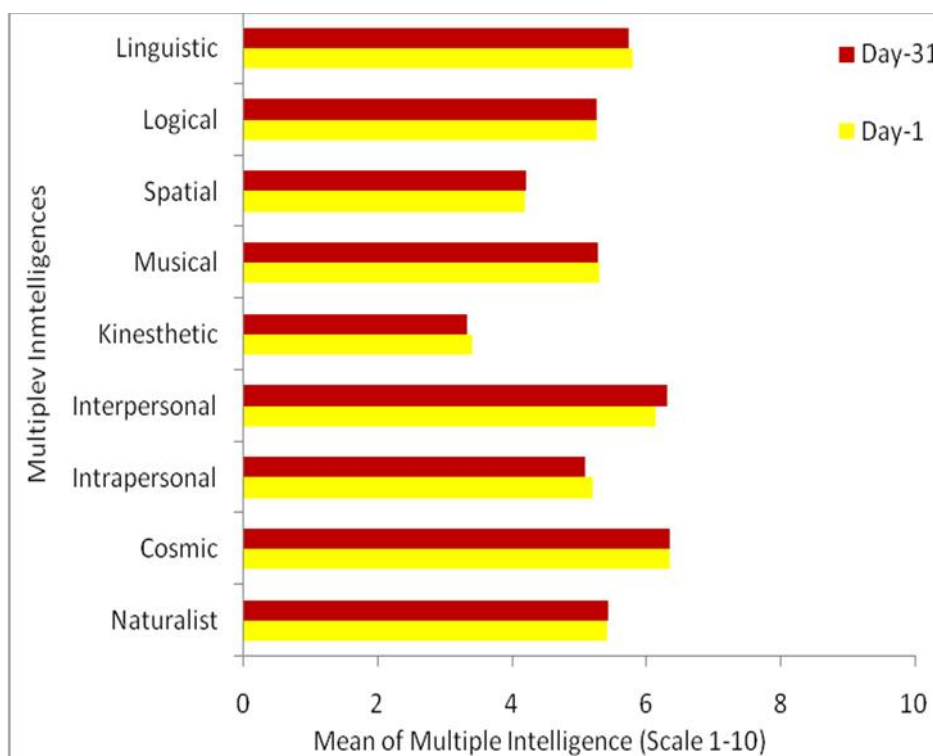


Fig. 4 Mean of Multiple Intelligences assessed in Test-1 on Day-1 & Day-31

Further, there was inevitably no significant difference found in the Naturalist, Cosmic, Intrapersonal, Interpersonal, Kinesthetic, Musical, Spatial, Logical as well as the Linguistic Intelligence of respondents as assessed through Re-Test-1 administered on same subjects after a period of 30 days.

4. Discussion

To recapitulate, it is inevitably clear that as per the assessment through both the tests, both of which were scientifically developed and standardized, there was no significant difference found in the Naturalist, Cosmic, Intrapersonal, Interpersonal, Kinesthetic, Musical, Spatial, Logical and Linguistic Intelligence. Moreover, there was no significant difference found in the Naturalist, Cosmic, Intrapersonal, Interpersonal, Kinesthetic, Musical, Spatial, Logical as well as the Linguistic Intelligence of respondents as assessed through Re-Test-1 administered on same subjects after a period of 30 days.

5. Conclusion

Shelling the nut, it can be concluded that the said Scale is a valid and reliable measure of the numerical value of the multiple intelligence levels and dominant thinking pattern of the subjects as assessed through the standardized Multiple Intelligence Level Scale (MILS) purely based on the Howard Gardner's theory of Multiple Intelligences. There was no significant difference found in the Naturalist, Intrapersonal, Interpersonal, Kinesthetic, Musical, Spatial, Logical and Linguistic Intelligence of respondents as assessed through Test-1 and Test-3. There was inevitably no significant difference found in the Naturalist, Cosmic, Intrapersonal, Interpersonal, Kinesthetic, Musical, Spatial, Logical as well as the Linguistic Intelligence of respondents as assessed through Re-Test-1 administered on same subjects after a period of 30 days.

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