



Are Students of Secondary Schools of Seven Districts Different on Their Self-Estimates of Multiple Intelligences? A Case Study of Southern Districts of Khyber Pakhtunkhwa

Gulap Shahzada^{1*}, Habib Nawaz Khan², Ayaz Muhammad Khan³ and Hakim Ullah²

¹Institute of Education & Research, University of Science and Technology, Bannu, Pakistan, ²Department of Economics, University of Science and Technology, Bannu, KP, Pakistan, ³University of Education Lahore, Lahore, Pakistan

OPEN ACCESS

Edited by:

Cheng Yong Tan,
The University of Hong Kong, China

Reviewed by:

Siti Rahmah Awang,
University of Technology Malaysia,
Malaysia

Suleman Suleman,
University of Swabi, Pakistan

*Correspondence:

Gulap Shahzada
gulap_786@yahoo.com

Specialty section:

This article was submitted to
Educational Psychology,
a section of the journal
Frontiers in Education

Received: 11 March 2021

Accepted: 21 June 2021

Published: 26 July 2021

Citation:

Shahzada G, Khan HN, Muhammad Khan A and Ullah H (2021) Are Students of Secondary Schools of Seven Districts Different on Their Self-Estimates of Multiple Intelligences? A Case Study of Southern Districts of Khyber Pakhtunkhwa. *Front. Educ.* 6:679289. doi: 10.3389/feduc.2021.679289

Self-assessment of intelligence is a personal belief of ability, which is counted for an important portion of success in life. With 905 students of secondary schools of seven districts of Khyber Pakhtunkhwa, a survey study was conducted in order to find out students' self-estimates and the differences of self-estimates on multiple intelligences. Data were collected from the subjects through a valid and reliable inventory. For a selection of the sample, a stratified, random, and proportion allocation technique was used; tests of between-subject effects, analysis of variance, and post hoc were applied as an inferential statistical test. The result of the study revealed that students of Lakki Marwat estimated their logical/mathematical, intrapersonal, verbal/linguistic, and visual/spatial intelligence to be higher than those of the students in the other districts. Students of Bannu rated their musical intelligences higher than that of the students of other districts. Students of Hango estimated their bodily/kinesthetic intelligence higher than that of the students of other districts. Students of Kohat estimated their existential intelligence higher than that of the students of other districts. Researchers suggested that schools should give such an environment of learning to the students where all the intelligences can be focused and promoted.

Keywords: self-estimates, multiple intelligences, secondary school students, southern districts, differences

INTRODUCTION

Self-estimation of intelligence is a subject of extraordinary interest for different reasons (Keefer 2015; Gignac 2018; Herreen and Zajac 2018; Howard and Cogswell 2018). In recent studies, various cognitive and noncognitive constructs such as self-concept, creativity, motivation, intelligence, and personality are extensively researched (Almeida et al., 2010; Dorrenbacher and Perels, 2016; Gajda, 2016; Prast et al., 2018). Different studies from multicultural countries have been reported such as those by Pérez et al. (2010) from Spain, Stieger et al., 2010 from Australia, Proyer (2011) from Switzerland, and Workman (2004) from Wales. Some late research studies have been carried out in countries such as Tanzania (Dixon et al., 2016), Pakistan (Shahzada et al., 2014), and Russia (Kornilova and Novikova 2012).

Self-estimation of intelligence is an individual's belief in their own abilities and is responsible for a significant portion of success in different areas of life (Chamorro-Premuzic and Furnham, 2006a). The concept of self-assessment of intelligence emerged during merging of the three fields: the study of self-estimation of intelligence, the study of self-esteem, and the study of intelligence. The assessment of a person's own or other intelligence holds a vital role in one's life for several grounds. Self-assessment of intelligence exerts a significant and substantial influence on self-belief and educational attainment (Dweck, 2000).

Understanding one's own strengths (intelligence) does an extraordinary work in their personal life, as it spurs and gives enthusiasm, and creates certainty in a person. Evidence recommends that students' belief on their intelligence anticipates academic performance even after recording their established intellectual abilities. Recently, it has been noted that genetic and environmental impacts fully contribute to the capacity of self-evaluation (Bratko et al., 2012). For the most part, social contrasts are the reason for the distinction in self-assessment (Neto et al., 2009). An individual's belief in his/her abilities is essential for certainty and achievement (Eccles and Wigfield, 2002). As indicated by Guay et al. (2003), ability and the recognition of one's own intelligence are associated in life.

Greven et al. (2009) stated that a hereditary effect can be observed in the self-perceived abilities (SPAs) and the hereditary covariance between the SPA and the independent academic performance. Academic potential tested through psychological testing is a critical measure of the educational performance of a man or a woman (Gottfredson, 2004; Deary et al., 2007). However, it is rarely responsible for more than half of the difference in academic performance (Chamorro-Premuzic and Furnham, 2005; Rhode and Thompson, 2007). To illustrate the reasons for the overall functioning of an individual, rather than intelligence, educators began to think about various other elements such as self-estimated abilities. Self-assessment of intelligence is a focal point for teachers, as it promotes self-confidence, attention, and fulfillment of tasks in an individual's life (Chamorro-Premuzic and Furnham, 2006).

Many studies were carried out on the idea of self-assessment of intelligence (Beloff, 1992; Bennett, 1996; Furnham, 2001; Neto et al., 2008; Furnham and Shagabudinova, 2012); however, many studies were limited to evaluating the general intelligence "g," the origination of the theory of multiple intelligence of Gardner, and thus opened a new avenue for further investigation to the researchers. Gardner (1983), Gardner (1993), Gardner (1999), Gardner (2006) introduced the theory of multiple intelligence stating that intelligence is not an autonomous or a solo thing which is the effect of a solitary factor. He raised a question about the measurement of intelligence through a conventional IQ test, which only considers logical/mathematical and verbal/linguistic abilities. The hypothesis of various abilities implies a more detailed and definite explanation of the intellect of an individual and offers a novel and complete representation of human intelligence. Multiple Intelligence Theory (MIT) guaranteed that individuals have different capacities, and they are not comparatively similar regarding these possibilities or

potentials. The distinction in psychological capacities of people likewise shows that they have different kinds of intelligence of varying degrees, for example, a person may have the most notable degree of linguistic intelligence but the least musical intelligence (Gen, 2000; Eid and Alizh, 2004; Shearer, 2004). If we want to include the area of human cognition adequately, it is necessary to include a range of comfort that is more comprehensive than what we usually consider. It is required to remain open to the possibility that many, if not most, of these competencies are not subject to a standard verbal measurement, which is very much dependent on a mixture of logical and linguistic abilities. There are no educational traces that can be derived directly from this psychological theory, but if individuals are different in their cognitive files, it is logical to keep this in mind when developing a system of education for individuals, groups, or even countries (Gardner, 2006).

These days, MIT (Multiple Intelligence Theory) plays a key role in recognizing various styles of learning in students. It helps educators, instructors, and students to effectively plan the "individualized instructions." Therefore, many specialists emphasize the involvement of students' various talents by means of the identification of their intelligences to improve their learning (Bowles, 2008; Wu and Alrabah, 2009; Gurbuz, 2010; Natasa, 2010). Consequently, it seems important to recognize the different types of students' intelligence instructions should be planned accordingly, to improve the learning of the students.

Objectives of the study are to find out the students' self-estimates of multiple intelligences verbal/linguistic, logical/mathematical, visual/spatial, musical, bodily/kinesthetic, intrapersonal, interpersonal, natural, and existential intelligence at the secondary school level, and to study the differences of students' self-estimates of multiple intelligence from seven different southern districts of Khyber Pakhtunkhwa, Pakistan.

Critically reviewing the previous literature on multiple intelligence, it has been found that Gardner's theory asserts nine intelligence; however, many of the studies used either seven or eight intelligence, thus ignoring the two intelligence: natural and existential (Greven et al., 2009; Perrone et al., 2010; Hanafin, 2014; Gurkan et al., 2019; Hassan, 2020). Therefore, the current research fills the gap by including these two important intelligences. This study empirically examined the differences in self-estimates of Gardner's multiple intelligences including the two latest intelligences in the case of the students of the secondary school of seven districts situated in the south of Khyber Pakhtunkhwa, Pakistan. The Khyber Pakhtunkhwa has been divided into southern and northern areas. The seven districts in the southern area are called southern districts while districts in the northern area are called northern districts of Khyber Pakhtunkhwa. The southern districts have cultural values with some variations; the same curriculum is taught in the public secondary schools, and these schools are having teachers of the same caliber and facilities with slight differences. Moreover, research studies conducted on multiple intelligences theory on this population are rarely available; thus, this study is different from the previous studies and bridges the research gap. The

present study increases parental, teachers', and students' wakefulness regarding the multiple intelligences and the differences in self-estimated multiple intelligences.

MULTIPLE INTELLIGENCES

- i. Verbal/linguistic: The capacity to use the language appropriately and to achieve particular objectives by the use of language (Gardner, 1999). This intelligence empowers an individual to use words and convey ideas competently and convince others to apply particular words for expression (Mbuva, 2003). It is evident and an exceptional language usage (Christison and Kennedy, 1999).
- ii. Logical/mathematical: The ability to think inductively or deductively, look at the cause and effects of a situation, draw logical conclusions, and to perform well with numerical tasks. It empowers an individual to understand the fundamental rule of things (Gardner, 1999).
- iii. Visual/spatial intelligence: The ability to see things with an eye of the mind and appreciate the space and its technicalities (Gardner, 1999). A person with this ability can create a visual and a spatial representation and may mentally or physically transfer and monitor that portrayal. This capacity helps a person to construct a space world three-dimensional model (Moran et al., 2006)
- iv. Musical intelligence: The ability to compose, enhance, and appreciate the music, and play various types of instruments. It is the knowledge of pitch, cadence, and sound delicacies (Gardner, 1999).
- v. Bodily/kinesthetic intelligence: It is the ability to resourcefully monitor and manipulate different body organs to achieve goals using various tools and equipment skillfully and capably (Gardner, 1999).
- vi. Interpersonal intelligence: It is the ability to communicate adequately with individuals and rightly understand their desires, thoughts, objectives, feelings, inspirations, and needs. It allows the individual to understand others and know persuasion and arousal.
- vii. Intrapersonal intelligence: It helps the person to learn, supervise, and use his/her attributes, faults, thoughts, imaginative mind, desires, abilities, and deep feelings appropriately (Moran et al., 2006).
- viii. Naturalistic intelligence: It is the ability by gathering and interpreting various living or nonliving objects on the bases of their basic properties and features. Individuals with this sort of intelligence look with extraordinary curiosity at animals, plants, and various natural phenomena (Gardner, 1999).
- ix. Existential intelligence: This intelligence is related to the very existence of the human (Gardner, 1999). It enables a person to find out answers to deeper questions related to human life, such as what is the purpose of the human existence on the planet; what is the role of the human in the universe; and where does a human come from? Where would he go after death? What is its relationship to the creator?

METHODOLOGY

Research Design

This study is descriptive–analytical inferential in nature; for this reason, a survey research quantitative design was used as it best suited to the study.

Population of the Study

Pakistan has four provinces. Balochistan, Khyber Pakhtunkhwa (KP), Sindh, and Punjab are the four constitutional provinces of the Islamic Republic of Pakistan. The KP is one of the provinces of Pakistan comprising northern and southern districts. Tank, Dera Ismail Khan (DIKhan), Lakki Marwat (Lakki), Bannu, Karak, Kohat, and Hango are located in the south of Khyber Pakhtunkhwa, and they are called the southern districts of the province as shown in **Figure 1**. Secondary school students in the southern region of Khyber Pakhtunkhwa make up the population for this study.

The Sampling Process

The Sampling frame 18,094 high school students, 10,827 boys and 7,277 girls (age 14–17), enrolled in 345 boys and 176 girls government schools in the southern part of the province. To reduce heterogeneity, ensure gender participation, and get maximum valid information, a stratified random sampling with a proportion allocation technique was used for sample selection. Proportion allocation ensures representation of each stratum as per the size of each stratum. To comply with the proportion allocation technique, 542 boys and 363 girls from both the strata, a total of 905 students were randomly nominated as a sample of the study.

Research Tool

For this research, we have used a standardized instrument developed by Armstrong (1994), which covers various intelligences such as verbal/linguistic, logical/mathematical, visual/spatial, musical, bodily/kinesthetic, interpersonal, intrapersonal, naturalistic, and existential intelligence. Each intelligence type was represented by 5-items, on a 5-point Likert scale.

Validation and Reliability of the Tool

Seventy-seven statements were identified portraying nine intelligences. The opinions of the research expert of education, language, and psychology were got regarding the research instrument in the light of the parameters of the following conditions: 1) relationship of the statement to construct, 2) link of the item to the topic, 3) link relation of the item to the culture, and 4) repetition. Thirty-two statements were discarded in connection with the specialists' input. 45 items were finalized for the tool.

As a pilot study, the tool was administered to 30 secondary school students (twenty males and ten women). To estimate the reliability of the tool, the Cronbach alpha value was computed for different constructs; the value varied from 0.72 to 0.92. 0.84 was the value of the whole scale. The split-half method was also used

Map of Pakistan and the Khyber Pakhtunkhwa showing different districts



FIGURE 1 | Map of Pakistan and the Khyber Pakhtunkhwa showing different districts.

for reliability. The Cronbach alpha estimates for section-1 and Section-2 were 0.92 and 0.94 respectively. The correlation coefficient between the two sections was 0.74.

The Process of Collecting Data

After assuring the school heads of the confidentiality of data and the use of data for academic purposes, their permission was sought through a written request. On obtaining the permission

from the school heads and subjects, the inventory was administered to the respondents with clear instructions on how to fill it out. One of the researchers was present with the respondents in order to clarify any problem regarding understanding the inventory. Most of the respondents returned the filled inventories on the spot; those of whom were unable to complete the inventories on the same day returned them the next day.

TABLE 1 | Mean and SD of students' multiple intelligences (N = 905).

District		Exist	Inter	LM	VS	Intra	Natural	VL	BK	Music
Kohat	M	4.50	3.60	3.35	3.51	3.62	3.13	3.31	2.28	2.02
	SD	0.50	0.77	0.96	0.71	0.51	0.79	0.79	0.67	0.78
Hango	M	4.30	3.51	3.14	3.62	3.45	3.46	3.38	3.57	1.64
	SD	0.51	0.63	0.73	0.79	0.65	0.77	0.76	0.57	0.63
Karak	M	4.27	3.69	3.61	3.57	3.53	3.48	3.24	3.12	2.03
	SD	0.63	0.72	0.81	0.69	0.63	0.83	0.76	0.71	0.85
Bannu	M	4.45	3.69	3.68	3.60	3.45	3.62	3.22	3.09	2.10
	SD	0.55	0.65	0.77	0.70	0.59	0.73	0.72	0.70	0.71
Lakki	M	4.47	3.80	3.85	3.66	3.64	3.73	3.91	3.20	2.07
	SD	0.50	0.62	0.71	0.69	0.57	0.71	0.51	0.59	0.82
DIK	M	4.18	3.51	3.44	3.32	3.39	3.05	2.99	2.79	2.06
	SD	0.63	0.67	0.83	0.83	0.66	0.73	0.71	0.66	0.85
Tank	M	3.97	3.51	2.38	2.68	3.15	3.30	2.68	1.72	1.56
	SD	0.74	0.63	1.03	0.93	0.84	0.96	0.96	0.60	0.72

BK = bodily/kinesthetic intelligence, DIK = Dera Ismail Khan, Exist = existential intelligence, Inter = interpersonal intelligence, Intra = intrapersonal intelligence, LM = logical/mathematical intelligence, M = mean, Music = musical intelligence, Natural = naturalistic intelligence, SD = standard deviation, VL = verbal/linguistic intelligence, and VS = visual/spatial intelligence.

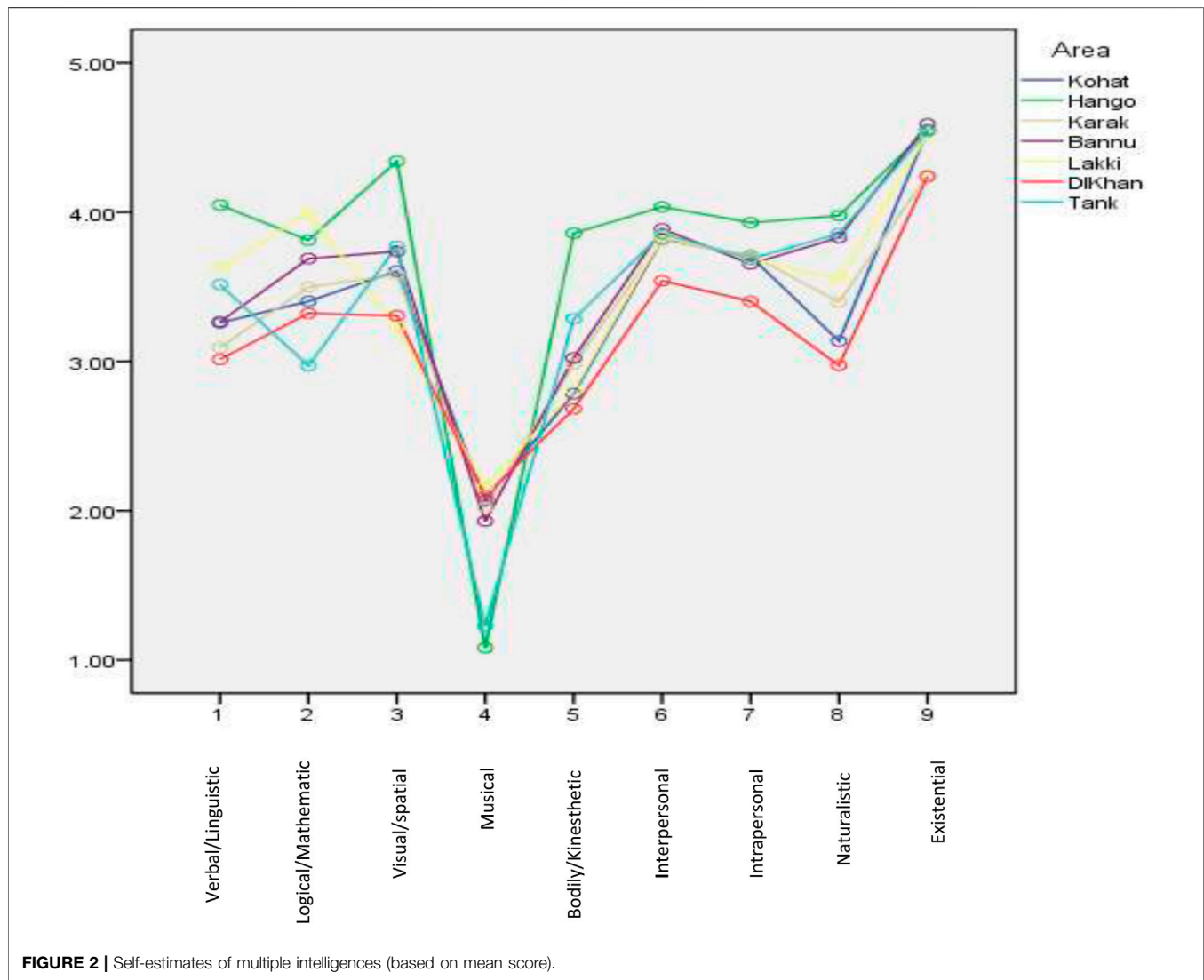


TABLE 2 | ANOVA analysis: Differences on students' self-estimation of multiple intelligence of southern districts ($n = 905$).

Intelligences	Districts	N	Mean	SD	F	Sig.
Verbal/linguistic	Kohat	154	3.310	0.790	28.810	0.0001
	Hango	45	3.380	0.760		
	Karak	168	3.240	0.760		
	Bannu	176	3.220	0.720		
	Lakki	166	3.910	0.510		
	DIKhan	174	2.990	0.710		
	Tank	22	2.680	0.960		
Logical/mathematical	Kohat	154	3.350	0.960	15.880	0.0001
	Hango	45	3.140	0.730		
	Karak	168	3.610	0.810		
	Bannu	176	3.680	0.770		
	Lakki	166	3.850	0.710		
	DIKhan	174	3.440	0.830		
	Tank	22	2.380	1.030		
Visual/spatial	Kohat	154	3.510	0.710	5.450	0.0001
	Hango	45	3.620	0.790		
	Karak	168	3.570	0.690		
	Bannu	176	3.600	0.700		
	Lakki	166	3.660	0.690		
	DIKhan	174	3.320	0.830		
	Tank	22	3.000	0.930		
Musical	Kohat	154	2.020	0.780	3.360	0.0001
	Hango	45	1.640	0.630		
	Karak	168	2.030	0.850		
	Bannu	176	2.100	0.710		
	Lakki	166	2.070	0.820		
	DIKhan	174	2.060	0.850		
	Tank	22	1.560	0.720		
Bodily/kinesthetic	Kohat	154	2.880	0.670	12.100	0.0001
	Hango	45	3.570	0.570		
	Karak	168	3.120	0.710		
	Bannu	176	3.090	0.700		
	Lakki	166	3.200	0.660		
	DIKhan	174	2.790	0.660		
	Tank	22	3.140	0.600		
Interpersonal	Kohat	154	3.600	0.770	5.890	0.0001
	Hango	45	3.510	0.630		
	Karak	168	3.690	0.720		
	Bannu	176	3.690	0.650		
	Lakki	166	3.800	0.620		
	DIKhan	174	3.510	0.670		
	Tank	22	3.030	0.930		
Intrapersonal	Kohat	154	3.620	0.510	5.070	0.0001
	Hango	45	3.450	0.650		
	Karak	168	3.530	0.600		
	Bannu	176	3.450	0.590		
	Lakki	166	3.640	0.570		
	DIKhan	174	3.390	0.660		
	Tank	22	3.150	0.840		
Naturalistic	Kohat	154	3.130	0.790	16.850	0.0001
	Hango	45	3.460	0.770		
	Karak	168	3.480	0.830		
	Bannu	176	3.620	0.730		
	Lakki	166	3.730	0.710		
	DIKhan	174	3.050	0.730		
	Tank	22	3.300	0.960		
Existential	Kohat	154	4.500	0.500	8.870	0.0001
	Hango	45	4.300	0.510		
	Karak	168	4.270	0.630		
	Bannu	176	4.450	0.510		
	Lakki	166	4.470	0.500		
	DIKhan	174	4.180	0.630		
	Tank	22	3.970	0.740		

DATA ANALYSIS AND RESULTS

Data were analyzed through SPSS; mean and standard deviation were applied as descriptive statistics. Investigating the differences between the students' self-estimates of intelligences of different districts, ANOVA and *post hoc* were applied.

Table 1 presents the mean and SD of the students' self-rating of multiple intelligences of seven southern district. The highest mean score is 4.50. Students' self-rating of existential intelligence is high. The self-estimated existential intelligence of the students of Kohat, Lakki Marwat, Bannu, Hango, Karak, DIKhan, and Tank was the highest as reported in **Table 1**, while the low values of the estimate of musical intelligence of the students of Tank, Hango, Kohat, Karak, DIKhan, Lakki Marwat and Bannu are presented in the same table as well. Moreover, the students of different districts rated their verbal/linguistic, logical/mathematical, visual/spatial, bodily/kinesthetic, interpersonal, intrapersonal, and naturalistic intelligence moderately. **Figure 2** shows the different levels of mean score of the students' self-estimates of multiple intelligences of seven southern districts.

Table 2 shows the results of two-way ANOVA between groups' analysis of variance to find out the differences on students' self-estimates of multiple intelligences. The subjects were divided into seven groups (districts). There is a statistically significant difference at the 0.05 level of significance between the different groups on the self-estimate of verbal/linguistic intelligence [$F(6,898) = 28.81, p = 0.0001$], logical/mathematical intelligence [$F(6,898) = 15.88, p = 0.0001$], visual/spatial intelligence [$F(6,898) = 5.45, p = 0.0001$], musical intelligence [$F(6,898) = 3.36, p = 0.0001$], bodily/kinesthetic intelligence [$F(6,898) = 12.10, p = 0.0001$], interpersonal intelligence [$F(6,898) = 5.89, p = 0.0001$], intrapersonal intelligence [$F(6,898) = 5.07, p = 0.0001$], naturalistic intelligence [$F(6,898) = 16.85, p = 0.0001$], and existential intelligence [$F(6,898) = 8.87, p = 0.0001$]. Receiving a statistically significant difference between the different groups (districts), since the null hypothesis is rejected for the groups (districts), we can now look at the result of the Scheffe *post hoc* test.

Table 3 shows the results of the Scheffe *post hoc* test with p -values of 0.00, 0.01, 0.02, and 0.03 are <0.05 , which indicate that there is a statistically significant difference on the self-estimate of verbal/linguistic intelligence between the students of different groups (districts). The mean score of the students of Kohat is higher than the that of the students of DIKhan and Tank. The mean score of the students of Lakki Marwat is higher than that of the students of Hango, Karak, and Bannu.

The p -values (0.04, 0.01, and $0.00 < 0.05$), indicate that there is a statistically significant difference on the self-estimate of logical/mathematical intelligence between the students of southern districts. The average score of the students of Kohat is higher than that of the students of Hango. The mean score of the students of Lakki Marwat is greater than that of the students of Kohat, Hango, DIKhan, and Tank.

The p -values (0.05, 0.04, and $0.00 \leq 0.05$) indicate a statistically significant difference on the self-estimate of visual/spatial intelligence between the students of southern districts. The mean score of the students of Bannu is higher than that of the

TABLE 3 | (Scheffie) *Post hoc* test on the students' self-estimates of multiple intelligences of seven districts (N = 905).

Intelligences	Districts (I)	Mean	SD	Districts (J)	Mean	SD	Mean differences (I-J)	p
Verbal/linguistic	Kohat	3.13	0.79	Lakki			-0.59887 ^a	0.000
				DIKhan	2.99	0.71	0.32363 ^a	0.010
				Tank	2.68	0.96	0.63377 ^a	0.020
	Hungo	3.38	0.76	Lakki			-0.53224 ^a	0.000
				Tank			0.70040 ^a	0.030
				Lakki			-0.67398 ^a	0.000
				Lakki			-0.68946 ^a	0.000
				DIKhan			0.92250 ^a	0.000
	Kohat	3.35	0.96	Tank			1.23264 ^a	0.000
				Bannu			-0.32825 ^a	0.040
Logical/mathematical	Hungo	3.14	0.73	Lakki			-0.49958 ^a	0.000
				Tank	2.38	1.03	0.97403 ^a	0.000
				Bannu			-0.54187 ^a	0.010
	Karak	3.61	0.81	Lakki			-0.71320 ^a	0.000
				Tank			0.76040	0.050
	Bannu	3.68	0.77	Tank			1.23009 ^a	0.000
				Tank			1.30227 ^a	0.000
	Lakki	3.85	0.71	DIKhan			0.41404 ^a	0.000
				Tank			1.47360 ^a	0.000
	DIKhan	3.44	0.83	Tank			1.05956 ^a	0.000
Bannu						0.28153 ^a	0.050	
Visual/spatial	Lakki	3.66	0.69	DIKhan	3.32	0.83	0.59773 ^a	0.040
				DIKhan	3.32	0.83	0.33495 ^a	0.000
				Tank	3.00	0.83	0.65115 ^a	0.020
				Tank	3.00	0.83	0.65115 ^a	0.020
Bodily/kinesthetic	Hungo	3.57	0.57	Karak			0.45754 ^a	0.010
				Bannu			0.48573 ^a	0.000
				DIKhan			0.78008 ^a	0.000
	Karak	3.12	0.71	DIKhan			0.32254 ^a	0.000
				DIKhan			0.29434 ^a	0.010
	Bannu	3.09	0.70	DIKhan			0.41073 ^a	0.000
				DIKhan			0.41073 ^a	0.000
	Lakki	3.20	0.66	DIKhan			0.41073 ^a	0.000
				DIKhan			0.41073 ^a	0.000
	Interpersonal	Kohat	3.60	0.77	Tank	3.60	0.77	0.56753 ^a
Tank							0.65411 ^a	0.000
Tank							0.65455 ^a	0.000
DIKhan							0.29092 ^a	0.020
Intrapersonal	Kohat	3.62	0.51	DIKhan	3.51	0.63	0.29092 ^a	0.020
				DIKhan	3.39	0.66	0.23287	0.050
				DIKhan			0.25388 ^a	0.020
Naturalistic	Kohat	3.13	0.79	Tank	3.15	0.84	0.49244 ^a	0.040
				Karak	3.48	0.83	-0.34805 ^a	0.010
				Bannu			-0.48620 ^a	0.000
	Karak	3.48	0.83	Lakki			-0.59848 ^a	0.000
				DIKhan	3.05	0.73	0.42594 ^a	0.000
Existential	Bannu	4.45	0.51	DIKhan			0.56409 ^a	0.000
				DIKhan			0.67637 ^a	0.000
				DIKhan			0.67637 ^a	0.000
	Lakki	4.47	0.50	DIKhan	4.27	0.63	0.23409 ^a	0.030
				Tank	4.18	0.63	0.32173 ^a	0.000
Kohat	4.50	0.50	Tank	3.97	0.74	0.53636 ^a	0.000	
			DIKhan			0.26264 ^a	0.000	
Bannu	4.45	0.51	Tank			0.47727 ^a	0.030	
			DIKhan			0.28975 ^a	0.000	
Lakki	4.47	0.50	Tank			0.50438 ^a	0.010	

^aThe symbol asteric means significance at certain level such as 1% or 5%.

students of DIkhan and Tank. The mean score of the students of Lakki Marwat is higher than that of the students of DIKhan and Tank.

The *p*-values (0.00, 0.01, and 0.00 < 0.05) indicate that there are statistically significant differences on the self-estimate of bodily/kinesthetic intelligence between the students of

southern districts. The mean score of the students of Hango is higher than that of the students of Kohat, Bannu, and DIkhan. The mean score of the students of Lakki Marwat is higher than that of the students of Kohat and DIkhan. The mean score of the students of Karak is greater than that of the students of Hango and DIKhan.

TABLE 4 | Test of between-subjects effects ($N = 905$).

	Source	Type III, sum of squares	Mean ²	F	Sig	Partial η^2	Power
Verbal/linguistic	Corrected model	90.160	15.350	29.800	0.00	0.150	0.99
	Intercept	5305.91	5305.910	10286.130	0.00	0.910	1.00
	Area	89.160	14.850	28.800	0.00	0.150	1.00
Logical/mathematical	Corrected model	64.570	10.750	15.870	0.00	0.080	1.00
	Intercept	5646.540	5646.540	8331.220	0.00	0.890	1.00
	Area	64.570	10.750	15.870	0.00	0.080	1.00
Visual/spatial	Corrected model	17.900	2.970	5.440	0.00	0.020	0.997
	Intercept	6062.410	6062.410	11068.780	0.00	0.910	1.00
	Area	17.900	2.970	5.440	0.00	0.020	0.997
Musical	Corrected model	12.920	2.140	3.350	0.00	0.010	0.941
	Intercept	1871.250	1871.250	2924.900	0.00	0.750	1.00
	Area	12.930	2.140	3.350	0.00	0.010	0.941
Bodily/kinesthetic	Corrected model	33.520	5.580	12.100	0.00	0.060	1.00
	Intercept	4880.370	4880.370	10565.000	0.00	0.910	1.00
	Area	33.520	5.580	12.100	0.00	0.060	1.00
Interpersonal	Corrected model	17.080	3.230	5.880	0.00	0.020	0.998
	Intercept	6326.940	6327.240	13099.100	0.00	0.920	1.00
	Area	16.080	2.830	6.280	0.00	0.020	0.998
Intrapersonal	Corrected model	17.070	3.730	6.280	0.00	0.020	0.841
	Intercept	6327.440	6327.240	13099.100	0.00	0.920	1.00
	Area	17.080	3.430	6.480	0.00	0.020	0.994
Naturalistic	Corrected model	60.210	9.960	16.840	0.00	0.900	1.00
	Intercept	5807.740	5807.740	9817.800	0.00	0.900	1.00
	Area	60.210	9.960	16.840	0.00	0.090	1.00
Existential	Corrected model	16.950	2.810	8.860	0.00	0.040	1.00
	Intercept	9330.590	9330.590	29280.310	0.00	0.960	1.00
	Area	16.950	2.810	8.860	0.00	0.040	1.00

The p -values (0.04, 0.00, and $0.02 < 0.05$) show a statistically significant difference on the self-estimate of interpersonal intelligence between the students of southern districts. The mean score of the students of Kohat is higher than that of the students of Tank. The mean score of the students of Karak is higher than that of the students of Tank. The mean score of the students of Bannu is higher than that of the students of Tank. The mean score of Lakki Marwat is higher than that of the students of Dikhan, Tank, Bannu, Hango, and Kohat.

The p -values (0.05, 0.02, and 0.04) are equal or less than 0.05, representing a statistically significant difference on the self-estimate of intrapersonal intelligence between the students of southern districts. The mean score of the students of Kohat is higher than that of the students of Dikhan. The mean score of the students of Lakki Marwat is higher than that of the students of Tank.

The p -values (0.01 and $0.00 < 0.05$) indicate a statistically significant difference on the self-estimate of naturalistic intelligence between the students of southern districts. The mean score of the students of Karak is higher than that of the students of Kohat and Dikhan. The mean score of the students of Bannu is higher than that of the students of Kohat and Dikhan. The mean score of the students of Lakki Marwat is higher than that of the students of Kohat and Dikhan.

The p -values (0.03, 0.00, $0.01 < 0.05$) indicate that there is a statistically significant difference on self-estimate of existential intelligence between the students of southern districts. The mean score of the students of Kohat is higher

than that of the students of Karak, Dikhan, and Tank. The mean score of the students of Lakki Marwat is higher than the that of the students of Tank.

Table 4 demonstrates the results of the test between subjects' effects. The district (area) effect on self-estimated multiple intelligences was examined at the significance level 0.05, which is statistically significant. The values of the *Partial* η^2 are 0.01, 0.02, 0.02, 0.02, and 0.04 show that although the area's effect on musical, interpersonal, intrapersonal, visual/spatial, and existential intelligence, respectively, is significant but small in strength, this effect on bodily/kinesthetic intelligence is moderate as the *Partial* η^2 value 0.06 indicates. The *Partial* η^2 values 0.15, 0.09, and 0.08 indicate that the area exercises a large effect on the students' self-estimated verbal/linguistic, naturalistic, and logical/mathematical intelligence; using the guideline proposed by Cohen (1988) small effect = 0.01, moderate effect = 0.06, and large effect = 0.14. Furthermore, the power values for the test 1.00, 1.00, 0.997, 0.941, 1.00, 0.998, 0.994, 1.00, and 1.00 indicate that the test is powerful.

DISCUSSION

In this descriptive-analytical inferential study, participants provided diverse self-assessments of the intelligences they possess. The diversity in the self-estimation of students' multiple intelligences may be due to various reasons. Bratko et al. (2012) asserted that the hereditary and non-shared

motivations of the ecological conditions contribute excessively to the unique contrasts. It is widely accepted that discrimination in the self-estimation of intelligence is due to social dissimilarities (Neto et al., 2009). People are unlike in their type of outstanding intelligence (Al-Faoury et al., 2011; Loori, 2005; Yuen and Furnham, 2005; Netwa et al., 2008). In a research study conducted by Furnham et al. (2002), participants rated their interpersonal intelligence higher, but their self-assessment of the musical intelligence was lower, and this finding was consistent with the results of this study. Yamauchi (2015) in his research, discovered that musical intelligence was the strongest followed by the personal and verbal/linguistic intelligences. These results are in contrast with the findings of the present study.

The higher estimation of some of the intelligences could be due to the contextual conditions favoring these intelligences because there are slight variations in the sociocultural values between the southern districts since the extraordinary genetic and ecological impacts have recently been noted and are contributing excessively to the capacity for self-assessment (Bratko et al., 2012). Different types of perceptions are influenced by social qualities (Best and Williams, 1994). The social recognition of specific intelligences invigorates the individual to help them improve their specific intelligences; valuing specific intelligence makes it more important than others (Gardner, 1993).

This study discovered considerable variances existent in the self-assessment of intelligences between students of different southern districts. Differences between the students' self-assessed multiple intelligences can be the result of the respondents who had an incomparable condition according to which they could nourish the intelligences distinctly, therefore providing unlike assessments of the intelligences; the findings of this research study are in agreement with the findings in a study by Kaufman (2013); Stieger et al. (2010). Findings of the Gottfried (1984) study are similar to those from the present research that the context strongly influences subjective improvement, and certainly self-estimate of students, as it has been revealed by the study in hand that students of nearly same age, studying in the same grade level and same curriculum, having nearly same type of schools; estimated their intelligences differently, the possible reason of this difference is that they belong to seven districts which have sociocultural variations in their contexts. The study by Brown and Leaper (2010) and Gonzales et al. (2002) suggested that self-estimate of intelligence exhibited internalization of social stereotypes; African American, Hispanic, or individuals belonging to the working class considered themselves as not very intelligent as a stereotype, and individuals belong to this group confirmed this stereotype by their diagnostic test of intelligence. Furnham and Grover, 2020 found that more religious and nonscientific beliefs contribute a big variance to the explanation of self-estimates of intelligence.

There are many other factors such as psychometric intelligence, personality traits which can be the result of variations in self-estimate of intelligences. Overrated intelligence is unlikely to be self-rated due to objective group differences in actual cognitive abilities. Also, the modest relationship of psychometric intelligence and self-estimated intelligence is $r = .30$, and the gender differences in subjective

assessments should be determined by more factors than measured in intelligence alone (Mabe and West, 1982; Ackerman and Wolman, 2007).

The self-assessed intelligence association with the characteristics of the Big Five personality was frequently examined. In general, self-assessed intelligence has been found to be positively correlated with openness to experience and extraversion, and negatively correlated to agreeableness and to neuroticism (Furnham et al., 2001; Chamorro-Premuzic, et al., 2005; Neubauer et al., 2018). Individuals with higher degrees of neuroticism may have a poor self-concept that is the reason for the low estimate of self-intelligence, while individuals who score higher on agreeableness may report low self-intelligence due to modesty (Chamorro-Premuzic, et al., 2005). On the contrary, higher self-assessed intelligence among those with higher degrees of extroversion may result from their overconfidence (Furnham et al., 2005).

Although every individual has varying estimate of different intelligences, since if a person is presented in an urgent situation and in specific didactic materials, organized and planned for a specific type of intelligence, this intelligence may improve to a higher level, and individual may present a high estimate of this intelligence. If young people are exposed to negative and debilitating conditions in early childhood, their subjective progression/assessment will be deeply affected. Southern districts are underdeveloped as compared to other districts of Khyber Pakhtunkhwa. During the data collection and informal discussion with teachers, the researchers found that MIT-based teaching is neither practiced in the schools nor the teacher are aware of the multiple intelligences theory teaching in southern districts. Hence, the participants provided low and moderate estimates for most of the multiple intelligences except existential intelligence. Proper training and facilitation regarding MIT-based teaching should be provided in the schools of the selected districts so that the different multiple intelligences of the students could be improved.

CONCLUSION

Based on the findings of the study students' estimation of their existential intelligence is high, while interpersonal, visual-spatial, logical mathematical, intrapersonal, naturalistic, verbal-linguistic, and bodily kinesthetic intelligences are average, and the musical intelligence is low. District-wise statistically, significant differences exist between the self-estimates of students' multiple intelligences of different southern districts. The student self-rating of Lakki Marwat on verbal/linguistic, logical/mathematical, visual/spatial, and intrapersonal intelligences is high, but the student self-rating of Tank is low. The self-estimate of the students' musical intelligence of Bannu is high, however; students of Tank show low level. Similarly, self-estimate of the students' bodily kinesthetic intelligence of Hango is high but that of students of DIKhan is low. Furthermore, the self-estimate of the students' naturalistic intelligence of Lakki Marwat is high, but that of students of DIKhan is low. Self-

estimate of the students' existential intelligence of Kohat is high but that of students of Tank is low.

There can be many factors responsible for the differences on self-estimates of multiple intelligences; sociocultural dissimilarities can be one of the causes of diversity in the students' self-estimates of multiple intelligences.

APPLICATION

1. Although difference exists on students' self-assessment of multiple intelligences, the societal effect exists over the populace. However, it is not solid. The teachers must teach through various intelligences, so the students become aware of their different abilities and the stereotype impact could be diminished over the populace. In such a case that self-conviction shapes conduct in term of self-assessment of intelligence, it might be beneficial for guys, especially for females who are awfully under gauge their capacities as a result of social stereotypes (Voges et al., 2019). Teaching through MIT may likewise help in relinquishing the feeling of inadequacy in students made by our way of life particularly in southern districts of Khyber Pakhtunkhwa.
2. Parents are instrumental in the construction of their kids' self-perception. Guardians being the essential socializers can disclose the truth to them and remove their underestimation of intelligence. It has been seen that the social generalizations impact equally the guardians' perspective about their youngsters and the kids' view point about themselves. In this way, the youngsters possibly will consider themselves what their different socializers set up conviction concerning them. Along these lines, guardians are proposed to have positive and empowering conduct toward their youngsters' abilities.
3. Parents ought to have the feeling of various intelligences of their youngsters and ought to encourage their specific intelligences as opposed to thrusting their very own choices on them.

RECOMMENDATION FOR FURTHER RESEARCH

The study carried out examined the differences of intelligences between the various intelligences of the southern districts; the

REFERENCES

- Ackerman, P. L., and Wolman, S. D. (2007). Determinants and Validity of Self-Estimates of Abilities and Self-Concept Measures. *J. Exp. Psychol. Appl.* 13 (2), 57–78. doi:10.1037/1076-898x.13.2.57
- Al-Faoury, O. H. A., Khataybeh, A., and Al-Sheikh, K. (2011). Multiple Intelligences of Students at Jordanian Universities. *J. Int. Edu. Res. (Jier)* 7 (4), 83–94. doi:10.19030/jier.v7i4.6869
- Almeida, L. S., Prieto, M. D., Ferreira, A. I., Bermejo, M. R., Ferrando, M., and Ferrándiz, C. (2010). Intelligence Assessment: Gardner Multiple Intelligence Theory as an Alternative. *Learn. Individ. Differ.* 20, 225–230. doi:10.1016/j.lindif.2009.12.010

data were collected from the respondents based on Armstrong (1994) inventory. The limitation of the inventory is so as to respondents decisions are restricted. At the same time as such, there is a reasonable requirement for further research using various methods for data collection such as interviews, peer evaluations, and observations. It is therefore proposed that mixed-methods studies can be carried out in different environments so that the results of the study can be verified and improved.

LIMITATIONS

In this article, the researchers investigated the differences of intelligence in students of the selected southern district of the KP. Data were collected through an inventory. The limitation of the inventories is that respondents' decisions are restricted. At the same time, other methods can be used to collect data such as interviews, peer evaluations, and observations. It is therefore proposed that mixed-methods studies can be carried out in different environments so that the results of the study can be verified.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved the by Uzma Syda Gilani University of Science and Technology Bannu Ikramullah khan university of science and technology Bannu. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

- Armstrong, T. (1994). *Multiple Intelligences in the Classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Beloff, H. (1992). Mother, Father and Me: Our IQ. *Psychol.* 5, 309–311.
- Bennett, M. (1996). Men's and Women's Self-Estimates of Intelligence. *J. Soc. Psychol.* 136, 411–412. doi:10.1080/00224545.1996.9714021
- Best, D. L., and Williams, J. E. (1994). "Masculinity/feminity in the Self and Ideal Self-Descriptions of university Students in Fourteen Countries," in *Journeys into Cross-Cultural Psychology*. Editors A. M. Bouvy, F van de Vijfer, P. Boski, and P. Schmetiz (Germany: Swets and Zeitlinger Publishers), 297–306.
- Bowles, T. (2008). Self-rated Estimates of Multiple Intelligences Based on Approaches to Learn-Ing. *Aust. J. Educ. Dev. Psychol.* 8, 15–26. doi:10.1126/science.1152110

- Bratko, D., Butkovic, A., Vukasovic, T., Chamorro-Premuzic, T., and Von Stumm, S. (2012). Cognitive Ability, Self-Assessed Intelligence and Personality: Common Genetic but Independent Environmental Aetiologies. *Intelligence* 40 (2), 91–99. doi:10.1016/j.intell.2012.02.001
- Brown, C. S., and Leaper, C. (2010). Latina and European American Girls' Experiences with Academic Sexism and their Self-Concepts in Mathematics and Science During Adolescence. *Sex roles*, 63(11), 860–870. doi:10.1007/s11199-010-9856-5
- Chamorro-Premuzic, T., and Furnham, A. (2005). *Personality and Intellectual Competence*. Hillsdale, NJ: Erlbaum.
- Chamorro-Premuzic, T., Moutafi, J., and Furnham, A. (2005). The Relationship between Personality Traits, Subjectively-Assessed and Fluid Intelligence. *Personal. Individ. Differ.* 38 (7), 1517–1528. doi:10.1016/j.paid.2004.09.018
- Chamorro-Premuzic, T., & Furnham, A. (2006). Self-assessed intelligence and academic performance. *Educational Psychology*, 26(6), 769–779.
- Chamorro-Premuzic, T., & Furnham, A. (2006a). Personality and self-assessed intelligence: Can gender and personality distort self-assessed intelligence? *Educational Research and Reviews*, 1(7), 227–233.
- Christison, M. A., and Kennedy, D. (1999). *Multiple intelligences: Theory and Practice in adult ESL*. Retrieved April 25, 2013 from <http://www.cal.org/nclcdigest/MI.htm>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ: Erlbaum.
- Deary, I. J., Strand, S., Smith, P., and Fernandes, C. (2007). Intelligence and Educational Achievement. *Intelligence* 35, 13–21. doi:10.1016/j.intell.2006.02.001
- Dixon, P., Humble, S., and Chan, D. W. (2016). How Children Living in Poor Areas of Dar Es Salaam, Tanzania Perceive Their Own Multiple Intelligences. *Oxford Rev. Edu.* 42, 230–248. doi:10.1080/03054985.2016.1159955
- Dörrenbächer, L., and Perels, F. (2016). Self-regulated Learning Profiles in College Students: Their Relationship to Achievement, Personality, and the Effectiveness of an Intervention to foster Self-Regulated Learning. *Learn. Individ. Differ.* 51, 229–241. doi:10.1016/j.lindif.2016.09.015
- Dweck, C. (2000). *Self-theories: Their Role in Motivation, Personality, and Development*. Philadelphia, PA: Psychology Press.
- Eccles, J. S., and Wigfield, A. (2002). Motivational Beliefs, Values, and Goals. *Annu. Rev. Psychol.* 53 (1), 109–132. doi:10.1146/annurev.psych.53.100901.135153
- Eid and Alizh, N. (2004). *Applying The Multiple Intelligence Theory in Teacher Training Programs*, Resalt Almulm, (2nd and 3rd Editions) and vol. (42).
- Fernández, E., García, T., Gómez, C., Areces, D., and Rodríguez, C. (2019). Creatividad e inteligencias múltiples percibidas como predictores de las aptitudes escolares en Educación Primaria. *Electron. J. Res. Educ. Psychol.* 17 (3), 589–608. doi:10.25115/ejrep.v17i49.2597
- Furnham, A., and Grover, S. (2020). Correlates of Self-Estimated Intelligence. *J. Intell.* 8 (1), 6. doi:10.3390/jintelligence8010006
- Furnham, A., Kidwai, A., and Thomas, C. (2001). Personality, Psychometric Intelligence, and Self-Estimated Intelligence. *J. Soc. Behav. Personal.* 16 (1), 97–114. doi:10.1016/S0191-8869(00)00202-6
- Furnham, A., Shahidi, S., and Baluch, B. (2002). Sex and Culture Differences in Perceptions of Estimated Multiple Intelligence for Self and Family: A British-Iranian comparison. *Journal of Cross-Cultural Psychology*, 33, 270–285. doi:10.1177/0022022102033003004
- Furnham, A., Moutafi, J., and Chamorro-Premuzic, T. (2005). Personality and Intelligence: Sex, the Big Five, Self-Estimated and Psychometric Intelligence. *Int. J. Selection Assess.* 13, 11–24. doi:10.1111/j.0965-075x.2005.00296.x
- Furnham, A. (2001). Self-estimates of Intelligence: Culture and Gender Difference in Self and Other Estimates of Both General (G) and Multiple Intelligences. *Personal. Individ. Differ.* 31, 1381–1405. doi:10.1016/S0191-8869(00)00232-4
- Furnham, A. (2002). The experience of being an overseas student. In *Overseas students in higher education* (pp. 25–41). Routledge.
- Furnham, A., and Shagabudinova, K. (2012). Sex Differences in Estimating Multiple Intelligences in Self and Others: A Replication in Russia. *Int. J. Psychol.* 47 (6), 448–459. doi:10.1080/00207594.2012.658054
- Gajda, A. (2016). The Relationship between School Achievement and Creativity at Different Educational Stages. *Thinking skills creativity* 19, 246–259. doi:10.1016/j.tsc.2015.12.004
- Gardner, H. (1983). *Frames of Mind. The Theory of Multiple Intelligences*. New York, USA: Basic Books.
- Gardner, H. (1993). *Multiple Intelligences: the Theory in Practice*. New York: Basic Books.
- Gardner, H. (1999). *Intelligence Reframed: Multiple Intelligences for the 21st century*. New York: Basic Books.
- Gardner, H. (2006). *Development and Education of the Mind. The Selected Works of Howard Gardner*. London: Routledge.
- Gen, R. (2000). Technology and Multiple Intelligences: The Praxis of Learning Intelligences. *Education a Distance* 14 (4). Available at: http://www.usdla.org/html/journal/MAY00_Issue/story_02.htm (Accessed February 11, 2009).
- Gignac, G. E. (2018). Socially Desirable Responding Suppresses the Association between Self-Assessed Intelligence and Task-Based Intelligence. *Intelligence* 69, 50–58. doi:10.1016/j.intell.2018.05.003
- Gonzales, P. M., Blanton, H., and Williams, K. J. (2002). The Effects of Stereotype Threat and Double-Minority Status on the Test Performance of Latino Women. *Pers Soc Psychol Bull*, 28(5), 659–670. doi:10.1177/0146167202288010
- Gottfredson, L. S. (2004). Schools and the G Factor. *Wilson Q.* 28 (3), 35–45.
- Gottfried, A. W. (1984). *Home Environment and Early Cognitive Development*. San Francisco, USA: Academic, 37.
- Greven, C. U., Harlaar, N., Kovas, Y., Chamorro-Premuzic, T., and Plomin, R. (2009). More Than Just IQ. *Psychol. Sci.* 20 (6), 753–762. doi:10.1111/j.1467-9280.2009.02366.x
- Guay, F., Marsh, H. W., and Boivin, M. (2003). Academic Self-Concept and Academic Achievement: Developmental Perspectives on Their Causal Ordering. *J. Educ. Psychol.* 95 (1), 124–136. doi:10.1037/0022-0663.95.1.124
- Gurbuz (2010). Determination of Preschool Children's Dominant and Non-dominant Types of Intelligences with Regard to "THE Theory of Multiple Intelligences": A Qualitative Evaluation. *E - J. New World Sci. Acad.* 5 (2), 456–470. doi:10.1080/00207391003675158
- Gurkan, T., Dincer, C., and Cabuk, B. (2019). Integrating Multiple Intelligences into Daily Plansa Preschool Example. *Turk. Online J. Qual. Inq.* 10, 321–345. doi:10.35235/uicd.646975
- Hanafin, J. (2014). Multiple Intelligences Theory, Action Research, and Teacher Professional Development: The Irish MI Project. *Aust. J. Teach. Edu.* 39 (4), 126–141. doi:10.14221/ajte.2014v39n4.8
- Hassan, H. (2020). The Effect of Using a Program Based on Multiple Intelligences Theory in Teaching Geometry on Developing Preparatory Stage Pupils' Habits of Mind. *J. Res. Curric. Instruct. Educ. Technol.* 6, 149–174.
- Herreen, D., and Zajac, I. T. (2018). The Reliability and Validity of a Self-Report Measure of Cognitive Abilities in Older Adults. *J. Intell.* 6, 1. doi:10.3390/jintelligence6010001
- Howard, M. C., and Cogswell, J. E. (2018). The "other" Relationships of Self-Assessed Intelligence: A Meta-Analysis. *J. Res. Personal.* 77, 31–46. doi:10.1016/j.jrp.2018.09.006
- Kaufman, S. (2013). *Ungifted: Intelligence Redefined*. United States, Basic Books. doi:10.1093/oxfordhb/9780195376746.013.0051
- Keefer, K. V. (2015). Self-Report Assessments of Emotional Competencies. *J. Psychoeduc. Assess.* 33, 3–23. doi:10.1177/0734282914550381
- Kornilova, T. A., and Novikova, M. A. (2012). Self-assessed intelligence, personality, and psychometric intelligence: Preliminary validation of a model with a selected student population. *Psych. Rus.*, 5, 33. doi:10.11621/pir.2012.0002
- Loori, A. A. (2005). Multiple Intelligences: A Comparative Study between the Preferences of Males and Females. *Soc. Behav. Pers* 33 (1), 77–88. doi:10.2224/sbp.2005.33.1.77
- Mabe, P. A., and West, S. G. (1982). Validity of Self-Evaluation of Ability: A Review and Meta-Analysis. *J. Appl. Psychol.* 67, 280–296. doi:10.1037/0021-9010.67.3.280
- Mbuva (2003). *Implementation of the Multiple Intelligences Theory in the 21st Century Teaching and Learning Environments: A New Tool for Effective Teaching and Learning in All Levels*. (ERIC Document Reproduction Service No. ED 476162).
- Moran, S., Kornhaber, M., and Gardner, H. (2006). Orchestrating multiple intelligences. *Educational Leadership*, 64(1), 22–27.
- Natasa, B. (2010). Multiple Intelligences Theory– A Milestone Innovation in English Language Teaching at the University of Nis Medical School. *Acta Med. Medianae* 49 (2), 15–19.

- Neto, F., Ruiz, F., and Furnham, A. (2008). Sex differences in self-estimation of multiple intelligences among Portuguese adolescents. *High Ability Studies*, 19 (2), 189–204. doi:10.1080/13598130802504387
- Neto, F., Furnham, A., and Pinto, M. D. C. (2009). Estimating One's Own and Others' Multiple Intelligence: A Cross-Cultural Study from Guinea Bissau and Portugal. *J. Psychol. Africa* 19 (2), 143–151. doi:10.1080/14330237.2009.10820273
- Neto, F., Ruiz, F., and Furnham, A. (2008). Sex Differences in Self-estimation of Multiple Intelligences Among Portuguese Adolescents. *High Ability Stud.* 19 (2), 189–204. doi:10.1080/13598130802504387
- Neubauer, A. C., Pribil, A., Wallner, A., and Hofer, G. (2018). The Self-Other Knowledge Asymmetry in Cognitive Intelligence, Emotional Intelligence, and Creativity. *Heliyon* 4, e01061. doi:10.1016/j.heliyon.2018.e01061
- Pérez, L. F., González, C., and Beltrán, J. A. (2010). Parental Estimates of Their Own and Their Relatives' Intelligence: A Spanish replication Parental Estimates of Their Own and Their Relatives' Intelligence: A Spanish Replication. *Learn. Individ. Differ.* 20, 669–676. doi:10.1016/j.lindif.2010.09.005
- Perrone, K. M., Ksiazak, T. M., Wright, S. L., Vannatter, A., Crane, A. L., and Tanney, A. (2010). Multigenerational Giftedness: Perceptions of Giftedness across Three Generations. *J. Edu. Gifted* 33 (4), 606–627. doi:10.1177/016235321003300407
- Prast, E. J., de Weijer-Bergsma, E. V., Miočević, M., Kroesbergen, E. H., and Van Luit, J. E. H. (2018). Relations between Mathematics Achievement and Motivation in Students of Diverse Achievement Levels. *Contemp. Educ. Psychol.* 55, 84–96. doi:10.1016/j.cedpsych.2018.08.002
- Proyer, R. T. (2011). Being Playful and Smart? the Relations of Adult Playfulness with Psychometric and Self-Estimated Intelligence and Academic Performance. *Learn. Individ. Differ.* 21, 463–467. doi:10.1016/j.lindif.2011.02.003
- Rhode, T. E., and Thompson, L. A. (2007). Predicting Academic Achievement with Cognitive Ability. *Intelligence* 35, 83–92. doi:10.1016/j.intell.2006.05.004
- Shahzada, G., Khan, U. A., Noor, A., and Rahman, S. (2014). Self-Estimated Multiple Intelligences of Urban and Rural Students. *J. Res. Reflections Edu.* 8, 116–124.
- Shearer, G. (2004). Multiple Intelligences Theory after 20 Years. *Teachers College Record.* 106 (1), 2–16.
- Stieger, S., Kastner, C. K., Voracek, M., Von Stumm, S., Chamorro-Premuzic, T., and Furnham, A. (2010). Independent Effects of Personality and Sex on Self-Estimated Intelligence: Evidence from Austria. *Psychol. Rep.* 107, 553–563. doi:10.2466/04.07.09.pr0.107.5.553-563
- Voges, M. M., Giabbiconi, C. M., Schöne, B., Waldorf, M., Hartmann, A. S., and Vocks, S. (2019). Gender Differences in Body Evaluation: Do Men Show More Self-Serving Double Standards Than Women? *Front. Psychol.* 10, 544. doi:10.3389/fpsyg.2019.00544
- Workman, L. (2004). Self-perception of Intelligence in Male and Female Undergraduates in Old and New Welsh Universities. *Psychol. Learn. Teach.* 4, 22–26. doi:10.2304/plat.2004.4.1.22
- Wu, S.-H., and Alrabah, S. (2009). A Cross-Cultural Study of Taiwanese and Kuwaiti EFL Students' Learning Styles and Multiple Intelligences. *Innov. Edu. Teach. Int.* 46 (2), 393–403. doi:10.1080/14703290903301826
- Yamauchi, D. (2015). Self-Evaluation of Learner's Multiple Intelligences in an Undergraduate ESP Program for Nurses at a Japanese University. *J. Teach. English Specif. Acad. Purposes* 2 (4), 591–602.
- Yuen, M., and Furnham, A. (2005). Sex Differences in Self-Estimation of Multiple Intelligences Among Hong Kong Chinese Adolescents. *High Ability Stud.* 16 (2), 187–199. doi:10.1080/13598130600618009

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2021 Shahzada, Khan, Muhammad Khan and Ullah. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.