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ÜNİVERSİTE ÖĞRENCİ VE MEZUNLARI İLE YETİŞKİNLERİN ÇOKLU ZEKA ALANLARI AÇISINDAN DEĞERLENDİRİLMESİ: ADANA/TÜRKİYE ÖRNEKLEMİNDE BİR ÇALIŞMA

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ÖZET

Bu araştırmanın temel amacı, üniversite öğrencileri ile üniversite mezunları ve yetişkinlerin zeka alanlarına yönelik tercihlerini belirlemektir. Çalışma betimsel karşılaştırmalı bir araştırma niteliğini taşımaktadır. Araştırmanın örneklemini Çukurova üniversitesinin farklı bölümlerinde okuyan, bir üniversiteden mezun olup Çukurova üniversitesinde yüksek lisans/doktora programlarına devam eden ve Adana'da yaşayan toplam 1466 (692 kadın, 774 erkek) birey oluşturmuştur. Örneklemi oluşturan bireylerin 545'i Çukurova üniversitesi öğrencisi, 921'i üniversite mezunları ve yetişkinlerden oluşmaktadır. Araştırmada veri toplama aracı olarak "Çoklu Zeka Alanları Gelişimsel Değerlendirme Ölçeği" kullanılmıştır. Araştırmada verilerin analizinde frekans ve yüzde hesaplamaları ile bağımsız gruplar t-testi analizi kullanılmıştır. Bulgular, üniversite öğrencileri ile üniversite mezunları ve yetişkinlerin sözel/dilsel, matematiksel/mantıksal, müziksel/ritmik ve bedensel/kinestetik zeka alanlarına ilişkin tercihleri açısından anlamlı bir şekilde farklılaştıkları ve ortalamalar incelendiğinde bu farklılığın üniversite öğrencileri lehine olduğu bulunmuştur. Cinsiyete göre farklılığın müziksel/ritmik ve doğa zekası ortalama puanları arasında ve müziksel ritmik zeka da kadınların, doğa zekasında da erkeklerin lehine olduğu belirlenmiştir. Sonuç olarak, bu araştırmanın sınırlılıkları ve bulguları doğrultusunda, çoklu zeka kuramıyla bireylerin çoklu zeka alanlarının belirlenmesinin, daha çok kişiye ulaşabilme ve bu kişilerin kendilerini tanımalarına yardımcı olarak kendileri ile barışık bireyler olmaları konusunda bir farkındalık oluşturma açısından önemli olduğu söylenebilir.

Anahtar Sözcükler: Cinsiyet, çoklu zeka, çoklu zeka düzeyleri, çoklu zeka alanları gelişimsel değerlendirme ölçeği, değerlendirme.

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ASSESSMENT OF MULTIPLE INTELLIGENCES AMONG UNDERGRADUATES, GRADUATES AND NON-STUDENTS: A SAMPLE STUDY FROM ADANA, TURKEY

ABSTRACT

The purpose of this study was to investigate the differences in intelligence preferences between undergraduate, graduate and non-student males and females living in Adana, Turkey. This was a descriptive casual comparative study. The Multiple Intelligences Developmental Assessment Scales (MIDAS) was administered to 1466 participants (692 male, 774 female) who were undergraduate and graduate students at the Cukurova University and non-students in Adana, a major urban city in Turkey. There were 545 undergraduate students and 921 graduate students and non-students (age 15-79). The results of the study revealed that the majority of the respondents had average and above average levels of intelligence for all sub scales of MIDAS. Significant differences were observed in the mean scores of the undergraduates and graduates/non-students for linguistic, logical, musical and naturalistic intelligences, with undergraduates having higher scores. Significant differences were observed in the mean scores of males and females for naturalistic, musical and bodily/kinesthetic intelligence. It was found that in the case of musical intelligence, girls took a slight lead, whereas boys were ahead of girls in naturalistic and bodily/kinesthetic intelligence. It can be said that determining the intelligence areas of the individuals according to the multiple intelligence theory is important in terms of being able to have an access to more people, creating an atmosphere for those people based on the intelligence areas or building an awareness about becoming individuals who are comfortable on their own skins by helping them to know themselves better.

Keywords: Assessment, multiple intelligence, multiple intelligence levels, MIDAS, sex differences,

Introduction

In view of the inadequacy of the notion of a general unitary intelligence that cuts across all areas of human competence to explain human performance, many psychologists and educators now believe that each individual, with his or her specific strengths and weaknesses, can be conceptualized as having multiple abilities (i.e., Guilford, 1967; Karolyi, Ramos-Ford, & Gardner, 2003; Sternberg, 1986, 1997, 2000). Gardner proposed the theory of multiple intelligences and challenged old beliefs about what it means to be smart. Gardner (1999, 33-34) defined intelligence as "bio-psychological 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 (1983, 1999) argues that intelligence is not some static reality fixed at birth and measured by standardized testing. Instead, intelligence is a dynamic, ever-growing reality that can be expanded in one's life through eight types of intelligence: (1) linguistic (words); (2) logical-mathematical (numbers); (3) spatial (pictures); (4) musical (musical/rhythmic); (5) bodily-kinesthetic (movement); (6) interpersonal (people); (7) intrapersonal (self);

and (8) naturalistic (flora and fauna). Although originally there were only seven intelligences, an eighth intelligence (naturalistic intelligence) has been added to the list, and there is now the possibility of a ninth type, existential intelligence (Armstrong, 2001; Fogarty & Stoehr, 2008) or spiritual intelligence.

Many studies can be cited on differences in intelligence(s), which is the main concern of the present study. Three of related studies (Bennet, 1996; Furnham & Fong, 2000; Yuen & Furnham, 2006) dealt with general intelligence, whereas the others (Chan, 2006; Furnham, Clark, & Bailey, 1999; Furnham, Shahidi & Baluch, 2002; Neto, Furnham, & Paz, 2007; Kaur & Chhikara, 2008) dealt with differences in multiple intelligences between males and females, around which the present study has been conducted.

In Bennet's study (1996), males tended to estimate their intelligences higher than females did. When asked to rate their parents' IQ, both males and females rated their fathers' IQ higher than their mothers'. In Neto, Furnham, and Paz's (2007) study, participants rated their fathers as more intelligent overall than their mothers. Consistent with Bennet's findings, males rated their intelligence higher than females did, but when their intelligence was psychometrically measured by using Raven's Test of Intelligence (Furnham & Fong, 2000), females scored higher than males. Yuen and Furnham's (2006) found that male participants estimated higher scores than female participants did. From the findings of the studies above, it seems that girls had less confidence in their intelligence than boys did.

In a study similar to the present one, Furnham, Clark and Bailey (1999) reported that when their study participants were asked to rate themselves on seven types of intelligence (linguistic, spatial, musical, logical/mathematical, bodily/kinesthetic, intrapersonal, and interpersonal) defined by Gardner (1983, 1993), the male participants showed higher ratings than the female participants. Kaur and Chhikara (2008) conducted research with the aim of assessing the multiple intelligence levels and studying sex differences among 12- to 14-year-old adolescents. The results of the investigation revealed that the majority of the respondents were found to have average levels of intelligence for all eight components of multiple intelligence (linguistic, spatial, musical, logical/mathematical, bodily/kinesthetic, intrapersonal, interpersonal, and naturalistic). In Kaur and Chhikara's study, significant differences were observed in the mean scores of boys and girls for linguistic, logical, musical and bodily/kinesthetic intelligences. It was found that in the case of linguistic and musical intelligence, girls took a slight lead, whereas boys were ahead of girls in logical and bodily-kinesthetic intelligence.

According to Gardner (1993), after Word War I IQ based thinking started and people were categorized as bright or not bright through some tests. However, in Gardner's view there is no single intelligence for success in life, he claims that there are eight intelligences and it is possible to increase this number. In fact, multiple intelligence theory is not new. Many scientists such as Gulford, Thondike and Thurstone are in favor of multiple dimensions of intelligence (Toker ve Ark. 1968). On the other hand, Gardner is standing at a different point of view supporting multiple intelligences and proposing a different understanding of the assessment of them. Gardner, who claims that instead of grading a person by giving him/her a single

intelligence point, it is possible to grade the intelligences and make a richer picture of a person's ability and potential compared to standard IQ, goes beyond the traditional intelligence view. In other words, Gardner (1983, s. 60) supporting the idea of assessing human intelligence objectively criticized the traditional view and suggests that intelligence involves multiple capacities that can not be explained by a single factor and proposed multiple intelligences theory.

People intelligence profiles differ from one another. That is to say, there are no two people having the exact proportion and mixture of intelligences. Thus, if we can determine the intelligence areas of a person by multiple intelligence theory, it may be possible to reach more people and make them be aware of themselves and be satisfied with their own existence. Furthermore, in the last decade concepts like "life long active learning", "problem solving ability" etc. have become popular in education with the joint studies by scholars from different disciplines. Individuals who can catch up with this new idea will be those who are aware of themselves. In order to raise people's awareness of themselves Multiple Intelligences Developmental Assessment Scales (MIDAS) which was developed for adults by Shearer (1996) can be utilized. Information gleaned from the MIDAS Profile can be used to formulate personalized educational and career plans by recognizing, valuing and focusing attention on areas of strength and potential. This scale was developed in three different forms: MIDAS for Kids (ages 6-14), Teen-MIDAS (ages 14-18) and MIDAS for adults & university students (19 and above). The MIDAS Profile provides detailed information in four broad categories. First, it gives a reasonable estimate of the person's intellectual disposition in each of eight constructs (Linguistic, Logical-mathematical, Spatial, Musical, Kinesthetic, Naturalist, Interpersonal and Intrapersonal). Second, twenty four or more kinds of skill associated with each intelligence are described (e.g. Instrumental and Vocal for Musical). Third, several intellectual style scales estimate the person's proclivity for Innovation, General Logic and Leadership. Fourth, qualitative information from each question can provide description of particular intellectual activities and actual outcomes (Shearer, 1996). For the purpose of this study, the intelligence area profile of the participants will be studied to see if profiles have changed according to different socio-demographic background.

In this study, the valid and reliable MIDAS adults & university students will be administrated to people living in Adana who have low, middle, high socio-economic background and who work in different fields as well as some university students so as to identify intelligence profiles. The study aims to include about 1700 participants; at least 300 participants from the three work fields that represent three different socio-economic background (for three socio-economic level 3x300=900) and 100 participants representing eight different faculty of Cukurova Universty, Turkey (for each faculty 8x100=800). Data will be gathered trough two different instruments: "MIDAS for adults & university students" and "Socio-Demographic Features Identification Questionnaire". Data will be analysed in the light of related literature.

Hence, the purpose of this study was to investigate differences in intelligence preferences, as defined by Gardner (1983, 1999) between undergraduates, graduates/non-students and between males and females living in Adana, Turkey by answering the following research questions:

1. What are the intelligence preferences of undergraduates/graduates/non-students?
2. Are there any significant differences between the intelligence preferences of undergraduates and graduates/non-students?
3. Are there any significant differences between the intelligence preferences of males and females?

Method

Research Design

This was a descriptive causal comparative study. It described participants' preferences for the intelligences proposed by Gardner (1983, 1999). The description was done at two levels. Level one is a description of all participants (males and females) as one group. The second level is a description of the comparison between the preferences of undergraduates and graduates/non-students and the male and female participants.

Participants

The participant were 1466 (692 male, 774 female) undergraduate and graduate students at the Çukurova University and non-students in Adana, a major urban city in Turkey.

There were 545 undergraduate students, 156 graduate students and 765 non-students (age 15-79). Due to a small proportion of graduate students, graduate and non-students groups were combined for the purpose of this study (henceforth called "graduates/non-students"). Table 1 outlines some demographic characteristics of the sample.

Table 1. Demographic Information for the Sample

		Age in Years		
Sample	*N (% of sample)*	*Mean*	*Standard Deviation*	*Range*
Undergraduates	545	21.96	2.39	17-35
Men	287 (52.7%)	21.85	2.55	17-35
Women	258 (47.3%)	22.08	2.19	17-29
Graduates/Non-students	930	30.07	10.91	15-79
Men	405 (44.0%)	30.68	10.97	17-64
Women	516(56.0%)	29.37	10.83	15-79
Total	1466	27.08	9.62	15-79
Men	692 (47.2%)	27.05	9.64	17-79
Women	774 (52.8%)	27.11	9.60	15-79

Instrument

Multiple Intelligences Developmental Assessment Scales (MIDAS) which developed by Shearer (1996, 2006) was used in the study. In the original form of the MIDAS there are 119 items in the MIDAS related to eight main scales. Each of the 119 items has a 5-

point Likert response scale. Options of "Do not know" or "Does not apply" exist for each item and are treated as missing values that do not contribute to the score.

In the adaptation study (Shearer, İflazoğlu Saban, Kuşdemir Kayıran and Işık, 2012), as a result of the exploratory factor analysis accounted for 41.93 % of the variance under 7 factors (93 item) [interpersonal-intrapersonal (21 item), naturalist (12 item), musical (13 item), logical-mathematical (14 item) linguistic (13 item), spatial (12 item), bodily/kinesthetic (8 item)].

The internal consistency coefficient (α = .87) was within ideal ranges. Also results of confirmatory factor analysis show that the model fitness indicator indexes meet the statistical standards (Byrne, 1998; Jöroskog & Sörbom, 1993; Kline, 1998; Sümer, 2000; Şimşek, 2007) [χ^2=16558.65 (sd=4164, p<.001), (χ^2/sd=3.98, NNFI= 0.95, NFI=0.93, CFI=0.95, IFI= 0.95, RMSEA=0.052, and SRMR= 0.062]. All items included in the tool had a significant content validity ratio and were valid for use with both age groups and both sexes.

After assessing the multiple intelligence levels among undergraduates and graduates/non-students, the significance of the difference between the mean scores of males and females was tested by the t-test.

Procedure

The MIDAS was administered to the participants by the researcher. The data from undergraduate students were collected in classrooms; the data from graduates/non-students were collected by the researcher in one-on-one interactions. Influence analysis was conducted to determine outliers that influence the study results unduly. Based on the leverage and standardized difference in fit value (Pedhazur, 1997), 44 subjects were found to be outliers. After removing 44 outliers, 1466 subjects were remained in the database. The data were analyzed using the SPSS package program. Responses to the MIDAS scale were aggregated for each person. Individuals scoring one standard deviation above or below the group MIDAS score of the scale were operationally defined as high and low, respectively, and those with scores within one standard deviation above/below the mean were defined as middle.

RESULTS AND DISCUSSION

Multiple Intelligence Between Undergraduates And Graduates/Non-Students

This section discusses the description of levels, (i.e., above average, average and below average), of all the components of multiple intelligence. The results shown in Table 2 suggest that for all the components of multiple intelligence, the maximum number of respondents fell into the "average" category of performance, followed by the "above average" and "below average" categories. Average performers have particular intelligence to an average extent, and they might be "above average" performers in other types of intelligence. Although "below average" and "average" categories always need attention, in the case of multiple intelligences, "above average" is the category that requires special attention by respondents themselves.

Table 2. Distribution of Respondents for Various Components of Multiple Intelligence (n=1466)

Components	Mean	SD	Min-Max Range	Levels					
				Below Average		*Average*		*Above Average*	
				f	*%*	*f*	*%*	*f*	*%*
Interpersonal-Intrapersonal	77.58	11.28	21-105	227	15.5	1000	68.2	239	16.3
Naturalist	30.93	9.82	12-60	254	17.3	955	65.1	257	17.5
Musical	39.64	9.28	13-65	255	17.4	948	64.7	263	17.9
Logical-Mathematical	43.48	9.81	14-70	216	14.7	1012	69.0	238	16.2
Linguistic	37.81	9.15	13-65	221	15.1	1005	68.6	240	16.4
Spatial	33.34	8.74	12-60	233	15.9	1009	68.8	224	15.3
Bodily/ Kinesthetic	20.16	6.59	8-40	250	17.1	931	63.5	285	19.4

Findings revealed that both undergraduates and graduates/non-students faired equally well in almost all the components of multiple intelligence (Table 3). The significance of the differences between the mean scores of undergraduates and graduates/non-students was tested by the t-test. Table 3 shows that significant differences were observed in the mean scores of undergraduates and graduates/non-students for linguistic ($t_{(1464)} = 2.828$, $p<0.01$), logical ($t_{(1464)} = 6.566$, $p<0.01$), musical ($t_{(1464)} = 5.408$, $p<0.01$), and naturalist ($t_{(1464)} = 1.896$, $p<0.05$) intelligences. When we looked at the mean score of the undergraduates and graduates/non-students we concluded that the differences were in favor of undergraduates. This finding corresponds with Kaur and Chhikara (2008).

Table 3. Means, Standard Deviation and t-test by Undergraduates and Graduates/Non-students for the Components of Multiple Intelligence

	Undergraduates (n=545)		Graduates/ Non-students (n=921)			
Components	Mean	SD	Mean	SD	$t_{(1464)}$	Cohen's d
Interpersonal-Intrapersonal	77.87	10.58	77.41	11.68	.752	0.04
Naturalist	31.56	10.06	30.55	9.66	1.896*	0.10
Musical	41.33	8.53	38.65	9.55	5.408**	0.30
Logical-Mathematical	45.63	8.98	42.20	10.06	6.566**	0.36
Linguistic	38.69	8.52	37.29	9.46	2.828**	0.16
Spatial	33.48	8.54	33.26	8.86	.460	0.03
Bodily/Kinesthetic	20.29	6.49	20.08	6.65	.578	0.03

*Significant at 0.05, ** Significant at 0.01

Sex-Wise Distribution Of The Respondents For Performance On MIDAS

Findings of the study revealed that both males and females faired equally well in almost all the components of multiple intelligences. The significance of the difference between the mean scores of males and females was tested by the t-test. Table 4 shows that significant differences were observed in the mean scores of males and females for musical ($t_{(1464)}$ = -2.238, $p<0.05$), naturalistic ($t_{(1464)}$ = 3.177, $p<0.05$) and bodily/kinesthetic ($t_{(1464)}$ = 4.367, $p<0.01$) intelligences. In the case of musical intelligence, females took a slight lead, whereas males were ahead of females in naturalistic and bodily/kinesthetic intelligence.

Several studies (Chan, 2006; Furnham, Shahidi & Baluch, 2002; Kaur & Chhikara, 2008; Loori, 2005; Yuen & Furnham, 2006; Teele, 2000) in various fields confirm the results of the present study.

Table 4. Means, Standard Deviation and t-Test by Sex for the Components of Multiple Intelligence

Components	Male (n=692)		Female (n=774)		Total (n=1466)		$t_{(1464)}$	Cohen's d
	Mean	SD	Mean	SD	Mean	SD		
Interpersonal-Intrapersonal	77.25	11.16	77.88	11.39	77.58	11.28	-1.076	0.06
Naturalist	31.79	9.97	30.16	9.63	30.93	9.82	3.177*	0.17
Musical	39.07	9.62	40.16	8.94	39.64	9.28	-2.238*	0.12
Logical-Mathematical	43.97	9.73	43.04	9.87	43.48	9.81	1.812	0.09
Linguistic	37.86	9.02	37.76	9.27	37.81	9.15	.199	0.01
Spatial	33.04	8.59	33.61	8.87	33.34	8.74	-1.253	0.07
Bodily/Kinesthetic	20.95	6.54	19.45	6.56	20.16	6.59	4.367**	0.23

*Significant at 0.05,
** Significant at 0.01

Although biology may contribute to superior performance, experience also seems to be important. In most societies, gender stereotyping of activities and occupations is well established. During middle childhood and adolescence, knowledge of stereotypes increases in the less obvious areas of personality traits and achievement (Signorella, Bigler, & Liben, 1993). Often, reading, spelling, art, and music are considered more appropriate for girls and mathematics, athletics and mechanical skills are considered more appropriate for boys (Eccles, Jacobs, & Harold, 1990; Jacobs & Weisz, 1994). These stereotypes influence children's preference for and sense of competence in certain subjects. Girls are usually found to be more interested in music than boys are and are seen discussing music in their free time with their friends. In our society, music and dance are considered more feminine traits, although girls are not encouraged to pursue these as professions.

Furthermore, girls seem to adopt a more general stereotype of males as smarter than females. Compared with boys, girls discount their talent (Stetsenko, Little, Gordeeva, Grassof, & Oettingen, 2000). Parents encourage a diverse array of gender-appropriate play activities and behaviors. They actively reinforce independence in boys and closeness and dependence in girls. Parents' gender-typed judgments, in turn, influence children's self-perceptions of ability and affect the effort they devote to mastering a particular skill and their later performance (Eccles, Freedman-Doan, Frome,

Jacobs, & Yoon, 2000). Fathers often tend to be engaged in more physically stimulating play with their sons than with their daughters. Sex differences in gross motor development are present as early as the preschool years, increase during middle childhood and are significant in adolescence. During adolescence, girls' gains in gross motor performance are modest, leveling off by age 14. In contrast, boys show a dramatic spurt in strength, speed and endurance that continues through the teenage years. Consequently, the gender gap widens. By mid-adolescence, very few girls perform as well as the average boy in running speed, broad jump and throwing distance (Malina & Bouchard, 1991). From a very early age, children absorb these social messages that parents hold higher expectations for boys' athletic performance. They view sports as much more important for boys. Girls see themselves as having less talent at sports and devote less time to athletics than their male classmates (Eccles et al., 1990; Eccles & Harold, 1991).

Work on multiple intelligence theory has increasingly been carried out in Turkey, mostly on young learners, and has revealed conflicting results. Özdemir, Güneysu & Tekkaya (2006) found that logical-mathematical intelligence was the leading intelligence type, followed by interpersonal and bodily-kinesthetic intelligence, while musical intelligence was the least common intelligence type held by students. In contrast, Yilmaz & Fer's (2003) small-scale study of 16 primary school students showed that visual-spatial intelligence was the leading intelligence, whereas interpersonal and intrapersonal were the least common intelligence types.

CONCLUSION AND RECOMMENDATIONS

In this study, according to the mean of the participants' total scores in each intelligence area and the standard deviation values a large majority of the participants had average and above-average preferences in all intelligence areas. A meaningful difference was observed between the preferences of undergraduate students, graduates/non-students on verbal/linguistic, logical/mathematical, musical/rhythmic and naturalist intelligence areas; this difference was in favor of the undergraduate students. It was also determined that the difference according to gender was between the average scores in the musical/rhythmic, naturalist and bodily/kinesthetic intelligence areas; it was in favor of the females in musical/rhythmic intelligence and in favor of the males in naturalist, bodily/kinesthetic intelligence.

The present study has important theoretical and practical implications for researchers and practitioners in educational guidance. Sex differences play a role in the development of some types of intelligence, whereas others are independent of sex differences. Similar interventions can be planned for both sexes. And also various data collection techniques can be used to obtain thorough data in further studies. In this way, individuals' preferences and their beliefs about those preferences can be identified as well as the effects of these beliefs on their self-esteem and other related individual differences.

Despite the above contributions, the limitations in the present study must be acknowledged. In the future, a more representative sample with a wider age range will help us to better understand the sex differences in self-evaluations of preferences among primary, secondary, undergraduates and graduate students and non-students. The present study does not provide interpretations of the relationship between self-estimated intelligence and beliefs about intelligence. Qualitative studies involving in-depth interviews with participants will clarify both the development of beliefs about intelligence as well as the way in which these beliefs influence self-evaluations of intelligence.

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