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Comparison of the physical education and sports school students' multiple intelligence areas according to demographic features

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The aim of this study is to compare the multiple intelligence areas of a group of physical education and sports students according to their demographic features. In the study, "Multiple Intelligence Scale", consisting of 27 items, whose Turkish validity and reliability study have been done by Babacan (2012) and which is originally owned by McClellan and Conti (2008) has been used as the data collection tool. Moreover, together with the scale, students have been asked for fulfilling another information form of 10 items which are aimed at revealing their demographic structures. Scale has been applied to 285 students of 113 females and 172 males. Obtained data has been downloaded into SPSS (Ver. 22), a statistical packet program, and then evaluated. During the evaluation process, frequency and percentage values, ANOVA and Student-t test statistical methods have been used. Level of Alpha was set as 0.05 for statistical significance. Average age value of the participants is 21.37 ± 2.39 year, which is shared between the female and male as 20.67 ± 1.96 and 21.84 ± 2.54 , respectively. In conclusion, there has been significant differences found among the intelligence areas according to the variables of gender, hometown and income level whereas, there haven't been any differences according to the variables of the colleges they graduated from, their grades in the school of physical education and sports, the educational level of their parents, being a licensed sportsman and training age.

Key words: Multiple intelligence, demographic features, physical education, sports.

INTRODUCTION

Intelligence upon which numerous studies have been done for years is an abstract concept. For this reason, it turns out to be a feature which has always been a matter of curiosity, whose borders are to be drawn and to be questioned. Until present, researchers have put forward numerous ideas upon the intelligence by examining the mental structures and behaviours of the individuals

(Bumen, 2014). Piaget (1972) brought an explanation about intelligence on the basis of development. He revealed how the individual has adapted to the environment by assimilation and congruity at different ages and claimed that in order to understand the intelligence, how the knowledge is obtained and used should be examined. According to Piaget (1972),

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intelligence is the power of adaptation to the surrounding in other words; it is a balancing process of balancing the mental development. From that point of his, the aim of realising the learning is to manage thinking as well. Because of the individual differences, there comes out differences in thought and in turn, differences in the intelligence areas. Multiple intelligence theory likes a window opening towards the brain and explains the specific functions of the various areas of the brain. In other words, multiple intelligence theory tries to explain how human intelligence reacts to the content of the world such as various concepts, events, sounds or objects and how he internalizes and interprets this content. In conclusion, from the point of multiple intelligence theory, intelligence is a multidimensional capacity, potential and an acquisition. Moreover, intelligence is shaped by the experiences of the individual with his ecological and cultural surrounding as well as his genetic heritage (Saban, 2005).

The purpose of the study

Aim of this study is to compare the demographic features of the multiple intelligence areas of a group of Physical Education and Sports School (PES) students according to "age, gender, hometown, total household income, level of education of the parents, the high school they graduated from, their grades, being a licensed athlete and training age" variables.

MATERIALS AND METHODS

This study has cross-sectional characteristics in a descriptive model. The participants have been fully informed about the procedures of the study. Written informed consent forms have been obtained from all participants. The study has been approved by the Cumhuriyet University Non-Interventional Clinical Studies Ethic Commission Chairmanship, and has been conducted in a consistent manner with the institutional ethical requirements for human experimentation in accordance with the Declaration of Helsinki. Total 285 volunteer undergraduate students, 113 female 172 male, randomly have participated in the research. When the distribution of the participants according to their grades was examined, it is found that 80, 67, 68 and 70 of the students are from the first, second, third and fourth grades, respectively.

Data collecting tool

Data collection tool consists of two parts; one of which is an information form aiming at detecting the socio-economic and demographic information of the participants and the other one is the Multiple Intelligence Scale (MIS) which is used for revealing the multiple intelligence areas of the students.

In order to reveal the multiple intelligence areas in which the university students dominate "Multiple Intelligence Scale" of 3 subcategories with 9 items each and 27 items in total have been used, which was developed by McClellann and Conti (2008), and whose Turkish validity and reliability study was accomplished by

Babacan (2012). Socio-economic and demographic information part consist of information form of 10 items. In this form, participants are asked questions to help to determine the "age, gender, hometown, total household income, level of education of the parents, high school they graduated from, their grades in the school of physical education and sports, being a licensed athlete and training age" features.

While the participants are answering the Multiple Intelligence Scale, they are required to put the answers to the questions-given as expressions-in an order starting from the item that they totally agree on, which will be called as the nearest, to the one that they do not agree on, which will be called as the furthest option. Participants are supposed to give the score 1 for the nearest ones and 9 for the farthest ones. The fact that for which intelligence area the participant has the tendency most is revealed by the lowest scores they give for the answers, each of which stands for a different intelligence area. Scores for each area are calculated and the intelligence area with the lowest score is accepted as the person's dominant intelligence area. The lowest score to get for each intelligence area in the scale is 3 point whereas, the highest is 27 point (Babacan, 2012).

Data analyses

The data has been evaluated by SPSS (Ver.22) statistic programme. While evaluating the data, "mean and standard deviation, frequency and percentage" statistical methods have been used; moreover, in order to explore the differences between the groups formed according to the variables, "Student's t-test" and ANOVA have been used. Tukey test has been used to identify which groups have resulted in these differences. Before using the parametric tests, the assumption of normality has been verified using the "Shapiro-Wilk test". Level of Alpha has been set as 0.05 for statistical significance. Inner consistency coefficient (Cronbach's Alpha) of the scale used in this study has been found as 0.70. Based on the related literature (Altunisik et al., 2010; Nakip, 2006), the alpha value of MIS (0.70) is to be accepted as reliable.

RESULTS

Average age value of the participants is 21.37 ± 2.39 years, whose distribution is as 20.67 ± 1.96 for female and 21.84 ± 2.54 years for male. Average values of the other gathered data and the results of the comparison and contrast are listed in Table 1. When the distribution of the graduated schools of the participants are examined, it is found that 63.50% of them, which is the highest rate, have graduated from the General State High Schools, whereas 3.20% of them, the lowest rate, are the graduates of the "Other" (Table 2). Participants have ticked the "City" alternative most with the rate of 63.90% whereas the "Village" has been the least ticked with the rate of 9.80%. The highest level of the participants' fathers' education level is of "Primary School", whereas the lowest level is of the "Uneducated" (Table 3). "Primary School" option is of the highest rate for the mothers' education level, whereas the "University graduate" gets the lowest rate (Table 4). Among the options of the participants' "Total Household Income Level", "0-1000" TL level has got the highest rate, whereas, the "4001-5000" one has the lowest rate

Table 1. Distribution of the high school graduation of participants.

Graduation	Frequency (n)	Percentage value (%)
General state high school	181	63.50
Sports high school	43	15.10
Vocational high school	38	13.30
Anatolian high school	14	4.90
Other	9	3.20
Total	285	100.00

Table 2. Distribution of the participants' hometowns.

Hometown	Frequency (n)	Percentage value (%)
Metropolis	32	11.20
City	182	63.90
Town	43	15.10
Village	28	9.80
Total	285	100.00

Table 3. Distribution of the education level of participant's fathers.

Educational level	Frequency (n)	Percentage value (%)
Primary School	126	44.20
Secondary School	61	21.40
High School	73	25.60
University	22	7.70
Uneducated	3	1.10
Total	285	100.00

Table 4. Distribution of the education level of participants' mothers.

Education level	Frequency (n)	Percentage value (%)
Primary School	185	64.90
Secondary School	64	22.50
High School	19	6.70
University	0	0.00
Uneducated	17	6.00
Total	285	100.00

(Table 5).

According to the results of the t test done by taking the gender variable as a base, there is a statistically significant difference between the female and male in "Bodily-Kinaesthetic, Interpersonal-Social and Verbal-Linguistic Intelligence" areas ($p < 0.05$) (Table 6). In the rest six intelligence areas, there are no significant differences found ($p > 0.05$). When the evaluation

technique of the scores gathered from the scale is taken into consideration, "Intra-personal, Existentialist, Logical-Mathematical, Interpersonal-Social and Bodily-Kinaesthetic Intelligence" areas bear similarities at the utmost level, whereas "Visual-Spatial, Naturalistic, Musical-Rhythmic and Verbal-Linguistic Intelligence" areas bear similarities at the least level between the female and male participants. When the intelligence area scores of the

Table 5. Distribution of the total house income of participants.

Income (Turkish Lira-TL)	Frequency (n)	Percentage value (%)
0-1000	167	58.60
1001-1500	61	21.40
1501-3000	42	14.70
3001-4000	6	2.10
4001-5000	2	0.70
5001+	7	2.50
Total	285	100.00

participants are examined according to the hometown variable, there is not a significant difference among groups except for the “Bodily-Kinaesthetic and Naturalistic Intelligence” (Table 7). However, according to Tukey test results, in the “Bodily-Kinaesthetic Intelligence” area, there is a significant difference between village and metropolis, and between village and city, in favour of village. When the intelligence area scores due to the income level of the participants are compared and contrasted, there arises a significant difference only between the groups of “1500-3000” and “5001+” for the “Visual-Spatial Intelligence” area (Table 8). Tukey test results present that this significance is in favour of “1500-3000” income group.

For the other eight intelligence areas, there are not any significant differences among the participants. Moreover, when the characteristics of the participants, that is, the high schools they graduated from, the grades in which they receive education in the School of Physical Education and Sports, the educational level of their parents, their ages, being a licensed athlete and training age features are classified and compared in ANOVA analysis, there are no statistically meaningful differences in their intelligence area points ($p>0.05$).

DISCUSSION

Average age value of all the participants is 21.37 ± 2.39 , whereas it has been found that the female average is 20.67 ± 1.96 years and male average is 21.84 ± 2.54 years. When the literature was reviewed, most of the age values found in other studies among the university students (Bacak and Dalkiran, 2016; Karakollukcu et al., 2014; Ozdogan et al., 2012; Aslan et al., 2010) bear similarity with values found in this study. In this case, it can be said that the sample of this study has similar characteristics to other samples in the universe. In this study, when the secondary education institutions were examined, it is seen that, of the participants, 150 people equivalent to 63.50%, 43 people with the rate of 15.10%, 38 people with 13.30%, 14 people with 4.90% and 6

people with 2.10% have graduated from general state high school, sports high school, vocational high school, Anatolian high school and the other type of high school, respectively. In literature, when the results of the researches related with PES students and the secondary education institution they graduated (Kayisoglu et al., 2014; Karademir et al., 2010) are examined, even if the rates are different, it can be said that students are mostly the graduates from the general state high schools.

As for the hometown of the participants, it has been concluded that 63.90% (182 people), 15.10% (43 people), 11.20% (32 people) and 9.80% (28 people) have grown up in city, town, metropolis and village, respectively. It has been revealed that students have mostly grown up in the city centre, which is a harmonious result with the other studies (Babacan, 2012; Gul, 2011; Tepekoylu et al., 2009). When the education level of participant’s fathers was examined, the highest rate goes to the primary school graduates with 44.20% (126 participants), then 25.60% (73 participants), 21.60% (61 participants), 7.70% (22 participants) are the graduates of high school, secondary school and university, respectively. 3 participants with the rate of 1.10% have no education at all. Fathers are mostly the graduates of primary school, the result which corresponds with the literature (Kurt et al., 2013; Tepekoylu et al., 2009; Izci et al., 2007). When the education level of the participants’ mothers is examined, the highest rate goes to the primary school graduates with 64.90% (185 people), then 6.70% (19 people) the graduates of secondary school and high school, respectively. 17 people with the rate of 6.00% have no education at all and there are no university graduates among the mothers. As it is the case for the other studies, it is concluded that the mothers are highly the graduates of the primary school.

When the “Total household income” option was examined, income distribution was as follows; 167 participants with 58.60% was at the “0-1000 TL”, 61 participants with 21.40% at the “1001-1500 TL”, 42 participants with 14.70% at the “1500-3000 TL”, 6 participants with 2.10% at the “3001-4000 TL” and 7 participants with 2.50% at the “5001+”. Results of this

Table 6. Comparing the intelligence area scores according to the gender variable (t test).

Intelligence areas	Female $\bar{x}\pm ss$	Male $\bar{x}\pm ss$	t value	p value	Result
Bodily-Kinaesthetic	13.53±4.72	12.27±4.99	2.124	0.035	p<0.05
Existential-spiritual	11.45±4.30	11.83±4.25	-0.724	0.470	p>0.05
Interpersonal-social	13.27±4.17	12.17±3.92	2.260	0.025	p<0.05
Intra-personal	10.29±3.75	10.36±4.01	-0.144	0.885	p>0.05
Logical-mathematical	11.96±4.01	12.70±4.14	-1.499	0.135	p>0.05
Musical-rhythmic	18.24±4.63	17.99±4.45	0.457	0.648	p>0.05
Naturalistic	18.14±3.80	17.62±3.89	1.113	0.267	p>0.05
Verbal-linguistic	20.01±4.64	21.63±4.74	-2.855	0.005	p<0.05
Visual-spatial	18.10±4.26	18.24±4.21	-0.275	0.784	p>0.05

Table 7. Comparison of the intelligence scores according to the hometowns of the participants (ANOVA).

Intelligence areas	F value	Level of significance	Result
Bodily-kinaesthetic	3.241	0.023	p<0.05
Existential-spiritual	1.035	0.378	p>0.05
Interpersonal	0.455	0.714	p>0.05
Intra-personal	0.459	0.711	p>0.05
Logical-mathematical	1.832	0.141	p>0.05
Musical-rhythmic	0.364	0.779	p>0.05
Naturalistic	2.770	0.042	p<0.05
Verbal-linguistic	1.461	0.225	p>0.05
Visual-spatial	1.973	0.118	p>0.05

Table 8. Comparison of the intelligence area scores according to the income level of the participants (ANOVA).

Intelligence areas	F value	Level of significance	Result
Bodily-Kinaesthetic	1.994	0.080	p>0.05
Existential-Spiritual	1.322	0.255	p>0.05
Interpersonal	0.335	0.891	p>0.05
Intra-personal	1.480	0.196	p>0.05
Logical-Mathematical	0.978	0.432	p>0.05
Musical-Rhythmic	0.344	0.886	p>0.05
Naturalistic	0.527	0.756	p>0.05
Verbal-Linguistic	0.727	0.604	p>0.05
Visual-Spatial	2.480	0.032	p<0.05

study have revealed great similarity with the literature (Binbasioglu and Tuna, 2014; Özşaker, 2013; Gul, 2011; Bavli, 2009) According to the data given for the "Hunger and Poverty Border" by Turkish Worker Union/Turk-Is (2013), total household income level of the PES students participating in the study is at the "Hunger and Poverty" boarder level. In conclusion, it can be said that total household income level of participating PES students is at the low income group, which has consistency with the

other study results for the university students. Kahraman and Bavli (2014) found the intelligent areas near to students as "Intra-personal, Social and Bodily-Kinaesthetic" whereas the further ones found as "Musical-Rhythmic, Verbal-Linguistic, Naturalistic and Visual-Spatial" in order. Similarly, Cinkilic and Soyer (2013) give the order as follows; the nearest intelligence area is "Bodily-Kinaesthetic", whereas the furthest one is "Visual-Spatial". Gullu and Tekin (2009) put the

intelligence areas in order as “Bodily-Kinaesthetic, Social, Intra-personal, Verbal-Linguistic, Naturalistic, Visual-Spatial and Musical-Rhythmic” and concludes that first, Bodily-Kinaesthetic intelligence; secondly, Social and thirdly, Intra-personal intelligence has developed most among these students.

Kul et al. (2014), states that the nearest intelligence areas to the students are “Social and Bodily-Kinaesthetic” ones, whereas, the furthest ones are “Musical-Rhythmic and Visual-Spatial”. Kiremitci and Canpolat (2014) found the nearest intelligence areas as “Bodily-Kinaesthetic, Social and Intra-personal” in order, and the furthest ones are “Naturalistic, Verbal-Linguistic and Musical-Rhythmic”. Tuncer (2011) in his study states that while “Bodily-Kinaesthetic Intelligence” of PES students is supposed to be the highest among the others; “Naturalistic Intelligence” comes out to be the highest unexpectedly. The results of the studies related to the intelligence areas of PES students have presented both similarities and dissimilarities in various places, however they have consistency about the fact that the nearest intelligence areas are “Bodily-Kinaesthetic, Interpersonal-Social and Intra-personal”, whereas the furthest intelligence areas are “Naturalistic, Verbal-Linguistic and Musical-Rhythmic”. According to the results of t test which has applied on the PES students to comprehend whether intelligence areas of them present any differences due to the gender variable, there seems statistically significant difference at “Bodily-Kinaesthetic and Interpersonal-Social Intelligence” areas in favour of male and at “Verbal-Linguistic Intelligence” in favour of female. Among other remaining six intelligence areas there were no significant differences due to the gender variable. When the points gathered from the scale are taken into consideration, “Intra-personal, Existential-Spiritual, Logical-Mathematical, Interpersonal-Social and Bodily-Kinaesthetic Intelligence” have taken their places at the first rows, whereas, “Visual-Spatial, Naturalistic, Musical-Rhythmic and Verbal-Linguistic Intelligence” areas have remained at the background both in male and female similarly.

Cinkilic and Soyer in their study (2014) found that only “Intra-personal Intelligence” area was different between male and female, which was in favour of male and in other intelligence areas there were not any differences found from the point of gender variable. Izci et al. (2007) state that there is no significant difference in any of the intelligence areas. However, Gullu and Tekin (2009) determined significant differences among the “Verbal-Linguistic, Visual-Spatial, Musical-Rhythmic, Social and Intra-personal” intelligence areas in favour of female. Yazici and Acar (2010) found significant differences at “Musical-Rhythmic and Linguistic Intelligence” areas in favour of female, whereas, “Bodily-Kinaesthetic” intelligence areas in favour of male. Karakas et al. (2014) found out significant difference in all intelligence areas except the “Interpersonal-Social” one in favour of female.

When the results of the other studies in literature are examined, there occurs different finding about the differentiation of the intelligence areas according to gender; that is, there is no mutual agreement.

When the intelligence area scores related to hometowns are compared, there is no significant difference found among the groups except for the “Bodily-Kinaesthetic and Naturalistic Intelligence”. According to t test results, in the “Bodily-Kinaesthetic Intelligence” area between village-metropolis and village-city comparisons, there is significant difference in favour of village, whereas the difference in “Naturalistic Intelligence” area is in favour of city. There is not any study done among PES students comparing the multiple intelligence areas from the point of hometown variable. Yilmaz and Ozkan (2011) couldn't find any statistical significant difference among the intelligence scores of Health Academy students from the point of “Longest Lived Place” variable. The fact that there is a significant difference between metropolis, city and village in “Bodily-Kinaesthetic Intelligence” in favour of village can be explained by the point that physical activities in village life are far denser than city life. However, it is surprising that “Naturalistic Intelligence” has come out to be higher in city than in village. The reason for this might be the continuous longing of the city and metropolis habitants for the natural surroundings (Urgup and Aslan, 2015).

When it comes to the intelligence area scores of the participants according to the total household income level, there is not any significant difference among income level groups for eight intelligence areas, whereas only for “Visual-Spatial Intelligence” area there is a significant difference between “1500-3000 TL” income group and “5001+ TL” group. Tukey analyses results show that the difference is in favour of “1500-3000 TL” income group. Cinkilic and Soyer (2013) state that students have one or more than one intelligence area due to the income level variable, there exist differences among the individuals and intelligence areas are affected by the social, environmental and economic etc. situations. Karademir et al. (2010) and Abaci and Baran (2007) couldn't find any correlation between the income level and intelligence areas. From this point of view, while some study results have revealed differences in multiple intelligence areas or intelligence scores according to the income level variable, some study results have shown no statistically significant difference among the intelligence scores due to the income variable. Moreover, when the participants are grouped according to the variables of graduated high school, grade at PES, parents' education level, their ages, being a licensed sportsman and training age features and then compared by ANOVA analyses, there is not any significant difference among any intelligence areas. Karademir et al. (2010), in their study done according to the graduated high school variable, state that there is no statistical difference among the

groups in terms of self-respect and emotional intelligence level.

Delice and Odabasi (2013), state that there is a difference in intelligence levels due to class grades of the students, while claiming that there is no correlation between the parents' education level and emotional intelligence levels of the students. Abaci and Baran (2007) declare that there is a positive correlation between the parents' education and "Musical-Rhythmic, Verbal-Linguistic and Intra-Personal Intelligence" scores. Gullu and Tekin (2009) state that there are statistically significant differences between "Verbal-Linguistic, Logical-Mathematical, Interpersonal-Social and Intra-personal" intelligence areas in relation with the grades the students are being educated. As it can be understood from the literature on this subject matter, there exist differences among the research studies. Some research results reveal that there is a significant influence of the graduated high school, grade at PES and the parents' education level upon the intelligence areas of the people, whereas some others present that there is no correlation between the areas and the variables.

SUGGESTIONS

The initial expectation of this study was to prove that PES students have the "Bodily-Kinaesthetic" intelligence area as the dominant intelligence area in mind within the frame of "Multi Intelligence Theory", however, it has been found that the students mentioned have the "Intra-personal Intelligence" area characteristics most. Moreover, while it was expected that "Naturalistic Intelligence" was to be dominant in mind of the student with the village and town background, the result has turned out to be the reverse; "Naturalistic Intelligence" area is dominant in those with the city background and it is thought that this might be the result of the longing of the city inhabitant for the natural life.

There are no statistically significant differences found between the scores of the intelligence areas and the ages, being a licensed sportsman, training age, graduated school, parents' education level, household income level and the grade they study. When it comes to the differences due to the gender, it has been detected that males are dominant in "Bodily-Kinaesthetic and Interpersonal-Social Intelligence", whereas females are dominant in "Verbal-Linguistic Intelligence". Since this study is a descriptive model, findings collected are not able to describe the "Reason-Result" relation precisely. The reasons of the results of this study can be explained best by the prospective studies in future.

Conflict of Interests

The author has not declared any conflict of interest.

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