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A Case Study on the Relationship Between Sport Motivation Orientations and Bodily/kinaesthetic Intelligence Levels of University Students

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Abstract: The aim of this research was to explore the relationship between sport motivation orientations and bodily/kinaesthetic intelligence levels of physical education students. The sample group of this study was composed of 196 students from Bart1n University Physical Education and Sport College. The sample group was adopted multiple intelligence inventory and sport motivation scale. The findings of both scales were evaluated through descriptive statistics and correlation analysis using SPSS 17.0 package programme. As a result of the research, it was found that there is a significant positive relationship between bodily/kinaesthetic intelligence and internal motivation sub-scales and significant, weak negative relationship between bodily/kinaesthetic intelligence and amotivation.

Key words: Multiple intelligence (MI) . Bodily/kinaesthetic intelligence . Sport motivation scale (SMS) . Physical education (PE)

INTRODUCTION

The traditional intelligence affirmation, intelligent quotient (IQ), had been criticised harshly for being simple, incomprehensive, biased and even racist [1]. Therefore it was substituted by multiple intelligence theory (MIT), which has long been an important approach in educational frame during last few decades by many scholars in order to measure the intelligence levels of the individuals. Gardner, who shared the same criticisms on the traditional understanding of intelligence, proposed the existence of at least seven basic intelligences in *Frames of Mind* [2]; and afterwards added an eighth category of intelligence [3]. Gardner's work has encouraged educators and parents to view children as equals regardless of a quotient produced from an intelligence exam or of academic areas for which they develop competence. Practitioners of MI understand that children do not fit a single prototype. Gardner sought to broaden the perception of human potential beyond the confines of traditional IQ scores, seriously questioning the validity of determining an individual's intelligence through the practice of taking the person out of his or her natural environment and asking him or her to attempt isolated tasks never done before-and probably never to be done again [4].

One of the eighth intelligences introduced by Gardner is bodily/kinaesthetic intelligence. This type of intelligence covers expertise in using one's whole body to express ideas and feelings to produce or transform things. It includes specific physical skills such as coordination, balance, dexterity, strength, flexibility and speed [5]. According to Bellanca, intelligence enables us to control and interpret body motions, manipulate physical objects and establish harmony between the mind and the body [5]. In addition, as Gardner expresses characteristic of this intelligence is the ability to use one's body in highly skilled ways for expressive as well as goal-directed purposes. Characteristic as well is the capacity to work skilfully with objects; both those that involve the fine motor movements of one's fingers and hands and those that exploit motor movements of the body [6]. The question that the instructor in History of Art class might ask to arouse Bodily-Kinaesthetic Intelligence could be; "How can I involve the whole body or use hands-on experiences?" [5].

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Another important psychometric issue is motivation. Motivation can simply be defined as an activated state within a person consisting of drives, urges, wishes and desires that lead to goal-directed behavior [6]. Deci and Ryan [7], divided motivation into three major parts, as intrinsic motivation (IM), extrinsic motivation (EM) and amotivation in order to better understand the psychological state of person. Previous researches have proposed that motivation in a specific domain resulted with success in that domain [8,9]. This is to mean that sport motivation refers to desire, willingness, wish to engage in athletic field and sport motivation will normally lead to athletic success.

This conceptual basis gives an insight that sport motivation and bodily/kinaesthetic intelligence may intersect in educational frame and most interesting would be the investigation of this intersection within athlete students. Therefore this research which tries to explore the relationship between sport motivation and bodily/kinaesthetic intelligence levels of physical education students has a significant importance in the literature and will be a pioneer to lead the study of this very specific subject.

MATERIALS AND METHODS

Sample Group: The sample group of the this study was composed of 196 first and second grade students studying at Bartın University Physical Education and Sport College. The age distribution of the sample group is presented in Table 1.

Data Gathering Tools: In order to gather data, Sport Motivation Scale (SMS) and Multiple Intelligence Inventory (MII) were applied to the whole sample group voluntarily. SMS, which is valid and reliable to measure sport motivation orientations was developed by Pelletier *et al*. [10]. This test, which is valid and reliable to measure sport motivation, was developed by Pelletier *et al*. in 1995 [29] and includes 28 items as reply to the question: "Why do you practice sport?". The test is composed of 7 subscales assessing the 7 motivational constructs, as following: 3 types of intrinsic motivation (intrinsic motivation to know, to accomplish things and to experience stimulation), 3 types of extrinsic motivation (external, introjected and identified regulation) and amotivation. Each item is ranked with a 7 point likert scale, ranging from 1 (does not correspond at all) to 7 (corresponds exactly).

Table 1: Age distribution of the sample group

	n	$\bar{x}$ (age)	SD (years)
Students	196	22.48	2.17

In order to analyze the multiple intelligence levels of the students, the multiple intelligence inventory (MII) in Turkish developed by Gonca Seber was used [11]. This inventory is composed of 64 questions, 8 questions for 8 type of intelligence and prepared as a three-point likert type scale (which was used to differentiate orientations from 1 as low and 3 as high). As this research takes bodily/kinaesthetic intelligence into consideration, only the 8 questions related to this intelligence type was taken into consideration.

Reliability and Data Analyses: The data derived from both tests were evaluated using the Statistical Package for the Social Sciences (SPSS) version 17.0 through arithmetic means ($\bar{x}$), standard deviation (SD) and Pearson Product Moment Correlation. For the statistical significance, p value was taken as 0.05 ($p<0.05$) for correlation analysis. Tabachnick and Fidell [12] underlined that correlational studies cannot use to explain causality, but this type of study at least can indicate whether a change in the value of the independent variables has a significant effect on changes to the dependent variables [13].

As this study makes use of self-report measures, the participants may be prone to furnish socially desirable responses to the questions, resulting in less accurate representations of their true motivational orientations as warned by Selltiz *et al*. [14]. Therefore internal consistency and reliability of the tests were calculated.

A reliability analysis with calculation of Cronbach's alpha was also conducted to determine if the measurement tools were acceptable and reliable or not. Cronbach's alpha was calculated as 0.77 for SMS and 0.79 for MII, which indicate that the items of both tests have relatively high internal consistency. The p value for 2-tailed significance is. 000, rounded to three decimal places.

RESULTS

The results of SMS and MII bodily/kinaesthetic type of intelligence were presented in table 2 through descriptive statistics. Examining the descriptive statistics, it was observed that IM levels of the students are relatively higher than EM levels. The higher averages of intelligence types are respectively as the following; IM to experience stimulation ($\bar{x}$=4.96), IM to know ($\bar{x}$=4.63),

EM introjected regulation ($\bar{x}$=4.59) and IM to accomplish ($\bar{x}$=4.47). On the other hand the arithmetic average of bodily/kinaesthetic intelligence level of the students were found to be as 2.39 over 3 points.

In order to explore the relationships of sport motivation sub-scales and bodily/kinaesthetic intelligence, Pearson Product Moment Correlation test was conducted. The results of correlation analysis were presented in table 3, separately for each type of motivation sub-scale.

According to the correlation analysis; significant positive relations were found between IM levels and bodily/kinaesthetic intelligence levels of the students. The highest significant relation was found between IM to accomplish and bodily/kinaesthetic intelligence (r=.516). The second highest significant relation was observed between IM to experience stimulation and bodily/kinaesthetic intelligence (r=.420) and the last was between IM to know and bodily/kinaesthetic intelligence (r=354). On the other hand no significant relations were found between EM sub-scales and bodily/kinaesthetic intelligence. When it comes to amotivation level, negatively significant relation were found between amotivation and bodily/kinaesthetic intelligence levels of the students at a weak level (r=-.119).

The strength of the found relationships should be interpreted accordingly to the values proposed by Choudry [15] in table 4.

Table 2: Motivation sub-scales and bodily/kinaesthetic intelligence levels of the students

	N=196	
	$\bar{x}$	SD
Sport motivation sub-scales		
IM-to know	4.63	1.41
IM-to accomplish	4.47	1.14
IM-to experience stimulation	4.96	1.10
EM-External regulation	4.21	1.12
EM-Identified regulation	4.41	0.99
EM-Introjected regulation	4.59	1.43
Amotivation	3.12	1.29
Bodily/kinaesthetic intelligence level	2.39	0.37

Table 3: Correlation between bodily/kinaesthetic intelligence levels and sport motivation sub-scales of the students

	r
IM-to know	.354**
IM-to accomplish	.516**
IM-to experience stimulation	.420**
EM-External regulation	-.007
EM-Identified regulation	.041
EM-Introjected regulation	.036
Amotivation	-.119**

(Sig. [2 tailed] =. 000; $p < 0.05$)

Table 4: The strength of relationship according to correlation value

Value of r	Strength of relationship
-1.0 to-0.5 or 1.0 to 0.5	Strong
-0.5 to-0.3 or 0.3 to 0.5	Moderate
-0.3 to-0.1 or 0.1 to 0.3	Weak
-0.1 to 0.1	None or very weak

DISCUSSION AND CONCLUSION

After the introduction of MIT, many scholars have applied this theory to measure intelligence levels, to develop education curriculum and to select the talents of the students. This theory has also been effectively used in sport domain as well. Many researchers tried to explore the relationship between different sportive, artistic, cultural practices and intelligence development in terms of MIT [16-18]. Some other scholars also concentrated on the effects of MI on physical education [19-21]. Mitchell and Kernodle, focused on the use of MI theory for more effective training of specific sport branch, which is tennis in their study [22]. Ilhan *et al*. tried to find out the effects MI theory on teaching volleyball and gymnastic units [23]. Another case study was carried out by Bozkus [24], who tried to explore the effects of folk dance practices on the intelligence development of 5th grade students in terms of MIT.

In the literature one of the other main psychometric subjects is motivation on which a wide range of studies have been carried out. Pelletier *et al*. [10] developed a new scale which was specific to sport domain and many researchers have so far applied this scale in their studies [25,26].

In this study, the relationship between sport motivation orientations and bodily/kinaesthetic intelligence levels of the PE students were explored. According to the results of this study, a strong relationship [15] was found between IM to accomplish and bodily/kinaesthetic intelligence levels of the students (r=.516). Therefore this study shows that there is a strong relationship between the pleasure of engaging and doing activities (IM to accomplish) and bodily/kinaesthetic

intelligence. This is to mean that the students who have higher averages in bodily/kinaesthetic intelligence also like engaging and doing activities.

This study also found that there are moderate relationships between IM to experience stimulation, IM to know and bodily/kinaesthetic intelligence levels of the students (respectively r=.420; r=.354). When it comes to amotivation sub-scale of sport motivation orientations, it was found that there is a weak negative relationship between amotivation and bodily/kinaesthetic intelligence (r=-.119). Although the level of the relationship is approved as weak according to Choudry [15], it is understood that the students who have lower levels in bodily/kinaesthetic intelligence type experience higher amotivation.

Although the findings of the study seem to be very predictable, it has utmost importance to reach parallel findings in MIT and SMS in sport domain. This would also inspire future studies to concentrate on these theories as they support each other in validity and reliability as measurement devices in physical education and sport.

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