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Applying athletic identity measurement scale on physical Educators: Turkish version of AIMS

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In sports research, defining athletic identity of individuals is an important study subject. The subject owes its significance to the fact that an individual's athletic identity affects his other identities throughout his life span. The aim of this study is to test the reliability and validity of the Turkish version of Athletic Identity Measurement Scale (AIMS). The sample of the study was selected among 501 university students, composed of 194 female and 307 male students. The original "Athletic Identity Measurement Scale" is a 10-item inventory developed by Brewer, Van Raalte and Linder (1993) and was used to measure the athletic identity levels of subjects. Subjects were asked to select the responses that fit them the most on a five point Likert type scale. According to the results of this study, 7-item multidimensional structure of AIMS was proven reliable and valid for Turkish population.

Key words: Athletic identity, physical educator, scale, validity, reliability.

INTRODUCTION

Athletic identity is a part of one's self-identity that obtains validation and meaning from participation in sports and exercise (Caroon-Santiago, 2009). Athletics is just one of any areas that might facilitate the growth of an individual's identity (Houle, 2011). The concept of identity relates to, at its roots, an individual's perception of (him or her) self. Various theories within psychology have commented on this idea of self (Sturm et al., 2011). In sport psychology, instead of the term "identity", the term "athletic identity" is used. Athletic identity has been defined in sport and exercise psychology literature as, "the degree to which an individual identifies with the athlete role" (Brewer et al., 1993). Patterns of identification with the athlete role would be expected tovary as a function of the sport situation (Brewer et al., 1999).

Individuals may have as many identities as they do in the networks of relationships in which they have a position. For example, individuals may have different networks associated with their family, school, occupation, and athletic team. In each of these networks, individuals may have a different set of relationships and expectations of behaviours; this may be described as a multi-dimensional structure of self (Derick, 2007). Also as Spokane (1996) stated; "identity can also be an indicator of the degree of clarity of the picture of one's goals, interests and talents" (Hook, 2012). Athletes attend to satisfy personal needs related to their athletic identity, personal goals and social affiliation by participation through sports (Medic et al., 2011). It therefore seems that the intrinsic motivation of the individual athlete should

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be considered as the main factor to define athletic identity (Van de Vliet et al., 2008).

Athletes' countries of origin and cultural belongings may impact their athletic identity through the developed meanings associated with the athletic identity standard. An identity standard is a set of meanings individuals hold for themselves in a given role (Visek et al., 2010). Personally, individuals who were involved in elite sport allowed sport to give meaning to their lives, got an enhanced feeling from being an elite athlete, and relished such things as having a muscular body and outstanding skills (Houle et al., 2010). Athletic identity provides structure with which to process and organize information, and finally as the catalyst for action (Lau et al., 2004).

The AIMS was developed to assess athletic identity and the strength and exclusivity of the athletic role (Brewer et al., 1991). Studies generally have shown that the AIMS, when used as a multidimensional assessment tool, it is a reliable and valid measurement in English-speaking cultures. Nevertheless, there is limited research investigating the generalization ability of the items and factor structure of the AIMS in non-English speaking cultures (Li and Andersen, 2008). This huge population must be measured according to athletic identity in their nature languages. For this reason the question of "Is the AIMS suitable for Turkish athletes?" must be searched. So, the purpose of this paper is to test the reliability and validity of the Turkish version of Athletic Identity Measurement Scale (AIMS).

The Athletic Identity Measurement Scale requires athletes to rate themselves on a 10-item instrument with responses ranging from "strongly disagree" to "strongly agree" on a 7-point scale. All empirical studies applying the AIMS as a model are listed in Table 1 (Cieslak, 2004).

METHOD

Participants

The study group was consisted of 194 female and 307 male students, totalling to 501 undergraduate students in Karadeniz Technical University-School of Physical Education and Sport during the 2012 to 2013 Fall Semester. In the School of Physical Education and Sport, there are three departments titled as; "Department of Physical Education and Sport Teaching", "Department of Coaching Education" and "Department of Sport Management".

This study group was chosen because of probability of strong athletic identities. Mostly students, 353 of them were determined themselves as athletes but 148 of them mentioned that they are non-athletes. Especially, students in Department of Sport Management were declared that they had no athletic backgrounds. There were elite level athletes in 35 different kinds of sports among the students. All of the student athletes were competitors in various sport clubs.

The sample size in the present study was adequate to estimate the various models based on two criteria: (a) the total sample size was larger than 300; and (b) the ratio of the total sample size to the number of freely estimated parameters should be greater than 10:1 and approximating 20:1 (Proios, 2012).

Instrument

The original Athletic Identity Measurement Scale (AIMS) with 10 items (Brewer et al., 1993) and 10 demographic questions were used in the research.

Items of the AIMS:

1. I consider myself an athlete.
2. I have many goals related to sport.
3. Most of my friends are athletes.
4. Sport is the most important part of my life.
5. I spend more time thinking about sport than anything else.
6. I need to participate in sports to feel good about myself.
7. Other people see me mainly as an athlete.
8. I feel bad about myself when I do poorly in sport.
9. Sport is the only important thing in my life.
10. I would be very depressed if I were injured and could not compete in sport.

AIMS-10 item was translated into Turkish separately by three physical education lecturers with good English proficiency. Translations were compared to each other and after the best translations were decided upon for each item, three English teachers back translated the items for compatibility to the original scale. All translations were compared to the original scale and the last form of the Turkish version was completed.

In the beginning of the study, a pilot group (n=225) were asked to indicate their responses on a 7-point Likert type scale from 1 (strongly agree) to 7 (strongly disagree). They were also undergraduate students in Karadeniz Technical University-School of Physical Education and Sport. After the data collection, psychometric data for 7 Likert was performed. The results showed that 7-point Likert type scale was not suitable for the Turkish sample (Table 2).

The revision of structured alternative formats to Likert scales helped to improve validity and reliability and did not increase socially desirable responses (Kalmet and Fouladi, 2008). It would imply that the meaning of the Likert format could change depending on number of scale choices in different cultural groups (Lee et al., 2002). On the other hand, as Krosnick and Berent (1990) stated that "verbal rating scales, which provide a label for each scale point, have been found to be more reliable than scales that provide labels for the endpoints" (Schwarz et al., 1991). The simulation studies and empirical studies have generally concurred that reliability and validity are improved by using 5 to 7-point scales rather than coarser ones (those with fewer scale points) (Dawes, 2008). So, in the current study, the original 7-Likert type was modified to 5-Likert type, ranging from 1 to 5; strongly disagree (1), disagree (2), undecided (3), agree (4), strongly agree (5). After applying the modified rating scale, statistical results were proofed that 5-point Likert type scale was more suitable for the Turkish culture (Table 3).

Procedures

The AIMS-5-Likert type Turkish version was applied to the subjects at the beginning of the undergraduate theoretical courses. All permissions were obtained from the directorate of the institution and the data collection tool was applied to the students voluntarily by the researcher. All participants were encouraged to provide honest responses.

Data analysis

Structural equation modelling (SEM) was widely used in the social sciences. The suitability of a single-group measurement model was usually assessed using an SEM procedure known as confirmatory

Table 1. Empirical studies applying the AIMS as a model.

Author(s)	Year	SE	SI	EX	NA	Omitted
Brewer, Van Raalte and Petitpas	1993					
Brewer, Van Raalte and Petitpas	1990		1,2,3,7	4,5,6,9	8,10	
Brewer, Boin, and Petitpas	1993		1,2,3 (.87)	4,5,6 (.73)	8,10 (.78)	7,9
Martin, Mushett and Eklund	1994	1,2 (.72)	3,7 (.64)	4,5,9 (.65)	8,10 (.72)	6
Martin, Eklund and Mushett	1997	1,2 (.66)	3,7 (.87)	4,5,9 (.73)	8,10 (.78)	6
Smith, Hale and Collins	1998		1,2,3,7	4,5,6,9		
Hale, James and Stambulova	1999		1,2,3	4,5,6,9	8,10	7
Hurst, Hale and Collins	2000		1,2,3,7 (.87)	4,5,6,9 (.88)		
Brewer-Cornelius	2002		1,2,3	4,5	8,10	6,7,9
Ryska	2002		1,2,3,7 (.82)	4,5,9 (.79)	8,10 (.77)	6
Ryska	2003		1,2,3,7 (.78)	4,5,9 (.81)	8,10 (.72)	6

The abbreviations are as follows: Self-Identity (SE), Social Identity (SI), Exclusivity (EX), and Negative Affectivity (NA).

Table 2. Psychometric data for 7-Likert AIMS.

χ^2/df	χ^2/df	RMSEA	CFI	GFI	AGFI	NFI	TLI
20.83/11	1.89	0.06	0.92	0.98	0.93	0.86	0.86

Note: Standardized regression weights (factor loadings) are between 0.26 and 0.68 (low values) (n=225 athletes).

Table 3. Psychometric data for AIMS models.

Models		χ^2/df	χ^2/df	RMSEA	CFI	GFI	AGFI	NFI	TLI	AIC	CAIC
	Athlete	180.23/35	5.15	0.11	0.88	0.91	0.85	0.85	0.84	220.23	317.56
Model-1 (10-item,1-factor)	Non-athlete	79.71/35	2.28	0.09	0.88	0.90	0.85	0.80	0.84	119.71	199.65
	Total	208.17/35	5.94	0.10	0.90	0.92	0.88	0.88	0.87	248.17	352.50
	Athlete	64.00/24	2.67	0.07	0.96	0.96	0.93	0.94	0.94	106.00	208.19
Model-2 (9-item, 3-factor)	Non-athlete	36.44/24	1.52	0.06	0.96	0.95	0.91	0.89	0.94	78.44	162.38
	Total	63.62/24	2.65	0.06	0.97	0.97	0.95	0.96	0.96	105.62	215.17
	Athlete	92.39/21	4.40	0.10	0.93	0.95	0.89	0.92	0.88	140.39	257.19
Model-3 (9-item, 4-factor)	Non-athlete	23.06/21	1.10	0.03	0.99	0.97	0.93	0.93	0.99	71.06	166.99
	Total	88.64/21	4.22	0.08	0.95	0.96	0.92	0.94	0.92	136.64	261.84
	Athlete	17.79/11	1.62	0.04	0.99	0.99	0.97	0.98	0.98	51.79	134.52
Model-4 (7-item, 3-factor)	Non-athlete	8.14/11	0.74	0.00	1.00	0.99	0.96	0.97	1.02	42.14	110.09
	Total	22.12/11	2.01	0.05	0.99	0.99	0.97	0.98	0.98	56.12	144.80

Notes: χ2/df = Chi-squared/degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; GFI = Goodness-of-fit Index; NFI = Normed Fit Index; Tucker-Lewis index (TLI); AIC = Akaike Information Criterion; CAIC = Consistent Akaike Information Criterion.

factor analysis (CFA) (Cheung and Rensvold, 2013). In the scope of CFA; chi-square goodness of fit (χ^2), chi-square/degree of freedom (χ^2/df), root mean square error of approximation (RMSEA), comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI) and normed fit index (NFI) coherence values were analyzed (Çokluk et al., 2010). To examine the AIMS models, confirmatory factor analysis (CFAs) was performed in this study.

Researchers typically compare the computed value of some GFI to a pre-specified cut off value for evaluating model fit. For normed fit indices (that is, goodness-of-fit index, NNCP, RNI, and TLI) whose values typically range between 0 and 1, with 1 indicating perfect fit, the cut off value of 0.90 is recommended to evaluate model fit (Sharma et al., 2005). Recommendations for RMSEA cut off points have been reduced considerably in the last fifteen years. Up until the early nineties, an RMSEA in the range of 0.05 to 0.10

Table 4. Factor loadings for Models of AIMS.

Variables	Total scale			Subscales		
	Athlete	Non-athlete	Total	Athlete	Non-athlete	Total
M1 (10-item, 1-factor)	0.85	0.81	0.85			
M2 (9-item, 3-factor)	0.83	0.79	0.83			
Social Identity				0.62	0.63	0.65
Exclusivity				0.76	0.71	0.75
Negative Affectivity				0.69	0.64	0.68
M3 (9-item, 4-factor)	0.84	0.79	0.84			
Self-Identity				0.69	0.62	0.70
Social Identity				0.51	0.43	0.51
Exclusivity				0.72	0.64	0.71
Negative Affectivity				0.69	0.64	0.68
M4 (7-item, 3-factor)	0.81	0.77	0.81			
Social Identity				0.62	0.63	0.65
Exclusivity				0.77	0.69	0.76
Negative Affectivity				0.69	0.64	0.68

was considered an indication of fair fit and values above 0.10 indicated poor fit. It was then thought that an RMSEA of between 0.08 to 0.10 provides a mediocre fit and below 0.08 shows a good fit. However, more recently, a cut off value close to .06 or a stringent upper limit of 0.07 seems to be the general consensus amongst authorities in this area (Hooper et al., 2008).

It has been suggested to raise the rule of thumb minimum standard for the CFI and the NNFI from 0.90 to 0.95 to reduce the number of severely misspecified models that are considered acceptable based on the 0.90 criterion (Schermelleh-Engel et al., 2003). Tucker-Lewis index (TLI), which is also known as non-normed fit index, and Akaike Information Criterion (AIC) and Consistent Akaike Information Criterion (CAIC) values were used as measures of goodness-of-fit to evaluate the models (Bayram, 2004; Sivo et al., 2006).

In the content of this study, 4 models were tested. First, most common used structure of the scale, 10-item uni-dimensional test was performed and then three multidimensional (9-item with 3-factor, 9-item with 4-factor and 7-item with 3-factor) structure were tested. The reason of selecting these versions was being the most common used instruments in the literature. All analyses were completed using AMOS 5.0. (Arbuckle, 2003). Internal consistency of the scales was assessed using Cronbach's alpha coefficients (Cronbach, 1951).

RESULTS

For reliability and validity of the AIMS Turkish version; the most common used instruments for the athletes were chosen. Model-1 with 10-item uni-dimensional solution, Model-2 and Model-3 with 9-item multidimensional solution and Model-4 with 7-item multidimensional solution were tested.

In Model-1, the 10-item uni-dimensional solution was showed poor fit to the data like the previous studies

(χ^2/df=5.94, RMSEA=0.10 and CFI = 0.90). Also the 9-item multidimensional solutions in Model-2 (χ^2/df=2.65, RMSEA=0.06 and CFI = 0.97) and Model-3 (χ^2/df=4.22, RMSEA=0.08 and CFI = 0.95) were showed poor fit to the data. Model-4 was consisted from 7-item multidimensional solution. After the analysis was performed in Model-4, statistics results were found as χ^2/df=2.01, RMSEA=0.05 and CFI = 0.99. Overall, these results indicated that the model fits to the Turkish culture (Table 3).

Internal consistencies for all the subscales for all the models were calculated. The correlation values between the scores were obtained from the scale and the scores of the sub-factors ranged among athletes; between 0.451 and 1, among non-athletes; between 0.318 and 1, and also the total factor loadings were ranged between 0.443 and 1. And these correlation coefficients were found meaningful at the 0.01 level.

According to the results of analyzing the factor loadings of Models, it was determined that Model-1 was 0.85 totally factor loading. Model-2 was calculated as 0.83 and Model-3 was calculated as 0.84 for total scale. And the last model (Model-4) was calculated as 0.81 for total scale. The results of the factor loadings of each model's total scale and subscales for athletes, non-athletes and totally are presented in Table 4.

Cronbach's alpha calculations for the Model-4 showed satisfactory (0.81 for athletes, 0.77 for non-athletes and 0.81 for totally) but generally results showed unsatisfactory internal reliability (0.70 and 0.79, respectively) in subscales. On the other hand no cross- loading of items or error terms were postulated and all factors were

allowed to correlate freely.

DISCUSSION

The aim of the study was to test the reliability and validity of the Turkish version of Athletic Identity Measurement Scale. First of all, the statistical analyses were showed poor fit in 10-item uni-dimensional structure. It could be said that uni-dimensional form of instrument was not suitable for the Turkish culture. With respect to the factor structure of AIMS, the findings of this study supports Li and Andersen (2008)'s statement. They stated that uni-dimensional model was not fit for English-speaking cultures. As a non-English speaking culture, the same results were seen in Turkish subjects too.

In an attempt to discern the dimensionality of the AIMS, Brewer and Cornelius (2001) examined its factorial structure and invariance in a sample that was collated from 10 years of various administrations of the AIMS (Cieslak, 2004; Visek et al., 2008). Exploratory factor analysis in studies indicated that AIMS may be multidimensional in athletic populations (Brewer, 1990; Martin et al., 1995). Results of findings indicated that three items from the 10-item measure performed poorly and were thus deleted prior to factor analysis. Results of the factor analysis indicated that the abbreviated 7-item AIMS was a multidimensional measure in which three first-order factors (that is, social identity, exclusivity, and negative affectivity) were found to be subordinate to one higher-order athletic identity factor (Visek et al., 2008).

Cieslak (2004) discovered that the measurement of athletic identity can be strengthened by utilizing a new 4-factor model that includes external components (that is, social identity and exclusivity) and internal components (that is, positive affectivity, and negative affectivity) of identity formation. He detected potential weaknesses in Brewer and Cornelius' (2001) 3-factor model (that is, social identity, exclusivity, and negative affectivity), while determining that Martin and his colleagues' (1994; 1995; 1997) fourth factor (that is, self-identity) should not be utilized to measure athletic identity, and verifying the significance of a new fifth factor (that is, positive affectivity) (Cieslak, 2004). The results showed that the goodness of fit indices of the three multidimensional models better than the uni-dimensional model. This result was parallel to current study, it's determined that the multi-dimensional model fixed more suitable in Turkish culture too.

Hale et al. (1999) found that 9-item, 3 factors AIMS instrument provided good fit indices in the English-speaking (UK and US) samples but not in the Russian sample (Hale et al., 1999). Their findings' success was possibly as a result of translation (Li and Andersen, 2008). Factors such as conceptual equivalence (that is, are different groups familiar with the items and do they interpret them in similar ways?), linguistic equivalence

(that is, does the language used in the different groups reflect the same meaning?), and psychometric equivalence (does the instrument tap the same construct at the same levels for different cultural groups?) may be valuable to discuss when explaining differences in response patterns across cultures (Lindwall, 2005). In the literature, AIMS 9-item model especially used for the disabilities. Van de Vliet et al. (2008) were applied AIMS 9-item, 3-factor model to Flemish Paralympics and Non-Paralympics Elite Athletes and Martin et al. (1997) were applied 9-item, 4-factor model to adolescent swimmers with disabilities. The ability to confirm the factor structure reported by Martin et al., (1994) provides further evidence for the validity of the 4-factor model with a population of athletes with disabilities (Martin et al., 1997). Additional research is needed to determine the factor structure of the instrument, particularly with regard to individuals with disabilities and international populations (Groff and Zabriskie, 2006). From this point, it could be said that the 9-item multidimensional structures doesn't fit for individuals without disabilities.

The development and evolution of the AIMS, and the construct of athletic identity, has received substantial attention in English-speaking cultures. Few studies investigated the universal prevalence of the AIMS in non-English speaking cultures. For example Li (2006) applied the Chinese version of the AIMS in Hong Kong sample and found that the results of the original 10-item uni-dimensional model demonstrated the poorest fit to the data. These findings further supported the previous studies showing that the uni-dimensional model was not the best fit in English-speaking cultures. At the end of this Chinese version, it was recommended to use the 3-factor multidimensional models of AIMS (9-item and 7-item) for further studies. Li and Andersen (2008) applied Chinese version of AIMS to the athletes in Hong Kong again in another study. The CFAs showed that three multidimensional models fit to the Hong Kong data than the original uni-dimensional model. The reason of the best fit model (9-item, 4-factor) was discussed as the encouraging by process of translation and strong collectivistic cultural elements in Hong Kong.

In another study, Meijen (2005) translated the AIMS into Dutch and analyzed the 7-item, 3-factor model. In the pilot study AIMS was not fit because of the small sample size and the difference in the meaning of (some) items in the translation of the original questionnaire. The most logical explanation, however, has its origin in the differences in culture. In the final sample it was determined that the most recent version of the AIMS fits well in a Dutch sample (Meijen, 2005). On the other hand, the study with Greek sample exhibited poor fit to the data (7-9-10 item) in uni-dimensional structure but in multidimensional 7-item, 3-factor structure of the AIMS was showed best fit to measure (Proios, 2012). The results were the same with current study. It could be occurring from the similarities of Greek and Turkish

cultures. And also it could be said that having Mediterranean characteristics and interacted with historical backgrounds may affect the results.

The athletic role is an important social dimension of self-concept influencing experiences, relationships with others and pursuit of sport activity (Griffith and Johnson, 2006). Whereas, the AIMS items focus on the athletic domain of participants' identities, a qualitative study exploring the participants' overall life experiences may allow researchers to explore the participants' athletic roles, how those roles interact with other life domains, and the possible cultural influences on those roles from a holistic perspective (Li and Andersen, 2008). Sport scientists might also more closely examine the AIMS as a culturally specific measure of athletic identity (Visek et al., 2010). Considering the possible cultural differences in the development of self, it would be beneficial to explore the construct of athletic identity and the AIMS in non-English speaking cultures (Li, 2006).

After analyzing the different models of AIMS, as a conclusion it could be said that the 7-item multidimensional structure of Turkish version of AIMS was proven reliable and valid for Turkish population. The reason of fitting this model could explain by cultural differences of Turkish individuals. In future studies, the scale may be applied to different samples. Such studies may further contribute to the reliability and validity of the scale. This study did have its limitations in terms of its sample characteristics and target sample. The study sample consisted of the physical education students from only one university.

In the future, further research would be needed to continue to test the higher-order factor structure of this 7-item AIMS in Turkish sample and in other cultures. As an additional recommendation, it could be suggested that the researchers should focus on preferring the modified rating scale of the AIMS for various cultures. Multicultural large athlete samples will identify whether differences in athletic identity within the different cultures in modified scales. Also it might help to test the scale's cultural dimensions more effective in other countries.

Conflict of Interests

The author has not declared any conflict of interest.

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