



Development and validation of the Ukrainian version of the Academic and Athletic Identity Scale (AAIS-UA)



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ABSTRACT

The aim of this study was to translate, adapt, and evaluate the psychometric properties of the Academic and Athletic Identity Scale - Ukrainian Version (AAIS-UA). This scale comprises 11 items designed to measure academic identity and athletic identity in college students participating in sports. The translation process involved a committee approach with two proficient scholars who are native to Ukraine and skilled in both Ukrainian and English languages. The validity and reliability of the AAIS-UA were examined using two datasets with a total of 268 collegiate student-athletes in Ukraine. The results demonstrated the validity and reliability of the AAIS-UA, indicating its usefulness as a valid and reliable tool for assessing academic and athletic identity among Ukrainian-speaking adults.

- Student-athletes face responsibility of being a successful student and a successful athlete, which often results in strong identities in both domains. Given the need for a reliable tool to assess academic and athletic identity in the Ukrainian language, this study focused on translating and validating the Ukrainian Version of the Academic and Athletic Identity Scale (AAIS-UA).
- The Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA) consists of 11 items, with five items designed to measure academic identity and six items designed to measure athletic identity.
- The AAIS-UA is a valid and reliable tool for assessing academic identity, athletic identity, or both among college students and/or athletes who are proficient in the Ukrainian language.

Specifications table

Subject area:	Psychology
More specific subject area:	Sport Psychology, Measurement, Statistics
Name of your method:	Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA)
Name and reference of original method:	Yukhymenko-Lescroart, M. A. (2014). Student and athletes? Development of the Academic and Athletic Identity Scale (AAIS). <i>Journal of Sport, Exercise, and Performance Psychology</i> , 3(2), 89–101. http://doi.org/10.1037/spy0000009
Resource availability:	The method described here is implemented using the following software: Mplus. Full details of the code are provided. Data associated with this work are provided in Supplementary Material (see Figs. 3 and 5 for syntax and list of variables)

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Method details

We conducted a translation, adaptation, and evaluation of the Academic and Athletic Identity Scale (AAIS) [1] for university athletes in Ukraine. Originally developed and validated with college students participating in sports in the United States, the AAIS assesses the degree to which individuals perceive being a student and an athlete as central to their sense of self [1]. The scale consists of 11 items, with five items capturing the centrality of academic identity and six items measuring the centrality of athletic identity. Two independent studies involving 867 college athletes were conducted to assess the psychometric properties of the scale. The findings provided strong evidence of content validity, factorial validity, and reliability. Internal consistency estimates ranged from 0.92 to 0.93 for academic identity and 0.93 to 0.94 for athletic identity in Studies 1 and 2. Additionally, the AAIS demonstrated measurement invariance across gender and level of sport participation, further supporting its validity [1].

Due to its practicality, validity, and reliability, the AAIS been widely utilized in diverse studies involving English-speaking athletes in the United States [2–10], the United Kingdom [11,12], and Australia [13]. Moreover, it has been successfully translated into multiple languages and demonstrated its validity and reliability in studies involving university athletes in Brazil (AAIS-Br) [14], France (AAIS-FR) [15], Japan (AAIS-J) [16–18]. These studies collectively support the AAIS as a practical and valuable tool. In fact, its excellent psychometric properties, concise structure, and ability to measure both academic and athletic identity dimensions have positioned the AAIS as a candidate to “become a gold standard in dual career research” (p. 83) [19]. Consequently, Steele et al. (p. 83) have encouraged “future research to examine the cross-cultural psychometric validity of the AAIS,” highlighting its potential for international investigations [19].

The translation and adaptation of the AAIS from English into Ukrainian were carried out by two proficient multilingual scholars who possessed fluency in both languages. The committee approach [20] was employed during the translation process. One scholar performed the initial translation, while the other scholar verified the accuracy and ensured the linguistic equivalence of the translated items. Notably, both scholars were former athletes who attended the same Department where method validation took place; therefore, as part of the translation process, they also discussed whether items were comprehensible for college athletes and whether any additional fine-tuning was necessary. This rigorous approach, combined with their expertise in both languages, ensured the fidelity and integrity of the translated version of the scale. The Ukrainian version of the scale was titled the Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA).

Table 1. Presents the instructions, scale items, and response categories of the Ukrainian version of the Academic and Athletic Identity Scale (AAIS-UA) in comparison to the original English-language version. This table allows for easy comparison between the Ukrainian and English versions.

Fig. 1 presents the complete version of the AAIS-UA that can be used to administer the AAIS-UA to participants. This figure allows for easy utilization of the method in the studies with Ukrainian-speaking participants.

Method validation

Sources of data

After translating the scale, a thorough examination of the factorial validity, construct validity, and reliability of the Ukrainian versions of the Academic and Athletic Identity Scale (AAIS-UA) was conducted with participants in Ukraine. The data were obtained from a larger project and consisted of two distinct but related sets of data. The participants were college athletes at one public university located in a city in the northern Ukraine, which serves as the administrative center within its oblast. The participants were enrolled in the Department of Physical Education, specializing in two majors: (1) Secondary Education: Physical Education and (2) Physical Education and Sport.

To provide context for the research setting, Ukraine inherited an extensive network of youth sports schools, including specialized institutions for Olympic reserve and sports mastery, from the Soviet Union. Usually, athletes planning to continue their athletic pursuits after high school graduation choose from several common pathways, such as enrolling in a sports university (e.g., the National University of Physical Education and Sport of Ukraine) or a physical education department. Although the exact number of physical education departments in Ukraine is currently challenging to determine due to the ongoing Russian war in Ukraine, it is estimated that there are approximately 10 such departments. Typically, these departments are housed within national and state pedagogical universities. Notably, alternative pathways for athletes, such as schools of Olympic reserve and sports boarding schools, also exist. To gain admission into a physical education department, applicants must demonstrate proficiency in their respective sports. During their academic studies, they often attend classes during the first part of the day (e.g., 8:00 a.m. to 2:20 p.m.) and are required to dedicate the latter part of the day to sports training. It is important to note that there is no centralized infrastructure or national association governing college sports in Ukraine. College athletes in Ukraine typically participate in a range of competitions, including local and national events as well as various international competitions, such as European and world cups and championships and the Olympic games.

The first dataset, collected between November 2021 and January 2022, included 159 college athletes, comprising 104 men and 54 women, with an average age of 19.4 years. These participants were pursuing bachelor's degrees (academic years one through four) and master's degrees (academic years five and six). Specifically, the dataset consisted of 18 first-year, 45 s-year, 64 third-year, 16 fourth-year, five fifth-year, and six sixth-year students. The sample was diverse in terms of sport participation, encompassing athletes specializing in basketball, biathlon, boxing, chess, choreography, fitness, gymnastics, heavy athletics, martial arts, table tennis, physical education, powerlifting, rowing, ski racing, soccer, swimming, tourism, track and field, and volleyball.

Table 1
The original and Ukrainian versions of the academic and athletic identity scale (AAIS).

Original Version (English) [1]	Ukrainian Version (Translation)
Scale Title Academic and Athletic Identity Scale (AAIS)	Назва шкали Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA) / Шкала академічної та спортивної ідентифікації
Instructions Imagine that the figure below is a diagram of you and characteristics that are central to your sense of who you are as a person. Please think about this figure as you rate the items below. Most people will use a variety of answers, rating some qualities as very central and others as not central to their sense of self. To get a good idea of how you will compare and rate the different qualities, please read all of the items before you go back to rate each of them. [Image] Please indicate how central to your sense of who you really are is each of the following characteristics. If a quality seems good or desirable to you but is not an important part of who you are, you should answer “Not at all central to who I really am.” Select the response that best represents your opinion about each characteristics being central to who you are.	Інструкції Уявіть, що на малюнку нижче зображені ви і характеристики, які є головними у вашому уявленні про себе як про особистість. Будь ласка, подумайте про це малюнку, коли будете оцінювати наведені нижче якості. Більшість людей будуть використовувати різні відповіді, оцінюючи одні якості як дуже важливі, а інші - як не дуже важливі в їхньому житті. [Зображення] Будь ласка, вкажіть, наскільки важлива для вашого розуміння того, хто ви є насправді, кожна з наступних характеристик. Якщо якість здається вам хорошим або бажаним, але не є важливою частиною Вашого "Я", ви повинні відповісти "абсолютно не центральна частина мого "Я"", ви повинні відповісти "абсолютно не центральна частина мого "Я"". Виберіть відповідь, яка найкращим чином відображає наскільки кожна характеристика є центральною в почутті Вашого "Я".
Academic identity 1. Being a capable student. 2. Being satisfied with my academic work. 3. Doing well in school. 4. Getting good grades. 5. Having high GPA. Athletic identity 6. Being a capable athlete. 7. Being a good athlete. 8. Being athletic. 9. Being proud to be an athlete. 10. Being satisfied with my athletic achievements. 11. Doing well during sport competitions.	Академічна ідентифікація 1. Бути здатним студентом. 2. Бути задоволеним своєю навчальною роботою. 3. Добре вчитися. 4. Отримувати хороші оцінки. 5. Мати високий середній бал. Спортивна ідентифікація 6. Бути здатним спортсменом. 7. Бути гідним спортсменом. 8. Бути спортивним. 9. Відчувати гордість, що я-спортсмен. 10. Бути задоволеним своїми спортивними досягненнями. 11. Процвітати під час спортивних змагань.
Response Categories Not central (1) Slightly central (2) Somewhat central (3) Central (4) Very central (5) Extremely central (6) The central core (7)	Варіанти відповідей Зовсім не центральна частина мого "Я" (1) Злегка центральна частина мого "Я" (2) Частково центральна частина мого "Я" (3) Центральна частина мого "Я" (4) Дуже центральна частина мого "Я" (5) Надзвичайно центральна частина мого "Я" (6) Найцентральніша серцевина мого "Я" (7)

The second dataset, obtained between April and June 2022, was derived from the same population and included 107 college athletes, with 66 men and 41 women. The participants had an average age of 19.9 years and consisted of 50 s-year and 56 fourth-year students. Table 2 shows the breakdown of the number of athletes by sport.

Both administration of the survey coincided with the last weeks of the first semester (dataset-1) and second semester (dataset-2). Data collection was conducted through online surveys administered via Qualtrics. The study received ethical approval from the institutional review board (IRB) under protocol IRB: #1203, approved on November 22, 2021. The survey was completely anonymous and voluntary, and participants were presented with a consent form at the beginning of the survey in Qualtrics. All participants whose responses were recorded provided informed consent.

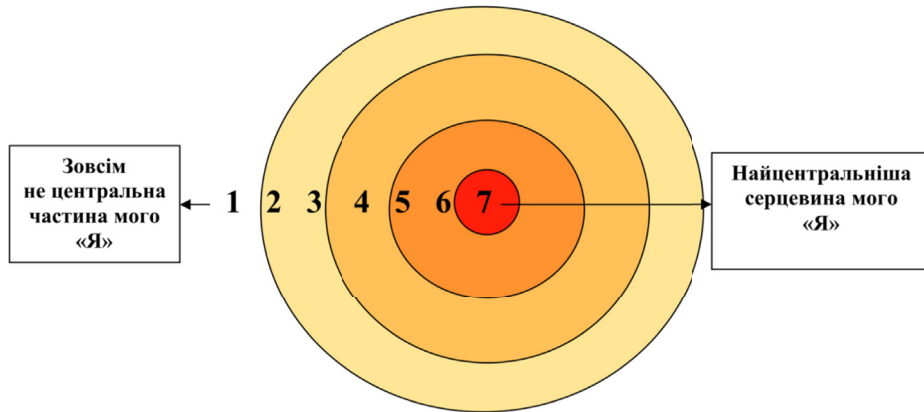
To assess the AAIS-UA, confirmatory factor analysis was conducted using the robust maximum likelihood estimation method in Mplus software, version 8.9 [21]. The models were evaluated based on various fit indices, including the comparative fit index (CFI), Tucker-Lewis index (TLI), root-mean-square-error of approximation (RMSEA), and standardized-root-mean residual (SRMR). Generally, CFI and TLI values above 0.90 and 0.95, respectively, and RMSEA and SRMR values below 0.08 and 0.06 are considered indicative of good and excellent fit [22].

Results

Missing data on individual items in dataset-1 ranged from 0 to 0.6 % and were missing completely at random (MCAR), $\chi^2(20, N = 159) = 29.70, p = .176$.

Missing data in dataset-2 ranged from 0 to 2.8 % and were not missing completely at random (MCAR), $\chi^2(30, N = 107) = 52.21, p = .007$. Further examination showed that item 3 (“*Doing well in school*”) had three missing responses, whereas item 6 (“*Being a capable athlete*”) and item 9 (“*Being proud to be an athlete*”) each had one missing response. Hence, missing at random was assumed.

Уявіть, що на малюнку нижче зображені ви і характеристики, які є головними у вашому уявленні про себе як про особистість. Будь ласка, тримайте у пам'яті цей малюнок, коли будете оцінювати наведені нижче якості. Більшість людей будуть використовувати різні відповіді, оцінюючи одні якості як дуже важливі, а інші - як не дуже важливі в їхньому житті.



Будь ласка, вкажіть, наскільки важлива для вашого розуміння того, хто ви є насправді, кожна з наступних характеристик. Якщо якість здається вам хорошою або бажаною, але не є важливою частиною Вашого «Я», ви повинні відповісти «абсолютно не центральна частина мого «Я»». Виберіть відповідь, яка найкращим чином відображає наскільки кожна характеристика є центральною в почутті Вашого «Я».

	Зовсім не центральна частина мого "Я"	Злегка центральна частина мого "Я"	Частково центральна частина мого "Я"	Центральна частина мого "Я"	Дуже центральна частина мого "Я"	Надзвичайно центральна частина мого "Я"	Найцентральніша серцевина мого "Я"
1. Бути здатним студентом.	1	2	3	4	5	6	7
2. Бути задоволеним своєю навчальною роботою.	1	2	3	4	5	6	7
3. Добре вчитися.	1	2	3	4	5	6	7
4. Отримувати хороші оцінки.	1	2	3	4	5	6	7
5. Мати високий середній бал.	1	2	3	4	5	6	7
6. Бути здатним спортсменом.	1	2	3	4	5	6	7
7. Бути гідним спортсменом.	1	2	3	4	5	6	7
8. Бути спортивним.	1	2	3	4	5	6	7
9. Відчувати гордість, що я-спортсмен.	1	2	3	4	5	6	7
10. Бути задоволеним своїми спортивними досягненнями.	1	2	3	4	5	6	7
11. Процвітати під час спортивних змагань.	1	2	3	4	5	6	7

Fig. 1. The AAIS-UA: instructions and scale items for the Ukrainian version.

Confirmatory factor analysis (CFA) with robust maximum likelihood estimation method was performed on the 11 items of the AAIS-UA to test its validity and reliability. Specifically, five items were specified to represent their intended factor of academic identity and six items were specified to represented their intended factor of athletic identity. Fig. 2 depicts the CFA diagram; whereas Fig. 3 provides the Mplus syntax for testing this model. The data can be located in the Supplemental Material.

The two-factor measurement model showed inadequate model fits with both dataset-1, $\chi^2(43, N = 159) = 124.37, p < .001$, RMSEA = 0.109, 90 % CI [.087, 0.132], CFI = 0.914, TLI = 0.890, SRMR = 0.061, and with dataset-2, $\chi^2(43, N = 107) = 85.76, p < .001$, RMSEA = 0.096, 90 % CI [.066, 0.126], CFI = 0.932, TLI = 0.913, SRMR = 0.058. Examination of factor loadings showed that they were all high. However, modification indices indicated high correlated uniquenesses between item 6 (“Being a capable athlete”) and item 7 (“Being a good athlete”) in both datasets. Therefore, the models were re-tested after specifying this correlated uniqueness, as shown in Fig. 4. Fig. 5 provides Mplus syntax for testing this modified model.

Results for the modified model showed a good model fit to the data with both dataset-1, $\chi^2(42, N = 159) = 75.45, p = .001$, RMSEA = 0.071, 90 % CI [.044, 0.096], CFI = 0.965, TLI = 0.954, SRMR = 0.052, and dataset-2, $\chi^2(42, N = 107) = 54.80, p = .089$, RMSEA = 0.053, 90 % CI [.000, 0.090], CFI = 0.980, TLI = 0.973, SRMR = 0.051.

As shown in Table 3, factorial validity was further supported by the high loadings, which ranged from 0.72 to 0.91 for academic identity and from 0.76 to 0.89 for athletic identity in dataset-1 and from 0.71 to 0.94 for academic identity and from 0.66 to 0.85 for athletic identity in dataset-2. The correlation between academic identity and athletic identity was 0.64 in dataset-1 and 0.66 in dataset-2.

Table 4 shows values for construct validity, average variance explained, and shared variance for the two subscales. Specifically, estimated of construct reliability were 0.90 for academic identity and 0.92 for athletic identity in dataset-1 and 0.92 for academic

Table 2
Breakdown of the number of athletes in each sport (≥ 5).

Sport	Dataset-1, N = 159	Dataset-2, N = 107
Basketball	< 5	< 5
Biathlon	< 5	< 5
Boxing	12	6
Chess	< 5	< 5
Choreography	15	8
Fitness	22	28
Heavy athletics	7	< 5
Martial arts	18	< 5
Physical education	< 5	< 5
Powerlifting	5	< 5
Rhythmic gymnastics	6	< 5
Rowing	< 5	< 5
Shooting sports	0	< 5
Ski racing	5	< 5
Soccer	28	19
Sport orienteering	0	< 5
Swimming	< 5	< 5
Table tennis	< 5	0
Triathlon	0	< 5
Tourism	< 5	0
Track and field	10	11
Volleyball	14	10

Note. To reduce the risk of a confidentiality breach, the standard of at least five observations was used for reporting the numbers.

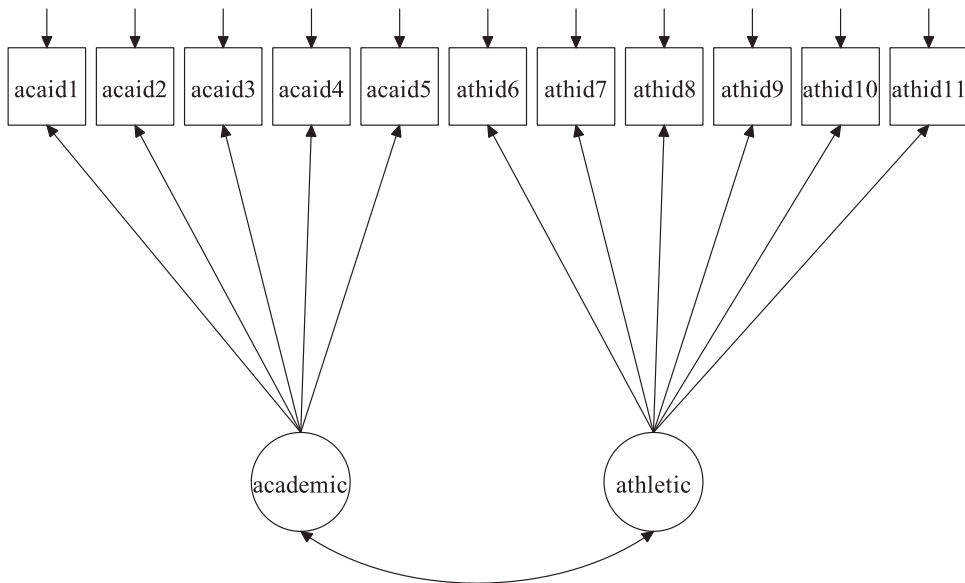


Fig. 2. Measurement model-1 of the AAIS-AU.

identity and 0.91 for athletic identity in dataset-2, and were all above the recommended threshold of 0.70 [23], indicating good internal consistency of the subscales. Further, the values of average variance explained were 0.65 for academic identity and 0.66 for athletic identity in dataset-1 and 0.69 for academic identity and 0.63 for athletic identity in dataset-2, which were all above the recommended threshold of 0.50 [23], further supporting construct validity of the subscales. Finally, the values of shared variance were 0.12 in dataset-1 and 0.14 in dataset-2, both did not exceed the values of average variance explained, further supporting good discriminant validity of the subscales [23].

In conclusion, university athletes face the challenge of balancing their roles as students and athletes, with these roles potentially influencing their sense of self to varying degrees. The Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA) demonstrated validity and reliability when assessing the academic and athletic identities of Ukrainian-speaking university students and athletes. This scale allows for the simultaneous or independent measurement of the two subscales, providing flexibility in capturing these dimensions of identity.

TITLE: Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA)

DATA: FILE IS AAIS.csv;

VARIABLE:

NAMES ARE

Dataset

ACAID1 ACAID2 ACAID3 ACAID4 ACAID5

ATHID6 ATHID7 ATHID8 ATHID9 ATHID10 ATHID11;

MISSING ARE ALL (-999);

USEOBSERVATIONS ARE (Dataset EQ 1); !1=dataset-1 2=dataset-2

USEVARIABLES ARE

ACAID1 ACAID2 ACAID3 ACAID4 ACAID5

ATHID6 ATHID7 ATHID8 ATHID9 ATHID10 ATHID11;

ANALYSIS:

ESTIMATOR = MLR;

MODEL:

ACADEMIC BY ACAID1-ACAID5;

ATHLETIC BY ATHID6-ATHID11;

OUTPUT:

SAMPSTAT STDYX MODINDICES CINTERVAL;

Fig. 3. Mplus syntax for measurement model-1 of the AAIS-AU.

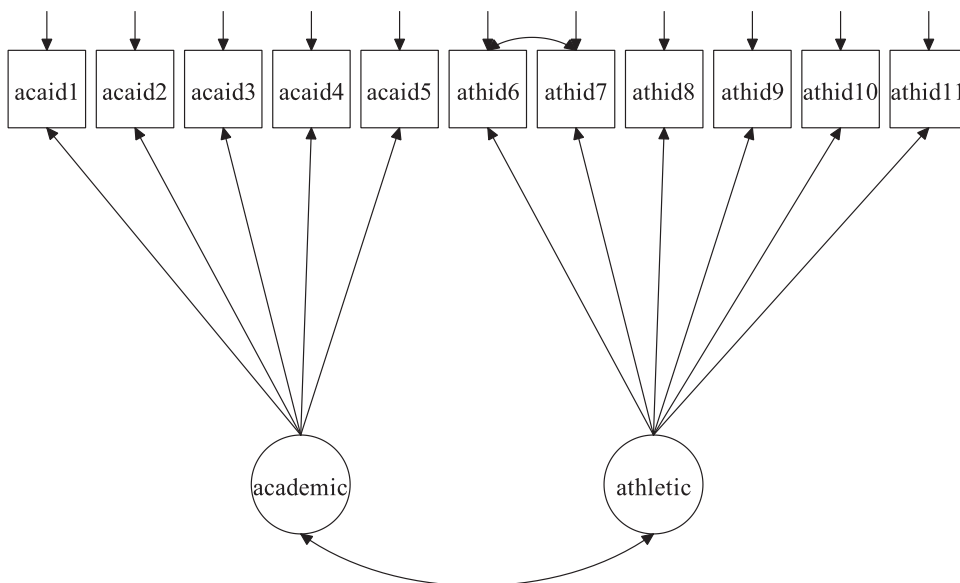


Fig. 4. Measurement model-2 of the AAIS-AU.

Additional information

Study background

College athletes face the dual challenges of excelling both academically and athletically, a well-established notion explored in numerous studies [1,3,6–19]. The identity of college athletes is viewed as a multifaceted construct, shaped by their social affiliations,

```

TITLE: Academic and Athletic Identity Scale – Ukrainian Version (AAIS-UA)
DATA: FILE IS AAIS.csv;

VARIABLE:
NAMES ARE
Dataset
ACAID1 ACAID2 ACAID3 ACAID4 ACAID5
ATHID6 ATHID7 ATHID8 ATHID9 ATHID10 ATHID11;
MISSING ARE ALL (-999);

USEOBSERVATIONS ARE (Dataset EQ 1); !1=dataset-1 2=dataset-2

USEVARIABLES ARE
ACAID1 ACAID2 ACAID3 ACAID4 ACAID5
ATHID6 ATHID7 ATHID8 ATHID9 ATHID10 ATHID11;

ANALYSIS:
ESTIMATOR = MLR;

MODEL:
ACADEMIC BY ACAID1-ACAID5;
ATHLETIC BY ATHID6-ATHID11;
ATHID7 WITH ATHID6;

OUTPUT:
SAMPSTAT STDYX MODINDICES CINTERVAL;

```

Fig. 5. Mplus syntax for measurement model-2 of the AAIS-AU.

Table 3
Factor Loadings for AAIS-AU Items in CFA Model-2.

Items	Dataset-1	Dataset-2
ACAID1 - Being a capable student.	.72	.74
ACAID2 - Being satisfied with my academic work.	.75	.71
ACAID3 - Doing well in school.	.91	.82
ACAID4 - Getting good grades.	.86	.94
ACAID5 - Having high GPA.	.80	.93
ATHID6 - Being a capable athlete.	.83	.81
ATHID7 - Being a good athlete.	.79	.76
ATHID8 - Being athletic.	.78	.66
ATHID9 - Being proud to be an athlete.	.76	.85
ATHID10 - Being satisfied with my athletic achievements.	.89	.82
ATHID11 - Doing well during sport competitions.	.83	.83

Note. ACAID = items of academic identity. ATHID = items of athletic identity.

connections, interactions, and group memberships. This identity encompasses both academic and athletic dimensions, referred to as academic identity and athletic identity, and empirical research has consistently corroborated this framework [1,3,6–19]. In this context, academic identity pertains to “the centrality of being a student to the sense of self” (p. 3), while athletic identity refers to “the centrality of being an athlete to the sense of self” (p. 3) [9].

Illustrated in Fig. 6 is a model applicable to college students who participate in sports. Within this model, academic and athletic identities intertwine and influence one another, ultimately having consequences on various aspects of college athletes’ lives, encompassing academic, athletic, and other related outcomes. This model has been applied across a wide range of studies involving college athletes, conducted in both English- and non-English speaking countries [1–19], and serves as the foundation upon which the AAIS [1] was developed.

The subsequent subsections will focus on: (a) the psychometric properties of the AAIS and its translated versions, (b) the validity and reliability evidence of the AAIS and its translated versions, (c) limitations and directions for future research, and (d) practical applications of the AAIS-UA.

Table 4
Construct validity indices for the AAIS-AU.

Index	Dataset-1		Dataset-2	
	Academic identity	Athletic identity	Academic identity	Athletic identity
Construct reliability	.90	.92	.92	.91
Average variance explained	.65	.66	.69	.63
Shared variance	.12	.12	.14	.14

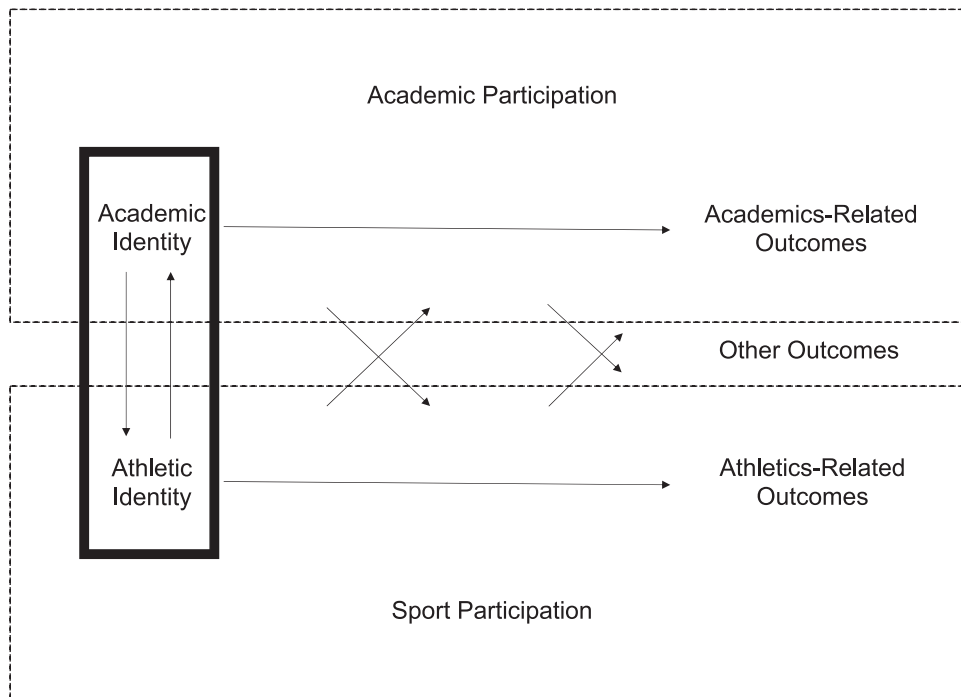


Fig. 6. Model for Integrating Academic and Athletic Identities in College Athletes.

Contrasting the AAIS across different languages

The AAIS was initially developed in English and validated with college athletes in the United States [1]. The original AAIS [1] consists of 11 items, with five assessing academic identity and six assessing athletic identity. In subsequent studies, the response scale was modified from the original 6-point scale, which only had labeled endpoints [1], to a 7-point scale with all response points labeled [7,8,10], while retaining the original wording and number of items.

The AAIS has been translated into various languages, including Brazilian Portuguese (AAIS-Br) [14], French (AAIS-FR) [15], Japanese (AAIS-J) [16–18], and Chinese-Mandarin [23]. Table 5 provides a summary of the AAIS scale translated into these languages. It is worth noting that, except for the French version (AAIS-FR), all other translated versions of the AAIS scale retain all 11 items.

Additionally, as shown in Table 5, in the Japanese language, a brief version known as AAIS-JB [18] was validated, which includes six items selected from the original 11 – three related to academic identity and three to athletic identity. The abbreviated version, AAIS-JB, was validated for practical reasons so that it can be easily conducted online nationwide in Japan [18]; thus, establishing a precedent for the validity of shorter adaptations of the AAIS.

It is noteworthy that many of these translated versions include correlated uniquenesses. For example, the AAIS-Br incorporates pairs of correlated uniqueness between ACAID4 and ACAID5, ATHID6 and ATHID7, as well as ATHID10 and ATHID11. Likewise, the AAIS-FR uses a correlated uniqueness between ATHID10 and ATHID11. These inclusions are not only statistically justified but also align conceptually with the wording of the items.

Validity and reliability of the AAIS and its translated versions

All translated versions demonstrated robust reliability and factorial validity, as confirmed through comprehensive factor and reliability analysis [14–18,23]. Furthermore, measurement invariance across gender and sport participation level was established for the Japanese version [18]. Additionally, criterion validity was established through correlations with diverse measures:

Table 5
The Academic and Athletic Identity Scale (AAIS) in other languages.

AAIS (Original Version, English) [1]	AAIS-Br [14]	AAIS-FR [15]	AAIS-J [16]	AAIS-JB [18]	AAIS-Chinese [24]
Academic identity					
1. Being a capable student.	Yes	Yes	Yes	–	Yes
2. Being satisfied with my academic work.	Yes	Yes	Yes	Yes	Yes
3. Doing well in school.	Yes	Yes	Yes	–	Yes
4. Getting good grades.	Yes	Yes	Yes	Yes	Yes
5. Having high GPA.	Yes	Yes	Yes	Yes	Yes
Athletic identity					
6. Being a capable athlete.	Yes	Yes	Yes	Yes	Yes
7. Being a good athlete.	Yes	Yes	Yes	–	Yes
8. Being athletic.	Yes	Yes	Yes	Yes	Yes
9. Being proud to be an athlete.	Yes	–	Yes	Yes	Yes
10. Being satisfied with my athletic achievements.	Yes	Yes	Yes	–	Yes
11. Doing well during sport competitions.	Yes	Yes	Yes	–	Yes

Note. AAIS-Br = Brazilian Portuguese version; AAIS-FR = French version; AAIS-J = Japanese version; AAIS-JB = Japanese Brief version; AAIS-Chinese = Mandarin version. Yes = included in the scale; “–” = not included in the scale.

- (1) the measures of professional identity and flourishing [14];
- (2) the measures of athlete engagement and athlete burnout [15];
- (3) time spent on self-study outside of academic class and independent self-practice outside of sport club activities in the Japanese sample [18];
- (4) the measures of athletic identity as assessed by the Athletic Identity Measurement Scale (AIMS) [25] and academic identity as assessed by the Measure of Student Identity (MSI) [26] in both studies with Japanese college athletes [16,18]; and
- (5) grades in the Japanese sample [16].

Furthermore, the relationship between athletic identity and the AIMS was also examined in an English-speaking sample [11], providing additional support for the concurrent validity of the athletic identity dimension of the AAIS.

Additionally, various studies have examined the associations between academic and athletic identities and an array of measures in the domains of academics, athletics, and wellbeing, revealing the following significant findings:

- (1) between athletic identity and GPA (low positive) [2];
- (2) between academic identity and (a) academic motivation (positive) and (b) athletic motivation (low negative); as well between as athletic identity and (a) athletic motivation (positive) and (b) academic motivation (low negative) [3];
- (3) between both academic and athletic identities and (a) meaning in life and sport: presence of meaning in life (positive), search for meaning in life (positive), presence of meaning in sport (positive), (b) sport commitment: enthusiastic commitment (positive) and constrained commitment (negative), (c) sport enjoyment (positive), and (d) athlete burnout: emotional and physical exhaustion (negative), reduced sense of accomplishment (negative), sport devaluation (negative) [4];
- (4) between both academic and athletic identities and (a) perceived behavioral control over reporting of concussion (positive), (b) intentions to report symptoms of concussion to coaches and athletic trainers: report in game (positive), report 24 h later (positive), report for teammates (positive); as well as between academic identity and concussion-related knowledge (positive) [5];
- (5) between both academic and athletic identities and (a) academic achievement goals: academic mastery (positive), academic performance (positive), (b) athletic achievement goal: athletic task goal (positive), (c) conduct in sport towards opponents: instrumental aggression (negative); as well as between academic identity and conduct in sport towards opponents: sportspersonship (positive) and gamesmanship (negative), and finally between athletic identity and athletic achievement goal: athletic ego goal (positive) [6];
- (6) between academic identity and (a) academic competence (positive), (b) relatedness to classmates (positive), (c) academic intrinsic interest (positive), (d) academic value (positive), and (e) academic interest (positive); as well as between athletic identity and (a) harmonious passion for sport (positive), (b) obsessive passion for sport (positive), (c) athletic competence (positive), (d) athletic intrinsic interest (positive), (e) athletic value (positive), and (f) athletic interest (positive) [7];
- (7) between academic identity and (a) grades (positive), and (b) academic persistence (positive); as well as between athletic identity and (a) harmonious passion for sport (positive), (b) obsessive passion for sport (positive) [8];
- (8) between both academic and athletic identities and (a) self-reported academic misconduct (negative), (b) academic achievement goals: academic mastery goal (positive), academic performance goal (positive), (c) athletic achievement goal: athletic task goal (positive); as well as between academic identity and grades (positive); and between athletic identity and athletic achievement goal: athletic ego goal (positive) [9];
- (9) between both academic and athletic identities and (a) institutional commitment (positive), and (b) intent to withdraw (negative); as well as between academic identity and (a) degree commitment (positive), and (b) perceived support of academic staff (positive) [10];

- (10) between both academic and athletic identities and (a) career self-efficacy (positive) and (b) athletic identity as measured by the AIMS (positive); as well as between academic identity and career identity (positive), and between athletic identity and athletic self-efficacy (positive) [11];
- (11) between academic identity and (a) grades (positive), (b) satisfaction with school experience (positive), (c) a total score of life satisfaction (positive); as well as between athletic identity and grades (negative) [13].

In terms of the response options, the French [15], Japanese [16,18], and Chinese [23] versions use the original 6-point response scale; whereas the Brazilian version used the newer 7-point response scale. Notably, the results from a multi-study with the U.S. college athletes that utilized the AAIS with the 6-point response options (Study 1) and the 7-point response options (Study 2) showed similar results [27], thus, suggesting that the two response scales are rather equivalent.

In general, the translated versions of the AAIS exhibit a high degree of similarity in their composition and psychometric properties.

Limitations and future research directions

The limitations encountered in this study mirror those found in other validation studies of translated versions of the AAIS [1,14–16,18], most notably the reliance on cross-sectional designs. Given that scale validation is an ongoing process [28], further validation studies for the AAIS-UA would be beneficial. Furthermore, future research directions could involve the creation and validation a brief version of the AAIS-UA, similar to what was accomplished with the Japanese translation [18].

Several studies have recognized the value of examining changes in academic and athletic identities over an academic year and/or competitive season [1,11,18]. Consequently, exploring the factorial structure and assessing measurement invariance over time is needed. Once measurement invariance is established, it becomes possible to investigate shifts in academic and athletic identities throughout the academic year and/or competitive season. This knowledge can aid in providing better support to college athletes as they navigate their academic and athletic commitments within higher education institutions.

Lastly, the measurement properties of the AAIS-UA and other translated versions can be examined by employing Rasch measurement models [29]. While the AAIS has been validated primarily through factor analysis techniques, Rasch models offer a valuable means of enhancing scale measurement quality by providing insights into item characteristics and the functioning of response options, aspects not typically explored within the framework of factor analysis [29,30]. Additionally, Rasch models are known for their robustness, even when applied to smaller samples [29,30]. Given the infrequent use of Rasch models in sport sciences studies, their utilizing in future investigations holds particular promise.

Practical applications of the AAIS-UA

This work holds several practical applications for Ukrainian-speaking university students and athletes. The AAIS-UA offers a practical and valid instrument for exploring the academic and athletic identities of college athletes who speak the Ukrainian language. Given that the majority of college students in Ukraine fall within the traditional age bracket (i.e., 18–23 years old), they find themselves in the transitional phase of emerging adulthood [31]. This period is marked by identity explorations within a specific cultural and environmental context [31]. The Russian aggression and the ongoing Russian war in Ukraine have brought about numerous adverse consequences for the Ukrainian population, potentially amplifying the challenges faced by emerging adults as they navigate identity development in such a demanding and traumatic environment.

The AAIS-UA serves as a valuable tool to help college athletes assess the significance of their academic and athletic identities in shaping their sense of self. Furthermore, it enables the examination and contemplation of the interplay between academic and athletic identities and the overall well-being of college athletes across academic, athletic, and social domains.

Ethics statements

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committees and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

Mariya A. Yukhymenko-Lescroart: Conceptualization, Methodology, Formal analysis, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Visualization, Supervision, Project administration. **Olena Voiedilova:** Conceptualization, Methodology, Data curation, Writing – review & editing.

Data availability

Data associated with this work are provided in Supplementary Material (see Figs. 3 and 5 for Mplus syntax and list of variables).

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Supplementary materials

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