

CROSS-CULTURAL ADAPTATION AND PSYCHOMETRIC PROPERTIES OF THE ACHIEVEMENT GOAL QUESTIONNAIRE 3X2-SPORT AMONG POLISH ATHLETES

Kanupriya Rawat¹, Aleksandra Błachnio², Nibu Rkrishna³

Summary. Aim. This study examined the reliability and validity of the Achievement Goal Questionnaire 3x2-Sport (3x2 AGQ-Sport) among Polish athletes ($N = 396$; aged 18–35 years) in different sports. **Tools.** The study used a metric that collected basic data, Task Orientation and Ego in Sport Questionnaire (TEOSQ) and State-Trait Anxiety Inventory (STAI). **Results.** Statistical analyses confirmed the validity of the scale. A 6-factor model best fit the 3x2 AGQ-Sport, with measurement invariance across gender, level of sport participation (high-performance vs. recreational athletes), and type of sport (individual vs. team). Cronbach's alpha for the total scale was .93, and subscale alphas ranged from .83 to .91. Test-retest reliability ($ICC = .89-.97$) was satisfactory. Task-oriented goals and self-oriented goals (3x2 AGQ-Sports) had moderately positive correlations with task orientation (TEOSQ), whereas other-oriented goals (3x2 AGQ-Sports) had moderately positive correlations with ego orientation (TEOSQ), which is consistent with the literature. However, weak correlations between 3x2 achievement goals and state or trait anxiety suggest that increased physical activity may alleviate anxiety symptoms. Analysis of sports participation levels between high-performance and recreational athletes revealed significant differences in other-approach orientation, with high-performance athletes showing higher levels compared to recreational athletes. These results are consistent with research indicating higher performance approach goals among high-performance athletes. **Conclusions.** The study demonstrates

¹ Department of Psychology, Kazimierz Wielki University, Bydgoszcz, Poland, ORCID: 0000-0003-4803-400X.

² Department of Psychology, Kazimierz Wielki University, Bydgoszcz, Poland, ORCID: 0000-0003-0756-7416.

³ Department of Psychology, Lakshmbai National Institute of Physical Education, Gwalior, India, ORCID: 0000-0003-2647-3909.

Mailing address: Kanupriya Rawat,
kanupriya.rawat@ukw.edu.pl

strong psychometric properties of the 3x2 Achievement Goal Questionnaire-Sport (3x2 AGQ-Sport) in the Polish population, offering insight into goal orientation and anxiety among athletes of varying levels and gender, with implications for sports psychology and athlete development.

Key words: cross-cultural adaptation; psychometrics; achievement motivation; athletes

Introduction

Achievement motivation affects both the athlete, and the coach, as well as the results of their interaction. Much seems to depend on this (Smith et al., 2017). The athlete is pushed to pursue competitive goals due to an inherent force i.e., achievement motivation. It helps the athletes to develop motivational characteristics to reach the highest level in their respective sports (Vallerand, Miquelon, 2007; Baker, Young, 2014). On the contrary, highly motivated athlete who has dysfunctional beliefs (win-at-all-cost mentality, borderline perfectionism etc.) can encounter adverse effects like burnout, unethical behaviour, conflicts, health issues, and disengagement from the sport (Boiché, Sarrazin, 2009; Van de Pol, Kavussanu, 2012; Mudrak et al., 2018). Interest in achievement motivation emerged at the turn of the 1970s and 1980s (Elliot, 2005). Since then, it has evolved from a definition-based approach, i.e., a dichotomous model of achievement goals (Nicholls, 1984; Dweck, 1986; Ames, 1992) to a trichotomous goal framework (Elliot, Harackiewicz, 1996). Later, the 2x2 achievement goal framework was updated with a valence-based approach and avoidance dimensions (Elliot, 1999). A 3x2 achievement goal model is now trending, which is an expanded version of the 2x2 achievement framework (Elliot et al., 2011). Initial conceptual work recognized a definition-based approach with two factors, also known as the dichotomous model of achievement goals: mastery goals and performance goals (Dweck, Elliott, 1983; Nicholls, 1984; Ames, 1992). Mastery goals refer to situations in which athletes strive to develop and improve their skills, while in performance goals, athletes try to compare or compete with others in their abilities. This approach gained many supporters (Ntoumanis, Biddle, 1999; Biddle et al., 2003; Duda, 2005). There were also opponents who emphasized its limitations. According to Ames (1992) and Nicholls et al. (1989) both goals are approach in nature. Others argued the lack of valenced nature of the performance goal orientation (Skaalvik, 1997; Harackiewicz et al., 2002). Therefore, the theory shifted towards a trichotomous goal framework, given by Elliot and Harackiewicz (1996). Valenced-based approach and avoidance performance goals were added as a distinct type along with mastery goals (Elliot, Harackiewicz, 1996; Payne et al., 2007).

Incorporating the valence-based approach and avoidance dimensions into mastery and performance extended the trichotomous goal framework into a 2x2 achievement goal framework. Herein competence is evaluated in terms of definition and valence (Wang et al., 2017). The cross-tabulation of approach (positive achievement behavior) and avoidance (negative achievement behavior) with mastery goals, and

performance goals results in the four achievement goals (mastery-approach, mastery-avoidance, performance-approach, performance-avoidance). The mastery-approach refers to the positive orientation toward attaining a skill or competence, and mastery-avoidance refers to avoiding the failure to attain a skill. A performance approach promotes the presentation of skills, while performance-avoidance goals are negatively oriented so as not to appear inept compared to others. These frames have gained great popularity, but not in sports.

The 2x2 framework evolved into the 3x2 achievement goal framework, as Elliot et al. (2011) argued, “the separation of task-based and self-based goals from mastery goals. Task-based goals are solely based on the demands of the tasks while self-based goals are based on comparing oneself with one’s own prior performances”. This distinction is supported on the basis of people’s engagement to complete the task only or to improve their skills. Few studies have examined the validity of the 3x2 model of AGQ in an academic or work context (Elliot et al., 2011; Diseth, 2015; León-del-Barco et al., 2019), fewer than that were examined in a sports context (Mascret et al., 2016; Lower, Turner, 2016; Wang et al., 2017).

The 3x2 achievement goal model was examined by Mascret et al. (2015) on the French population, where they reported two unique goals: task-based and self-based goals. They compared ten alternative models with the six-factor model, and found that the six-factor model was a good fit for the empirical data. Similar results were found in the study by Wang et al. (2017), where they altered some items because of the ambiguous nature of task-approach and task-avoidance dimensions. Instead of the phrases: “to perform well”, “to obtain good results”, and “to be effective” (Mascret et al., 2015), Wang et al. (2017) included the statements: “I aim to execute the skills correctly”, “I strive to apply the right tactics and strategies”, and “I want to execute every technique successfully”. Instead of “to avoid performing badly”, “to avoid bad results”, and “to avoid being ineffective”, they used items such as “I avoid making a lot of technical errors”, “I avoid applying the wrong tactics and strategies”, and “I avoid making a lot of mistakes” (Wang et al., 2017, p. 462–463). We agree with Wang et al.’s modifications, which is why we used them in the Polish adaptation of the 3x2 Achievement Goals Questionnaire - Sport. Other cultural adaptations are also available i.e. 3x2 AGQ-Sports (see Picoli et al., 2022; Nikitskaya, Uglanova, 2021), AGQ-Sports for physical education (Méndez-Giménez et al., 2014), and AGQ-Sports for recreational (Lower, Turner, 2016).

In Poland, two research teams – ours and Tomczak et al. (2024) – independently undertook the cross-cultural adaptation of the 3x2 Achievement Goal Questionnaire. Although both projects were conducted concurrently, Tomczak et al. (2024) completed theirs first and subsequently published their findings, which brought their work to our attention. Upon comparison, we identified differences between our version of the questionnaire, which was adapted from Wang et al. (2017) take on the 3x2 AGQ, and the version used by Tomczak et al. (2024), which was based on Mascret et al. (2015) study of the 3x2 AGQ. Acknowledging the value of replication, we decided to proceed

with our project. Furthermore, our study offers additional contributions by comparing individual and team sports, and by assessing convergent validity to evaluate the relationships between the scale and other instruments measuring similar constructs – an area not addressed in the previous adaptation.

Therefore, this study assessed the psychometric properties of the 3x2 Achievement Goal Questionnaire-Sports in the Polish population, for example, construct validity and reliability. The criterion validity of the 3x2 Achievement Goal Questionnaire- Sports was examined, and research on its relationship with other scales, such as STAI and TEOSQ, was included. The research fill gaps in the literature on the subject and bring forth interesting findings as this is the first study to use modifications in the 3x2 AGQ-Sports suggested by Wang et al. (2017).

Method

Study group and procedure

This study includes 396 athletes as a sample, where female ($N = 191$), and male ($N = 205$) with the average age of ($M = 22.89$, $SD = 3.82$). Convenience sampling was used where the authors went to sports clubs and trainers to invite the players to participate in the data collection. The study included participants from both individual and team sports, with individual sports ($N = 215$) and team sports ($N = 181$) participants. Team sports include football, volleyball, field hockey, and handball, while individual sports include sprinting, track (<400 m, 800-1500 m, >5000 m), marathon, field athletics, swimming (<400 m, 800 m+), kayaking, rowing and weightlifting. The research involved two groups of participants: 186 classified as recreational and 210 as high-performance athletes. The university's ethics committee approved this study. The subjects were given informed consent form to sign and they agreed to voluntarily participate in the study.

Measures

In addition to the Polish version of the 3x2 Achievement Goal Questionnaire-Sports, participants filled out two additional questionnaires (Task and Ego Orientation in Sport Questionnaire (PL) and State and Trait Anxiety Inventory (PL)). These two questionnaires were used to assess the validity of the 3x2 AGQ-Sports. In addition, participants responded to the demographic questions, e.g., gender, age, sports played, frequency of training per week, career duration, quality of career etc.

Achievement Goal Questionnaire-Sports (3x2 AGQ-S), Mascaret et al. 2015, modifications made by Wang et al., 2017: This questionnaire measures the task-based, self-based, and other-based goals in terms of approach and avoidance dimensions. Elliot et al. (2011) measured the 3x2 achievement goals in a general undergraduate classroom context. The 3x2 AGQ was revised by Mascaret et al. (2015) in a sports

setting. Some terms like “questions” and “answers” were replaced with “skills”, “techniques”, “tactics”, and “strategies”. Similarly, “other students” was replaced with “others” or “players”, and “in this class” with “in my sport”. However, the questionnaire was further modified by Wang et al. (2017) due to the ambiguous nature of items in task-approach and task-avoidance. Some examples of modifications made in the questionnaire are following: “I aim to execute the skills correctly”, “I strive to apply the right tactics and strategies” items were changed in task-approach, and in task-avoidance goals: “I avoid making a lot of technical errors”, and “I avoid applying the wrong tactics and strategies” items were changed. A 7-point scale of “strongly disagree” (1) to “strongly agree” (7) were used for taking response from athletes. Each achievement goal consists of three items.

Adaptation Procedure

Three experts were involved in translating the 3x2 Achievement Goal Questionnaire-Sports from English to Polish. A linguist and psychologist, an English and Polish expert, translated the questionnaire from English to Polish. Then, it was given to a sports psychologist to review its accuracy. The Polish version of the 3x2 AGQ-S instrument was also tested for readability, carried out by Polish language experts and a few students of Physical education and sports players to check the instructions and readability of the items. After back-translation, we started a pilot study on high-performance and recreational sports players. The good fit model for the Polish version of the 3x2 Achievement goal questionnaire-sports was analysed using CFA. Then, the study was conducted on main sample.

Task and Ego Orientation in Sport Questionnaire (TEOSQ), (Tomczak et al., 2020); Tomczak et al. (2020) modified this scale specifically for the Polish population. Seven items pertain to task orientation and six to ego orientation, for a total of thirteen statements. An individual uses a scale from 1 to 5 to indicate how much a statement relates to them. The Cronbach’s alpha for task subscale, and ego subscale were .81, and .84 respectively.

State-Trait Anxiety Inventory (STAI); Polish adaptation-Wrzeńniewski et al. (2012): State anxiety and trait anxiety are the two categories that STAI measures. State anxiety and trait anxiety are two subscales of this scale. Each subscale consists of 20 items each. All items are rated on a 4-point scale in both subscales. The scores can range from 20-80, where higher scores indicate high anxiety. One can tell the difference between trait anxiety and situational anxiety by comparing the results of the subscales.

Data analysis

In this segment, we outline the outcomes of the initial examinations pertaining to the following: the evaluation of item reliability, confirmatory factor analysis (CFA)

for 12 models, the methodologies employed for conducting the invariance assessment across gender, athlete type, and sport type, as well as the Spearman correlation and Mann-Whitney U test. First, The item reliability assessment included an analysis of factor loadings and their squared values, which reveal how much of each item's variance is attributed to a specific concept. This approach was instrumental in assessing the convergent validity indices for the 3x2 AGQ-S scale. The minimum standardised loading value of .40 indicates a high degree of flexibility, whereas a value of .70 indicates that the factor accounts for around 50% of the item's variance. Following the methods proposed by Fornell and Larcker (1981), the study then calculated the composite reliability (CR) and average extracted variance (AVE) for each sub-scale.

Scholarly consensus supports the notion that a CR score exceeding .6 (or .7) and an AVE value surpassing .5 are generally regarded as indicative of sound convergent validity. On the other hand, the assessment of discriminant validity involved a comparison between the maximum shared variance (MSV), and the average variance extracted (AVE) of the same latent variable. Discriminant validity for the construct is deemed to be established when the AVE value exceeds the MSV, in accordance with the criteria outlined by Fornell and Larcker (1981).

The intraclass correlation coefficient (ICC) and Cronbach's alpha were utilised to determine the reliability of the scale. The ICC was calculated using repeated assessments of the same athlete at two-week intervals ($N = 100$, with all athletes completing the scale twice). The differentiation capability of a particular test item was determined through an analysis of its correlation with the total score of the subscales.

To evaluate construct validity, 12 alternative models were evaluated for confirmatory factor analysis. The analysis was done according to the Mascaret et. al. (2015) study, where, firstly a 3x2 achievement goal model with six factors—task-approach, task-avoidance, self-approach, self-avoidance, others-approach, and others-avoidance—was estimated for Polish population based on 3x2 achievement goal theory. Next, 11 other models (see Table 2) were estimated to assess the validity by extracting the subscales of the questionnaire in different ways and then comparing them with other models. CFI and TLI values over .90, and RMSEA and SRMR values below .08 were used to indicate that the proposed models fit the data well (Whittaker, 2016). The Satorra-Bentler correction was applied due to the deviation of the multivariate data from the normality assumptions (Satorra, Bentler, 2001).

Furthermore, we explored the concept of scale invariance in the context of gender, level of sports participation and type of sports. Initially, a configural invariance model was estimated, followed by the estimation of a metric invariance model in which factor loadings were constrained within the respective groups. The regression intercepts were then fixed, and subsequently, a model ensuring scalar invariance was fitted. Finally, the residuals within the comparison groups were fixed, and a model for strict invariance was estimated. Significant group differences were revealed by a decrease in CFI greater than .01 and an increase in RMSEA exceeding .015.

Furthermore, statistically significant group differences become evident when SRMR increases by .01 in cases of strict and scalar invariance and by .03 in instances of metric invariance (Chen, 2007).

The association between the 3x2 AGQ-Sports, TEOSQ, and STAI questionnaires was explored through the utilisation of the Spearman correlation approach. Mann-Whitney U test was used to find significant differences between achievement goal orientation and variables like level of sports participation. The analysis in this study was conducted using SPSS version 29.1.0 and R version 4.2.2.

Results

Sample

The findings from the analysis of descriptive statistics, as presented in Table 1, indicate that the self-approach goal had the greatest average value ($M = 17.55$, $SD = 3.56$), followed by the task-approach goal ($M = 16.98$, $SD = 3.81$).

In reliability analysis, the Cronbach's coefficient for the TAp, TAv, SAp, SAv, OAp, and OAv subscales were .853, .894, .873, .889, .906, and .827 respectively. While the discriminant power coefficients for the subscale's items were: TAp (1- .83, 2- .87, 3- .86), TAv (4- .91, 5- .90, 6-.88), SAp (7- .87, 8- .87, 9- .85), SAv (10- .88, 11- .90, 12- .90), OAp (13- .92, 14- .88, 15- .93), OAv (16- .85, 17- .91, and 18- .78) respectively. Cronbach's alpha for the scale as a whole was .93. McDonald's Omega for the whole scale was .91.

The factor loadings and squared multiple correlations of items 1 to 18 were .823 (.677), .813 (.66), .80 (.64), .841 (.707), .874 (.763), .866 (.749), .827 (.683), .816 (.665), .861 (.741), .839 (.703), .901 (.811), .822 (.675), .87 (.756), .836 (.698), .92 (.846), .755 (.57), .939 (.881), .68 (.462), respectively. The values for composite reliability, average extracted variance, and maximum shared variance were presented in Table 1. The assumption of discriminant validity was made based on the observation that the average variance extracted (AVE) values for each subscale were higher than the maximum shared variance (MSV) values. Intraclass correlations (ICC) of the scale were: Total achievement motivation = .966, TAp = .896, TAv = .943, SAp = .971, SAv = .972, OAp = .925 and OAv = .891.

Construct validity: Factor structure

Parameters (CFI, TLI, RMSEA, and SRMR) suggested an adequate fit to the data, as shown in the test results (Table 2). Table 2 illustrates that the 6-factor model most effectively accounted for the empirical data. The data analysis reveals that the 6-factor model has a good level of fit among individuals of each gender, and across both level of sports participation and type of sports, as seen in Table 2. The factor loadings, which were determined to be statistically significant based on a 6-factor model with a p-value of less than .001, exhibited a range from .68 to .939.

Table1. Descriptive statistics and reliability analysis for the Polish version of the 3x2 achievement goal questionnaire-sports

		TAp M (SD)	TAv M (SD)	SAp M (SD)	SAv M (SD)	OAp M (SD)	OAv M (SD)
Gender	Total (N = 396)	16.98 (3.81)	16.28 (3.93)	17.55 (3.56)	16.46 (4.02)	13.76 (4.9)	12.97 (4.67)
	Female (N = 191)	17.13 (3.8)	16.35 (3.92)	17.59 (3.63)	16.59 (4.08)	13.8 (4.88)	13.56 (4.63)
	Male (N = 205)	16.83 (3.82)	16.2 (3.95)	17.51 (3.5)	16.34 (3.97)	13.73 (4.92)	12.41 (4.65)
Level or sports participation	Recreational (R) (N = 186)	16.78 (3.79)	16.32 (3.68)	17.45 (3.56)	16.32 (3.89)	12.58 (5.13)	12.5 (4.83)
	High Performance (HP) (N = 210)	17.15 (3.83)	16.24 (4.16)	17.64 (3.57)	16.59 (4.14)	14.8 (4.44)	13.38 (4.49)
Type of sports	Individual sport (N = 215)	17.14 (3.34)	16.35 (3.56)	17.57 (3.28)	16.31 (3.74)	13.43 (4.81)	12.65 (4.71)
	Team sport (N = 181)	16.77 (4.29)	16.18 (4.33)	17.51 (3.87)	16.63 (4.33)	14.14 (4.97)	13.33 (4.60)
Reliability analysis	CR	.853	.895	.873	.89	.908	.838
	AVE	.659	.74	.695	.732	.769	.646
	MSV	.51	.51	.614	.614	.27	.27
	α	.853	.894	.873	.889	.906	.827

Note. TAp = task-approach; TAv = task-avoidance; SAp = self-approach; SAv = self-avoidance; OAp = other-approach; OAv = other-avoidance, CR = Construct Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Variance; α = Cronbach's Alpha.

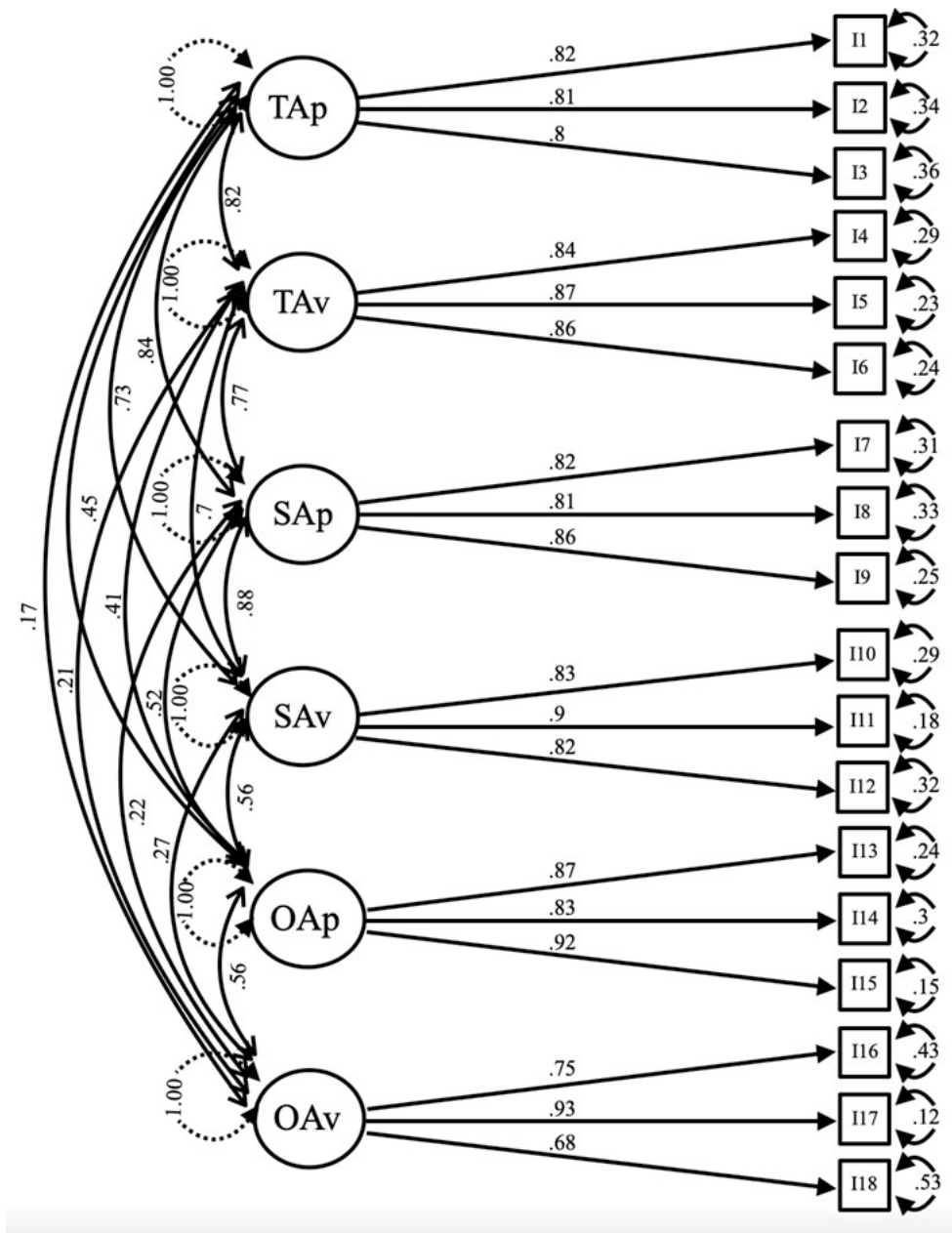


Figure 1. Factor loadings for the 3x2 AGQ
 Note. TAp = task-approach; TAv = task-avoidance; SAp = self-approach; SAv = self-avoidance; OAp = other-approach; OAv = other-avoidance

Table 2. CFA models for Polish version of the 3x2 achievement goal questionnaire-sports

Models	N	Chi-square (df)	p	CFI	TLI	RMSEA 90%CI	SRMR
6-factor	396	221.34 (120)	<.001	.98	.97	.046 [.037, .056]	.045
1 factor	396	1818.41 (135)	<.001	.67	.63	.177 [.17, .185]	.122
2 × 2 Achievement Goal Model	396	102.13 (134)	<.001	.82	.8	.129 [.122, .137]	.075
Trichotomous goal model (OAp, OAv, all other goals)	396	709.97 (132)	<.001	.88	.87	.105 [.098, .113]	.063
Dichotomous goal model (Other-based goals, all other goals)	396	102.13 (134)	<.001	.82	.80	.129 [.122, .137]	.075
TAp/TA _v , 5-Latent Factors Model	396	351.83 (125)	<.001	.95	.94	.068 [.059, .076]	.050
S _{Ap} /S _{Av} 5-Latent Factors Model	396	308.1 (125)	<.001	.96	.95	.061 [.052, .069]	.049
O _{Ap} /O _{Av} 5-Latent Factors Model	396	534.6 (125)	<.001	.92	.9	.091 [.083, .099]	.061
Approach goal model	396	1041.7 (129)	<.001	.82	.79	.134 [.126, .141]	.103
Avoidance goal model	396	1095.72 (129)	<.001	.81	.77	.138 [.13, .145]	.103
Definition model	396	102.13 (134)	<.001	.82	.8	.129 [.122, .137]	.075
Valence model	396	1781.19 (134)	<.001	.68	.63	.176 [.169, .184]	.122
Male	205	161.24 (120)	.007	.98	.98	.041 [.022, .056]	.05
Female	191	246.73 (120)	<.001	.95	.94	.074 [.061, .088]	.051
High-performance athletes (HP)	210	189.84 (120)	<.001	.97	.96	.053 [.038, .066]	.053
Recreational athletes (R)	186	213.93 (120)	<.001	.96	.95	.065 [.051, .079]	.05
Individual game	215	173.75 (120)	<.001	.97	.97	.046 [.030, .060]	.044
Team game	181	198.01 (120)	<.001	.97	.96	.060 [.045, .075]	.063

Note. TAp = task-approach; TA_v = task-avoidance; S_{Ap} = self-approach; S_{Av} = self-avoidance; O_{Ap} = other-approach; O_{Av} = other-avoidance; CFI = Comparative Fit Index; TLI = Tucker-Lewis Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual

Analysis of invariance in measurement

The findings of an invariance analysis conducted on the Polish adaptation of the AGQ-Sports questionnaire are presented in Table 3. The hypothesised models performed well in analyses grouped by gender, level of sport participation, and types of sport. Given that no instances of the aforementioned scenario (i.e., a decrease in CFI exceeding .01 and an increase in RMSEA exceeding .015) were observed in any instance, it can be concluded that the Polish version of the AGQ-Sports can be considered a universally valid and reliable instrument, irrespective of the participant's sports level, type of sport or gender.

Table 3. Measurement invariance of the AGQ-Sports by gender and level of participation

	CFI	RMSEA	SRMR	Δ CFI	Δ RMSEA	Δ SRMR
Gender (males vs females)						
Configural	.993	.030	.042	-	-	-
Metric	.993	.030	.046	0	0	.004
Scalar	.993	.029	.046	0	-.001	0
Strict	.993	.028	.048	0	-.001	.002
Level of sports participation (High Performance vs Recreational)						
Configural	.993	.031	.042	-	-	-
Metric	.993	.029	.044	.001	-.002	.002
Scalar	.992	.030	.046	-.001	.001	.001
Strict	.991	.031	.050	-.001	.001	.004
Types of sports (Individual and Team Sports)						
Configural	.992	.032	.043	-	-	-
Metric	.991	.034	.049	-.002	.002	.006
Scalar	.991	.034	.050	0	0	.001
Strict	.990	.033	.053	0	-.001	.003

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual

Relationship between 3x2 achievement goals, goal orientation, and state and trait anxiety among athletes

The analysis in Table 4 reveals significant associations among the 3x2 achievement goal, goal orientation, and anxiety levels. Notably, moderate positive correlations were observed between other-approach goals (3x2 AGQ-Sports) and ego

orientation (TEOSQ). There is a moderate positive correlation between task-approach, task-avoidance, self-approach, and self-avoidance goals (3x2 AGQ-Sports) and task orientation (TEOSQ), with task-approach and self-approach goals showing stronger correlations. Regarding anxiety and athletes' 3x2 achievement goals, state anxiety (STAI) exhibits a weak positive correlation with other-approach goals (3x2 AGQ-Sports), while trait anxiety (STAI) demonstrates a weak negative correlation with task-approach goals (3x2 AGQ-Sports).

Table 4. Correlations between 3x2 achievement goals, athletes' goal orientation, and state and trait anxiety

3x2 AGQ-S (N = 246)	TEOSQ-Ego orientation	TEOSQ-Task orientation	STAI-S (Form X-1)	STAI-T (Form X-2)
TAp	.2***	.56***	-.028	-.15*
TAv	.24***	.52***	-.021	-.078
SAp	.27***	.57***	-.010	-.058
SAv	.25***	.48***	-.046	-.046
OAp	.55***	.29***	.17**	-.112
OAv	.33***	.07	.14*	.061

Note. TAp = task-approach; TAv = task-avoidance; SAp = self-approach; SAv = self-avoidance; OAp = other-approach; OAv = other-avoidance; * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5. Mann-Whitney test between achievement goals and level of sports participation

3x2 AGQ-S (N = 396)	LOP		
	Z	p	Effect size
TAp	-1.247	.212	-.063
TAv	-.45	.653	-.023
SAp	-.696	.486	-.035
SAv	-.965	.335	-.048
OAp	-4.213	<.001	-.212
OAv	-1.76	.095	-.084

Note. TAp = task-approach; TAv = task-avoidance; SAp = self-approach; SAv = self-avoidance; OAp = other-approach; OAv = other-avoidance; * $p < .05$, ** $p < .01$, *** $p < .001$

Mann-Whitney U test between achievement goals and other variables

Level of sports participation (High-Performance vs Recreational athletes) did not have any significant effect on any achievement goal orientations, except other approach goal orientation (see Table 5). By comparing the means of other approach

goals of high-performance and recreational athletes, it shows that high-performance athletes ($M = 14.8$) have higher value of mean than recreational athletes ($M = 12.58$).

Discussion

Achievement Goal Questionnaire-Sports (AGQ-S) is a reliable and valid scale for Polish athletes. Additionally, we investigate the associations between the 3x2 achievement goals, anxiety and goal orientation. The hypothesised six-factor model was the best fit among all measurement models (see Table 2), exhibiting strong fit indices with CFI exceeding .95, TLI exceeding .95, and RMSEA below .08. These results align with previous literature findings (Elliot et al., 2011; Diseth, 2015; Mascret et al., 2015; Lower, Turner, 2016; Wang et al., 2017; Picoli et al., 2022). The 6-factor model of the Polish calculated on the whole scale, showed a better fit to the data compared to the Chinese (Wang et al., 2017) and Brazilian results (Picoli et al., 2022). Similar to the French analysis (Mascret et al., 2015), the six-factor model exhibits a strong fit with the Polish data, both in the overall sample and in distinct subgroups: gender and sports activity level. All items exhibit factor loading values greater than or equal to .50 (see results 3.1), i.e., their values are acceptable (Ghozali, 2017; Hair et al., 2019). The AVE values are also satisfactory (see Table 1). The convergent validity is proved with high composite reliability values for TAp, TAv, SAp, SA_v, OAp, and OAv (see Table 1). Discriminant validity of all subscales is met since AVE is greater than its MSV. Hence, the internal consistency reliability of the six Polish AGQ-Sports subscales is satisfactory.

Result show the overall value of Cronbach's alpha for the instrument is .93, and for the subscales .83–.91. The values are better than the Chinese version (Wang et al., 2017) and comparable to the results of French analysis (Mascret et al., 2015). The test-retest reliability (ICC = .80–.97) was satisfactory.

Furthermore, the study revealed that the measurement was unaffected by varying degrees of sports engagement (i.e., high performance athletes, recreational athletes), gender (i.e., male and female), and by types of sport (i.e., individual and team sports). Four basic types of measurement invariance were incorporated: configural, metric, scalar, and strict (see Table 3). The analysis proved measurement invariance among high-performance and recreational male and female athletes involved in any type of sport in the Polish version of AGQ-Sports. These results are consistent with earlier studies demonstrating measurement invariance across gender (Wang et al., 2017; Picoli et al., 2022), type of sport (Wang et al., 2017) and level of sports engagement (Tomczak et al., 2024).

Following the approach of Elliot et al. (2011), a series of ten alternative models were tested to compare their fit with the hypothesized model. The alternative models included a 2x2 model, where other-based goals loaded on their specific latent factors, while same-valenced task-based and self-based goals loaded together on combined latent factors. The Trichotomous model allowed other-approach and other-avoidance

goals to load on their respective latent factors, with task-based and self-based goals combined on a single latent factor. In the Dichotomous model, all other-based goals loaded together on one latent factor, while task-based and self-based goals loaded on another.

Additional models included the Tap/Tav (task-approach/task-avoidance) model, where all items loaded on their hypothesized factors except task-approach and task-avoidance items, which loaded on a combined factor, and the Sap/Sav (self-approach/self-avoidance) model, where self-approach and self-avoidance items loaded together on a single latent factor. Similarly, the Oap/Oav (other-approach/other-avoidance) model combined other-approach and other-avoidance items on one factor. The Approach model grouped all approach-based items together on a combined latent factor, while avoidance items retained their hypothesized loadings; conversely, the

Avoidance model grouped all avoidance-based items on one factor while retaining hypothesized loadings for approach items. The Definition model grouped items based on shared competence definitions, and the Valence model combined items with shared valence on joint latent factors. As shown in Table 2, the comparisons revealed that the hypothesized model offered a better fit to the data than any of the alternative models, supporting its robustness and validity in capturing the intended constructs.

The correlation between the 3x2 achievement goals, task and ego orientations, and state and trait anxiety were explored (See Table 4). The results show task-based and self-based goals have moderately positive correlations with task orientation while other-based goals have moderately positive correlation with ego orientation which is theoretically accurate and inline with the literature. However, no relevant conclusions can be made by correlating the 3x2 achievement goals and state or trait anxiety, suggesting that heightened physical activity may mitigate anxiety symptoms, as supported by previous research (Biddle, Asare, 2011; Rebar et al., 2015). Notably, only other-approach achievement goal displayed a weak positive correlation with state anxiety, indicating anxiety related to the desire to outperform others (Ntoumanis, Biddle, 1998). Additionally, there was no significant correlation between achievement goals and trait anxiety, except for task-approach achievement goal, which displayed a weak negative correlation. This aligns with existing literature where the task-approach goal serves as a negative predictor of trait anxiety (Thomas, 2021).

The analysis on the differences between achievement goals and other variables such as level of sports participation. Level of sports participation (high performance athletes, recreational athletes) reveals a significant difference solely in other approach orientation (OAp). High performance athletes demonstrate higher levels of other approach orientation (OAp) compared to recreational athletes. Despite inconsistent findings in previous studies, our results align with research by Yperen, Renekema (2008) and Lachman (2014), which reported higher performance-approach goals among high-performing athletes.

This study has several limitations; first, it evaluates the relationship between 3x2 achievement goals and only two other relevant variables. In future studies, the

number of variables should be increased in order to better understand and influence the achievement motivation of athletes. Second limitation is the small sample size which restricts robust analysis when breaking down into smaller samples. Lastly, it is worth continuing the research on different age groups and career levels of the sports players (regional to international and world class groups) which can yield better results.

Conclusion

Intercultural validation studies, although they do not introduce new categories, are important. In international cooperation, they shall ensure the sameness of measured indicators, and implemented solutions. In practice, with multicultural teams, they give practitioners good tools for their daily work with athletes. Our work facilitates a better understanding of achievement motivation in the sports domain. This study successfully established the high factorial validity and reliability of the Polish version of the 3x2 achievement goal questionnaire in the sports domain. The 3x2 achievement goals correlated with state or trait anxiety and goal orientation, which are essential variables in achievement motivation literature. Goal orientation's relationship with the 3x2 achievement goals shows a clear distinction where task orientation is correlated with task-based and self-based goals, and the ego orientation is correlated with other-based goals. In anxiety, weak correlations between the 3x2 achievement goals and state or trait anxiety, suggest that heightened physical activity may mitigate anxiety symptoms. High-performance athletes had higher other approach goal orientation (OAp) than recreational athletes which is inline with the previous researches. Although these issues are significant, they require additional investigation and research. Nevertheless scale is suitable for planning and controlling interventions in the field of changes related to the achievement of goals in Polish athletes.

Translated by Authors

References

- Ames, C. (1992). Achievement goals and the classroom motivational climate. In D.H. Schunk, J.L. Meece (Eds.), *Student perceptions in the classroom* (pp. 327–348). Lawrence Erlbaum Associates, Inc.
- Baker, J., & Young, B. (2014). 20 years later: Deliberate practice and the development of expertise in sport. *International Review of Sport and Exercise Psychology*, 7(1), 135–157, doi: 1.1080/1750984X.2014.896024
- Biddle, S.J.H., Wang, J., Kavussanu, M., & Spray, C.M. (2003). Correlates of achievement goal orientations in physical activity: a systematic review of research. *European Journal of Sports Science*, 3(5), 1–19.

- Biddle, S.J., & Asare, M. (2011). Physical activity and mental health in children and adolescents: a review of reviews. *British journal of sports medicine*, 45(11), 886–895, doi: 1.1136/bjsports-2011-090185
- Boiché, J.C., & Sarrazin, P.G. (2009). Proximal and distal factors associated with dropout versus maintained participation in organized sport. *Journal of Sports Science and Medicine*, 8(1), 9–16. <https://www.jssm.org/jssm-08-9.xml%3EFulltext>
- Chen, F.F. (2007) Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Struc Equ Model Multidiscip J*, 14, 464–504.
- Thomas, C.L. (2022). Predicting test anxiety using the 3x2 achievement goal model. *International Journal of School and Educational Psychology*, 10(2), 232–242, doi: 1.1080/21683603.202.1816237
- Diseth, Å. (2015). The advantages of task-based and other-based achievement goals as standards of competence . *International Journal of Educational Research*, 72, 59–69, doi: 1.1016/j.ijer.2015.04.011
- Duda, J.L. (2005). Motivation in sport: the relevance of competence and achievement goals. In A.J. Elliot, C.S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 318–335). Guilford Publications.
- Dweck, C.S. (1986). Motivational processes affecting learning. *American Psychologist*, 41, 1040–1048.
- Dweck, C.S., & Elliott, E.S. (1983). Achievement Motivation. In P.H. Mussen (Gen. Ed.), E.M. Hetherington (Ed.), *Handbook of Child Psychology*, 4, (pp. 643–691). Wiley.
- Elliot, A.J., & Harackiewicz, J.M. (1996). Approach and avoidance achievement goals and intrinsic motivation: a mediational analysis. *Journal of Personality and Social Psychology*, 70, 461–475.
- Elliot, A.J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, 34, 169–189.
- Elliot, A.J. (2005). A conceptual history of the achievement goal construct. In A. Elliot, C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 52–72). Guilford Press.
- Elliot, A.J., Murayama, K., & Pekrun, R. (2011). A 3x2 achievement goal model. *J. Educ. Psychol.* 103, 632–648.
- Fornell, C., & Larcker, D.F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J Mark Res*, 18(1), 39–5.
- Ghozali, I. (2017). Model Persamaan Struktural: Konsep Dan Aplikasi Dengan Program Amos 24 (7th Ed.) [Model of Structural Function: Theory and Application with the Amos 24]. *Badan Penerbit Univ. Diponegoro* .
- Hair, J.F., Black, W.C., & Babin, B.J. (2019). Anderson, R. E. *Multivariate Data Analysis* (8th ed.). Cengage.
- Harackiewicz, J.M., Barron, K.E., Pintrich, P.R., Elliot, A.J., & Thrash, T.M. (2002). Revision of achievement goal theory: Necessary and illuminating. *J. Educ. Psychol.*, 94, 638–645, doi: 1.1037/0022-0663.94.3.638

- Lachman, M. (2014). *Antecedents of athletes' achievement goal orientations* (Master's thesis). Retrieved from Digital Commons (1134).
- León-del-Barco, B., Mendo-Lázaro, S., Polo-del-Río, M.I., & Rasskin-Gutman, I. (2019). Which academic goals do university students pursue when working in teams? Questionnaire on academic goals in teamwork, 3x2 Model. *Front. Psychol.* 10:2434.
- Lower, L.M., & Turner, B.A. (2016). Examination of the 3x2 achievement goal model in collegiate recreation: Comparison across sport programs. *J. Amateur Sport*, 2, 75–102.
- Mascret, N., Elliot, A.J., & Cury, F. (2015). Extending the 3x2 achievement goal model to the sport domain: The 3x2 Achievement Goal Questionnaire for Sport. *Psychol. Sport Exer.*, 17, 7–14, doi: 1.1016/j.psychsport.2014.11.001
- Méndez-Giménez, A., Cecchini-Estrada, J.A., & Fernández-Río, J. (2014). Examinando el modelo de metas de logro 3x2 en el contexto de la educación física. *Ciad. Psicol. Deporte*, 14, 157–168.
- Mudrak, J., Slepicka, P., & Slepickova, I. (2018). Sport motivation and doping in adolescent athletes. *PLOS ONE*, 13(10): e0205222, doi: 1.1371/journal.pone.0205222
- Nicholls, J.G. (1984). Achievement motivation: conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328–346.
- Nicholls, J.G., Cheung, P.C., Lauer, J., & Patashnick, M. (1989). Individual differences in academic motivation: Perceived ability, goals, beliefs, and values. *Learning and Individual Differences*, 1(1), 63–84.
- Nikitskaya, M.G., & Uglanova, I.L. (2021) The Russian Version of the Educational Achievement Goal Questionnaire: Development, Validation and Research of Functionality. *Psikhologicheskaya nauka i obrazovanie [Psychological Science and Education]*, 26(5), 67–84, doi: 1.17759/pse.2021260506
- Ntoumanis, N., & Biddle, S.J.H. (1998). The relationship of coping and its perceived effectiveness to positive and negative affect in sport. *Personality and Individual Differences*, 24(6), 773–788, doi: 1.1016/S0191-8869(97)00240-7
- Ntoumanis, N., & Biddle, S.J.H. (1999). Affect and achievement goals in physical activity: a meta-analysis. *Scandinavian Journal of Medicine and Science in Sport*, 9, 315–332.
- Øvretveit, K., Sæther, S.A., & Mehus, I. (2019). Mastery goals are associated with training effort in brazilian jiu-jitsu. *Journal of Physical Education and Sport*, 19(4), 1294–1299, doi: 1.7752/jpes.2019.4188
- Payne, S.C., Youngcourt, S.S., & Beaupien, J.M. (2007). A meta-analytic examination of the goal orientation nomological net. *J. Appl. Psychol.*, 92, 128–15, doi: 1.1037/0021-901.92.1.128
- Pekrun, R., Elliot, A.J., & Maier, M.A. (2006). Achievement goals and discrete achievement emotions: a theoretical model and prospective test. *J. Educ. Psychol.*, 98, 583–587, doi: 1.1037/0022-0663.98.3.583
- Picoli, R.M.M., Gomes, A.R.S., & Bueno, J.L.O. (2022). Cross-cultural adaptation of

- the 3×2 Achievement Goal Questionnaire for Sport in Brazil. *Sports Humanities*, 28, e10220003422, doi: 1.1590/s1980-657420220003422
- Rebar, A.L., Stanton, R., Geard, D., Short, C., Duncan, M.J., & Vandelanotte, C. (2015). A meta-meta-analysis of the effect of physical activity on depression and anxiety in non-clinical adult populations. *Health Psychology Review*, doi: 1.1080/17437199.2015.1022901
- Satorra, A., & Bentler, P.M. (2001). A Scaled Difference Chi-Square Test Statistic for Moment Structure Analysis. *Psychometrika*, 66(4), 507–514.
- Skaalvik, E.M. (1997). Self-enhancing and self-defeating ego-orientation: relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology*, 89, 71–81.
- Smith, N., Quested, E., Appleton, P.R., & Duda, J.L. (2017). Observing the coach-created motivational environment across training and competition in youth sport. *Journal of Sports Sciences*, 35(2), 149–158, doi: 1.1080/02640414.2016.1159714
- Tomczak, M., Walczak, M., Kleka, P., Walczak, A., & Bojkowski, Ł. (2020). Psychometric Properties of the Polish Version of Task and Ego Orientation in Sport Questionnaire (TEOSQ). *International journal of environmental research and public health*, 17(10), 3593, doi: 1.3390/ijerph17103593
- Tomczak, M., Kleka, P., Tomczak-Łukaszewska, E., Bojkowski, Ł., & Walczak, M. (2024). Validation and personality conditionings of the 3 × 2 achievement goal model in sport. *Scientific Reports*, 14(1), 1588, doi: 1.1038/s41598-024-52075-7
- Vallerand, R.J., & Miquelon, P. (2007). Passion for sport in athletes. In S. Jowette, D. Lavallée (Eds.), *Social psychology in sport*, (pp. 249–263). Human Kinetics, doi: 1.5040/9781492595878.ch-018.
- Van de Pol, P.K.C., & Kavussanu, M. (2012). Achievement motivation across training and competition in individual and team sports. *Sport, Exercise, and Performance Psychology*, 1(2), 91–105, doi: 1.1037/a0025967
- Wang, C.K.J., Liu, W.C., Sun, Y., & Chua, L.L. (2017). Psychometric properties of the 3×2 achievement goal questionnaire for sport. *International Journal of Sport and Exercise Psychology*, 15(5), 460–474, doi: 1.1080/1612197X.2016.1142458
- Whittaker, T.A. (2016) Structural Equation Modelling. In *Applied Multivariate Statistics for the Social Sciences: Analyses with SAS and IBM's SPSS*, (pp. 639–733). Routledge.
- Wrześniewski, K., Sosnowski, T. & Matusik, D. (2012) *Inwentarz Stanu i Cechy Leku STAI. Polska adaptacja STAI*. Pracownia Testów w Psychologicznym Polskiego Towarzystwa Psychologicznego.
- Yperen, N.W.V., & Renkema, L.J. (2008). Performing great and the purpose of performing better than others: On the recursive of the achievement goal adoption process. *European Journal of Social Psychology*, 38, 260-271, doi: 1.1002/ejsp.425

ADAPTACJA MIĘDZYKULTUROWA I WŁAŚCIWOŚCI PSYCHOMETRYCZNE

KWESTIONARIUSZA CELÓW OSIĄGNIĘĆ 3x2 – SPORT WŚRÓD POLSKICH SPORTOWCÓW

Streszczenie

Cel. W niniejszym badaniu zbadano rzetelność i trafność Kwestionariusza Celów Osiągnięć 3x2-Sport (3x2 AGQ-Sport) wśród polskich sportowców ($N = 396$; w wieku 18–35 lat) reprezentujących różne dyscypliny sportowe.

Narzędzia. W badaniu wykorzystano metryczkę zbierającą podstawowe dane socjometryczne, Kwestionariusz Orientacji na Zadanie i Ego w Sporcie (TEOSQ) oraz Inwentarz Stanu i Cechy Lęku (STAI).

Rezultaty. Analizy statystyczne potwierdziły poprawność skali. Model 6-czynnikowy najlepiej pasował do 3x2 AGQ-Sport, z niezmiennością pomiaru w zależności od płci, poziomu uczestnictwa w sporcie (sportowcy o wysokiej wydajności vs. rekreacyjni) i rodzaju sportu (indywidualny i drużynowy). Alfa Cronbacha dla całej skali wynosiła .93, a alfa podskal wahała się od .83 do .91. Niezawodność testu-retestu ($ICC = .89-.97$) była zadowalająca. Cele zorientowane na zadania i cele zorientowane na Ja (3x2 AGQ-Sports) mają umiarkowanie dodatnią korelację z orientacją na zadania (TEOSQ), podczas gdy cele zorientowane na innych (3x2 AGQ-Sports) mają umiarkowanie dodatnią korelację z orientacją na ego (TEOSQ), co jest zgodne z literaturą i słabe korelacje między celami osiągnięć 3x2 a stanem lub cechą lęku sugerują, że zwiększona aktywność fizyczna może łagodzić objawy lęku. Analiza poziomu uczestnictwa w sporcie między sportowcami o wysokiej wydajności i sportowcami rekreacyjnymi ujawniła istotne różnice w orientacji na inne, przy czym sportowcy o wysokiej wydajności wykazywali wyższe poziomy w porównaniu ze sportowcami rekreacyjnymi. Wyniki te są zgodne z badaniami wskazującymi na cele, mające silną orientację na wynik wśród sportowców o wysokiej wydajności.

Wnioski. Badanie wykazuje wysokie właściwości psychometryczne Kwestionariusza Celów Osiągnięć 3x2-Sport (3x2 AGQ-Sport) w populacji polskiej, oferując wgląd w orientację na cele i lęk wśród sportowców o różnym poziomie i płci, z implikacjami dla psychologii sportu i rozwoju sportowców.

Słowa kluczowe: adaptacja międzykulturowa; psychometria; motywacja do osiągnięć; sportowcy

Receipt Date: 11th August 2024

Date after correction: 5th September 2024

Print Acceptance Date: 8th September 2024