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## From elite sport to the job market: Development and initial validation of the Athlete Competency Questionnaire for Employability (ACQE)

Del deporte de elite al mercado laboral: Desarrollo y validación inicial del Cuestionario de Competencias de Deportistas para la Empleabilidad (ACQE)

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### Abstract

This paper describes two studies aimed at developing and initially validating an instrument that measures athletes' competencies required to optimize their employability across three career phases (i.e., active, retirement and new career phase; B-WISER, 2018). *Study 1* describes the development of the Athlete Competency Questionnaire for Employability (ACQE). *Study 2* examines the ACQE's factor structure using exploratory structural equation modelling (ESEM;  $N = 954$ , 46% female;  $M_{\text{age}} = 26.74 \pm 9.90$ ; 54% active, 24% retirement, 22% new career). ESEM supported a 28-item ACQE with four factors: *Career & Lifestyle Management*, *Career Communication*, *Career Resilience*, and *Career Engagement & Flexibility*. This is the first study to identify athletes' competencies for optimizing employability across different phases of athletic retirement. The results can inform stakeholders in different fields (e.g., sport, education, employment) about ways to assist athletes in their transition from elite sport to the job market.

**Key words:** Transitions, employment, post-athletic career, athletic retirement, Erasmus+.

### Resumen

Este artículo describe dos estudios encaminados a desarrollar y realizar la validación inicial de un instrumento que mide las competencias que los deportistas requieren para optimizar su empleabilidad en tres fases de su carrera (i.e., activos, en retirada deportiva, en nueva fase de carrera; B-WISER, 2018). El Estudio 1 describe el desarrollo del Cuestionario de Competencias de Deportistas para la Empleabilidad (ACQE). El Estudio 2 examina la estructura factorial del ACQE a partir del modelamiento exploratorio de ecuaciones estructurales (ESEM;  $N = 954$ , 46% mujeres;  $M_{\text{edad}} = 26.74 \pm 9.90$ ; 54% activas, 24% en retirada, 22% nueva carrera). El ESEM apoya una solución de 28 ítems y 4 factores para el ACQE: *Gestión de carrera y estilo de vida*, *Comunicación de Carrera*, *Resiliencia de carrera*, y *Compromiso y flexibilidad de carrera*. Este es el primer estudio que identifica las competencias de los deportistas para optimizar su empleabilidad en distintas fases de la retirada deportiva. Los resultados pueden informar a los interesados en distintos ámbitos (e.g., deporte, educación, empleabilidad) sobre los modos de asistir a los deportistas en su transición del deporte de elite al mercado laboral.

**Palabras clave:** Transiciones, empleabilidad, carrera post-deportiva, retirada deportiva, Erasmus+.

## Introduction<sup>1</sup>

Sooner or later, every athlete is confronted with the end of the athletic career. The topic of athletic retirement has a rich history of research evolving from conceptualizing athletic retirement as a negative, traumatic and singular event to a more positive, phase-like, developmental and holistic process (Wylleman, Rosier, & De Knop, 2016). This approach considers athletic retirement as a process of making the transition from one particular career (i.e., the athletic career) to another new career (i.e., employment in the post-athletic career), covering both pre- and post-retirement phases. This paper aims to develop and initially validate an instrument that measures athletes' competencies (i.e., skills, attitudes, knowledge; Roe, 2002) required to optimize their employability across different phases of athletic retirement.

The Erasmus+ Sport project 'Be a Winner In elite Sport and Employment before and after athletic Retirement' (B-WISER, 2018) emphasized the importance for athletes to invest in their employability throughout three consecutive career phases: when still active in elite sport (*active phase*), when planning to retire soon or have retired and are not (yet) employed in the post-athletic career (*retirement phase*), and when employed in their post-athletic career (*new career phase*). Research has shown that during those three consecutive phases, athletes are confronted with demands at different levels of development (i.e., athletic, psychological, psychosocial, academic/vocational, financial, legal; Wylleman, 2019a). For example, an athlete's transition to a new career not only entails (changed) requirements at vocational level (e.g., fixed working hours), but also at athletic (e.g., physical deterioration), psychological (e.g., being like everyone else), psychosocial (e.g., changing

social network), financial (e.g., different income) and legal level (e.g., tax obligations; Wylleman, 2019a). In order to overcome those multi-level demands, studies emphasized that athletes require strong competencies (i.e., skills, attitudes, and knowledge; Roe, 2002) and external resources (i.e., social and structural support; Stambulova, Ryba, & Henriksen, 2020). If athletes successfully develop and employ their resources, they are more likely to experience a successful transition (Stambulova, 2003). Driven by Stambulova's Athlete Career Transition framework (2003) and the Holistic Athletic Career model (Wylleman et al., 2016), researchers investigated the competencies athletes require to cope with specific career phases.

Research focusing on *active* elite athletes, for example, identified competencies facilitating development from the initiation to the mastery stage of an athletic career. Blijlevens, Elferink-Gemser, Wylleman, Bool, and Visscher (2018) identified, amongst others, stress-resistance, adaptability, competitiveness, confidence, the ability to focus, and a hard-work ethic as competencies athletes typically need in achieving and maintaining world-class sport status. Since many athletes advance their athletic career while pursuing education, research also identified the competencies athletes require to cope with the challenges of a dual career (DC) pathway (e.g., Brown et al., 2015; De Brandt et al., 2018). Based on data of 3,350 European athletes, De Brandt and colleagues (2018) highlighted the relevance of athletes' wide range of competencies required for a DC by developing and validating the Dual Career Competency Questionnaire for Athletes (DCCQ-A). The DCCQ-A describes four key competencies important for a successful DC in sport and education: *DC management* (e.g., using your time efficiently; dedication to succeed in both sport and study), *career planning* (e.g., being curious to explore career plans outside elite sport; being flexible and changing career plans if necessary), *emotional awareness* (e.g., regulating your emotions in different situations; using setbacks in sport and/or study as a positive stimulus) and *social intelligence & adaptability* (e.g., asking advice to the right people at the right time; maintaining relations with important others). Practitioners have used the DCCQ-A as a formative self-assessment and identification-support tool to structure their work with student-athletes (Alcaraz et al., 2020; De Brandt et al., 2018). Another possible but less often pursued pathway during active athletes' careers includes the combination of elite sport and employment. This combination has been shown to be often incompatible for athletes because of a shortage of employment/internship opportunities, inflexible employers or difficult sched-

1 This research was conducted as part of the Erasmus + Sport Project 'Be a Winner In elite Sport and Employment before and after athletic Retirement' (B-WISER). The B-WISER project brought together a consortium of researchers and practitioners in the topics of dual careers, post-athletic careers and athlete employment from six universities, seven elite sport organisations (i.e., Olympic/Paralympic committees, sport federations, high performance centre), and seven employment organisations across six European Member States (Belgium, Germany, Italy, Slovenia, Spain, Sweden). Institutional ethical approval was granted for each of the studies and for each participating Member State of the B-WISER project.

*Esta investigación se realizó como parte del proyecto Erasmus + Sport 'Ser un ganador en el deporte de élite y el empleo antes y después de la retirada deportiva' (B-WISER). El proyecto B-WISER agrupó un consorcio de investigadores y profesionales aplicados en los temas de carrera dual, carrera post-deportiva y empleo de deportistas de seis universidades, siete organizaciones de deporte de elite (i.e., Comités olímpicos y paralímpicos, federaciones deportivas, centro de alto rendimiento deportivo) y siete organizaciones de empleo en seis países europeos (Bélgica, Alemania, Italia, Eslovenia, España y Suecia). Cada uno de los estudios y equipos participantes obtuvieron aprobación institucional y ética para el proyecto.*

ules. B-WISER results emphasized the importance of social competencies, personal flexibility, time-efficiency and self-regulation in pursuing a DC elite sport and employment (B-WISER consortium, 2018). However, to date, athletes' competencies required for a dual career in elite sport and employment remain relatively unexplored (Stambulova et al., 2020).

Looking at the competencies athletes require in the *retirement phase*, research highlighted the importance of developing competencies to cope with specific transition demands such as changes in well-being (e.g., feelings of loss), adapting to a new social status, financial insecurity, adjusting to a new lifestyle and daily routine, and the phenomenon of occupational delay (Wylleman et al., 2016). In their systematic review on athletic retirement, Park, Lavallee, and Tod (2013) indicated that coping with those demands requires job seeking and interview competencies, career planning, leadership skills, decision-making, and communication skills.

Finally, research targeting athletes in *new careers* emphasized the importance of successful transfer of competencies developed in elite sport to the workplace in order to gain a competitive advantage over employees without an elite sport background. Coffee and Lavallee (2014), for example, identified a set of athletes' skills and attitudes valued in the job market, including determination to excel, networking, goal setting, being disciplined, interpersonal skills, handling pressure, teamwork, planning, commitment, leadership, and emotional awareness. Some companies are even specifically looking to hire athletes when recruiting new employees because of their added value in a business environment (Chalfin, Weight, Osborne, & Johnson, 2015).

As outlined above, several studies investigated the competencies athletes require to cope with the different career phases leading to employment in a new career. To date, however, no valid and reliable instrument exists that measures the competencies athletes require to optimize their employability. Such an instrument can assist athletes in monitoring their competencies and career needs (e.g., Van der Heijde & Van der Heijden, 2006), and help career support providers to structure their work with active and former elite athletes (Baron-Thiene & Alfermann, 2015; De Brandt et al., 2018). The aim of this paper was therefore to develop and initially validate an instrument that measures athletes' competencies required to optimize their employability across different phases of athletic retirement. Two studies were conducted to develop and provide initial validity for this instrument. Study 1 describes the development of the Athlete

Competency Questionnaire for Employability (ACQE). Study 2 examines the ACQE's factor structure using exploratory structural equation modelling.

### Study 1: Development of the Athlete Competency Questionnaire for Employability

*Study 1* describes the development of the Athlete Competency Questionnaire for Employability (ACQE). Specifically, the objectives were to (1) develop a pool of items representing athletes' skills, attitudes and knowledge required for optimizing their employability, and decide on the format of the questionnaire, (2) test the ACQE for face and content validity through a panel of experts, and (3) conduct a pilot study to investigate participants' perceptions of the questionnaire.

#### Item generation and format of the ACQE

In first instance, the development of the ACQE was informed by a thorough literature review in the topics of athletes' dual and post-athletic career (e.g., De Brandt et al., 2018; Park et al., 2013) and employability (e.g., Van der Heijde & Van der Heijden, 2006). The review resulted in the identification of two relevant competence-based questionnaires: one in the context of elite sport (i.e., the Dual Career Competency Questionnaire for Athletes; De Brandt et al., 2018) and one in the context of employability (i.e., the competence-based and multidimensional measurement of employability; Van der Heijde & Van der Heijden, 2006). The DCCQ-A describes four competencies bundling a list of 29 skills, attitudes and knowledge that are shown to facilitate student-athletes' combination of elite sport and study. The competence-based and multidimensional measurement of employability conceptualises employability under one main dimension, namely occupational expertise, complemented with four general competencies (i.e., anticipation and optimization, personal flexibility, corporate sense, and balance). After an expert discussion with the B-WISER consortium, it was decided to use the two questionnaires as starting frameworks for developing the ACQE's item pool and format.

The B-WISER consortium generated an initial pool of 46 relevant items to be included in the ACQE. Specifically, the B-WISER consortium selected 28 items of the DCCQ-A (e.g., 'ability to use your time efficiently', 'being patient about the progression of your sport and study career') and 18 items of the competence-based and multidimensional measurement of employability (e.g., 'I consider myself competent to engage in in-depth, specialist discussions in my job domain', 'I am

involved in achieving my organisation's/department's mission') as relevant for the ACQE. To better reflect the context of athletes' employability, the first author transformed the wording of some items. For example, while 'ability to use your time efficiently' was kept in its original form, the items 'being patient about the progression of your sport and study career' and 'during the past year, I was, in general, competent to perform my work accurately and with few mistakes' were transformed to 'patience and optimism about the progression of your career' and 'confidence that you have the competencies needed for the job'.

In parallel, the questionnaire format was developed, mainly informed by the structure and content of the DCCQ-A. Two of the authors selected relevant questions of the DCCQ-A (e.g., gender, career phase, perceived importance and possession of competencies) and adapted those to the context of the ACQE. The ACQE consisted of two parts. In the first part, participants were asked to provide general information (e.g., gender, career phase). In the second part, participants were asked to assess their perceived importance and possession of the 46 items by answering two questions on a 5-Point Likert-type Scale: "How important is this item for you to optimize your employability?" ('1 – unimportant' to '5 – very important'), and "To what extent do you possess this item?" ('1 – very poor possession' to '5 – very strong possession').

### Initial face and content validation of the ACQE

An expert panel, consisting of three expert practitioners in the field of athlete employment and six researchers in the topics of (dual) career development and athletic retirement, assessed the face and content validity of the ACQE. Each expert was asked to review the relevance of the 46 items on a Likert-type scale ('1 – not relevant at all' to '5 – very relevant'), assess the spelling and grammar of the items, and suggest improvements and/or additions to the list of items. Based on their feedback, less relevant items (i.e., mean score < '4 – relevant') were deleted, and suggested adaptations were made, resulting in a pool of 37 items. In view of its use across the six European countries participating in the B-WISER project, the 37-item ACQE was then translated in Catalan, Dutch, French, German, Italian, Slovenian, Spanish and Swedish by the research partners of the B-WISER consortium.

### Pilot study with active and former athletes

In order to investigate the target population's perceptions of the ACQE's format and items, the 37-item

ACQE was pilot tested with 43 athletes (51% active, 12% retiring, 37% new career; female = 51%;  $M_{age} = 26.27 \pm 7.21$ ) across the six B-WISER partner countries (Germany = 16, Belgium = 6, Italy = 6, Spain = 6, Sweden = 6, Slovenia = 3). Participants received an email with access link to the ACQE via the sport partners of the B-WISER consortium. After completing the ACQE, participants were asked during short interviews to provide feedback on (a) the relevance of the questionnaire and the list of items in particular, (b) the wordings and grammar used throughout the questionnaire, (c) items that were overlapping or missing, and (d) the feasibility, duration and online structure of the ACQE. Analysis of the pilot data included that items with mean scores < 4 for athletes' perceived importance were deleted, resulting in a final pool of 31 items. No grammatical changes were suggested by the participants. For the final version of the ACQE, the question on perceived importance was dropped because of unfavourable skewness results, the assumption that we developed a list of items considered important, and in order to shorten the questionnaire. Changes made compared to the previous version of the questionnaire were translated by the research partners of the B-WISER consortium and subjected to a final test by the consortium.

### Study 2: Exploring the factor structure of the ACQE

Study 2 examines the ACQE's factor structure using exploratory structural equation modelling. Specifically, the objective was to further examine the ACQE's content validity by initially investigating its factorial validity in a diverse large-scale sample of European athletes across three phases of retirement (i.e., active, retirement, new career).

## Methods

### Participants

Participants included 954 athletes ( $M_{age} = 26.74 \pm 9.90$ ; 54% active and 46% former athletes; 46% female) who are or were recognised as elite by their respective national sport governing body and competing at minimum national level in team sports or international level in individual sports. Participants competed in individual sports (64%) and team sports (36%) in Olympic (summer = 64%; winter = 10%), Paralympic (summer = 4%; winter = 1%) or non-Olympic/Paralympic



pic (22%) disciplines, representing six countries (Italy = 434, Spain = 205, Belgium = 129, Germany = 112, Slovenia = 59, Sweden = 15). By answering the first part of the ACQE, participants classified themselves in one of three consecutive career phases (54% active phase, 24% retirement phase, 22% new career phase). Athletes in the active phase ( $n = 515$ ) included full-time athletes ( $n = 170$ ; 33%) and athletes pursuing a dual career in sport and education ( $n = 237$ ; 46%) or a dual career in sport and work ( $n = 108$ ; 21%). Athletes in the retirement phase ( $n = 231$ ) included active athletes planning to retire before the end of 2020 ( $n = 187$ ; 81%) or those who retired from elite sport and were not (yet) employed in their post-athletic career ( $n = 44$ ; 19%). Athletes in the new career phase included those who were employed in their post-athletic career ( $n = 208$ ; 22%).

### Instrument and procedure

Participants received an email with access link to the 31-item ACQE. Participants completed the ACQE, providing personal information (e.g., gender, career phase) in the first part, and evaluating their perceived possession of competencies on a 5-point Likert-type scale in the second part by answering the following question: "To what extent do you possess this item?" ('1 – very poor possession' to '5 – very strong possession'). In order to maximize the response and completion rates, at least two formal (e.g., official emails) and informal (e.g., personal contact) reminders per country were sent to the participants. All participants received an informed consent form, describing the aim of the study, the confidentiality of information, the voluntary nature of participation and the possibility to withdraw at any time

### Data analysis

As a preliminary step, missing values, distribution of data, and sample size adequacy for factor analysis were analysed using SPSS 25.0. Sample size requirements and distribution of data criteria were compared to literature recommendations (e.g., Byrne, 2006). Principal component analysis with maximum likelihood extraction and direct oblimin rotation, parallel analysis (PA; Horn, 1965) and the minimum average partial test (MAP; Velicer, 1976) were used in SPSS 25.0 to determine an estimation of the number of factors in the ACQE.

Next, exploratory structural equation modelling (ESEM) was performed to investigate the ACQE's factor structure (De Brandt et al., 2018; Marsh et al., 2010). ESEM was chosen over EFA and CFA as it is considered a flexible and realistic approach to

identify valid factor structures for examining relatively unexplored constructs (Marsh et al., 2010; Marsh, Morin, Parker, & Kaur, 2014; Myers, 2013). ESEM allows cross-loadings of items on multiple factors and therefore represents interrelationships closer to reality (Myers, 2013). Furthermore, De Brandt and colleagues (2018) confirmed in their validation of the DCCQ-A the value of an ESEM-procedure to investigate athletes' competencies. ESEM was performed on the scores for perceived possession with Mplus 8.0 using the Weighted Least Squares Means and Variance Adjusted (WLSMV) estimator. During the first stage, oblique Geomin rotation was used to estimate the psychometric properties of four nested measurement models with a specified number of factors (Marsh et al., 2014). Model fit was assessed by analysing cut-off criteria of multiple fit indexes suggested by Marsh et al. (2014): the Chi-square statistic ( $\chi^2$ ;  $p < .05$ ), the Comparative Fit Index (CFI;  $\geq .90$  or  $\geq .95$ ), the Tucker-Lewis index (TLI;  $\geq .90$  or  $\geq .95$ ), the Root Mean Square Error of Approximation (RMSEA;  $\leq .06$  or  $\leq .08$ ) including its 90% confidence interval ( $[ < .05 - < .08 ]$ ), and the Standardized Root Mean Square Residual (SRMR;  $< .01$  or  $< .08$ ).

In order to determine the most appropriate model, both theoretical (i.e., theoretical relevance; Shanmugam & Marsh, 2015) and statistical criteria were used in evaluating the ESEM measurement models. From a statistical point of view, a comparison between the nested models was made based on differences in CFI, TLI and RMSEA, and standardised factor loadings of individual items of each model ( $\lambda$ ; Marsh et al., 2014). Following the recommendations of Marsh et al. (2014), the more parsimonious model was selected if  $\Delta CFI$  and  $\Delta TLI$  are  $\leq .01$  and  $\Delta RMSEA \leq .015$ . In line with the study of De Brandt et al. (2018) and based on the recommendations of Costello and Osborne (2005), models were considered stable when their factors comprised three or more items loading  $> .32$  on their primary factor. The most appropriate model was subjected to further analyses. Cross-loadings were considered when one loading was at least  $.32$  and were appointed to the factor with the best theoretical fit (Payne, Hudson, Akehurst, & Ntoumanis, 2013). Items with a primary factor loading  $< .32$  were eliminated (Costello & Osborne, 2005). The remaining items were then again subjected to an estimation of the model. Cronbach's Alpha ( $\alpha$ ) and correlation coefficients ( $r$ ) were used to assess the internal consistency of the items and factors of the ACQE (Boateng et al., 2018). As a last step, factor names were determined by consulting existing literature and two dedicated group discussions with the B-WISER consortium.

## Results

### Preliminary analyses

As the number of missing values was less than 1.2%, listwise deletion of missing data was used on the initial 954 cases, resulting in 936 remaining cases (Tabachnick & Fidell, 2018). Absolute values for skewness and kurtosis observed for the scores of perceived possession did not exceed the threshold of 2 (skewness range = .13 – .71) and 7 (kurtosis range = .01 – .36), indicating a normal data distribution. Data were considered appropriate for factor analysis as Kaiser-Meyer-Olkin was .952 and Bartlett's test of Sphericity was significant. Sample size requirements were met with a sufficient number of cases ( $N = 936$ ) and an adequate participant-to-item ratio (30:1; Byrne, 2006). Descriptive statistics showed that in general athletes reported an average to strong possession of all 28 items ( $M = 3.78 \pm .86$ ; range = 3.28 – 4.26). Table 1 shows the five items for which athletes on average reported the weakest and strongest possession. While PA and MAP suggested the presence of two to three factors, the Kaiser criterion and scree plot test suggested the presence of two to five factors in the ACQE. Therefore, four sequential models with two to five factors were estimated using ESEM.

### Model fit for four nested measurement models

Table 1 indicates that the four- and five-factor models showed an acceptable to excellent model fit. The two- and three-factor model did, based on theoretical relevance and the RMSEA 90% CI, not fit the data to an acceptable degree, resulting in the exclusion of both models for further analyses. In a comparison between the two remaining models, the four-factor model was preferred because of its theoretical relevance and the smaller differences in CFI and TLI ( $\leq .01$ ) and RMSEA ( $\leq .015$ ). In addition, analysis of the standardised factor loadings of the individual items of the remaining models showed that the five-factor model was insufficiently stable as two factors were represented by only two items loading  $> .32$ .

### Finalizing the four-factor ACQE

ESEM results for the four-factor 31-item ACQE are reported in Table 1. ESEM fit indices were acceptable to excellent, confirming the initial content- and factorial validity of the ACQE. Upon further inspection of the four-factor model, three items did not have a primary factor loading  $> .32$  and were eliminated from the

initial 31-item ACQE. Hence, an alternative ESEM-model with four factors and 28 items was tested. The 28-item ACQE was theoretically relevant and met the predefined cut-off criteria, indicating an acceptable to excellent fit (see Table 1). Standardized factor loadings were satisfactory, ranging from (.81 – .32);  $\lambda_{mean} = .49$ ) including eight items with a primary factor loading  $< .40$ . Two items (i.e., items 1 and 16) cross-loaded on two factors while fitting theoretically only on one. Table 2 shows that six items loaded primary on factor 1 ( $\lambda_{mean} = .56$ ), eight on factor 2 ( $\lambda_{mean} = .44$ ), nine on factor 3 ( $\lambda_{mean} = .65$ ) and five on factor 4 ( $\lambda_{mean} = .43$ ). Cronbach's  $\alpha$  for the factors ranged from .71 to .85, suggesting an acceptable internal consistency (Nunnally & Bernstein, 1994). Significant factor correlations (Safrit & Wood, 1995;  $r_{range} = .35 - .56$ ,  $p < .001$ ) were observed between all factors, indicating that they are distinct but related, reflecting reality (Myers, 2013).

The four factors were named *Career & Lifestyle Management* (CLM), *Career Communication* (CCO), *Career Resilience* (CRE), and *Career Engagement & Flexibility* (CEF). *CLM* relates to athletes' competence to organise, balance and stay committed to their combination of professional and private life. *CCO* includes athletes' career awareness and interpersonal competencies to communicate effectively and build a supportive network. *CRE* refers to athletes' competence to recognize, understand and manage their emotions and to control and cope effectively with adversity and pressures of daily life. *CEF* comprises athletes' competence to be fully engaged at work and adapt to changing environments and situations.

## Discussion

Up until now, no instrument was available that investigates athletes' competencies (i.e., skills, attitudes, knowledge) to optimize their employability across different phases of athletic retirement. The aim of the current research was therefore to develop and initially validate the Athlete Competency Questionnaire for Employability (ACQE), designed to measure athletes' competencies required to optimize their employability. Two consecutive studies were conducted that described (1) the development of the ACQE, and (2) the initial factor validation of the ACQE using ESEM in a diverse large-scale sample of European athletes across three phases of retirement (i.e., active, retirement, new career). Study findings provided support for the initial content, criterion, and construct validity and reliability of a four-factor 28-item ACQE,

**Table 1. Goodness-of-fit indices of the ACQE's nested measurement models (N = 936).**

Measurement model	$\chi^2$	df	p	CFI	TLI	RMSEA [90% CI]	SRMR	$\Delta$ CFI	$\Delta$ TLI	$\Delta$ RMSEA
2-factor ACQE-31i	1862.63	(404)	**	.926	.915	.062 [.059-.065]	.042	/	/	/
3-factor ACQE-31i	1441.33	(375)	**	.946	.933	.055 [.052-.058]	.035	+0.02	+0.018	-0.007
4-factor ACQE-31i	1229.13	(347)	**	.955	.94	.052 [.049-.055]	.032	+0.009	+0.007	-0.003
5-factor ACQE-31i	1087.21	(320)	**	.961	.943	.051 [.047-.054]	.029	+0.006	+0.003	-0.001
4-factor ACQE-28i	1036.38	(272)	**	.957	.94	.055 [.051-.058]	.031	+0.002	+0.000	+0.003

Note.  $\Delta$ CFI,  $\Delta$ TLI, and  $\Delta$ RMSEA for the 4-factor ACQE-28i are made in comparison with the 4-factor ACQE-31i.;  $\chi^2$  = Chi-Square; df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; SRMR = Standardized Root Mean square Residual; \*\* = p < .001

**Table 2. Standardized factor loadings, inter-factor correlations and internal consistency of the four-factor 28-item ACQE (N = 936).**

		Standardized factor loadings ( $\lambda$ )			
Item N°	Item	CLM	CCO	CRE	CEF
15	Ability to use your time efficiently	<b>.697</b>	.155	.000	-.154
14	Self-discipline to manage the demands of different life domains*	<b>.665</b>	-.010	.149	-.043
3	Ability to prioritize in order to balance multiple life domains	<b>.527</b>	.270	-.024	.059
21	Ability to make your own responsible choices*	<b>.465</b>	.170	.096	.190
31	Ability to be goal-oriented*	<b>.421</b>	-.069	.301	.104
22	Dedication to succeed in different life domains*	<b>.414</b>	.048	.083	.300
25	Ability to create a professional network°	-.002	<b>.710</b>	-.036	.107
5	Ability to maintain relations with important others	.093	<b>.604</b>	.025	-.073
4	Understanding of your own career interests and options°	.263	<b>.469</b>	.016	.017
24	Confidence that you have the competencies needed for the job	.097	<b>.391</b>	.248	.123
8	Ability to communicate your ideas clearly°	-.148	<b>.370</b>	.309	.258
19	Asking advice to the right people at the right time	.070	<b>.356</b>	.199	.017
28	Ability to lead a group of people	.042	<b>.334</b>	.218	.238
2	Ability to balance your organisation's goals with your individual needs°	.252	<b>.322</b>	.157	.064
3	Ability to remain self-confident after mistakes°	-.084	.167	<b>.811</b>	-.198
18	Ability to use setbacks as a positive stimulus	.174	-.084	<b>.638</b>	.015
10	Ability to regulate your emotions in different situations	.080	-.114	<b>.626</b>	.092
17	Ability to cope with stress effectively	.215	-.111	<b>.583</b>	.024
29	Ability to understand your own emotions	.040	.121	<b>.576</b>	-.029
27	Belief in your own ability to overcome challenges in different life domains*	.227	.072	<b>.539</b>	.057
7	Awareness of your own strengths and weaknesses	.050	.069	<b>.484</b>	.109
13	Patience and optimism about the progression of your career	.155	.056	<b>.422</b>	-.024
16	Confidence to take work-related decisions	.320	.242	<b>.327</b>	-.046
11	Ability to engage in in-depth discussions in your job domain	-.091	.027	.316	<b>.556</b>
12	Ability to identify yourself with the culture of your organisation	.121	.239	-.007	<b>.452</b>
1	Willingness to do more for your organisation than your direct responsibilities	.416	-.009	-.047	<b>.420</b>
2	Ability to be flexible and change career plans if necessary	.304	.026	.016	<b>.364</b>
9	Curiosity to explore career opportunities	.060	.146	.170	<b>.348</b>
Factor correlations					
Factor		CLM	CCO	CRE	CEF
1	CLM	1			
2	CCO	.47	1		
3	CRE	.56	.55	1	
4	CEF	.35	.45	.42	1
Internal consistency					
Cronbach $\alpha$		.81	.82	.85	.71

Note. Bold values indicate items' primary factor loading. Items are ranked according to their primary factor loading (largest to smallest). CLM = Career & Lifestyle Management, CCO = Career Communication, CRE = Career Resilience, CEF = Career Engagement & Flexibility. \* the 5 items for which athletes on average reported the strongest possession. ° the 5 items for which athletes on average reported the weakest possession.



similar to the DCCQ-A (De Brandt et al., 2018). The ACQE measures four conceptually meaningful competencies relevant to athletes in order to optimize their employability across different career phases, namely *Career & Lifestyle Management*, *Career Communication*, *Career Resilience*, and *Career Engagement & Flexibility*.

The first competence, *Career & Lifestyle Management*, indicates the importance of well-developed self-discipline, responsibility, prioritising, and time management skills to ensure a balanced combination of both private and professional life domains during, as well as after the athletic career (De Brandt et al., 2018; Park et al., 2013). Athletes' strongest perceived possession of items such as, 'ability to be goal-oriented', and 'dedication to succeed in different life domains', confirms athletes' typical strengths (e.g., determination to excel, being disciplined, planning, commitment) and potential transferability of these strengths from (elite) sport to the job market identified in other studies (e.g., Coffee & Lavalley, 2014).

Our second competence, *Career Communication*, supports the findings of Coffee and Lavalley (2014) and Torregrossa, Ramis, Pallarés, Azocar and Selva (2015), indicating the importance of interpersonal skills and career planning in both pre- and post-retirement phases. Torregrossa et al. (2015) emphasized that a balanced multi-personal identity facilitates athletes' transition into a new career as it provides athletes with more resources to deal with non-athletic spheres of life. Coffee and Lavalley (2014) emphasized that a set of social skills (e.g., leadership, networking) is highly valued by employers. In our study, athletes reported the weakest possession for 'ability to create a professional network' and 'ability to communicate your ideas clearly', which highlights the need to invest in athletes' development of interpersonal skills.

The identification of the third competence, *Career Resilience*, supports previous research emphasizing the importance of stress management and emotional awareness to make a successful transition from elite sport to the job market (Park et al., 2013). Athletes' perceived weaker possession of 'the ability to remain self-confident after mistakes' could be a consequence of athletes experiencing moderate negative emotional reactions upon athletic retirement such as emptiness, sadness, and uncertainty (Stambulova, Stephan, Jäphag, 2007). In line with the recommendations of Stambulova and colleagues (2007), we therefore recommend both proactive support focused on the development of personal resources (i.e., crisis-prevention interventions) and reactive support including psychological and psychotherapeutic interventions to support retiring athletes.

As a fourth competence, this study recognised the importance of *Career Engagement & Flexibility*. The identification of this competence supports previous research highlighting that employers attach great importance to professional engagement and related personal qualities such as the ability to present ideas clearly, the ability to identify yourself with the culture, and the willingness to do more for your organisation than your direct responsibilities (Van Der Heijde & Van Der Heijden, 2006).

Overall, the identification of the four competencies supports the multidimensional approach to employability taken by Van der Heijde and Van der Heijden (2006). Comparing the ACQE framework with the competence-based and multidimensional measurement of employability of Van der Heijde and Van der Heijden (2006), we identified similarities between our competence '*Career & Lifestyle Management*' and their competencies '*Occupational Expertise*' and '*Balance*', and between our '*Career Engagement & Flexibility*' and their '*Anticipation and Optimization*' and '*Corporate Sense*'. The competencies *Career Communication* and *Career Resilience* are reflected in their '*Personal Flexibility*'. Additionally, the four competencies of the ACQE underpin the importance of a holistic (i.e., whole person) and developmental (i.e., career phases) perspective on athletes' employability. Specifically, while *Career & Lifestyle Management* and *Career Engagement & Flexibility* relate to athletes' athletic, academic/vocational, financial, and psychosocial level, *Career Communication* aligns to athletes' academic/vocational and psychosocial level. The competence *Career Resilience* relates to athletes' academic/vocational and psychological level.

### Improvements and future lines of investigations

The current study adds to the scarce literature on athletes' employability by developing and initially validating the ACQE, an instrument that measures athletes' competencies required to optimize their employability. Nevertheless, this study has some limitations that suggest possible avenues for future research. First of all, it should be noted that there may be social desirability and recall biases in athletes' perceived possession of competencies. We aimed to reduce these biases by ensuring athletes' anonymity and letting them reflect on their current situation. Second, while providing initial evidence of the validity of the ACQE, future research is needed to generalize and complement the study results. We therefore encourage researchers to (1) further test the dimensionality of the questionnaire in new samples to confirm that the ACQE truly measures the intended construct

(i.e., construct validity) and to establish external and further internal validity, and (2) further investigate the factorial structure of the ACQE in specific (type of) sports (e.g., Paralympic sports, football, athletics) or countries to consider its sport- and country-specific applicability. Third, comparative studies could provide more insight in the topic of athletes' competencies required to optimize their employability. For example, the effect of interindividual differences such as career phase, gender, nationality and type of sport could be considered. Additionally, while a cross-sectional study design was appropriate for developing and providing initial evidence of the ACQE's validity, it is recommended for future research to adopt longitudinal designs. Such designs are more effectively in examining how athletes' competencies change over time (e.g., active, retirement, new career phase). The Maximum Information Minimum Discomfort (MIMO in Spanish; Alcaraz et al., 2020) holds considerable promise as a tool for longitudinal research by increasing the quality of the collected data. The MIMO method can be used to develop a shorter version of the ACQE to minimize the "burden" for participants, while still assessing the core constructs. Finally, as the process of entering the job market involves the interaction between both employees and employers, it is necessary to gather more information from the job market's perspective. Specifically, identification of the reasons why employers (do not) hire athletes and their perceptions on athletes' potential competitive advantage on the job market will advance our understanding of athletes' employability.

### Applied recommendations

From an applied perspective, our findings suggest that the ACQE could serve for both longitudinal and intervention purposes with athletes before, during, and after athletic retirement to assist them in preparing for and sustaining a new career (Stambulova

et al., 2020; Wylleman, 2019b). Concretely, the measurement of the four competencies allows the identification of strengths and competence gaps and thus can yield practical information for career support providers to structure their work with active and former elite athletes (Baron-Thiene & Alfermann, 2015). Additionally, the ACQE could serve as a self-evaluation tool enabling individual (both active and former) athletes to keep track of their competencies and career needs (Van der Heijde & Van der Heijden, 2006). Within the present research, athletes reported an average to strong possession of all items, suggesting that athletes, in general, do not report any notable weaknesses and are sufficiently equipped to make the transition from elite sport to the job market. On the other hand, the interindividual range and average possession of some competencies highlights the need for athletes to invest in the development of their competencies to maximize their chances for a successful transition into the job market.

### Conclusions

The two consecutive studies presented in this paper report the development and initial validation of the ACQE, an instrument to measure competencies required to optimize their employability across different career phases (i.e., active, retirement, new career phase). Findings provide evidence for the initial validity of an ACQE bundling 28 items (i.e., skills, knowledge, attitudes) within four competencies: *Career & Lifestyle Management*, *Career Communication*, *Career Resilience*, and *Career Engagement & Flexibility*. The use of the ACQE can yield theoretical and practical knowledge for elite sport stakeholders to assist athletes in their transition from elite sport to the job market. Future research is recommended to further validate, generalize and complement the results of this paper.

## BIBLIOGRAFÍA

- Alcaraz, S., Jordana, A., Pons, J., Borrueco, M., Ramis, Y., & Torregrossa, M. (2020). Máxima Información, Mínima Molestia (MIMO): Reducir cuestionarios para cuidar de las personas participantes en psicología del deporte. *Informació Psicològica*, 119, 49–64. <https://doi.org/10.14635/IPASIC.2020.119.7>
- B-WISER (2018). Erasmus+ Sport project: “Be a Winner In elite Sport and Employment before and after athletic Retirement”. Retrieved from <http://www.vub.ac.be/topsport/b-wiser>
- B-WISER Consortium. (2018). *Career support for (former) elite athletes: Current status and future perspectives*. Retrieved from <http://www.bwiser.eu/wp-content/uploads/2017/04/B-WISER-WP1-SUMMARY.pdf>
- Baron-Thiene, A., & Alfermann, D. (2015). Personal characteristics as predictors for dual career dropout versus continuation - A prospective study of adolescent athletes from German elite sport schools. *Psychology of Sport and Exercise*, 21, 42–49. <https://doi.org/10.1016/j.psychsport.2015.04.006>
- Blijlevens, S. J. E., Elferink-gemser, M. T., Wylleman, P., Bool, K., & Visscher, C. (2018). Psychological characteristics and skills of top-level Dutch gymnasts in the initiation, development and mastery stages of the athletic career. *Psychology of Sport and Exercise*, 38, 202–210. <https://doi.org/10.1016/j.psychsport.2018.07.001>
- Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quinonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Public Health*, 6(149). <https://doi.org/10.3389/fpubh.2018.00149>
- Brown, D. J., Fletcher, D., Henry, I., Borrie, A., Emmett, J., Buzza, A., & Wombwell, S. (2015). A British university case study of the transitional experiences of student-athletes. *Psychology of Sport and Exercise*, 21, 78–90. <https://doi.org/10.1016/j.psychsport.2015.04.002>
- Byrne, B. (2006). *Structural equation modeling with EQS: Basic concepts, applications, and programming*. Routledge.
- Chalfin, P., Weight, E., Osborne, B., & Johnson, S. (2015). The value of intercollegiate athletics participation from the perspective of employers who target athletes. *Journal of Issues in Intercollegiate Athletics*, 8, 1–27.
- Coffee, P., & Lavalley, D. (2014). *Winning students are employable students*. School of Sport, University of Sterling. Retrieved from <https://core.ac.uk/download/pdf/42543184.pdf>
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment Research & Evaluation*, 10(7). <https://doi.org/10.7275/jyj1-4868>
- De Brandt, K., Wylleman, P., Torregrossa, M., Defruyt, S., & Van Rossem, N. (2017). Student-athletes' perceptions of four dual career competencies. *Revista de Psicología Del Deporte*, 26(4), 28–33.
- De Brandt, K., Wylleman, P., Torregrossa, M., Schipper-van Veldhoven, N., Minelli, D., Defruyt, S., & De Knop, P. (2018). Exploring the factor structure of the Dual Career Competency Questionnaire for Athletes in European pupil- and student-athletes. *International Journal of Sport and Exercise Psychology*. <https://doi.org/10.1080/1612197X.2018.1511619>
- Dwyer, B., & Gellock, J. L. (2018). Does athletic participation signal employability?: An experimental analysis of male and female athlete job applicants. *Journal of Intercollegiate Sport*, 11(1), 40–64. <https://doi.org/10.1123/jis.2017-0037>
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30(179), 85. <https://doi.org/10.1007/BF02289447>
- Marsh, H. W., Morin, A. J. S., Parker, P., & Kaur, G. (2014). Exploratory structural equation modeling: An integration of the best features of exploratory and confirmatory factor analysis. *Annual Review of Clinical Psychology*, 10, 85–110. <https://doi.org/10.1146/annurev-clinpsy-032813-153700>
- Marsh, H. W., Muthén, B., Morin, A. J. S., Lüdtke, O., Asparouhov, T., & Trautwein, U. (2010). A new look at the Big Five factor structure through exploratory structural equation modeling. *Psychological Assessment*, 22(3), 471–491. <https://doi.org/10.1037/a0019227>
- McKnight, K. (2007). *Athletic career transition and transferable skills*. [Unpublished doctoral dissertation]. Univeristy of Lethbridge Research Repository.
- Myers, N. D. (2013). Coaching competency and (exploratory) structural equation modeling: A substantive-methodological synergy. *Psychology of Sport and Exercise*, 14(5), 709–718. <https://doi.org/10.106/j.psychsport.2013.04.008>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York, NY: McGraw-Hill
- Park, S., Lavallee, D., & Tod, D. (2013). Athletes' career transition out of sport: A systematic review. *International Review of Sport and Exercise Psychology*, 6(1), 22–53. <https://doi.org/10.1080/1750984X.2012.687053>
- Payne, S., Hudson, J., Akehurst, S., & Ntoumanis, N. (2013). Development and initial validation of the Impression Motivation in Sport Questionnaire - Team. *Journal of Sport and Exercise Psychology*, 35, 281–298. <https://doi.org/10.1123/jsep.35.3.281>
- Raykov, T., & Marcoulides, G. A. (2011). *Introduction to Psychometric Theory*. New York, NY: Routledge.
- Roe, R. A. (2002). Competences, A key toward the integration of theory and practice in work and organizational psychology. *Gedrag En Organisatie*, 15(4), 203–224.
- Safrit, M. J., & Wood, T. M. (1995). *Introduction to measurement in physical education and exercise science* (3rd ed.). St. Louis, MO: Times Mirror/Mosby.
- Shanmugam, V., & Marsh, J. E. (2015). Application of structural equation modeling to the social sciences: A brief guide for researchers. *Mesure et Évaluation En Éducation*, 37(3), 99–123. <https://doi.org/10.7202/1036329>
- Stambulova, N. (2003). Symptoms of a crisis-transition: A grounded theory study. In N. Hassmen (Ed.), *Svensk Idrottspsykologisk Förening* (pp. 97–109). Örebro, Sweden: Örebro University Press.
- Stambulova, N., Ryba, T., & Henriksen, K. (2020). Career development and transitions of athletes: The International Society of Sport Psychology Position Stand Revisited. *International Journal of Sport and Exercise Psychology*, 1–27. <https://doi.org/10.1080/1612197X.2020.1737836>
- Stambulova, N., Stephan, Y., & Jäphag, U. (2007). Athletic retirement: A cross-national comparison of elite French and Swedish athletes. *Psychology of Sport and Exercise*, 8(1), 101–118. <https://doi.org/10.1016/j.psychsport.2006.05.002>
- Tabachnick, B. G., & Fidell, L. S. (2018). *Using multivariate statistics* (7th ed.). Pearson Education.
- Torregrossa, M., Ramis, Y., Pallarés, S., Azócar, F., & Selva, C. (2015). Olympic athletes back to retirement: A qualitative longitudinal study. *Psychology of Sport and Exercise*, 21, 50–56. <https://doi.org/10.1016/j.psychsport.2015.03.003>
- Van Der Heijde, C. M., & Van Der Heijden, B. I. J. M. (2006). A competence-based and multidimensional operationalization and measurement of employability. *Human Resource Management*, 45(3), 449–476. <https://doi.org/10.1002/hrm.20119>
- Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, 41(321), 7. <https://doi.org/10.1007/BF02293557>
- Wylleman, P. (2019a). A developmental perspective on transiting out of elite sport. In M.H. Anshel (Ed.), *APA handbook of sport and exercise psychology* (pp. 201–216). American Psychological Association.
- Wylleman, P. (2019b). A holistic and mental health perspective on transitioning out of elite sport. *Oxford Research Encyclopedia of Psychology*, 1–15. <https://doi.org/10.1093/acrefore/9780190236557.013.189>
- Wylleman, P., Rosier, N., & De Knop, P. (2016). Holistic perspective on the development of elite athletes. In M. Raab, P. Wylleman, R. Seiler, A-M. Elbe, and A. Hatzigeorgiadis (Eds.), *Sport and Exercise Psychology Research: From Theory to Practice* (pp. 270–288). Oxford, UK: Elsevier Inc.