

# Factors Influencing Student-Athletes' Identity: A Multilevel Regression and Poststratification Approach

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Ricardo T. Quinaud<sup>1</sup> ,  
Carlos E. Gonçalves<sup>2</sup> ,  
Laura Capranica<sup>3</sup>, and  
Humberto M. Carvalho<sup>1</sup> 

## Abstract

We considered identity variation among Brazilian university student-athletes in relation to their gender, sport type, competition level, and university type. Participants were 506 student-athletes (219 males and 287 females) from public and private Brazilian universities, competing in team and individual sports, at local, state, and national levels. We used multilevel regression and poststratification to estimate each participant's identity from the aforementioned variables. Gender and sport type were not associated with any substantial identity variation, but there were higher values on Baller Identity Measurement Scale dimensions for student-athletes from public versus private universities, and student-athletes competing at the highest level had lower Baller Identity Measurement Scale values compared to peers competing at lower levels. Overall, university type and sport competitive level were the contextual factors that most influenced Brazilian student-athletes' identities.

<sup>1</sup>Department of Physical Education, School of Sports, Federal University of Santa Catarina, Brazil

<sup>2</sup>Faculty of Sport Sciences and Physical Education, University of Coimbra, Portugal

<sup>3</sup>Department of Movement, Human and Health Sciences, University of Rome "Foro Italico," Italy

## Corresponding Author:

Humberto M. Carvalho, Departamento de Educação Física, Centro de Desportos, Universidade Federal de Santa Catarina, Campus Reitor João David Ferreira Lima, Santa Catarina 88040-900, Brazil.

Email: hmoreiracarvalho@gmail.com

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sports, social identity, multilevel modeling, university, questionnaires, Bayesian methods

**Introduction**

Elite athletes face multiple demands and challenges when combining elite sport and higher education careers (e.g., dual career), requiring 20-30 hours/week and 30 hours/week, respectively (Aquilina, 2013; Condello, Capranica, Doupona, Varga, & Burk, 2019). In the past decade, this dual career focus has been recognized as an athlete's right (European Commission, 2012; European Parliament, 2015, 2017), even though major differences exist between and within countries in the support given to athletes to accommodate these combined commitments. While in the United States, student-athletes are well recognized and benefit from sports embedded within both private and public academic systems (National Collegiate Athletic Association, 2018), in many other countries, sports are organized at the club level, with little or no formal relationship to the educational system (e.g., Amsterdam University of Applied Sciences, Birch Consultants, the Talented Athlete Scholarship Scheme, the Vrije Universiteit Brussel, and European Athlete as Student Network, 2016; Aquilina & Henry, 2010; Capranica & Guidotti, 2016; Henry, 2013). In Brazil, recent policies promoting health to enhance physical activity (Malta & Silva, 2012) and sports participation (Mezzadri, Silva, Figuêroa, & Starepravo, 2015) have been introduced, but there is still a need for dual career support to help with athletes' holistic development and managing transitions to the labor market at the end of their sport career (Brandão & Vieira, 2013). In fact, the substantial growth of sports within public and private Brazilian universities has led to an increased number of Brazilian student-athletes competing in the Olympic Games (Camargo & Mezzadri, 2018),

Simultaneous engagement in academic, sports, and social contexts presents several concurrent dimensions to the development of the student-athlete's identity (Sturm, Feltz, & Gilson, 2011). In the presence of concomitant sport and education challenges, student-athletes might experience identity conflict leading them to drop out of sports or academics to maintain a dominant student or athlete identity (Lally, 2007; Lally & Kerr, 2005; Stambulova, Engström, Franck, Linnér, & Lindahl, 2015; Wylleman & Reints, 2010; Yukhymenko-Lescroart, 2014).

The Baller Identity Measurement Scale (BIMS) has been developed and validated with student-athletes from the United States (Harrison et al., 2010). Based on the Athletic Identity Measurement Scale (Brewer & Cornelius, 2001) and the Student-Athletes' Motivation Toward Sports and Academics

Questionnaire (Gaston-Gayles, 2005), the original BIMS encompassed 10 items to be answered on a 5-point Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), organized within a four-factor structure of the student-athlete's motivation for performance (i.e., Social Identity: Items 1, 2 and 3; Exclusivity: Items 4 and 5; Positive Affectivity: Items 6 and 7; and Negative Affectivity: Items 8, 9, and 10; Harrison et al., 2010; Harrison, Tranyowicz, Bukstein, McPherson-Botts, & Lawrence, 2014). Conversely, the validated Italian version of BIMS (BIMS-IT) resulted in a two-factor model (e.g., Social Identity and Identity Gain/Loss), probably due to a lack of dual career policies in place in the specific Italian socio-cultural context (Lupo et al., 2017b). From these findings, scholars have been urged to validate the psychometric properties of the BIMS in different countries (Lupo et al., 2017b).

Several individual factors (e.g., age, gender) and contextual factors (e.g., academic, sports, and social levels) may influence student-athletes' identities (Sturm et al., 2011), and traditional research has addressed single-level considerations to simplify test interpretation, despite several limitations to this approach (McElreath, 2015). Alternatively, multilevel regression modeling provides a more flexible and robust research design that considers data hierarchically (Gelman & Hill, 2007). Even better, multilevel regression and poststratification (MRP) allows partial pooling of information across similar groups and provides aggregated estimates of a target population (Gelman & Hill, 2007) for groups with limited or even nonexistent data (Ghitza & Gelman, 2013). MRP has been used to estimate pre-election polls at state and national levels (Gelman & Little, 1997; Park, Gelman, & Bafumi, 2004). MRP has outperformed traditional empirical means and regression models (Lax & Phillips, 2009), and more recently, it has been applied to health science data (Barrington-Leigh & Millard-Ball, 2017; Downes et al., 2018; Eke et al., 2016; Van der Heyden et al., 2014; Zhang et al., 2015).

In our study with Brazilian student-athletes, we first explored the validity of our Portuguese translated version of the BIMS and then used MRP to estimate identity variation among participants in relation to their gender, sport type, competition level, and university type.

## Method

### *Experimental Approach*

Our university research ethics committee approved the present survey research with voluntary student-athlete participants, all of whom were enrolled in a higher education degree program and were competing in organized sports of the National Federation of University Sports. We collected state-level data during the Santa Catarina University championships in July 2018; we collected national-level data during the Brazilian University championship in November

2018. We used a model-based approach (Gelman & Little, 1997) to estimate the population parameters of interest (i.e., identity dimensions, as function of student-athlete's individual and contextual characteristics).

### *Participants*

We recruited 506 student-athletes (219 males and 287 females;  $M_{\text{age}} = 21.9$  years,  $SD = 3.7$  years) enrolled in both public (49.6%) and private (50.4%) Brazilian universities. All were competing in either team sports (79%: basketball, beach volleyball, handball, field hockey, football, futsal, rugby, and volleyball) or individual sports (21%: judo, rowing, swimming, tennis, and track and field) at local (44.2%), state (19.0%), or national (36.8%) levels. All participants provided their informed consent for the study. Among those enrolled in private universities, 78.4% were competing at the national level and 57.3% were competing at the state level.

### *Translation and Validation of the Portuguese Version of BIMS*

In accordance with prior literature (Herdman, Fox-Rushby, & Badia, 1997; Su & Parham, 2002), we produced a conceptually and semantically equivalent translation of the original BIMS by having two native Portuguese speakers independently perform and agree to a forward translation and then having an English reviewer back translate the instrument following a blind translation procedure. We then compared the original and backward translated BIMS versions to eliminate any misunderstandings or imprecisions in the translation process. Then, we administered the adapted 10-item BIMS-PT to a subsample of 74 Brazilian university student-athletes who individually indicated their level of agreement with the statements on a 6-point Likert scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). We interviewed these respondents to verify the clarity of the instructions, the items, and response options. Finally, we considered the BIMS-PT suitable for administering to the Brazilian student-athletes in this study (Table 1). Details about its factor structure are available as supplementary material to this article.

### *Multilevel Regression and Poststratification*

Initially, we explored possible variations among student-athletes' identity responses when aggregated by gender, sport type (individual and team sports), competitive level (local, state, and national level), and university type (public and private). In this process, we used variant intercept models assuming, student-athletes (Level 1) nested by groups (Level 2, e.g., gender) to measure the proportion of total variance that fell between-group (i.e., variance partition coefficients; Goldstein, 2011). We considered variance partition coefficients  $> 0.05$  derived from the varying intercept models in order to reflect

**Table 1.** Exploratory Factor Analysis and Reliability Estimates of the Portuguese Version of the Baller Identity Measurement Scale.

Item	Factors	
	Affectivity	Social identity
1. I consider myself a student-athlete.		0.82
2. I have many goals related to being a student-athlete.	0.59	0.50
3. Most of my friends are considered more students than athletes.		0.63
4. Being a student-athlete is the most important part of my life.	0.72	0.43
5. I spend more time thinking about being a student-athlete than anything else.	0.45	0.58
6. When I'm a student-athlete, I feel good about myself.	0.57	
7. Other people see me mainly as a student-athlete.		0.83
8. I feel bad about myself when I do poorly when I'm not a student-athlete.	0.73	
9. Being a student-athlete is the only important thing in my life.	0.57	0.49
10. I would be very depressed if I were injured and could not be a student-athlete.	0.74	
Alpha	.80	.74

substantial variations between groups. Using this method, no substantial variation between BIMS indicators grouped by gender and sport type emerged (Supplementary Table 1). Hence, we estimated the student-athlete's identity as a function of his or her individual characteristics, using the following formula:

$$y_i = \beta_0 + \alpha_{j[i]}^{competitive\ level} + \alpha_{k[i]}^{university\ type}$$

where  $i$  indicates the individual,  $j$  indicates the competitive level, and  $k$  indicates university type. Terms after the intercept were modeled as group effects (also referred to as random effects) drawn from normal distributions with variances to be estimated from the data:

$$\alpha_{j[i]}^{competitive\ level} \sim N(0, \sigma_{competitive\ level}^2), \quad \text{for } j = 1, 2, 3$$

$$\alpha_{k[i]}^{university\ type} \sim N(0, \sigma_{university\ type}^2), \quad \text{for } k = 1, 2.$$

We used the model estimates to predict the student-athletes' identity variables for groups defined in a poststratification dataset (i.e., university type and competitive level). The poststratification dataset had an observation corresponding to each group defined for all combinations of the variables included in the

model. Since, in the present study, models included two university types and three competitive levels, the poststratification dataset encompassed six rows ( $2 \times 3$ ), including the population size, in each group. After predicting the outcome variable for each group, we aggregated estimates with respect to the type of university level (or other subgroup units) with the subgroup population sizes to determine their relative weights.

We specified weakly informative prior distributions for the parameters in the models: normal prior (0, 10) for population-level effect (intercept) and normal priors (0,1) for group-level effects (i.e., the standard deviations of varying intercepts). We ran two chains for 4,000 iterations, with a warm-up length of 1,000 iterations, warranting convergence of the Markov chains. We used trace plots to examine the convergence of Markov chains and posterior predictive checks to validate our models (Gelman et al., 2013). We used the brms package (Bürkner, 2017), available in the R statistical language (R Core Team, 2018) to perform the Bayesian estimations. The brms package affords an interface to fit Bayesian multilevel models using Stan, which is a C++ package for obtaining full Bayesian inference (Bürkner, 2017; Carpenter et al., 2017).

## Results

Regression models for BIMS-PT factors considering the combined effects of competitive level and university type are summarized in Table 2. These data reveal that student-athlete participants in this study showed high values for social identity and low negative values for affectivity. For both private and public universities, there was a substantial variation between affective and social identity in relation to competition level. For both BIMS dimensions and type of university, student-athletes who attained higher levels of

**Table 2.** Fitted Estimates of BIMS-PT Factors Considering the Combined Effects of Competitive Level and University Type.

	Posterior estimates (95% credible interval)	
	Affectivity	Social identity
Private university		
Local level	3.27 (3.07–3.48)	4.77 (4.57–4.96)
State level	2.66 (2.45–2.87)	4.54 (4.34–4.73)
National level	2.46 (2.33–2.59)	4.38 (4.26–4.51)
Public university		
Local level	4.06 (3.92–4.20)	5.21 (5.08–5.34)
State level	3.44 (3.24–3.65)	4.97 (4.78–5.15)
National level	3.25 (3.05–3.44)	4.82 (4.64–5.00)

competition had substantially lower values of affectivity and social identity than those who attained lower levels of competition.

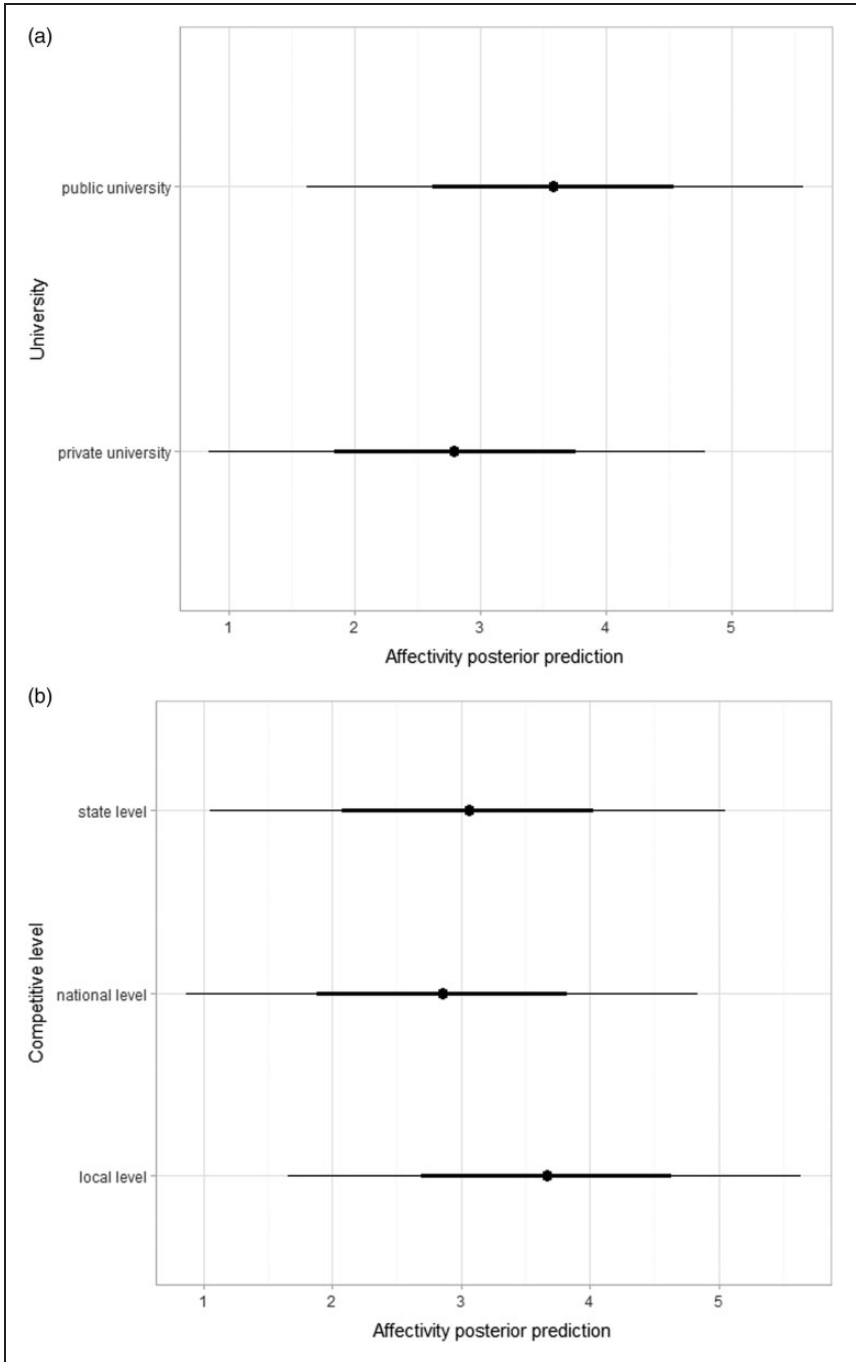
We plotted the estimates of each student-athletes' identity dimensions of affectivity (Figure 1) and social identity (Figure 2). Data in these simulation models indicated that student-athletes from public universities presented a higher likelihood of affectivity and social identity compared with their peers from private universities.

## Discussion

After validating the BIMS-PT questionnaire for Brazilian participants, we considered estimates of variance in student-athletes' identity as a function of their gender, sport type, competitive level, and type of Brazilian university. The obtained variance partition analysis showed no substantial variation between student-athletes' BIMS indicators when participants were grouped by gender and sport type, but the models showed substantial variation between their affectivity and social identity as a function of competition level. Overall, the academic (university type) and sport (competitive level) had a substantial influence on Brazilian student-athletes' affectivity and social identity dimensions.

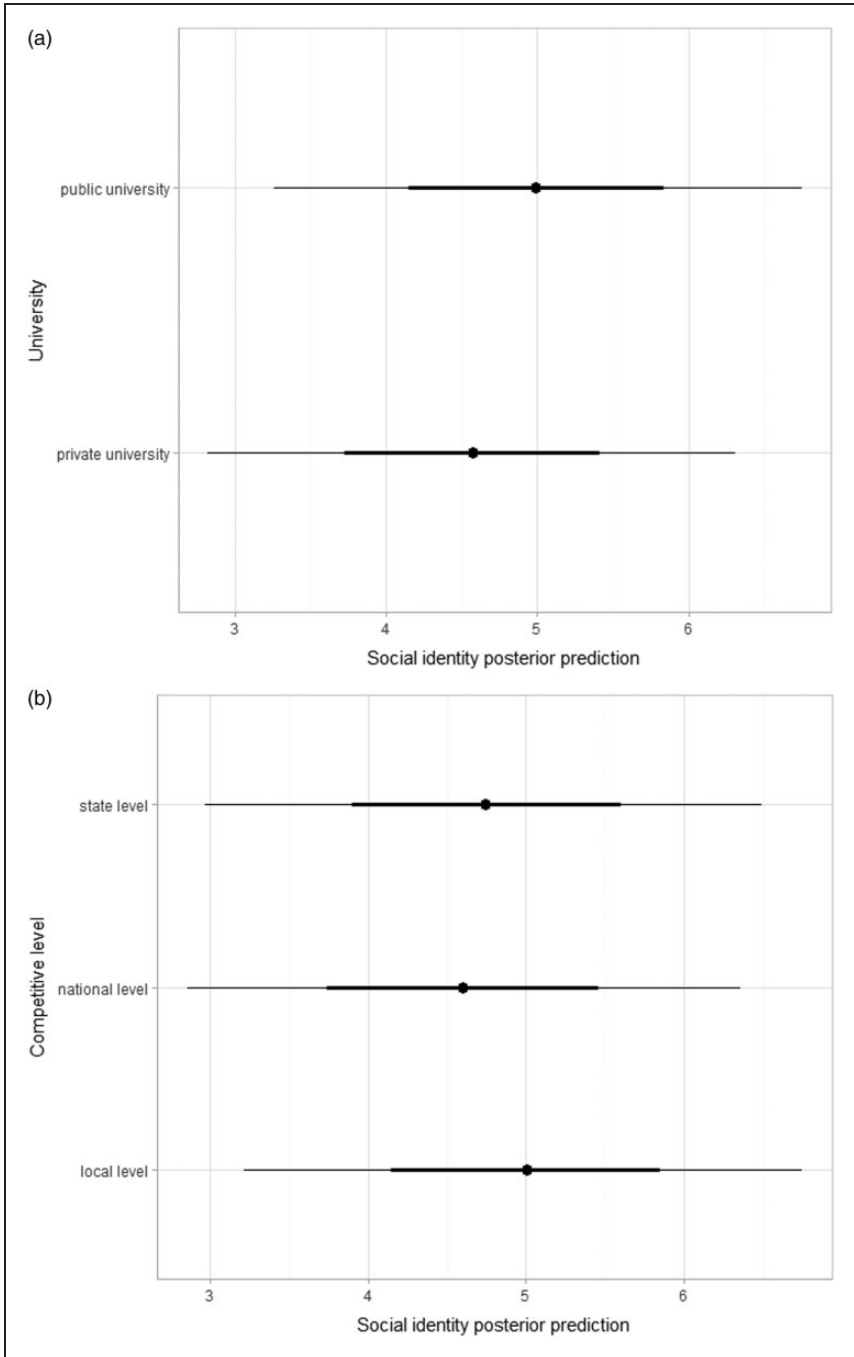
Unlike the four-factor model of the original American BIMS (Harrison et al., 2010), our BIMS-PT presented a two-factor *Social Identity* and *Affectivity* structure that was consistent with a version of the instrument previously validated for Italian student-athletes (Lupo et al., 2017b). Thus, these findings support the view that countries without formal support for a dual career path present similar cultural trends that differ from countries with a well-established dual career structure (Su & Parham, 2002).

We found no substantial variation between student-athletes' identities when they were grouped by their participation in individual versus team sports. However, athletes' behavior from both team and individual sports did diverge in some ways (Bruner et al., 2016; Miller & Hoffman, 2009; Slater, Haslam, & Steffens, 2018). The present results suggest that university sports contexts may promote positive identity perceptions, independent of the type of sport, and Brazilian female and male student-athletes shared a similar, moderate level of belonging and seemed to have similarly high student and athlete identities. These observations are consistent with findings from previous studies reporting no gender-related difference in student-athletes' identity (Lupo et al., 2015; Lupo et al., 2017b; Yukhymenko-Lescroart, 2014). The identity similarity between athletes of different genders' in the university context may be due to a development of women's sports in the shared opportunities across different institutions of higher education. Considering the positive link between social identity and positive individual identity development through youth sports participation (Bruner et al., 2016), the present observation of high social identity values in both female and male student-athletes, independent of type of sport,



**Figure 1.** Posterior predictions of affectivity dimension of BIMS by university type (a) and competitive level (b).





**Figure 2.** Posterior predictions of social identity dimension of BIMS by university type (a) and competitive level (b).

adds a potential benefit of engagement in organized sports within university contexts.

The predictions of the present models indicate a high probability that student-athletes from public universities present higher values for affectivity and social identity compared with their peers from private universities. Higher values for affectivity and social identity were also predicted in the model for student-athletes in the lower competition level. However, there was large uncertainty in these predictions, suggesting a need for caution in interpreting these results. Differences in student-athletes' identity (Lupo et al., 2017b) and motivation (Lupo et al., 2015; Lupo et al., 2017a) based on their competition level were previously observed among Italian university student-athletes, although those engaged in higher levels of competition scored higher than those engaged in lower levels of competition. These findings may reflect differences in the sports culture across Brazil, given its different demographic dimensions as well as cultural and social variabilities (Hofstede, Garibaldi de Hilal, Malvezzi, Tanure, & Vinken, 2010). Since most national- and state-level student-athletes in this study were from private universities, variation in both identity factors in relation to different academic typology may be due to different facilities and support policies offered by public and private universities (Aquilina & Henry, 2010).

In Brazil, about eight million students attend graduate courses (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2018), with about two million enrolled in public universities that do not require tuition fees, and about six million paying tuition fees to attend private institutions (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2018). Private universities in Brazil are mainly comprised of smaller university centers and faculties, with smaller teaching units and educational resources, in contrast with public universities (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2004). Moreover, it is likely that private Brazilian universities follow similar models as North-American universities that use sports to promote their image and increase student enrollment (Teixeira, 2010). Enrollment differences between public and private universities in Brazil may partially explain our observations. Enrollment in public universities depends upon achieving a threshold score on national exams, and this may be a very difficult task given the limited number of entrance spots available. On the other hand, private universities in Brazil may recruit more competitive student-athletes. Based on data from this study, it is reasonable to assume that support for student-athletes and the relative importance of sports may vary substantially between public and private higher education structures in Brazil.

On the other hand, it has been noted that winning competitions is not the main goal for student-athletes, even though doing so positively impacts their athletic career and personal identity (Coker-Cranney, Watson, Bernstein, Voelker, & Coakley, 2018). More relevant to personal identity than competitive results is a sense of personal fulfillment from engagement (Comeaux &

Harrison, 2011; Coker-Cranney et al., 2018; Martyn, Fowler, Kropp, Oja, & Bass, 2019). Hence, it may be possible that student-athletes from public universities in Brazil may be more engaged in the academic and sport context of the university, and it may be related to student-athletes' satisfaction regarding sport and academic career development (De Brandt, Wylleman, Torregrossa, Defruyt, & Van Rossem, 2017). Our observations suggest that student-athletes' perceived identities may be influenced by the university's efforts to prepare them for the labor market, providing the means for them to meet academic requirements and combine both sport and academic commitments. However, to fully address this possibility, it might be useful to have more information regarding university policies in support of student-athletes' development (Fuller, 2014).

Our findings show the important nuances of participation, as non-elite athletes express stronger feelings of belonging and self-awareness. University administrators, athletic managers, and coaches should pay attention to the potential risks that their students might put too much focus on sports results. Sports titles and medals often bring media exposure to the institution, but this raises questions about the effects on student-athletes' affectivity and social identity. Of additional importance to the implications of this study, Portuguese is the seventh most spoken language in the world (Myers, 2018), meaning that there are many practical applications for our new Portuguese version of the BIMS.

## **Conclusion**

In summary, we estimated the variation in Brazilian university student-athletes' identities as influenced by these participants' gender, sport type, competition level, and type of university. We used MRP to present university type-level estimates of students-athletes' identity after accounting for such individual characteristics as the participants' current sport competition level. We also established the reliability and validity of a translated Portuguese version of the BIMS that provides a valuable instrument for future research regarding student-athletes in Portuguese-speaking countries across different continents (e.g., Europe, Africa, and South America) with different policies regarding the support of student-athletes. Overall, our models showed that the academic (university type) and sport (competitive level) contexts are likely to have a substantial influence on Brazilian student-athletes' identity. Our observations highlight the need for further research, especially to better interpret the presumed difficulties experienced by student-athletes in countries with no formal dual career policies in their institutions of higher education. Additionally, future studies should focus on identity development among student-athletes who are attending different levels of academic study (high-school, undergraduate, and graduate) while also considering the degree of dual career support offered to student-athletes by different educational programs.


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## ORCID iDs

Ricardo T. Quinaud  <https://orcid.org/0000-0001-6043-3658>

Carlos E. Gonçalves  <https://orcid.org/0000-0002-6687-9041>

Humberto M. Carvalho  <https://orcid.org/0000-0002-2855-0296>

## Supplemental Material

Supplemental material for this article is available online.

## References

- Amsterdam University of Applied Sciences, Birch Consultants, the Talented Athlete Scholarship Scheme, the Vrije Universiteit Brussel, & European Athlete as Student Network. (2016). Study on the minimum quality requirements for dual career services. *Research report*. Retrieved from [http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en\\_GB/-/EUR/ViewPublication-Start?PublicationKey=NC0116370](http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en_GB/-/EUR/ViewPublication-Start?PublicationKey=NC0116370)
- Aquilina, D. (2013). A study of the relationship between elite athletes' educational development and sporting performance. *The International Journal of the History of Sport*, 30(4), 374–392. doi:10.1080/09523367.2013.765723.
- Aquilina, D., & Henry, I. (2010). Elite athletes and university education in Europe: A review of policy and practice in higher education in the European Union Member States. *International Journal of Sport Policy*, 2(1), pp. 25–47. doi:10.1080/19406941003634024
- Barrington-Leigh, C., & Millard-Ball, A. (2017). The world's user-generated road map is more than 80% complete. *PLoS One*, 12(8), p e0180698. doi:10.1371/journal.pone.0180698
- Brandão, M. R. F., & Vieira, L. F. (2013). Athletes' careers in Brazil: Research and application in the land of ginga. In N. Stambulova & T. R. Ryba (Eds.), *Athletes' careers across cultures* (pp. 63–72). London, England: Routledge.
- Brewer, B., & Cornelius, A. (2001). Norms and factorial invariance of the Athletic Identity Measurement Scale. *Academic Athletic Journal*, 15(2), 103–113.
- Bruner, M. W., Boardley, I. D., Allan, V., Root, Z., Buckham, S., Forrest, C., & Côté, J. (2016). Examining social identity and intrateam moral behaviours in competitive youth ice hockey using stimulated recall. *Journal of Sports Sciences*, 35(20), 1963–1974. doi:10.1080/02640414.2016.1243797

- Bürkner, P.-C. (2017). brms: An R package for Bayesian multilevel models using Stan. *Journal of Statistical Software*, *80*, 1–28.
- Camargo, P. R., & Mezzadri, F. M. (2018). A organização e configuração do esporte universitário no Brasil (1940-1980) [Organization and configuration of university sports in Brazil (1940-1980)]. *Motrivência*, *30*(53), 52–68. doi:10.5007/2175-8042.2018v30n53p52
- Capranica, L., & Guidotti, F. (2016). *Research for cult committee qualifications/dual careers in sports*. European Parliament: Directorate-General for Internal Policies. Policy Department: Structural and Cohesion Policies: Cultural and Education. Retrieved from [http://www.europarl.europa.eu/RegData/etudes/STUD/2016/573416/IPOL\\_STU\(2016\)573416\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/573416/IPOL_STU(2016)573416_EN.pdf)
- Carpenter, B., Gelman, A., Hoffman, M. D., Lee, D., Goodrich, B., Betancourt, M., . . . Riddell, A. (2017). Stan: A probabilistic programming language. *Journal of Statistical Software*, *76*(1), 32. doi:10.18637/jss.v076.i01
- Coker-Cranney, A., Watson, J. C., Bernstein, M., Voelker, D. K., & Coakley, J. (2018). How far is too far? Understanding identity and overconformity in collegiate wrestlers. *Qualitative Research in Sport, Exercise and Health*, *10*(1), pp. 92–116. doi:10.1080/2159676X.2017.1372798
- Comeaux, E., & Harrison, C. K. (2011). A conceptual model of academic success for student-athletes. *Educational Researcher*, *40*(5), 235–245. doi: 10.3102/0013189X11415260
- Condello, G., Capranica, L., Doupona, M., Varga, K., Burk, V. (2019). Dual-career through the elite university student-athletes' lenses: The international FISU-EAS survey. *PLoS One*, *14*(10): e0223278. doi: 10.1371/journal.pone.0223278
- De Brandt, K., Wylleman, P., Torregrossa, M., Defruyt, S., & Van Rossem, N. (2017). Student-athletes' perceptions of four dual career competencies. *Journal of Sport Psychology*, *26*(Suppl 4), 28–33.
- Downes, M., Gurrin, L. C., English, D. R., Pirkis, J., Currier, D., Spittal, M. J., & Carlin, J. B. (2018). Multilevel regression and poststratification: A modeling approach to estimating population quantities from highly selected survey samples. *American Journal of Epidemiology*, *187*(8), 1780–1790. doi:10.1093/aje/kwy070
- Eke, P. I., Zhang, X., Lu, H., Wei, L., Thornton-Evans, G., Greenlund, K. J., . . . Croft, J. B. (2016). Predicting periodontitis at state and local levels in the United States. *Journal of Dental Research*, *95*(5), 515–522. doi:10.1177/0022034516629112
- European Commission. (2012). *Guidelines on dual careers of athletes: Recommended policy actions in support of dual careers in high-performance sport*. Brussels, Belgium: Author.
- European Parliament. (2015). *EU sport policy: An overview*. Brussels European Commission: European Parliamentary Research Service. Retrieved from [http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565908/EPRS\\_IDA\(2015\)565908\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565908/EPRS_IDA(2015)565908_EN.pdf)
- European Parliament. (2017). *European Parliament Resolution of 2 February 2017 on an integrated approach to sport policy: Good governance, accessibility and integrity*. Retrieved from <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2017-0012&language=EN&ring=A8-2016-0381>
- Fuller, R. D. (2014). Transition experiences out of intercollegiate athletics: A meta-synthesis. *Qualitative Report*, *19*(46), 1–15.

- Gaston-Gayles, J. (2005). The factor structure and reliability of the student athletes' motivation toward sports and academics questionnaire (SAMSAQ). *Journal of College Student Development, 46*(3), 317–327. doi:10.1353/csd.2005.0025
- Gelman, A., Carlin, J. B., Stern, H. S., Dunson, D. B., Vehtari, A., & Rubin, D. B. (2013). *Bayesian data analysis* (3rd Ed.). Boca Raton, FL: Chapman & Hall/CRC Press.
- Gelman, A., & Hill, J. (2007). *Data analysis using regression and multilevel/hierarchical models*. Cambridge, England: Cambridge University Press.
- Gelman, A., & Little, T. C. (1997). Poststratification into many categories using hierarchical logistic regression. *Survey Methodology, 23*(2), 127–135.
- Ghitza, Y., & Gelman, A. (2013). Deep interactions with MRP: Election turnout and voting patterns among small electoral subgroups. *American Journal of Political Science, 57*(3), 762–776. doi:10.1111/ajps.12004
- Goldstein, H. (2011). *Multilevel statistical models* (4th ed.). Chichester, West Sussex: Wiley.
- Harrison, K., Rasmussen, J., Connolly, C., Janson, N., Bukstein, S., & Parks, C. (2010). Diggin' deeper into the culture of revenue sports. *Journal for the Study of Sports and Athletes in Education, 4*(3), 325–332. doi:10.1179/ssa.2010.4.3.325
- Harrison, K., Tranyowicz, L., Bukstein, S., McPherson-Botts, G., & Lawrence, S. M. (2014). I am what I am? The Baller Identity Measurement Scale (BIMS) with a Division I football team in American higher education. *Sport Sciences for Health, 10*(1), 53–58. doi:10.1007/s11332-014-0171-3
- Henry, I. (2013). Athlete development, athlete rights and athlete welfare: A European Union perspective. *The International Journal of the History of Sport, 30*(4), 356–373.
- Herdman, M., Fox-Rushby, J., & Badia, X. (1997). 'Equivalence' and the translation and adaptation of health-related quality of life questionnaires. *Quality of Life Research, 6*(3), 237–247. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9226981>
- Hofstede, G., Garibaldi de Hilal, A. V., Malvezzi, S., Tanure, B., & Vinken, H. (2010). Comparing regional cultures within a country: Lessons from Brazil. *Journal of Cross-Cultural Psychology, 41*(3), 336–352.
- Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. (2004). *Sistema Nacional de Avaliação da Educação Superior (Sinaes): Bases para uma nova proposta da educação superior* [National System of Higher Education Assessment (Sinaes): Basis for a new proposal for Higher Education]. Brasília: Author.
- Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. (2018). *Sinótese estatística da educação superior 2017* [Statistical summary of Higher Education 2017]. Brasília: Author. Retrieved from <http://portal.inep.gov.br/web/guest/sinopses-estatisticas-da-educacao-superior>
- Lally, P. (2007). Identity and athletic retirement: A prospective study. *Psychology of Sport and Exercise, 8*(1), 85–99. doi:10.1016/j.psychsport.2006.03.003
- Lally, P., & Kerr, G. A. (2005). The career planning, athletic identity, and student role identity of intercollegiate student athletes. *Research Quarterly for Exercise and Sport, 76*(3), 275–285. doi:10.1080/02701367.2005.10599299
- Lax, J. R., & Phillips, J. H. (2009). How should we estimate public opinion in the states? *American Journal of Political Science, 53*(1), 107–121. doi:10.1111/j.1540-5907.2008.00360.x

- Lupo, C., Guidotti, F., Goncalves, C. E., Moreira, L., Doupona Topic, M., Bellardini, H., ... Capranica, L. (2015). Motivation towards dual career of European student-athletes. *European Journal of Sport Science, 15*(2), 151–160. doi:10.1080/17461391.2014.940557
- Lupo C., Mosso C. O., Guidotti F., Cugliari G., Pizzigalli L., & Rainoldi A. (2017a). Motivation toward dual-career of Italian student-athletes enrolled in different university paths. *Sport Sciences for Health, 13*(3), 485–494. doi: 10.1080/17461391.2014.940557
- Lupo, C., Mosso, C. O., Guidotti, F., Cugliari, G., Pizzigalli, L., & Rainoldi, A. (2017b). The adapted Italian version of the Baller Identity Measurement Scale to evaluate the student-athletes' identity in relation to gender, age, type of sport, and competition level. *PLoS One, 12*(1), 1–11. doi:10.1371/journal.pone.0169278
- Malta, D. C., & Silva, J. B. (2012). Policies to promote physical activity in Brazil. *Lancet, 380*(9838), 195–196. doi:10.1016/s0140-6736(12)61041-1
- Martyn, J., Fowler, B., Kropp, D. C., Oja, B. D., & Bass, J. R. (2019). Managing an identity: Social identity complexity and NCAA faculty athletics representatives. *Journal of Issues in Intercollegiate Athletics, 12*, 365–383.
- McElreath, R. (2015). *Statistical rethinking: A Bayesian course with examples in R and Stan*. Boca Raton, FL: Chapman & Hall/CRC Press.
- Mezzadri, F. M., Silva, M. M., Figueira, K. M., & Starepravo, F. A. (2015). Sport policies in Brazil. *International Journal of Sport Policy and Politics, 7*(4), 655–666.
- Miller, K. E., Hoffman, J. H (2009). Mental well-being and sport-related identities in college. *Social Sport Journal, 26*(2), 335–356. doi: 10.1123/ssj.26.2.335.
- Myers, J. (2018). These are the world's most spoken languages. Retrieved from <https://www.weforum.org/agenda/2018/02/chart-of-the-day-these-are-the-world-s-most-spoken-languages/>
- National Collegiate Athletic Association. (2018). 2018–2019 Guide for the college-bound student-athlete. Retrieved from <http://www.ncaapublications.com/productdownloads/CBSA19.pdf>
- Park, D. K., Gelman, A., & Bafumi, J. (2004). Bayesian multilevel estimation with poststratification: State-level estimates from national polls. *Political Analysis, 12*(4), 375–385. doi:10.1093/pan/mp024
- R Core Team. (2018). *R: A language and environment for statistical computing*. Retrieved from <http://www.R-project.org/>
- Slater, M. J., Haslam, S. A., & Steffens, N. K. (2018). Singing it for “us”: Team passion displayed during national anthems is associated with subsequent success. *European Journal of Sport Science, 18*(4), 541–549. doi:10.1080/17461391.2018.1431311
- Stambulova, N. B., Engström, C., Franck, A., Linnér, L., & Lindahl, K. (2015). Searching for an optimal balance: Dual career experiences of Swedish adolescent athletes. *Psychology of Sport Exercise, 21*, 4–14.
- Sturm, J., Feltz, D., & Gilson, T. (2011). A comparison of athlete and student identity for Division I and Division III athletes. *Journal of Sport Behavior, 34*(3), 295–306.
- Su, C. T., & Parham, L. D. (2002). Generating a valid questionnaire translation for cross-cultural use. *American Journal of Occupational Therapy, 56*(5), 581–585.

- Teixeira, M. (2010). *Influência dos eventos esportivos no posicionamento competitivo de uma universidade particular: Estudo de caso UNISANTA* [Influence of sports events on the competitive position of a private university: A case study of UNISANTA]. Santos, Brazil: Universidade Católica de Santos.
- Van der Heyden, J., Demarest, S., Van Herck, K., De Bacquer, D., Tafforeau, J., & Van Oyen, H. (2014). Association between variables used in the field substitution and post-stratification adjustment in the Belgian health interview survey and non-response. *International Journal of Public Health, 59*(1), 197–206. doi:10.1007/s00038-013-0460-7
- Wylleman, P., & Reints, A. (2010). A lifespan perspective on the career of talented and elite athletes: Perspectives on high-intensity sports. *Scandinavian Journal of Medicine & Science in Sports, 20*(2), 88–94. doi:10.1111/j.1600-0838.2010.01194.x
- Yukhymenko–Lescroart, M. (2014). Students and athletes? Development of the Academic and Athletic Identity Scale (AAIS). *Sport, Exercise, and Performance Psychology, 3*(2), 89. doi:10.1037/spy0000009
- Zhang, X., Holt, J. B., Yun, S., Lu, H., Greenlund, K. J., & Croft, J. B. (2015). Validation of multilevel regression and poststratification methodology for small area estimation of health indicators from the behavioral risk factor surveillance system. *American Journal of Epidemiology, 182*(2), 127–137. doi:10.1093/aje/kwv002

### Author Biographies

**Ricardo T. Quinaud** is a PhD student at the Department of Physical Education, Federal University of Santa Catarina, Brazil. His research interests are focused on sport management and student-athlete's context.

**Carlos E. Gonçalves** is a professor at the Faculty of Sport Sciences and Physical Education, University of Coimbra, Portugal. His research areas are sport pedagogy and education, and adolescent development.

**Laura Capranica** is a professor at the University of Rome Foro Italico, Italy. Her main research interests are focused on athletic performance and student-athlete's context.

**Humberto M. Carvalho** is a professor at the Department of Physical Education, Federal University of Santa Catarina, Brazil. His main areas of research are focused on youth sport and data analysis.