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The Road to Victory in the UEFA Women's Champions League:

A Multi-Level Analysis of Successful Coaches, Teams, and Countries

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Abstract

Objectives: To explore coach-level, team-level, and country-level factors associated with performance in the UEFA Women's Champions League.

Design: This study involved archival analysis of factual data on teams and coaches participating in the UEFA Women's Champions League (2011-12 until 2015-16).

Method: Official data records were provided by UEFA. Hierarchical linear modeling analysis was used to predict performance in the UEFA Women's Champions League. Specifically, coaches' characteristics (level-1 variables), team factors (level-2 variables), and country information (level-3 variables) were tested as predictors of performance (final rank, ranging from 1 to 32).

Results: Data analysis yielded a two- and three-level solution. The two-level solution was deemed more realistic and applied, and was chosen as the omnibus final model. Within the two-level solution, *years coaching experience in Champions League* at level-1 (γ_{10} = -2.90), and *number of times team has won Champions League* (γ_{01} = -7.13) and *number of international players* (γ_{02} = -1.08) at level-2, predict final performance at the UEFA Women's Champions League (i.e., negative coefficient is indicative of performance improvement).

Conclusions: Our findings suggest that the quality of the team, positive cross-cultural effects from an international roster, and the experience of the coach are positively associated with performance in the UEFA Women's Champions League.

Keywords: coaching, expert performance, women's football, UEFA Champions League, hierarchical linear modeling

Highlights

- Over 85% of the coaches in the UEFA Women's Champions League are male.

- More experienced coaches are more likely to be successful or, alternatively, successful coaches keep their jobs for a longer time.

- Successful teams at the UEFA Women's Champions League win because of the quality of the "team as a whole".

- Internationalization is a good thing. For every international player on the team, performance improved by about 1 position.

The Road to Victory in the UEFA Women's Champions League: A Multi-Level Analysis of Successful Coaches, Teams, and Countries

It is important to examine the profile of successful coaches as previous research has suggested that coach behaviors influence team outcomes across domains of human performance (Bloom, 1985; Côté & Gilbert, 2009). It is also imperative to consider the role of team factors, as intra-team characteristics (e.g., number of international players) have been shown to influence performance in sports (Filho, Gershgoren, Basevitch, & Tenenbaum, 2014). Broader environmental factors, including country effects, have also been linked to expert performance in sports (Salmela & Moraes, 2003). Given the paucity of research on the unique mechanisms of expert performance in women's football, we aimed to examine the factors differentiating successful coaches and teams from unsuccessful coaches and teams in the Union of European Football Associations (UEFA) Women's Champions League, while accounting for the role of country-level variables.

The uniqueness of the present study rests on examining excellence in women's professional football, as most of the research in football has been focused on the men's game (for a review see Gledhill, Harwood, & Forsdyke, 2017). Previous research in sports has revealed gender differences in team processes and performance (Carron, Colman, Wheeler, & Stevens, 2002; Duda, 1987; Eagly & Johnson, 1990; Filho, Tenenbaum, & Yang, 2015; Fransen, Vanbeselaere, Cuyper, Vande Broek, & Boen, 2015; Leo, Sánchez-Miguel, Sánchez-Oliva, Amado, & García-Calvo, 2013). Specifically regarding the UEFA Champions League, previous research has revealed large gender differences in physical and technical match performance characteristics, such as distance covered by the players and pass completion rates (Bradley, Dellal, Mohr, Castellano, & Wilkie, 2014).

We based our research on the notion that expert performance in sports is a multi-layered phenomenon, and depends on inputs from various micro, meso, and macro levels of analysis (Baker & Farrow, 2017). In fact, several frameworks have been proposed to explain consistent superior performance in sports (i.e., *explanatory pluralism*; see Dale, Dietrich, & Chemero, 2009), with emphasis being placed on different variables and levels of analysis, including coach, team, and contextual-level variables (for a review see Baker, Cobley, Schorer, & Wattie, 2017). Notwithstanding, the various conceptual frameworks on expertise have been primarily informed by two research frameworks, namely the *expert-novice paradigm* and the *expert performance approach* (Filho & Tenenbaum, 2015). In the former, scholars seek to describe (descriptive adequacy) variables related to expertise, whereas in the latter the focus is on identifying variables that predict (explanatory adequacy) expert performance in sports. In the present study we sought to both describe (through descriptive statistical analysis) and explain (through hierarchical linear modeling) coach, team, and country-level factors related to performance at the UEFA Women's Champions League.

Characteristics of Successful Coaches

Coach-level characteristics consider any variable related to the coach that may influence sports performance, positively or negatively. To this extent, there is consensus that coaches with different background characteristics (e.g., *age*, *nationality status*, *international playing experience*) are more or less likely to be successful in sports (Côté & Gilbert, 2009; Gilbert, Côté & Mallett, 2006; Starkes & Ericsson, 2003). Previous research suggests that expert coaches have athletic experience, participate in formal and informal educational programs, and have extensive coaching experience (Erickson, Côté, & Fraser-Thomas, 2007).

Previous research has also shown that competing in elite sport is an important

denominator of successful coaches (e.g., Cregan, Bloom, & Reid, 2007; Nash & Sproule 2009; Schinke, Bloom, & Salmela, 1995). For instance, Gilbert and colleagues (2006) found that successful coaches in interactive sports viewed themselves as high-performing athletes during their playing careers. Overall, successful coaches tend to perceive themselves as "better than average" athletes during their competitive careers (Gilbert, Lichtenwaldt, Gilbert, Zelezny, & Côté, 2009).

In addition to playing experience, formal education in a sport-related domain (e.g., Exercise Physiology, Physical Education, Sport Biomechanics, Sport Psychology), as well as informal education opportunities, such as mentorship programs and networking with other coaches, are important elements of successful coaches (Martens, 2012). Anderson and Gill (1983) found that many expert coaches acquired their initial coaching knowledge while enrolled in an undergraduate Physical Education degree. Interviews with high-performance coaches across a range of team and individual sports revealed the importance of studying Physical Education or Kinesiology and participating in formal coaching education courses (Carter & Bloom, 2009; Erickson, Côté, & Fraser-Thomas, 2007).

Coaching experience also plays an important role in coaching development and expertise (Cregan et al., 2007; Schinke et al., 1995). In interviews with Olympic coaches, coaching experience at the national and international level was the most frequently cited variable in preparation to become an elite coach (Gould, Giannini, Krane, & Hodge, 1990; Gould, Hodge, Peterson, & Giannini, 1989). Expert basketball coaches outlined several developmental stages that led to their current position, including novice coaching, developmental coaching, national elite coaching, and international elite coaching (Schinke et al., 1995). Moreover, time in a given coaching position (i.e., coach tenure and turnover) has also been linked to the development of

expert performance in sports (De Paola & Scoppa, 2008). Long-term coaches have more time to develop shared mental models with players, which in turn might increase the likelihood of positive outcomes (for a review see Mohammed, Ferzandi, & Hamilton, 2010). A new coach, on the other hand, may enhance motivation for players and provide beneficial changes in tactics and playing styles (Höffler & Sliwka, 2003).

Characteristics of Successful Teams

Successful sport teams tend to share certain characteristics. In other words, the quality of players on the team, rather than the quality of coaches, might determine sport success (Szymanski & Kuypers, 1999). For instance, comparing a coach of an amateur team to a coach of a professional team would not take into consideration the differences in the quality of the players on each team. To this extent, previous studies examining football performance have compared top to bottom teams, in line with the expert-novice paradigm (Filho & Tenenbaum, 2015; Hirotsu & Wright, 2003; Tenga, Holme, Ronglan, & Bahr, 2010; Yates, North, Ford, & Williams, 2006). In the present study, we were interested in examining the effect of team quality on performance in women's football, and thereby we explored the effects of the *number of times team has qualified for Champions League* and *number of times team has won Champions League*.

The bulk of empirical findings suggest that football teams can be successful by adopting different playing styles, akin to the equifinality principle in human movement sciences (Schmidt, McGown, Quinn, & Hawkins, 1986). For instance, one team may succeed by playing offensive style football (e.g., Brazil), whereas other teams may succeed by playing defensive football (e.g., Italy; see Filho, Basevitch, Yang, & Tenenbaum, 2013). Notwithstanding, having skilled players (i.e., players with task-related knowledge) on the roster seems paramount to team success

irrespective of the playing style adopted by a given team (Mohammed et al., 2010). As such, in the present study we were interested in analyzing whether the *number of international players* and *number of players with national team experience* increased the likelihood of successful performance at the UEFA Women's Champions League. On one hand, athletes with national team experience have access to high-level competition experiences and are more likely to be experts in their respective sport domains (Côté, Salmela, & Russell, 1995). On the other hand, international football players have been shown to perceive performance and team dynamics differently than domestic athletes (Filho et al., 2014b), congruent with the overarching notion that country-level effects influence athletic performance (Côté, Macdonald, Baker, & Abernethy, 2006).

Characteristics of Successful Countries

The country in which the team hails from may also play a role in success (Salmela & Moraes, 2003). Certain countries have reputations for excellence in football in general, and women's football in particular. In fact, since the inception of the men's FIFA World Cup in 1930, winners of the tournament have come from only eight countries (i.e., Argentina, Brazil, England, France, Germany, Italy, Spain, and Uruguay. The picture is similar for the women's game. Since the women's FIFA World Cup began in 1991 only four teams (i.e., Germany, Japan, Norway, and the United States) have won the tournament.

The rate of success of different countries may depend on various factors, including the popularity of the sport in the country (Salmela & Moraes, 2003). The size of the country may also impact the success of teams from that nation (Noll, 2002; Torgler, 2004). Teams from small countries may have a competitive disadvantage compared to teams that hail from large countries and thus benefit from having a greater number of football divisions, teams per division, and

professional players (Dejonghe & Vandeweghe, 2006).

Overall, myriad country-level variables may influence how teams play and coaches develop and instruct, ultimately affecting the performance of club and national teams in important international tournaments. Therefore, in the present study, we explored whether several country-level variables (e.g., *total number of divisions*, *number of teams in top division*, *favorite team sport*, *budget for women's football*) were predictive of performance at the UEFA Women's Champions League.

Research Questions & Hypotheses

The overarching research question guiding the present study was: "*What is the profile of winning teams in the UEFA Women's Champions League?*" This question was proposed as a broad exploratory inquiry stemming from the notion that coach, team, and country characteristics are associated with excellence in sports. The specific research questions were:

(1) What coaches' characteristics are associated with successful performance in the UEFA Women's Champions League?

(2) What teams' characteristics are associated with performance in the UEFA Women's Champions League?

(3) What country characteristics are associated with performance in the UEFA Women's Champions League?

Congruent with the three research questions, the following three hypotheses were proposed:

(H1) Coaches' characteristics (level-1) were expected to predict performance in the UEFA Women's Champions League.

(H2) At least one team-level characteristic (level-2) was expected to add explanatory power to the final hierarchical linear model.

(H3) At least one country-level characteristic (level-3) was expected to add explanatory power to the final hierarchical linear model.

H1 is congruent with previous research suggesting that coach characteristics are linked to expert performance in sports. H2 and H3 are aligned with the notion that expert performance in sports depends on team and country factors, and consistent with current methodological guidelines on parsimonious hierarchical linear model estimation in which level-2 and level-3 variables must be added "one by one" to allow for the development of a parsimonious robust model (see Raudenbush & Bryk, 2002).

Methods

Design

This study involved archival analysis of factual data on teams and coaches participating in the UEFA Women's Champions League (2011-12 until 2015-16). Country-level variables for the same period were also taken into account. The final UEFA Women's Champions League rank was the dependent variable, coaches' characteristics represented level-1 data, teams' characteristics represented level-2 data, and country characteristics were included as level-3 data.

Data Collection

Official documents with information about the coaches, teams, and countries were provided by UEFA, including team rosters and result sheets. Additional information was gathered from the UEFA website, FIFA.com, and official country association websites. To this extent, previous exploratory research on the predictors of performance in professional football has relied on factual, publicly available online sources (Filho et al., 2013; Hirotsu & Wright,

2003).

Inclusion criteria. After reviewing the qualifying procedures for the tournament and noting the number of teams that attempted to qualify each season (i.e., over 50 teams competed for a spot in the Round of 32 in 2015-16), it was decided that the data input and analysis would measure only the knockout stage of the tournament (Round of 32). In this way, the dependent variable for the regression model (i.e., UEFA Women's Champions League final rank) would have the same range (i.e., 1 to 32) for all seasons. Furthermore, it is important to note that the structure of the UEFA Women's Champions League allows teams to submit different rosters for each part of the tournament (e.g., Qualifying Round, Round of 32, Round of 16, Quarter-finals, Semi-finals, and Final). Therefore, to be consistent across all teams, regardless of how far the team advanced in the tournament, the coach- and team-level data was based on information for the Round of 32.

With respect to the independent measures, all variables that were not consistently recorded across levels of analyses for varying reasons (e.g., different countries reporting data differently) were excluded from the data pool to ensure the analysis was performed on reliable and valid information. Decisions on the inclusion/exclusion of any variable were made over a series of peer-debriefing meetings involving the authors and "external judges" from UEFA who are not authors of this manuscript. Any issues were discussed until consensus was reached. In total, 11 variables were excluded from analysis. A detailed explanation for the rationale supporting the exclusion of each variable is provided as Supplementary Material (Part 1).

Data Input

The dependent variable and independent variables related to the coach (level-1), team (level-2), and country (level-3) included in the analysis are described in detail next. Data before

the 2011-12 tournament was considered for coaches and teams. For instance, coach variables exceed the 5-year interval considered for the dependent variable. By doing so, we accounted for coaches and teams previous participation in the UEFA Women's Champions League since its inception in 2009-10.

Dependent variable. Final rank for the UEFA Women's Champions League was determined based on the official regulations of the game (see FIFA.com). Specifically, the winner of the final match was ranked 1 and the finalist was ranked 2. All remaining teams were ranked based on the official criteria put forth by FIFA: (1) Greatest combined goal difference in all matches; (2) Greatest combined number of goals scored in all matches; and (3) If more than one team remained level after applying the above criteria, their final ranking was determined based on how far the team that they were eliminated by advanced in the tournament. If the teams that were tied were beaten by teams that advanced to the same round of the tournament, then the greatest combined goal difference in all matches for the advanced team was used to separate the tie.

Independent coach-level variables. Coach-level variables included *age*, *gender*, *nationality status*, *former professional player*, *full national team playing experience*, *international playing experience*, *position as a player*, *coaching experience of a national team*, *years coaching experience in Champions League*, and *time at current position* (Table 1).

Age. Age, in years, was calculated based on the date of birth for each coach listed on the official UEFA roster.

Gender. Gender was included to examine whether differences exist between male and female coaches.

Nationality status. The coach's nationality status was coded according to whether they coached a team from their native country or a team from outside their native country.

Former professional player. Whether the coach was a former professional football player was included as a measure of playing experience. Of note, this variable represented the highest level of playing experience the coach achieved during his/her career.

Full national team playing experience. The coach's involvement as a player in his/her full national team was recorded based on information from national team rosters available online.

International playing experience. It was noted whether the coach competed at the international level for his/her full national team (e.g., FIFA World Cup, Olympics, UEFA Champions League).

Position as a player. It was also considered whether successful football coaches were more likely to have played a certain position. Performance roles and expectations differ between goalkeepers, defenders, midfielders, and forwards. Therefore, the position in which the coach played during his/her career was coded for in the data.

Coaching experience of a national team. This variable took into consideration whether the coach had experience as the head coach of a national team, including a youth or full national team, from any country.

Years coaching experience in Champions League. The number of previous times each coach was involved in the UEFA Women's Champions League was recorded as a measure of previous coaching experience.

Time at current position. Time at current position, measured in years, was calculated for each coach to assess whether team performance was related to the length of time the coach has been in the position.

Independent team-level variables. Team-level variables included *number of times team has qualified for Champions League*, *number of times team has won Champions League*, *number of international players*, and *number of players with national team experience* (Table 1).

Number of times team has qualified for Champions League. The number of times the team has qualified for the UEFA Women's Champions League reflects the experience of the team in previous years.

Number of times team has won Champions League. The number of times the team has won the UEFA Women's Champions League title provides information about the past quality of the team.

Number of international players. The number of international players on the roster might be related to the financial capacity of the team. Wealthier teams have the financial means to recruit talent from overseas.

Number of players with national team experience. The total number of players with national team experience was included as an indicator of the football quality of the club team.

Independent country-level variables. Country-level variables included *FIFA world ranking*, *total number of divisions*, *number of teams in top division*, *number of registered female players*, *favorite team sport*, and *budget for women's football* (Table 1). All country-level variables, with the exception of FIFA world ranking that was gathered from FIFA.com, were official records provided by UEFA.

FIFA world ranking. The FIFA world ranking for the country of which the team is from was included in order to account for the strength of women's football in the given country. It was deemed important to consider the ranking for each country at the point closest to the start of the UEFA Women's Champions League, as it was expected that this most accurately reflects the

quality of football in the country at the given time. The ranking used for the analysis was the one issued most immediately preceding the start of the UEFA Women's Champions League knockout round. For instance, for the 2015-16 competition, the rankings were from September 25, 2015 and the knockout stage started on October 7, 2015. The same procedure was applied to all other seasons (i.e., 2011-12 to 2014-15).

Total number of divisions. To explore differences in league structures across countries, the total number of divisions in the domestic women's football league was included in the model.

Number of teams in top division. Given that the size of divisions also differs across countries, the total number of teams in the top national division was included in the model.

Number of registered female players. The total number of registered female players, above 18 years of age, for the current year was used to measure the popularity of women's football in each country.

Favorite team sport. Whether football was the favorite team sport, based on media, exposure, marketing and spectators, was included in the model to explore the potential effect of popularity of women's football on the dependent variable.

Budget for women's football. The budget (in Euros) for women's football for each country was included in the data set to assess whether the general financial status of the sport in the country was related to performance in the UEFA Women's Champions League.

Data Analysis

The first step in data analysis involved dealing with missing data. Subsequently, descriptive and hierarchical linear modeling analyses were applied to the data set.

Missing data. Only two variables (i.e., former professional player; position as a player) were excluded from the data analysis due to a large percentage (over 30%) of non-available

information. Noteworthy, variables with up to 10% missing data points were treated, in line with recommendations for quantitative research analysis (see Creswell, 2008). Specifically, missing data was treated in three ways: (1) for dummy variables, missing data was coded as "0" ("no" or the absence of the attribute), thus reflecting a conservative approach in inference making; (2) for continuous variables, the median was computed to avoid inflation resulting from outliers; and (3) for *budget for women's football* interpolation was used on a case-to-case basis to determine the values for the missing data.

Descriptive analysis. Descriptive analysis is particularly informative in census-like inquiries, such as in the case of the present study (Creswell, 2008). Accordingly, measures of central tendency, namely mean, median, and standard deviation, as well as natural frequency counts, were performed.

Hierarchical linear modeling. The data for all seasons was analyzed together as the goal was not to examine changes over time for particular teams but rather to conduct a census-like analysis of the factors linked to success in the UEFA Women's Champions League. Potential carry-over effects were not an issue as we explored the effects of level-1, level-2, and level-3 variables over the time span analyzed. It follows that a three-level hierarchical linear model was tested. Figure 1 is a schematic descriptive summary and graphic representation of all variables considered in the hierarchal linear modeling analysis.

For the null unconditional model, all dummy coded variables were treated as fixed effects, whereas continuous variables were initially conceptualized as random effects in the tested model. Furthermore, across the three levels of analysis, all variables were treated as raw, non-centered scores, given that there was (1) an interest in estimating the unique contribution of

each predictor, and (2) no occasion in which a value of zero represented either an undesirable or an unreasonable score (see Raudenbush & Bryk, 2002).

Results

Congruent with the importance of describing (expert-novice paradigm) and explaining (expert performance approach) potential mechanisms linked to expert performance in sports, we first present the descriptive analysis applied to the final data set. Subsequently, we present the multi-level analysis in a step-by-step mode, from the null unconditional model until the final parsimonious model.

Descriptive Analysis for Coaches

For demographic factors (Table 2), the descriptive analysis revealed that the coaches were in their early forties (M = 43.51; SD = 9.95), were mostly male (85.60%; n = 137), and primarily coached a team in their native country rather than a foreign country. A post-hoc chi-square analysis (see Garcia-Pérez & Núñez-Antón, 2003) confirmed that the proportion of male coaches was statistically greater than the proportion of female coaches ($\chi 2$ (5) = 186.39, $p <$ .001), and the magnitude of this difference was found to be large (Cohen's d = 2.03).

With respect to coaches' previous experience as football players (see Table 2), the majority of the coaches were not former professional players (54.10%, n = 59). Noteworthy, for the most part (88.90%, n = 136) coaches with professional playing experience did not play at a premier international level competition, such as the FIFA World Cup, Olympics, or UEFA Champions League. Coaches with previous playing experience at any level were mostly midfielders (43.10%, n = 31; see Figure 2). The proportion of midfielders was found to be greater than the proportion of former goalkeepers and defenders $\chi 2$ (2) = 10.90, $p < .01$, but did not differ significantly from the proportion of forwards, $\chi 2$ (1) = 1.13, $p = .29$.

With respect to the coaches' coaching experience (Table 2), the descriptive analysis revealed that most of them were at their current club in a head coach capacity for about three years (M = 3.36; SD = 4.51), and coaching for the first time in the UEFA Women's Champions League (M = 0.81; SD = 1.00). Over a third of the coaches (37.10%, n = 56) had previously led a youth or full national team.

Descriptive Analysis for Teams

Central tendency estimates and frequency counts for all level-2 team variables are presented in Table 3. On average, teams had qualified for the UEFA Women's Champions League two times (M = 1.79; SD = 1.56). Furthermore, the teams had a median of 13 players with national team experience, and the average team size was approximately 23 players (M = 22.71; SD = 2.19). The teams had around four international players on their rosters (M = 4.40; SD = 3.43). The majority of international players were from European countries (66% out of 703 in total, n = 469), followed by North American (16%, n = 110), and African countries (9%, n = 60; see Figure 3, Panel A). South American and Oceania countries accounted for 4% (n = 30) of the international trade each, with Asian nations accounting for the remaining 1% (n = 9) of foreign players. This trend was found to be consistent across all five years analyzed (Figure 3, Panel B). The proportion of European players was found to be greater than all other continents, $\chi 2$ (5) = 186.39, $p < .001$. The number of players from North America was found to differ significantly from the proportion of players coming from Africa, South America, Oceania, and Asia, $\chi 2$ (4) = 20.48, $p < .001$. No other statistically significant differences were observed when comparing the proportion of international players across continents.

Descriptive Analysis for Countries

Central tendency estimates and frequency counts for all level-3 country variables are presented in Table 4. Teams were from countries with a large range of FIFA world rankings. Across countries, the average number of football divisions was approximately four (M = 4.21; SD = 2.06), with the average number of teams in the top division being about 10 (M = 10.55; SD = 2.60). The number of registered female football players, over age 18, varied greatly among countries and was roughly 21,000 (M = 21,287; SD = 24,216). However, this value is not particularly informative as the variance was larger than the mean, likely because Europe is comprised of countries with varying sizes and socio-economic characteristics. Also, noteworthy, football was the favorite sport in approximately 60% of the countries (59.70%; n = 92), with the budget allotted to women's football being, on average, close to four million Euros per year (Median = 2,500,000; M = 3,953,011; SD = 4,152,050). Altogether, the country-level data was marked by wide variability, thereby corroborating the importance of accounting for country specificity in line with multi-level analysis guidelines.

Hierarchical Linear Modeling

First, correlation analyses were performed among the independent variables included in the analysis and the dependent variable (see Supplementary Material – Part 2). Overall, a linear relationship was observed, thus attesting the application of hierarchical linear modeling analysis to the data set (see Raudenbush & Bryk, 2002). For brevity, only the omnibus final model is defined in the text. The statistical definitions and coefficients for all models, including the intermediate models not detailed in the text, are given as Supplementary Material (Part 3) in the order in which they were ran.

Null unconditional model. Initially, the null unconditional model with two levels and no independent variables was tested. The fixed and random effect estimates for the null unconditional model are presented in Table 5. The reliability estimate for this model indicated that 19% of the variance of final rank for the UEFA Women's Champions League was due to between-team variables. The grand mean estimate was significant at 17.75 (CI = 19.72, 15.77), and thus near the median value (final ranking = 16, as there are 32 teams) for the final ranking across all teams. There was no significant effect for the variance components, thus suggesting the adoption of a fixed effect model for the subsequent models.

Level-1 modeling. Model A included all level-1 coach variables. The coefficients, standard errors, t-ratios and *p*-values for all tested variables are presented in Table 6. Based on the results of Model A (Table 6), the next step involved advancing a more parsimonious model. Specifically, congruent with guidelines on parsimonious statistical modeling (see Cohen, West, & Aiken, 2002), Model B contained only the level-1 significant predictor of final rank: *years coaching experience in Champions League* (see Table 7). Within Model B (Table 7), every additional *year of coaching experience in Champions League* was found to improve final rank by 3.63 positions (γ_{70} = -3.63, p = .015). The intercept for Model B was estimated at 14.25 (CI = 11.66, 16.84) with the confidence interval encompassing the expected average value for final ranking across all teams. Compared to Model A (Table 6), the reliability estimate for between-teams decreased slightly to 17% after adding *years coaching experience in Champions League* to the Model B. Nevertheless, computation of Pseudo R^2 (see Raudenbush & Bryk, 2002) indicated that Model B explained 6.84% more variance of final ranking than the null unconditional model (Table 5) with no predictors.

Level-2 modeling. This step involved the consideration of team-level variables. Congruent with guidelines on parsimonious hierarchical linear modeling (Raudenbush & Bryk, 2002), an a priori exploratory analysis was conducted to determine which significant level-2 predictors should be included in the model (see Supplementary Material – Part 3) in order to advance the best, yet most parsimonious two-level model.

Level-2 variables were included on a "one to one basis" in the analysis, until a final solution, wherein all predictors were statistically significant, was reached. Results for this model, namely Model C (Table 8), suggested that *years coaching experience in Champions League* at level-1, and *number of times team has won Champions League* and *number of international players* at level-2, were significant predictors of final rank. Specifically, for every additional year of experience coaching in the Champions League, final rank improved by approximately three positions (γ_{10} = -2.90, p = .038). Moreover, for every time a team raised the Champions League trophy, final rank was estimated to improve by seven positions (γ_{01} = -7.13, p < .001). Finally, every international player on the roster represented an improvement in final rank by about one position (γ_{02} = -1.08, p < .001). The intercept for the model was significant at 24.56 (CI = 21.76, 27.36).

Level-3 modeling. To test whether a three-level model was required or whether a two-level model would suffice, variance was fixed at ".19" (see Raudenbush & Bryk, 2002), which was the reliability estimate for Model C (Table 8), and an exploratory analysis of all level-3 predictors was conducted (see Supplementary Material – Part 3).

The variables found to be statistically significant at level-1 (i.e., *years coaching experience in Champions League*) and level-2 (i.e., *number of times team has won Champions League*; *number of international players*) were then added to the hierarchical regression analysis,

along with *FIFA world ranking* at level-3, which was found to significantly predict final rank (Table 9). The intercept for the model was estimated at 21.85 (CI = 18.86, 24.84), with the reliability estimate for level-2 suggesting that 12% of the variation in the means of final rank was due to true variation between countries. Importantly, in this three-level solution, *years coaching experience in Champions League* was no longer found to be a significant predictor of final rank.

Final model. Both the three-level solution given in Table 9 and the two-level solution presented in Table 8 are suitable omnibus models to explain final rank for the UEFA Women's Champions League. Importantly, reliance on statistical guidelines for model estimation does not provide a straightforward answer for deciding between two alternative non-equivalent models (Raudenbush & Bryk, 2002). On the one hand, arguments can be developed in favor of choosing better-fit indices (see Stapleton, 2006), in which case the three-level solution given in Table 9 would be preferable as Pseudo R^2 computation indicates that this model accounted for an additional 55.23% of the variance of final ranking scores. On the other hand, arguments can be developed in favor of the more parsimonious two-level solution given in Table 8 (Gigerenzer, 2010; Tenenbaum & Filho, 2015). Every time you add factors to a model, the complexity of the model increases (over parameterization) and its applicability tends to decrease.

To reach a decision between the two alternative solutions, the estimated impact of the level-3 and level-1 predictors on the criterion final rank were analyzed in detail. In regard to a three-level solution (Table 9), the median effect of *FIFA world ranking* on final ranking was close to a two-position downgrade (γ_{001} = 0.09 * 17.5 = 1.58), with numerous effects in between being possible (Figure 4, Panel A). Regarding a two-level solution (Table 8), the estimated average effect of years coaching experience in Champions League on final ranking is about a two-position upgrade ($\gamma 10$ = -2.90 * .81 = -2.35). This effect was found to be linear over time

(Figure 4, Panel B), influencing final ranking by a maximum of approximately twelve positions for coaches with four years of experience in the league (γ_{10} = -2.90 * 4 = 11.60), as per the observed range for this variable (Table 2). Given that the impact of *years coaching experience in Champions League* is more substantial than the impact of *FIFA world ranking* on final rank, a final choice for a two-level solution is proposed herein (see Figure 5) and defined below:

Level-1 Model

$$Final\ rank_{ij} = \beta_{0j} + \beta_{1j}*(Years\ coaching\ experience\ in\ Champions\ League) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Number\ of\ times\ team\ has\ won\ Champions\ League) + \gamma_{02}*(Number\ of\ international\ players) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

β_{0j} : The predicted final rank mean controlling for the number of previous Champions League wins and the number of international players on a given team j

β_{1j} : The predicted change in final rank for every year of coaching experience in the Champions League for a given coach i in a given team j

γ_{00} : The grand mean for the dependent variable final rank across teams

γ_{01} : The average change in final rank for every time a given team j has won the Champions League

γ_{02} : The average change in final rank for every international player on a given team j

r_{ij} : The deviation of final rank from its predicted value for a given coach i in a given team j

u_{0j}: A random effect for team j

The above-specified model, therefore, supports H1 and H2 but does not corroborate H3. Had a three-level solution been selected, H3 and H2 would have been supported but not H1.

Considering the final coefficients estimated for this study (Table 8), the lowest "error free" hypothetical final rank value consists of a coach with no previous experience in the league, coaching a team with no previous league title, and without any international players on the roster according to the equation:

$$Final\ rank = 24.56 + (-2.90) * (0) + -7.13 * (0) + -1.08\ (0)$$

Variations in the final rank value would depend on the number of previous years of experience in the UEFA Women's Champions League by a given coach, a team with up to two overall UEFA Women's Champions League titles within the past five years, and with a maximum number of 15 international players on the roster. Again, the reported coefficients are fixed rather than random and apply to the studied population given the range of the variables.

Discussion

The purpose of this study was to explore coach, team, and country factors linked to performance in the UEFA Women's Champions League. To this end, descriptive statistics and hierarchical linear modelling was applied to a data set spanning five seasons, for the three-aforementioned levels of analysis. The main observed findings are discussed next.

Descriptive Analysis for Coaches

Our analysis revealed that the coaches were in their early forties. To coach at a high level of performance, previous experience in the sport seems compulsory. To illustrate, over a third of the coaches reported previous coaching experience of a full or youth national team. Hence, it is unlikely that early professionals will be managing a women's team in the premier football tournament in Europe. This is often the case in other domains of human performance as well, as individuals tend to peak in certain careers at very specific age intervals, or "sensitive windows" (see Bloom, 1985; Munakata, Casey, & Diamond, 2004). Particular to coaching and

management, in a classic study profiling the characteristics of over 1,000 executives, Bantel and Jackson (1989) observed that CEOs from large corporations were in their forties on average.

Whereas previous experience seems to be essential to lead premier football clubs in the UEFA Women's Champions League, the type of experience might differ across individuals. In particular, the statistical analysis revealed that former professional players were not more likely to coach in the league than those with no previous professional experience as a player. Thus, the pathways to become a coach in the UEFA Women's Champions League seem to vary, akin to the equifinality principle (see Von Bertalanffy, 1968), which purports that expert performance can be reached through different routes. This finding bears implication for the on-going global debate on coaching education (see Vargas-Tonsing, 2007), as it suggests that different types of experience (e.g., former professional player, explicit academic training, formal coaching education) can lead individuals to coaching at the highest competitive level.

It is noteworthy, however, that the majority of coaches with playing experience at any level used to play as midfielders. Coaches who played as a midfielder might have a greater chance of leading an elite women's football club in Europe. Midfielders have been found to perceive performance requirements differently than players from other positions (i.e., goalkeepers, defenders, and forwards) likely because midfielders are, in a sense, a hybrid position that shares both defensive and offensive responsibilities (Filho et al., 2014b). As such, former midfielders might have developed a better understanding of the game in both its defensive and offensive requirements. Moreover, previous research has shown that athletes that play in centralized positions have more access to information, and thus are more likely to facilitate team coordination and performance by communicating shared and complementary information to their teammates (Filho, Gershgoren, Basevitch, Schinke, & Tenenbaum, 2014a).

Noteworthy, our analysis revealed that there were significantly more male than female coaches in the league. This finding echoes previous research in the field in that women coaches' report difficulties in progressing to a high-ranking coaching status in professional sports (Norman, 2013). In particular, women coaches have noted that advancing to high-performance coaching positions is difficult likely because of implicit gender biases, as coaching in sports is dominated by men (Norman & Rankin-Wright, 2016; Rankin-Wright, Hylton, & Norman, 2017). It is therefore important to support initiatives to increase the number of women in leadership positions in sports and other domains of human performance (Blau, 2016). Particularly with regards to women's football, policies should be continually developed to encourage former female players to seek the necessary licenses and qualifications to pursue a career in coaching. Examining the effectiveness of gender equality policies currently in place is also paramount to ensure women take on leadership positions across domains of human performance (see Burton, 2015).

It is important to highlight that only about 10% of the coaches were from international countries. There are limited financial resources in women's football and this might shed light on the relatively low frequency of international coaches at the knockout round of the UEFA Women's Champions League. Availability of financial resources may also explain job stability in the analysed sample. Coaches were found to serve in their current position for over three years on average, thus signalling a smaller coaching turnover than that observed in the men's game (see De Paola & Scoppa, 2008). This finding might explain why coach tenure was positively linked to performance. Over time, coaches get to know their player and teams, and thus are able to foster the development of various team processes (e.g., cohesion, team mental models,

collective efficacy) while devising more effective performance strategies (Balduck, Prinzie, & Buelens, 2010; Shamsie & Mannor, 2013).

Descriptive Analysis for Teams

Frequency counts revealed that only three teams had won the UEFA Women's Champions League within the 5-year span analysed. Accordingly, there is evidence that "hubs of expertise" occur and are dominant within the European league network. As per the Pareto law, 80% of outcomes tend to come from 20% of the inputs. It follows that qualitative analysis of these highly successful cases is warranted as previous research suggests that studying the modus operandi of a few expert teams can yield important insights to inform the development of less successful teams (see Gershgoren, Filho, Tenenbaum, & Schinke, 2013).

Although few teams had earned the title, the teams had on average two years of experience participating in the UEFA Women's Champions League. This suggests that the quality of the team is paramount. Skill matters in the quest for success, which is why companies from all domains seek to hire and retain highly qualified employees (Lockwood & Ansari, 1999). In fact, the team-level data suggests that teams in the UEFA Women's Champions League have top quality players, with an average of over 12 players with national team experience per team.

This finding opens another question pertaining to the direction of this putative relationship: Do players that play for their national teams join the best club teams in Europe or does playing on a strong team in the UEFA Women's Champions League increase a player's chance of being invited to join her national team? It is likely that a reciprocal relationship occurs, wherein playing on a top club team increases the players' visibility to join her respective national squad and vice-versa: playing on a national team increases the chance of being hired by a leading football club in Europe. Also noteworthy, countries with more or less tradition in football

produce players of more or less quality. In other words, hiring players from soccer powerhouse countries (e.g., Brazil, England, Germany, the United States) might be more impactful than hiring players from less traditional soccer nations. As discussed above, there is a grand influx of players from the United States, which currently is the dominant country in women's football.

On average, teams had just over four international players on their squad. This figure is likely constrained by the fact that European countries regulate the number of players outside Europe that can play in their leagues (see Flores, Forrest, & Tena, 2010). While the number of players is a constrained factor, the origin of the players is a "free parameter", mainly shaped by the unique dynamics of women's football. Specifically, the majority of international players at the UEFA Women's Champions League come from North America, particularly the United States, who has been the major force in women's football for the past decade. As is the case with many job markets, local protective measures along with the strength of the marketplace in other countries establish the migration flow of workers around the globe (Greenwood, 2014).

Descriptive Analysis for Countries

Across the 35 countries represented in the UEFA Women's Champions League over the 5-year span analyzed, football was found to be the *favorite team sport* among women. In the past, football has been stereotypically associated with male rather than female socially desirable traits (Azzarito, Solmon, & Harrison, 2006). However, a positive shift has been noticed more recently, with an increasing number of girls and women playing football around the globe (Lunz, 2007). It is important that researchers and practitioners continue to observe how societal and cultural changes (e.g., gender rights movement) influence sport play and choice for women in different countries.

All other country-level variables were characterized by wide variability. In fact, from the *FIFA world ranking* to *total number of divisions* and *number of teams in top division*, great dispersion in the data pool was the major trend observed. Scattered data patterns were also noticed for *number of registered female players* and *budget for women's football* among the 35 countries that were analysed. Together, these findings suggest that heteroscedasticity in the organization of national leagues as well as the economics of football is part of the women's game in Europe. Hence, the recommendation derived from these findings is that scholars and practitioners should continue to account for country-level factors when studying expertise among individual sport actors, such as coaches in the present study, and teams at large.

Multi-Level Effects: Coaches within Teams within Countries

Agents at one level are systems at another level (Von Bertalanffy, 1968). For this reason, mapping cross-level effects allows for a deeper understanding of optimal performance across domains of human interest, including football (Filho et al., 2014b). In the multi-level analysis applied herein, the results support the hypotheses that coach- and team-level variables are related to performance in the UEFA Women's Champions League for a two-level solution, and that team-level factors and country-level factors are paramount within a three-level solution. From a three-level perspective, countries with higher FIFA world rankings have better teams that are more likely to be successful regardless of their coaches, in comparison to weaker teams from less traditional football countries. From a two-level view, coaches with more experience increase the chances of victory in the UEFA Women's Champions League.

Experienced and successful coaches are also more likely to be recruited and retained by better teams. Altogether, "reciprocal determinism" (see Bandura, 1997) from a socio-cognitive standpoint or "affordances" (see Fajen, Riley, & Turvey, 2009) from a naturalistic account might

659 be at play here. Reciprocal determinism pertains to the notion that individual, group, and
660 contextual processes are intertwined and mutually influence one another. Within an affordance
661 view, changes to input throughout and output relations in a given system are more or less likely
662 depending on a set of constraints and initial values. For instance, it has been shown that success
663 in sports and other areas of human performance depends, in part, on place of birth (Côté et al.,
664 2006). In all, countries influence the development of teams and coaches. Likewise, hiring
665 experienced coaches may influence the development of strong teams, which in turn may
666 influence the development of football over time in a given country.
667 Regardless of which view is adopted (the two-level solution proposed herein or the
668 aforementioned three-level alternative solution), the quality of the teams was found to matter the
669 most in predicting performance at the UEFA Women's Champions League. In other words, the
670 strongest predictive effects originate from the team-level of analysis. A team that has won the
671 UEFA Women's Champions League before is more likely to succeed again. In fact, previous
672 performance accomplishments are a major predictor of efficacy beliefs, which in turn are major
673 predictors of performance in team sports in general (Feltz, Short, & Sullivan, 2008), and football
674 in particular (Filho, Tenenbaum, & Yang, 2014c; Leo et al., 2013). To put plainly, success boosts
675 confidence, which in turn increases the chance of further success. Additionally, more successful
676 teams are likely more attractive to high-quality athletes motivated by the best chances to win
677 titles (Sanderson & Siegfried, 1997).
678 The number of international players on the team was also found to predict final rank at
679 the UEFA Women's Champions League after analyzing several level-1 coach and level-3
680 country relevant variables. International players aggregate value to the team, as they perceive
681 performance differently, and apply different defensive and offensive tactics to football play

(Filho et al., 2014b). Moreover, international football players are usually top-level athletes that have left their native countries to take on more prosperous job opportunities in foreign nations (Kleven, Landais, & Saez, 2013). Similar to top-level engineers from around the world who are hired by multinational corporations in Silicon Valley for instance, world-class foreign football players are hired by European clubs to add value to their squads. To illustrate further, for part of the 2015-16 season, Marta Da Silva (Brazil) and Carli Lloyd (United States), two the most successful women football players of all times, played away from their homes for clubs in Europe.

With respect to level-1 data, previous experience coaching in the UEFA Women's Champions League was also found to predict final rank. Coaches that have competed in the league before are likely more aware of the challenges that the competition imposes, such as strategies to counter-act home field advantage and the away goals rule (i.e., goals scored at away venues count more than goals scored at home). In effect, experience at the highest level of competition is important in the development of expertise (Bloom, 1985; Côté et al., 1995; Williams & Ericsson, 2005). Previous experience allows one to develop mental representations that can be applied before, during, and after decisive moments in sport competitions (Filho & Tenenbaum, 2015; Tenenbaum, Basevitch, Gershgoren, & Filho, 2013). Put differently, once exposed to high-pressure situations, individuals develop mental skills that allow them to self-regulate and perform better the next time around.

With respect to level-3 data, expressive variability was observed across countries in all measured variables. Hence, considering country-level factors is important in research on women's football. However, the size and financial power of a country is not the major factor predicting performance of teams at the UEFA Women's Champions League. In fact, previous

research has shown that the size and financial power of a country does not necessarily explain performance in football (Hoffmann, Ging, & Ramasamy, 2002). Countries of smaller sizes and budgets may also succeed in sports if the culture around that sport is strong enough. From the present analysis, the only factor that might play a role in performance at the UEFA Women's Champions League was the FIFA world ranking for a given country. More traditional countries may perform better than less traditional ones. Thus, it is important to examine country-level factors when studying performance in women's football. However, it is important to reiterate that, for the present study, the quality of the team and the experience of the coach are paramount for success in the UEFA Women's Champions League. That is, teams from less traditional countries that have a winning story and an experienced coach may triumph in the end. The scope of these findings, limitations, applied implications, and avenues for future research are discussed next.

Limitations and Strengths

There are at least two limitations that need elaborating to orient future research in women's football. As previously mentioned, the iterative model was fixed rather than random and thus generalizability is limited to the variables tested within their respective ranges. Moreover, this study was correlational in nature and, as such, inferences of causality are not appropriate. Despite these limitations, this study advances the literature on women's football, as the majority of research efforts in football have targeted the men's game. In the present study, an inductive model of expert performance in women's football emerged from our data analysis (Figure 5), addressing, at least in part, the call for empirical research geared towards developing frameworks of expert performance in women's sports (see Gledhill et al., 2017). To this extent, findings of this study contrasted many common notions in men's football, thus making it clear

that gender effects exist in the "beautiful game" and that guidelines derived from men's football do not necessarily apply to high-performance women's football. Also, notwithstanding the cross-sectional nature of the study, the comprehensive census-like analysis presented herein provides more than a "snapshot profile" of high-performance women's football in Europe. Natural frequency counts revealed the current status of coaches, teams, and countries participating in the league bringing to light, for instance, the small number of women coaches in the League. Stakeholders should use the findings of this study to "think-act-reflect" (i.e., reflexive practice) on best practice guidelines for coaches, teams, and countries. Awareness of factors related to high-performance at the UEFA Women's Champions League is an important step to promote positive (and evidence-based) changes in premier women's football.

Future Research

Future research could focus on studying expert coaches through qualitative lenses. As the results have shown, the proportion of female coaches in the league is much smaller than the proportion of male coaches. Accordingly, we echo the call for more studies on the challenges that women face in pursuing a professional coaching career in sports (see Norman, 2013; Norman & Rankin-Wright, 2016; Rankin-Wright et al., 2017). In particular, additional research on the intersections of gender and other minority statuses (e.g., race/ethnicity) among football coaches is warranted. More studies on the migration flow of international athletes are also warranted. As the findings illustrate, the immigration flow of football players at the UEFA Women's Champions League contrasts with what is known about the male player migration (see Elliott & Harris, 2014). Also, the effect of the team's budget on performance variables should be examined. In the present study, budget for women's football was modelled at the country-level of analysis, not the team-level. It is likely that the quality and number of international players on

the team, factors that have been found significant in the present study, co-vary with the team's annual operating budget. However, it might be challenging to obtain this information, as teams might not be willing to disclose financial data.

Future research should look beyond the demographic characteristics of coaches and teams by addressing the multi-layered relationship among latent individual psychological factors ("I" factors, such as personality) and team processes (e.g., cohesion, collective efficacy). Furthermore, while it is unclear whether a general theory of expertise will ever be developed (Farrow & Baker, 2018), scholars should continue to work towards theoretical integration in research on expert performance in sports. An integrated yet parsimonious model of expertise in team sports might help to inform research and practice in sport psychology.

Applied Implications

Our analysis revealed that individual and team-level factors should be taken into account by practitioners working in women's professional football. Foremost, team-level factors are most important in predicting successful performance at the UEFA Women's Champions League. As such, sport professionals should think about interventions that address "the team first". Specifically, drafting players from traditionally successful teams as well as international players may increase the chance of winning games at the UEFA Women's Champions League. Former winners and international players bring the experience and confidence that propels performance in high-level competitions. Practitioners wanting to promote peak performance in women's football should also consider developing "cultural intelligence" interventions aimed at promoting cross-cultural understanding in teams with numerous international players on their rosters.

The "team comes first", but our findings also revealed that coaching experience matters. Accordingly, teams seeking to improve their performances in the UEFA Women's Champions

League should also consider hiring coaches who have previous experience in the competition. As discussed, previous high-stake experience fosters the development of mental representations, which are the basis for effective cognitive, affective, and behavioral patterns differentiating expert individuals and teams from their less successful counterparts. Alternatively, teams could work towards developing their coaches by reducing turnover and providing opportunities for continued education and "learning the job while doing the job", rather than emphasizing an immediate outcome. Repeated participation in the UEFA Women's Champions League may equip coaches with the experience needed to help teams perform better over time.

Finally, the findings of this study reinforce the importance of governing bodies and Football Associations in developing (a) coaching education programs tailored to the specific needs of women's football; (b) initiatives to increase the number of women coaching high-performance football teams; and (c) campaigns publicizing the benefits of cultural diversity in sports. Governing bodies should consider ways to promote "competitive balance" in order to avoid a few teams consistently winning the championship, which negatively impacts the economic sustainability of other teams (Sanderson & Siegfried, 2003). To conclude, we call for comprehensive multi-levels of analysis studies on expert-performance across domains of human interest. By examining multi-level effects it is possible to advance knowledge on how to foster talent at the individual level of analysis, while promoting the development of expert teams, and advancing country-level policies to promote quality sport play around the world.

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Table 1

Coding and Description for Variables

Variable	Data Source	Coding Description
Coach-Level Variables		
Age	UEFA[a]	Continuous
Gender	Team website or sporting website	Dummy coded; 0 = male; 1 = female
Nationality status	UEFA[a]	Dummy coded; 0 = coaches team from outside native country; 1 = coaches team from native country
Former professional player	Team website or sporting website	Dummy coded; 0 = did not play as a professional; 1 = played as a professional
Full national team playing experience	Team website or sporting website	Dummy coded; 0 = did not play on full national team; 1 = played on full national team
International playing experience	Team website or sporting website	Dummy coded; 0 = did not play internationally; 1 = played in World Cup, Olympics, or Champions League
Position as a player Goalkeeper; Defender; Midfielder; Forward	Team website or sporting website	Dummy coded; 0 = no; 1 = yes
Coaching experience of a national team	Team website or sporting website	Dummy coded; 0 = did not coach a youth or full national team; 1 = coached a youth or full national team
Years coaching experience in Champions League	Team website or sporting website	Continuous
Time at current position	Team website or sporting website	Continuous

Table #1 – Continued

Variable	Data Source	Coding Description
Team-Level Variables		Continuous
Number of times team has qualified for Champions League	UEFA[b]	Continuous
Number of times team has won Champions League	UEFA[b]	Continuous
Number of international players	UEFA[a]	Continuous
Number of players with national team experience	Team website or sporting website	Continuous
Country-Level Variables		
FIFA world ranking	FIFA[c]	Continuous
Total number of divisions	UEFA[d]	Continuous
Number of teams in top division	UEFA[d]	Continuous
Number of registered female players	UEFA[d]	Continuous
Favorite team sport	UEFA[d]	Continuous
Budget for women's football	UEFA[d]	Continuous

[a]Data came from the UEFA Women's Champions League Player List, provided by UEFA.
[b]Data came from the official UEFA Women's Champions League website (http://www.uefa.com/womenschampionsleague/index.html).
[c]Data came from the official FIFA website (http://www.fifa.com/fifa-world-ranking/ranking-table/women/index.html).
[b]Data came from the Women's Football Across The National Associations yearly reports, provided by UEFA

Table 2

Descriptive Statistics for Coach-Level Variables

Variables	Code or Range	Median	Mean (SD)	Valid % (n)	Missing % (n)	Included in HLM Model
Age	27–71	43.00	43.51 (9.95)	99.40 (159)	.60 (1)	Yes
Gender	0/1			100 (160)	0 (0)	Yes
Male	0			85.60 (137)	-	
Female	1			14.40 (23)	-	
Nationality status	0/1			100 (160)	0 (0)	Yes
Coaches team from outside native country	0			8.10 (13)	-	
Coaches team from native country	1			91.90 (147)	-	
Former professional player	0/1			68.10 (109)	31.90 (51)	No
Did not play as a professional	0			54.10 (59)	-	
Played as a professional	1			45.90 (50)	-	
Full national team playing experience	0/1			100 (160)	0 (0)	Yes
Did not play on full national team	0			86.90 (139)	-	
Played on full national team	1			13.10 (21)	-	
International playing experience	0/1			95.60 (153)	4.40 (7)	Yes
Did not play internationally	0			88.90 (136)	-	
Played in World Cup, Olympics, or Champions League	1			11.10 (17)	-	
Position as a player				45.00 (72)	55.00 (88)	No
Goalkeeper	0/1			13.90 (10)	-	
Defender	1			13.90 (10)	-	
Midfielder	1			43.10 (31)	-	
Forward	1			29.10 (21)	-	

Table #2 – continued

Variables	Code or Range	Median	Mean (SD)	Valid % (n)	Missing % (n)	Included in HLM Model
Coaching experience of a national team	0/1			94.40 (151)	5.60 (9)	Yes
Did not coach a youth/full national team	0			62.90 (95)	-	
Coached a youth/full national team	1			37.10 (56)	-	
Years coaching experience in Champions League	0–4	0.00	0.81 (1.00)	100 (160)	0 (0)	Yes
Time at current position	0–24	2.00	3.36 (4.51)	98.80 (158)	1.20 (2)	Yes

Table 3

Descriptive Statistics for Team-Level Variables

Variables	Range	Median	Mean (SD)	Valid % (n)	Missing % (n)	Included in HLM Model
Number of times team has qualified for Champions League	0 – 6	2.00	1.79 (1.56)	100 (160)	0 (0)	Yes
Number of times team has won Champions League	0 – 2	0.00	0.11 (.42)	100 (160)	0 (0)	Yes
Number of international players	0 – 15	4.00	4.40 (3.43)	99.40 (159)	.60 (1)	Yes
Number of players with national team experience	2 – 20	13.00	12.46 (3.85)	99.40 (159)	.60 (1)	Yes

Table 4

Descriptive Statistics for Country-Level Variables

Variables	Code or Range	Median	Mean (SD)	Valid % (n)	Missing % (n)	Included in HLM Model
FIFA world ranking	2 – 111	17.50	22.72	98.80 (158)	1.20 (2)	Yes
Total number of divisions	1 – 18	4.00	4.21 (2.06)	93.10 (149)	6.90 (11)	Yes
Number of teams in top division	5– 20	10.00	10.55 (2.60)	96.90 (155)	3.10 (5)	Yes
Number of registered female players[*]	100 – 117,100	14,140	21,287 (24,216)	93.80 (150)	6.20 (10)	Yes
Favorite team sport	0/1	-	-	96.20 (154)	3.80 (6)	Yes
Any sport other than football	0			40.30 (62)		
Football	1			59.70 (92)		
Budget for women's football[*]	51,600 – 18,370,000	2,500,000	3,953,011 (4,152,050)	95.60 (153)	4.40 (7)	Yes

Table 5

Multilevel Regression Estimates for the Null Unconditional Model

Fixed Effect	Coefficient	SE	*t*-Ratio	*p*-value
Intercept, γ_{00}	17.75	1.01	17.61	< .001
Random Effect	Variance	*df*	x^2	*p*-value
Intercept, u_0	3.69	68	84.12	.090
Level-1 effect, r_{ij}	57.53			
Reliability estimate for level-1= .19 Deviance 487.23; Number of estimated parameters = 2				

Table 6

Multilevel Regression Estimates for Two-Level Model A

Fixed Effect	Coefficient	SE	*t*-Ratio	*p*-value
Intercept, γ_{00}	14.25	6.63	2.15	.04
Age, γ_{10}	-0.01	0.10	-0.14	.90
Gender, γ_{20}	0.95	4.85	0.20	.85
Nationality status, γ_{30}	6.10	5.33	1.15	.26
Full national team playing experience, γ_{40}	1.50	5.11	0.29	.77
Coaching experience of a national team, γ_{50}	4.38	2.48	1.77	.08
International playing experience, γ_{60}	-4.30	3.91	-1.10	.28
Years coaching experience in Champions League, γ_{70}	-4.29	1.58	-2.71	.01
Time at current position, γ_{80}	-0.04	.37	-0.11	.91
Random Effect	Variance	*df*	x^2	*p*-value
Intercept, u_0	3.43	68	72.35	.34
Level-1 effect, r_{ij}	57.35			
Reliability estimate for level-1= .17 Deviance = 453.24; Number of estimated parameters = 2				

Table 7

Multilevel Regression Estimates for Two-Level Model B

Fixed Effect	Coefficient	SE	*t*-Ratio	*p*-value
Intercept, γ_{00}	20.02	1.32	15.16	< .001
Years coaching experience in Champions League, γ_{10}	-3.63	1.46	-2.49	.015
Random Effect	Variance	*df*	x^2	*p*-value
Intercept, u_0	3.53	68	82.62	.109
Level-1 effect, r_{ij}	53.59			
Reliability estimate for level-1 = .19 Deviance = 476.77; Number of estimated parameters = 2				

Table 8

Multilevel Regression Estimates for Two-Level Model C

Fixed Effect	Coefficient	SE	*t*-Ratio	*p*-value
Intercept, γ_{00}	24.56	1.43	17.23	< .001
Number of times team has won Champions League, γ_{01}	-7.13	1.83	-3.89	< .001
Number of international players, γ_{02}	-1.08	0.25	-4.26	< .001
Years coaching experience in Champions League, γ_{10}	-2.90	1.37	-2.12	.038
Random Effect	Variance	*df*	x^2	*p*-value
Intercept, r_0	9.24	66	80.15	.113
Level-1 effect r_{ij}	39.64			
Reliability estimate for level-1= .19 Deviance = 451.28; Number of estimated parameters = 2				

Table 9

Multilevel Regression Estimates for Three-Level Model D

Fixed Effect	Coefficient	SE	*t*-Ratio	*p*-value
Intercept, γ_{000}	21.85	1.53	14.25	< .001
FIFA world ranking, γ_{001}	0.09	0.03	3.03	.005
Number of times team has won Champions League, γ_{010}	-5.79	1.87	-3.10	.004
Number of international players, γ_{020}	-1.25	0.25	-4.99	< .001
Years coaching experience in Champions League, γ_{100}	-0.81	1.49	-0.54	p >.05
Random Effect Level-3	Variance	*df*	x^2	*p*-value
Intercept 1/Intercept 2, u_{00}	1.80	32	37.52	.23
Reliability estimate for level-1 = .99				
Reliability estimate for level-2 = .12				
Deviance = 215.20; Number of estimated parameters = 7				

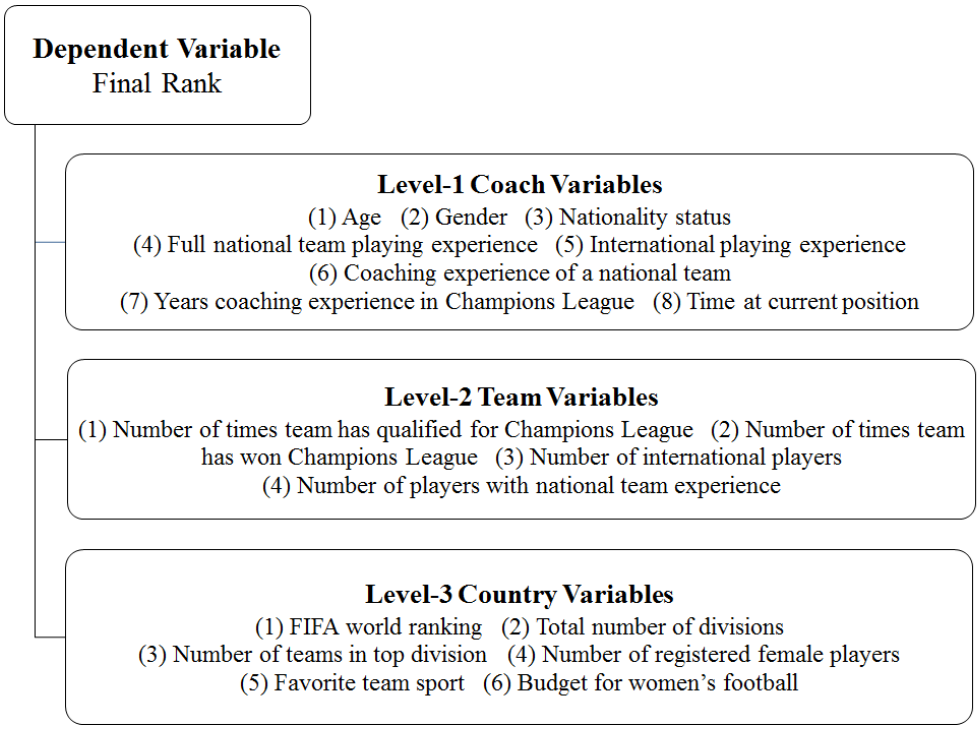
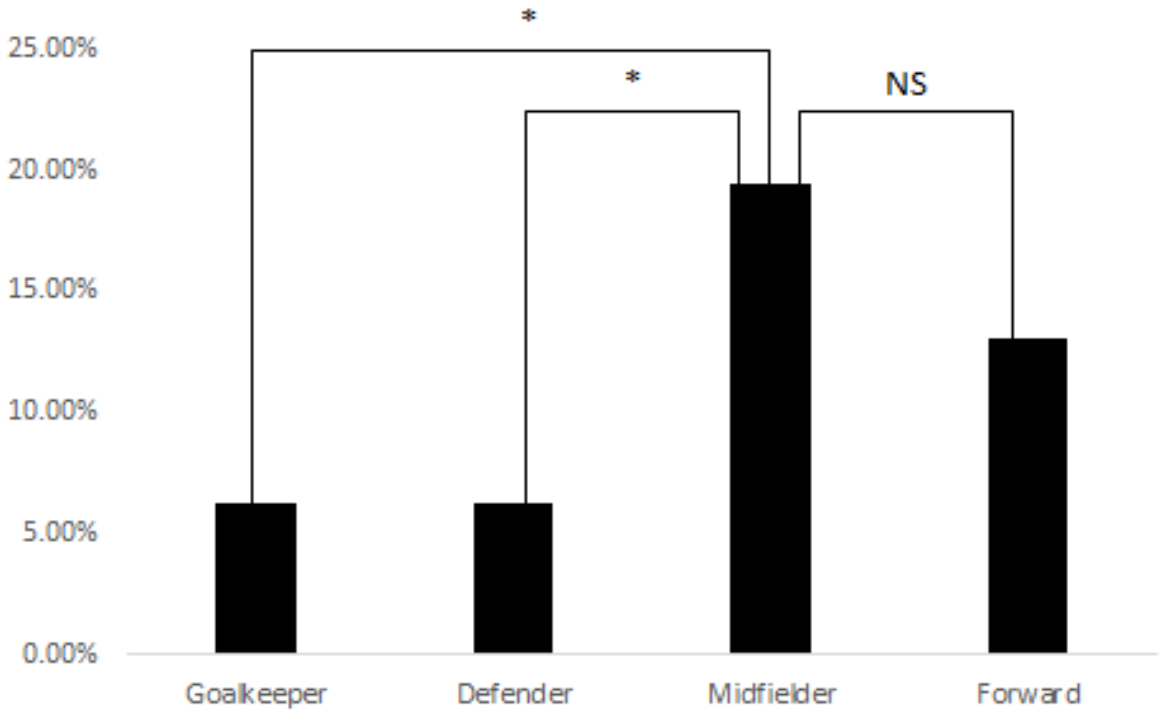


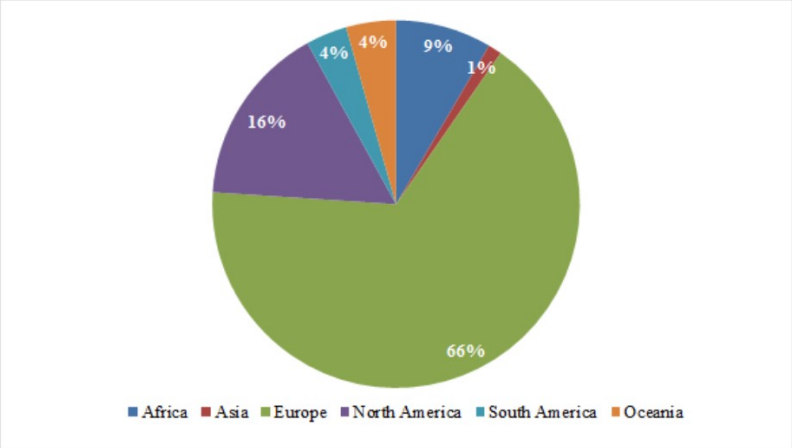
Figure 1. *Summary of variables included in the hierarchical linear modeling analysis.*



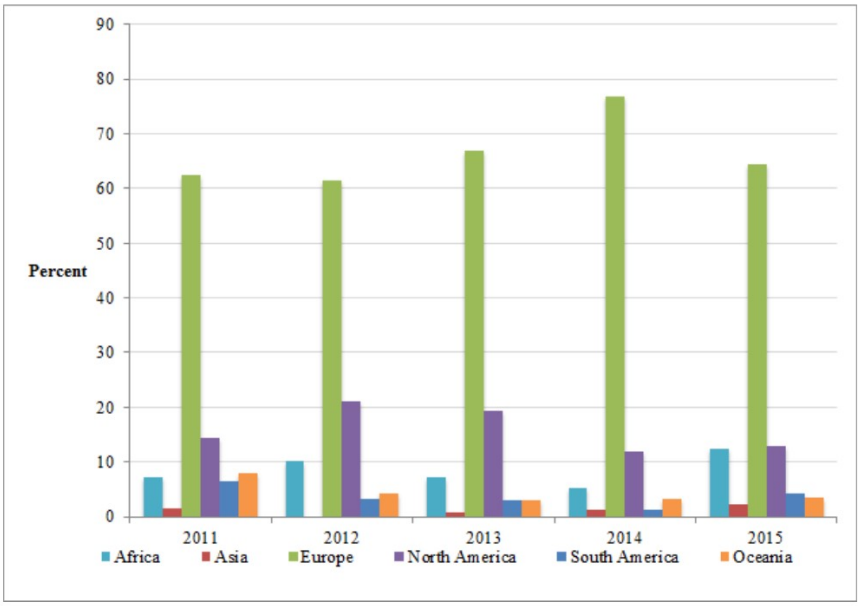
Note. *$p < .01$

Figure 2. *Playing position of coaches.*

Panel A



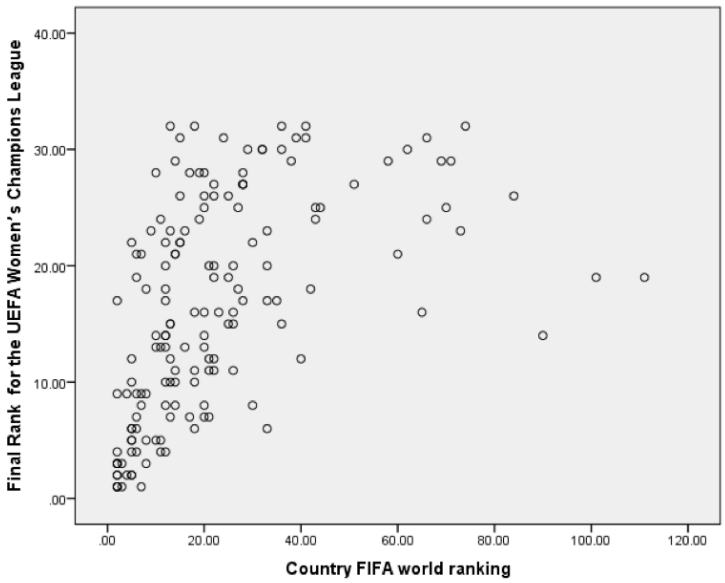
Panel B



1072

1073 ***Figure 3.*** *Overall proportion of international players per continent competing in the UEFA*
1074 *Women's Champions League from 2011-12 to 2015-16 (Panel A). Proportion of international*
1075 *players per continent by year (Panel B).*
1076

Panel A



Panel B

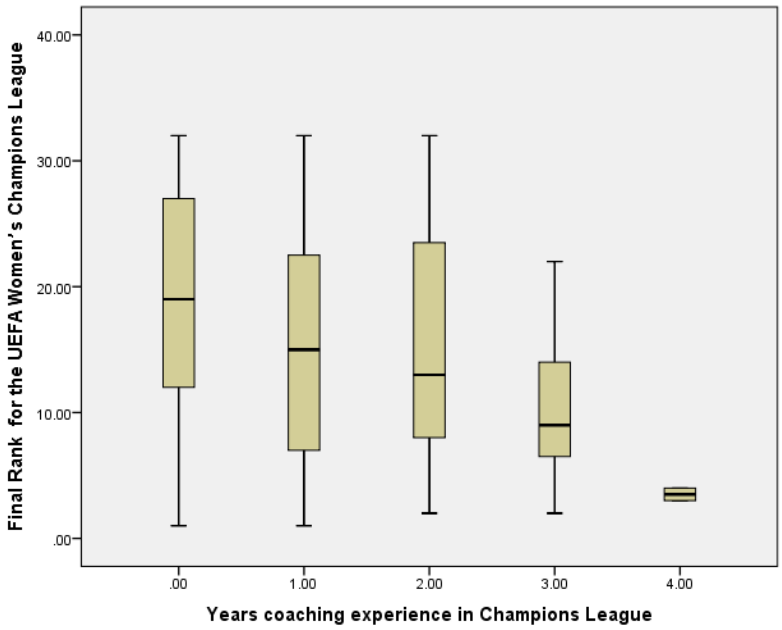


Figure 4. *Relationship between country FIFA world ranking and final rank for the UEFA Women's Champions League (Panel A). Relationship between years coaching experience in Champions League and final rank for the UEFA Women's Champions League (Panel B).*

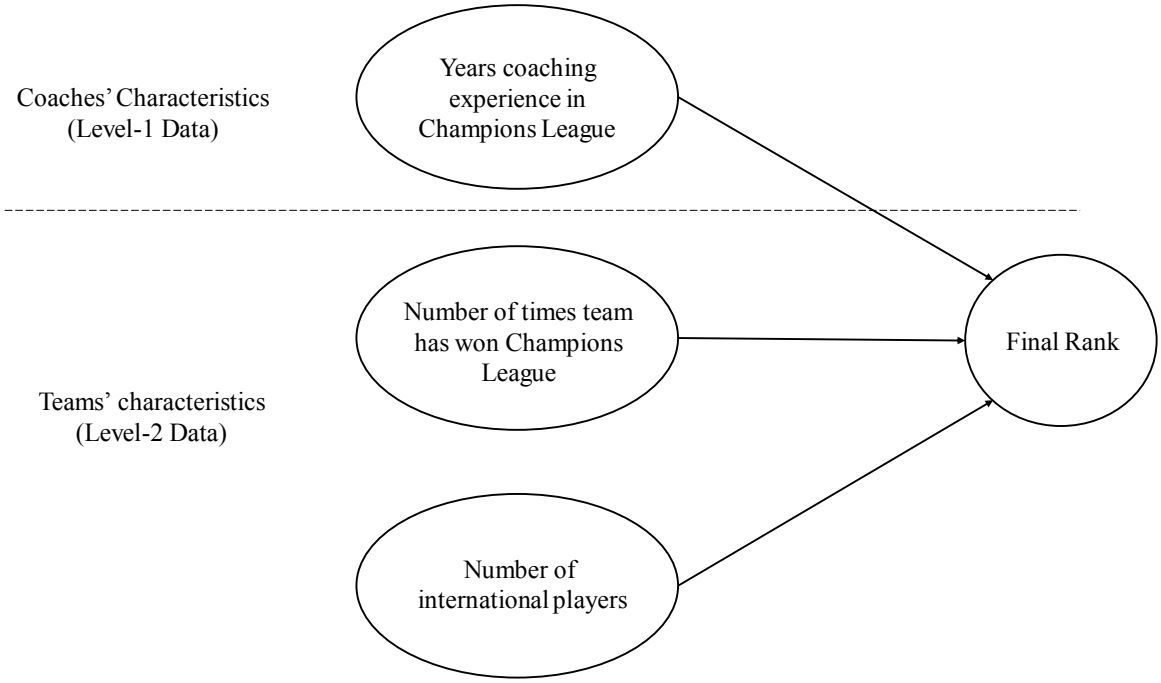


Figure 5. *Final multi-level model of coaching and team characteristics associated with performance at the UEFA Women's Champions League.*