Journal of Athlete Development and Experience

Volume 1 | Issue 2 Article 2

August 2019

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Recommended Citation

Gellock, Jennifer L.; Ekholm, Eric; Greenhalgh, Gregory P.; LeCrom, Carrie W.; Reina, Christopher S.; and Kudesia, Ravi S. (2019) "Women's Lacrosse Players' perceptions of teammate leadership: Examining athlete leadership behaviors, attributes, and interactions," *Journal of Athlete Development and Experience*: Vol. 1 : Iss. 2 , Article 2.
DOI: https://doi.org/10.25035/jade.01.02.02
Available at: https://scholarworks.bgsu.edu/jade/vol1/iss2/2

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Cover Page Footnote

Women's Lacrosse Players' perceptions of teammate leadership: Examining athlete leadership behaviors, attributes, and interactions Jennifer L. Gellock, Eric Ekholm, Gregory P. Greenhalgh, Carrie LeCrom, Christopher S. Reina, Virginia Commonwealth University, Richmond, VA Ravi S. Kudesia Temple University, Philadelphia, PA

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A B S T R A C T

Athletes fulfill both on the field (task) and off the field (social) team roles. For this reason, recent research on athlete leadership has concluded there is no one best type of athlete leader. In the current study, role differentiation theory was applied to investigate how peers perceive teammate leadership roles and behaviors of one women's lacrosse program at a NCAA Division I university. Each player (N = 30) participated in a survey in which they were tasked with rating every teammate on the following leadership behaviors: technical, interpersonal, and contagious energy. Individual player attributes also were considered in the analysis of a cross-classified nested model that resulted in 870 total ratings that predicted overall athlete leadership. Results suggest behaviors of technical, interpersonal, and contagious energy all impact the perception of teammates' overall leadership. Practical implications for how coaches and athletes can leverage both on-field and off-field leadership behavior development is discussed.

Keywords: Athlete Leadership, Leadership Behaviors, Role Differentiation, Women's Lacrosse

Since 1982, participation rates for collegiate women's lacrosse have more than tripled. According to the National Collegiate Athletic Association (NCAA), total player participation numbers have increased from 2,648 to 12,061, and the total number of teams has increased from 105 to 505 (NCAA, 2018a). While it is evident the participation rates of women's lacrosse are growing exponentially at universities across the United States, little sport-specific research has been conducted among this population of student-athletes. Because women's lacrosse is a growing and emerging sport, its athletes' unique characteristics may create differing college experiences than other student-athletes. In a thorough search of college athletic-related research, the only articles focusing solely on the women's lacrosse population are related to injury and equipment. Yet, women's lacrosse is one of the fastest growing NCAA sports (Errington, 2015), so it would serve scholars and practitioners well to know more about athletes competing in this sport.

In addition, one mission of the NCAA focuses on fostering the personal development of student-athletes. Hence, examining the development of leadership behaviors of players would be beneficial to help support that mission, as those behaviors can extend beyond the playing field. Due to the lack of knowledge on women's lacrosse players and the desire for assessing leadership characteristics among this population, the purpose of the study was to examine perceptions of teammate overall leadership among Division I women's lacrosse players.

It is no secret that players can have significant leadership influence over one another (Loughead, Hardy, & Eys, 2006). For this reason, research on sport leadership over the last few decades has evolved from examining solely coach driven leadership to a more holistic team leadership approach (Chelladurai & Riemer, 1998; Cotterill & Fransen, 2016), and even specifically to individual athlete leadership. Athlete leadership historically has been difficult to measure due to the lack of a central definition, which Loughead and colleagues (2006) attempted to remedy, defining athlete leadership as "an athlete occupying a formal or informal role within a team who influences a group of team members (i.e., a minimum of two team members) to achieve a common goal" (p. 144). Team cohesion, performance, and player satisfaction are among some of the desired team outcomes researchers have linked to athlete leadership (Crozier, Loughead, & Munroe-Chandler, 2013; Loughead et al., 2016; Price & Weiss, 2013). A sport such as women's lacrosse, in its early development phase, may be a good avenue for understanding teammate leadership emergence and how to best leverage intangible player leadership behaviors to gain a competitive advantage both on and off the field of play.

Both task and social player roles can significantly impact peer perceptions of overall leadership behavior. For example, one player could be perceived as a leader on the field because of his or her starter status, playing time, and ability to score goals. While other teammates are perceived as a leader for their relationship skills and ability to maintain peace in the locker room or willingness to lend a listening ear. Student-athletes who possess both social and task leadership behaviors have been found to receive more positive reviews of their leadership ability from peers (e.g., Bucci, Bloom, Loughead, & Caron, 2012; Fransen et al., 2015a). However, it is unknown which behaviors best determine

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teams' top leaders. Personal player attributes also can influence teammate leadership perceptions. Being a starter, a captain, or the longer one has been on a team all have been found to influence leadership perceptions (Cotterill & Fransen, 2016).

Acknowledging the lack of data on women's lacrosse players, the goal of the NCAA to holistically develop the athlete, and the need to better understand leadership within players on a team specifically, the current study fills these gaps by examining perceptions of teammate overall leadership, with a specific focus on role differentiation theory as a guiding principle. This information could prove valuable to coaches and administrators alike, who are constantly trying to gain a better understanding of student-athletes. Ultimately, when coaches have a better comprehension of how perceptions of players among their team view leadership, they will be able to help players develop in those areas, which may contribute to both on-field and off-field results and experiences. Hence, both leadership behaviors and player attributes were used to develop the following research questions to guide the current study:

RQ1) Do athlete leadership behaviors of technical skill, interpersonal skill, and contagious energy predict overall leadership?

RQ2) Do player attributes of formal leadership status, team tenure, and starter status predict perceptions of overall leadership?

RQ3) Do player attributes moderate the relations between athlete leadership behaviors and perceptions of overall leadership?

Review of Literature

Role Differentiation Theory

Role differentiation theory was applied as the guiding framework to aid in the investigation of the perceived leadership behaviors of athletes. In the sport context specifically, role differentiation theory similarly has been applied to group dynamics and athlete leadership research to examine athlete roles on a team. Bales and Slater (1955) conducted the seminal work on role differentiation theory dates and posited that group members can serve two different leadership roles: adaptive-instrumental or integrative-expressive.

Adaptive-instrumental leaders serve as leaders who are focused on the accomplishment of group tasks and goals. Leaders in these roles primarily are concerned with the development of the group's technical skill. Conversely, integrative-expressive leaders are focused on the social orientation of the team and primarily are concerned with building relationships among group members. For example, Rees (1983) found that athletes who were perceived by their teammates as the best overall leaders were rated highly by their teammates in both expressive (social) and instrumental (task) leadership roles. Rees and Segal (1984) further validated the integration of both the task and social roles while also noting that some players can specialize in either one role or the other. Additionally, Todd and Kent (2004) found that players perceived ideal team leaders as having both task and social leadership behaviors that correspond to fulfilling a task or social role. The previous studies that have applied role differentiation theory in similar research justified the inclusion of examining both task and social athlete leadership behaviors in the current study.

Athlete Leadership

Most sports teams follow a top-down leadership structure, with head coaches at the top, followed by the coaching staff, then appointed players with formal leadership titles (i.e. captains), and finally the rest of the team. Due to this hierarchical structure, examining the coach's leadership behavior has been a traditional approach to understanding team structure and leadership (Becker, 2009). Chelladurai's Multidimensional Model of Leadership as well as the Leadership Scale for Sports have been the most widely used model and scale, respectively, in understanding a coach's leadership behavior and his or her leadership influence on teams (Chelladurai, 1990; Chelladurai & Saleh, 1980). Coach leadership behavior has been found to positively influence outcomes such as team efficacy, athlete satisfaction, and team cohesion (Kao & Tsai, 2016; Price & Weiss, 2013).

While a coach's influence has been found to be impactful, recent research on athlete leadership has pivoted from the examination of the hierarchical leadership structure toward a more holistic team influence of peer leadership. In the authors' summative review on athlete leadership, Cotterill and Fransen (2016) described how scholars have started to represent athlete leadership by examining all players and not just coaches. Multiple scholars have posited that athlete leaders, both formal and informal, have a positive impact on desired team outcomes such as cohesion, performance, effectiveness, and overall player satisfaction (e.g., Crozier et al., 2013; Fransen, Delvaux, Mesquita, & Van Puyenbroeck, 2018; Loughead et al., 2016; Pearce & Sims, 2000). For this reason, scholars who examine athlete leadership have been guided toward the notion that there is no one best type of leader on or off the field.

Cotterill and Fransen (2016) concluded that leadership is shared among all members of a team: coaches, team captains, and informal leaders. Shared peer leadership has been found to directly impact team dynamics. For example, Crozier et al. (2013) found that in an ideal situation, 85% of the team should take on leadership roles, and this large percentage of the team will have a positive impact on the team's structure, cohesion, team processes, and peer communication. Ultimately, Fransen and colleagues (2015a) concluded the more athlete leaders on a team the better. For these reasons, the current study examined the perceptions of all teammates rather than only those who hold formal leadership titles like that of a captain.

Athlete Leadership Roles and Behaviors

Players who assume social roles are important components of a team's leadership structure. These players are able to leverage their interpersonal skill and have been found to be perceived as better peer leaders (Dupuis, Bloom, & Loughead, 2006; Holmes, McNeil, & Adorna, 2010; Price & Weiss, 2013). As an example, Holmes et al. (2010) conducted focus groups with athletes and found that both male and female athletes preferred team leaders who are vocal, trustworthy, lead by example, are good role

models, and possess good interpersonal skill. Additionally, Fransen et al. (2015a) used social network analysis and found the more players felt connected to a particular player, the greater his or her perceived overall leadership ability.

While social roles seem to be an important piece to the athlete leadership puzzle, task roles also hold importance. Moran and Weiss (2006) found coaches' perceptions of who the team leaders were was based solely on the player's task ability, while teammates conversely considered a player's social roles as well. Meanwhile, self-ratings showed both task ability and social role behaviors (e.g., peer acceptance and friendship quality) related to their perceived leadership abilities.

Outside of the context of athlete leadership, organizational behavior scholars also have examined leadership behaviors. Recently, scholars have begun to investigate behavioral energy as an important characteristic that has a positive leadership impact on work teams (Müceldili & Erdil, 2015). Collins (2004) describes how focused, high solidarity groups, draw emotional strength developed through collective group energy. This organizational theory can be translatable to sport teams. To this point, Müceldili and Erdil (2015) analyzed team members' roles of, "feeling energetic, alive, inspiring, and fully functioning" (p. 517) and their impact on team cohesiveness and cooperation. The authors found a positive association between collective energy and team cohesiveness. This is an important concept because team cohesion has been found to be a positive predictor of team performance both inside and outside the context of sport teams (Dobersek, Gershgoren, Becker, & Tenenbaum, 2014; Salas, Grossman, Hughes, & Coultas, 2015).

While there is evidence to suggest athletes can serve in multiple roles and be looked to by his or her teammates for these different roles, there is limited research on which type of behaviors are perceived as being attributed to overall leadership. Within the athlete leadership literature on role differentiation, technical skill and interpersonal skill have been found to impact overall leadership, while the business literature has pointed to contagious energy as an influential behavior of team leaders. These perceived roles were used as the behaviors predicting a player's overall leadership and guided the first research question.

Athlete Leadership Attributes

To determine a team member's role, often times both behaviors and individual attributes are examined. Attributes are identifiers that are used to describe a player's status on a team. Common attributes used to find who is seen as an athlete leader are captainship, starter status, playing position, and tenure on the team (Bucci et al., 2012; Klonsky, 1991; Loughead et al., 2006). These attributes are an evolving part of a player's identity.

Players who hold formal leadership titles, such as a captain, are often designated by the coaching staff or voted upon by teammates. For this reason, players with formal leadership titles are seen as an extension of the coaching staff (Dupuis et al., 2006) and have been found to be looked to by his or her teammates as better peer leaders (Loughead et al., 2006). However, this may not always be the case. Research on athlete leadership has started to acknowledge the importance of informal leaders on a team (e.g., Fransen, Decroos, Broek, & Boen, 2016; Loughead & Hardy, 2005). Informal leaders hold no formal title but still can exude either positive or negative influence over his or her teammates (Cope, Eys, Schinke, & Bosselut, 2010; Loughead et al., 2006). They therefore can acquire or lose the respect of their teammates through his or her informal interactions.

Tenure status and starter status are two additional attributes often used to define athlete leaders. Players who have been on the team the longest have a longer tenure status. The more experience a player has the more he or she is typically looked at as having better leadership qualities (Fransen et al., 2015a). As an example, Bucci et al. (2012) found that one way coaches selected athlete leaders was by the players' tenure, as older players had more playing experience compared to younger players on the team. Additionally, players who are starters are perceived to be leaders due to their perceived task ability. As a combination of athlete attributes, Fransen et al. (2015a) found team tenure, captaincy (formal leadership), and playing time all to have an impact on player's perceptions of their teammates' overall leadership. The literature on player attributes guided the development of the second research question.

Based on findings in the existing literature, it is possible that player attributes impact the relations between behaviors and perceptions of overall leadership. For example, contagious energy may be more predictive of leadership perceptions in captains compared to non-captains, or technical skill may be more predictive of leadership perceptions in starters compared to non-starters. For those reasons, research question three explored these interactions.

Method

Sample and Procedure

This study was part of a larger project aimed at better understanding the experiences of team members of a newly-formed NCAA Division I women's lacrosse program at a mid-Atlantic university. Therefore, we employed a purposeful sampling strategy to recruit members of this specific team to participate in the study, through direct contact with the coaches, then the athletes. All recruitment and study activities were approved by the university's Institutional Review Board.

The context of the team's make-up is important to consider for athlete leadership emergence. This team's inaugural season was the 2015-2016 season. The NCAA Division I Manual (2018b) states athletes get a five-year period to participate in four years of competition. So, if for any reason a student-athlete misses a season of play athletically, he or she has the opportunity to make it up – but the athlete still moves forward in academic standing. Athletes who miss their freshman year of athletic competition are then referred to as red-shirt freshman during their second year of academics, but the first year of collegiate athletic competition. Hence, most established teams could have eight classifications of player tenure (freshman, red-shirt freshman, sophomore, red-shirt sophomore etc.). However, due to the fact that the team within the current study had just completed their second official season, there were no juniors/red-shirt juniors or seniors/red-shirt seniors. This study was able to specifically look at tenure status for

underclassmen only, truncating the effects of player status on the outcome variables. Team members were sent an online survey, created and distributed in Qualtrics survey software, in August of 2017 (the team's post-season). Each of the 30 players on the team ($N = 30$) completed the survey fully, resulting in a 100% response rate. Player demographics can be found in Table 1.

Table 1.

Player Demographics

	N	%
Starter	14	46.67
Captain	2	6.67
Squad Leader	4	13.3
Freshman	10	33.3
Redshirt Freshman	1	3.33
Sophomore	14	46.67
Redshirt Sophomore	5	16.67

$N = 30$

Measures

Perceptions of Leadership Behaviors: To measure athlete perceptions of their teammates' leadership behaviors, every player rated their peers similar to a social network measurement tool. Fransen et al. (2015a) surveyed each athlete asking them to rate each teammate from 0 (*very poor leader*) to 4 (*very good leader*) on a five-point Likert scale. The current study adopted this measure so that each athlete on the team was tasked with responding to the following prompts about each of their respective teammates: "Please indicate the extent to which you agree with the following statement about "name of teammate": "Our team relies on her for leadership," "Our team relies on her for her contagious energy," "Our team relies on her for her technical skills," and "Our team relies on her for her interpersonal skill."" Perceptions of team members' overall leadership, contagious energy, technical skill, and interpersonal skill all were measured on a 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*). All 30 players rated each of her 29 teammates on these four traits. Additional player attribute data also was collected as described below. These other variables (captain, squad leader, tenure, and starter status) all have been found to impact perceptions of leadership. These variables were defined as follows:

Captain Status: Titles of captain were assigned by the coaching staff prior to the beginning of the regular season.

Squad Leader Status: Titles of squad leaders were assigned after team members voted prior to the beginning of the regular season.

Tenure Status: Tenure status was assigned by athletic eligibility: true freshman, redshirt freshman, sophomore, and redshirt sophomore.

Starter Status: Starter status was assigned by "starter" or "non-starter" which was provided via a list from the coaching staff.

Data Analysis

A cross-classified multilevel modeling technique was used to analyze the data. According to Hox, Moerbeek, and Van de Schoot (2017) "not all multilevel data are purely hierarchical" (p. 171). For this reason, it was appropriate to use for this study, as each participant rated all of her teammates' leadership behaviors, and each participant was in turn rated on her leadership behaviors by all of her teammates. This resulted in a data structure in which all 870 leadership ratings were cross-classified by two nonhierarchical factors: rater (i.e. the person completing the rating) and ratee (i.e. the person being rated). Given these dependencies, the research team opted to fit several cross-classified random effects multilevel models (Moreno, Harwell, Guzey, Phillips, & Moore, 2016; Rabe-Hesketh & Skrondal, 2008).

As is the case with more typical hierarchical multilevel models in which lower-level observations are nested within a single higher-level cluster, cross-classified multilevel models allow researchers to account for dependencies within a dataset. However, unlike these hierarchical models, cross-classified models allow for observations to be nested within, or dependent upon, any combination of nonhierarchical higher-level factors. In this study, fitting cross-classified models allowed the researchers to account for the influence that factors unique to a given rater and a given ratee had on leadership ratings. For instance, some team members may rate everyone harder than another team member; our analysis accounted for these differences. Additionally, including random effects in these models allowed the researchers to estimate the amount of variance in each random parameter attributable to a given rater or ratee.

Models were built in several steps. First, the research team estimated an unconditional model with ratings nested within raters and ratees. This model included random intercepts for raters and ratees without any additional explanatory variables. Doing so allowed the researchers to calculate intraclass correlation coefficients (ICCs) for each higher-level factor, which provide an estimate of the proportion of the total variance in overall leadership ratings (outcome variable) that can be attributed to raters and ratees (Rabe-Hesketh & Skrondal, 2008; Raudenbush & Bryk, 2002). In these models, ICCs describing the proportion of the total variance attributable to the rater factor (ρ_{rater}) and the proportion of the total variance attributable to the ratee factor (ρ_{ratee}) are calculated using the following formulas:

$$\rho_{rater} = \frac{\psi_1}{\psi_1 + \psi_2 + \sigma^2}$$

$$\rho_{ratee} = \frac{\psi_2}{\psi_1 + \psi_2 + \sigma^2}$$

In these models, ψ_1 represents variance attributable to the rater factor, ψ_2 represents variance attributable to the ratee factor, and σ^2 represents residual variance at the observation (rating) level. In other words, the current study utilized a statistical procedure to account for the impact that both the teammate doing the rating and the teammate being rated had on each of the leadership variables. By doing this, the results are a purer reflection of how influential

each of the predictors (technical skill, interpersonal skill, and contagious energy) are on perceptions of overall leadership. This accounts for the bias that may exist within a given teammate rater and ratee (i.e., this helps control for a situation where one teammate may be an overly harsh grader or another teammate may not be well liked).

Next, researchers fit a series of models to estimate the influence of several predictors on ratings of overall leadership behaviors. In all models, the researchers included random intercepts for the rater and ratee factors to account for dependencies within the ratings. No random slopes were included in any models. The model building procedure employed in this study follows guidelines similar to those recommended by Hox et al. (2017) and aligned with the research questions posed by this study. Model 1 included three rating-level behavioral predictors: technical skill, interpersonal skill, and contagious energy, and aligns with RQ1, which sought to investigate the extent to which these rating-level predictors are associated with overall leadership ratings.

In Model 2, all predictors from Model 1 were retained and ratee-specific predictors were added. These ratee-specific predictors were all dummy-coded variables that indicated a given ratee's starter status, captain status, squad leader status, and tenure on the team. The starter, captain, and squad leader variables were coded such that a 1 indicated a player was a starter, captain, or squad leader, whereas a 0 indicated that she was not. The tenure variables were modeled with true freshmen as the reference category. Model 2 aligns with RQ2, which sought to investigate the extent to which athlete characteristics predicted overall leadership ratings.

In Model 3, all predictors from Model 2 were retained and several interaction effects were added to examine the extent to which ratee-specific attributes might moderate the relations between specific leadership behaviors and overall leadership behaviors. For instance, including a starter-by-technical skill interaction allowed investigation of the extent to which technical skill might be a stronger (or weaker) predictor of overall leadership behaviors for starters and non-starters. Model 3 aligns with RQ3, which sought to investigate the extent to which athlete characteristics might interact with behavioral predictors to influence ratings of overall leadership. Model 2 is represented by the following Level 1 and Level 2 equations[1]:

Level 1 (Rating Level):

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}(Technical_{ijk)} + \pi_{2jk}(Interpersonal_{ijk}) + \pi_{3jk}(Contagious_{ijk)} + \varepsilon_{ijk}$$

Level 2 (Ratee and Rater Level):

$$\pi_{0jk} = \theta_0 + b_{00j} + c_{ook} + (\gamma_{01} + c_{01k})Starter_j + (\gamma_{02} + c_{02k})Captain_j + (\gamma_{03} + c_{03k})Squad_j + (\gamma_{04} + c_{04k})RedFresh_j + (\gamma_{05} + c_{05k})Soph_j + (\gamma_{06} + c_{06k})RedSoph_j$$

In these equations, Y_{ijk} is the overall leadership rating of the *i*th observation nested within ratee *j* and rater *k*, π_{0jk} is the mean overall leadership rating associated with ratee *j* and rater *k*, θ_0 is the grand mean overall leadership score, b_{00j} is the random intercept of ratee *j*, and c_{00k} is the random intercept of rater *k*. In general, parameters with a subscript *i* refer to those specific to an observation (rating), parameters with a subscript *j* refer to those specific to a ratee, and parameters with a subscript *k* refer to those specific to a rater. Gamma coefficients ($\boldsymbol{\gamma}$) capture the impact of Level 2 ratee covariates on the overall leadership rating means (i.e. intercepts) while accounting for differences between raters (captured in the *c* coefficients), and pi coefficients (π) capture the impact of Level 1 covariates on overall leadership ratings.

All models were fit in R using the lme4 package (Bates, Maechler, Bolker, & Walker, 2015), and ICCs were calculated using the sjstats package (Ludecke, 2018). Further, because there is some debate regarding how best to estimate *p*-values for parameter significance tests in multilevel models (e.g., Baayen, Davidson, & Bates, 2008), the lme4 package does not provide significance tests for fixed-effect parameters. Therefore, the researchers used the lmerTest package (Kuznetsova, Brockhoff, & Christensen, 2016) to test parameter significance in all models. However, readers may want to interpret these *p*-values with caution. In addition to these *p*-values, the researchers also present the *t*-statistics associated with each fixed parameter in all models. Generally, and particularly given the relatively large number of ratings in this study, parameters with *t*-statistics whose absolute value is greater than two can be considered significant, whereas parameters with *t*-statistics whose absolute value is less than two can be considered non-significant (Baayen, et al., 2008).

Results & Discussion

The current study extends the literature on peer leadership as it has been noted that athletes have a significant leadership influence on their teammates (Loughead et al., 2006). The current study accomplished this by evaluating leadership from the athletes' perspective as opposed to the traditional view of leadership coming unilaterally from a coach to a player (Chelladurai & Riemer, 1998; Cotterill & Fransen, 2016). The importance of this work has clear implications for athletic teams as both formal (coaches, captains) and informal (teammates) leaders have been found to impact team performance, effectiveness, and overall player satisfaction, consistent with what several other scholars have found (e.g., Crozier et al., 2013; Fransen et al., 2018; Loughead et al., 2016; Pearce & Sims, 2000).

Within the current study, descriptive statistics were initially estimated for all observations in the sample. These results indicate the average score for all of the leadership behaviors was above the midpoint of the scale, with average ratings of interpersonal skill (M = 4.29, SD = 1.37) being the highest and average ratings of overall leadership (M = 4.34, SD = 1.62) being the lowest. Full descriptive statistics are presented in Table 2.

[1] For simplicity, interaction effects are omitted. All interactions tested in Model 3 are presented in Table 3.

Table 2.
Descriptive Statistics for Behavioral Predictors

	Mean	SD	Min	Max
Overall Leadership	4.34	1.62	1	7
Technical Skill	4.92	1.48	1	7
Contagious Energy	4.96	1.36	1	7
Interpersonal Skill	5.29	1.37	1	7

$N = 870$ for all variables.

Yielding the call from Fransen et al. (2018) to incorporate multilevel modelling in the analysis of sport leadership and athlete development, and specifically paying heed to the comments of Moran and Weiss (2006) who noted that "who" does the rating has an impact on what behaviors predict an athlete leader, the current study was able to account for variance in overall leadership ratings that was attributable to the raters and ratees. Hence, the research team fit an unconditional model with random intercepts for raters and ratees. From this model, ICCs for both the rater and ratee factors were calculated. The results of these analyses indicate that the ICC for the rater factor was .17, and the ICC for the ratee factor was .34. This suggests that differences between raters accounts for roughly 17% of the variance in overall leadership ratings, and differences between ratees account for roughly 34% of the variance in overall leadership ratings. Results suggest that about 51% of the total variance in overall leadership ratings was due to these factors. In other words, the results indicated the variance associated with individual raters and individual ratees had a significant impact on results. Because both of these values are well above the recommended threshold of .05 at which accounting for dependencies is recommended (Raudenbush & Bryk, 2002), the research team proceeded with the cross-classified modeling approach. In other words, the current study was able to control for the fact that some teammates may be more stringent raters with respect to the factors assessed compared to the other raters (teammates) within the sample. Similarly, the study was able to account for unmeasured characteristics of players being rated by including random effects for ratees. By controlling for these factors, the results of the current study are more emblematic of the true leadership perspectives of the sample.

The first research question in the current study sought to investigate the extent to which behavioral predictors (technical skill, interpersonal skill, and contagious energy) were associated with ratings of overall leadership. In Model 1, which included only behavioral predictors (i.e., Level 1 covariates), technical skill ($\beta = .28$, $t = 9.3$), interpersonal skill ($\beta = .21$, $t = 6.4$), and contagious energy ($\beta = .27$, $t = 8.6$) all emerged as significant predictors of overall leadership. These behavioral predictors showed similar relations to overall leadership ratings in Model 2, which included athlete characteristics (e.g., starter, captain, squad leader, and tenure status) as ratee-level covariates; that is, technical skill ($\beta = .26$, $t = 9.2$), interpersonal skill ($\beta = .21$, $t = 6.7$), and contagious energy ($\beta = .28$, $t = 8.9$) once again emerged as highly significant predictors of overall leadership. Although the parameter estimates for technical skill and contagious energy were slightly larger than those of interpersonal skill, overlaps in the 95% confidence intervals of these parameter estimates in both Model 1 and Model 2 suggest that these regression weights are not significantly different from one another. Therefore, the results of these models suggest that, even after accounting for relevant athlete characteristics, ratings of technical skill, interpersonal skills, and contagious energy are about equally predictive of ratings of overall leadership. Because including interaction effects changes the interpretation of main effects, the results of Model 3 are not discussed in relation to RQ1. Results from all models are presented in Table 3 at the end of the paper.

Grounded in role differentiation theory, findings of the current study support the more contemporary work of Lewis (1972) who concluded while role differentiation exists, individuals can hold both task and social roles simultaneously as opposed to the seminal work of Bales and Slater (1955) and Slater (1955) who initially posited that a leader must take on one form or the other. Within the sport leadership context, the current study supports the work of Rees (1983) who found that the best leaders were those possessing both social and task leadership roles. Results of the current study could speak to those of Todd and Kent (2004) who found that athletes ranked the best leaders as those who served both in task and social roles. However, Moran and Weiss (2006) found coaches only assessed task ability when evaluating a player's overall leadership, while teammates took a more holistic approach including both task and social components of leadership. While this study did not directly investigate which roles athletes assumed, it did directly investigate task and social behaviors and found technical skill, interpersonal skills, and contagious energy all had an impact on perceptions of an athlete's overall leadership.

Perhaps the sex of the athletes impacted results, as Todd and Kent (2004) found technical leadership behaviors to be the most influential predictor of overall leadership in the authors' study of male athletes, and the current study found both technical and social leadership to significantly predict overall leadership. Because the current study only included female athletes, and Todd and Kent's (2004) study only included male athletes, it is difficult to make a comparison. But certainly, this warrants further investigation through a multi-gender study. Interestingly, the current study did not support the findings of Moran and Weiss (2006) who reported that female athletes' task ability, as perceived by their teammates and coaches, was the only type of leadership behavior to predict overall leadership. The current study did find technical skill to be a significant predictor of overall leadership, but contagious energy and interpersonal skills were equally impactful.

It is possible the competition level and age of players impacts leadership perceptions. Moran and Weiss (2006) sampled adolescent female soccer players ranging in age from 14-18 and presumably playing on a club team while the athletes in the current study were all NCAA DI student-athletes. These are questions that require further investigation. Perhaps, as athletes age or advance to higher levels of competition they begin to appreciate the social components of athlete leadership behaviors rather than only technical skill.

The second research question sought to investigate the extent to which ratee attributes (Level 2 covariates) – starter status, captain status, squad leader status, and team tenure – are related to ratings of overall leadership. The results of Model 2 suggest that captain status ($B = 1.33$, $t = 4.2$) and squad leader status ($B = .493$,

t = 2.5) significantly predicted ratings of overall leadership. Players who were designated captains earned, on average, overall leadership ratings that were 1.3 points higher (on a 1-7 scale) than players not designated as captains. Similarly, players designated as squad leaders earned, on average, overall leadership ratings that were .49 points higher than players not designated as squad leaders. Starter status did not emerge as a significant predictor of overall leadership in this model (B = -.12, t = -.86). Finally, sophomores tended to earn significantly higher ratings of overall leadership than did freshmen (B = .423, t = 2.98). Results of a likelihood ratio test comparing Model 1 to Model 2 indicated that Model 2 fit the data significantly better than did Model 1 [χ^2 (6, N = 870) = 29.19, p < .001]. This suggests that including ratee characteristics improved the model. Once again, because including interaction effects changes the interpretation of main effects, the results of Model 3 are not discussed in relation to RQ2.

These findings indicate that perceptions of overall leadership are significantly impacted by both behavioral predictors (technical skill, interpersonal skill, and contagious energy) and player characteristics (starter, captain, squad leader, and tenure status). Clearly, players' perceptions of general leadership are influenced by both official and unofficial designations of power (e.g., captaincy, squad leader, and start status) but also by the behaviors of the individuals. However, it is currently unknown if player characteristics and behavioral predictors compound together to influence perceptions of general leadership. The athletes within the current study clearly understand the importance of intangible leadership behaviors when evaluating their teammates as they perceived the players who were given more formal leadership roles (captains and squad leaders) higher on overall leadership, but starter status had no bearing on overall leadership. This also sends a very clear message to coaches looking to forge future leaders that they must attempt to develop the athlete as a person holistically and not spend all of their time honing the technical aspects of the game chasing wins. Since this study examined players' perceptions, further investigation is warranted to continue to compare coaches and athletes' perceptions of players' leadership.

Therefore, the third research question sought to investigate possible interactions between behavioral predictors and ratee characteristics. These were tested in Model 3, which included several interaction terms (see Table 3). None of the interaction terms included in Model 3 emerged as significant predictors of overall leadership ratings, which suggests that athlete attributes do not moderate the relations between ratings of behavioral predictors and ratings of overall leadership. Further, results of a likelihood ratio test comparing Model 2 to Model 3 indicate no significant difference in model fit between the two models [χ^2 (5, N = 870) = 6.04, p = .302], which also suggests that adding these interaction effects did not improve the fit of the model. Collectively, results indicated the characteristics of starter status, captain status, and squad leader status, had a significant impact on perceived overall leadership, yet, these characteristics did not significantly add or retract from the impact that ratings of technical skills, interpersonal skill, and contagious energy had on overall leadership.

Practical Implications

Findings from the current study provide insight into the fact that NCAA DI women's lacrosse athletes viewed general leadership as consisting of multifaceted inputs. In their eyes, to be a good leader requires more than technical skills. Technical skills within a sport are only really valuable on the field/court, but mastery of technical playing skills can build the tools and habits to master other job-related skills later in life. Contagious energy behaviors and interpersonal skill, similarly, easily can translate into a professional working career.

Crozier et al. (2013) indicated that the best functioning teams have 85% of their members taking on leadership roles. One could argue it is nearly impossible for 85% of a team to be relied upon, by their teammates or coaches, for their technical abilities as leaders. Hence, in order to have 85% of the team contributing to team leadership, coaches and players should consider that other factors such as interpersonal skill and contagious energy must be present and valued within the team culture with respect to leadership. Evidenced by the results in the current study, players sampled valued the non-task related forms of leadership. Therefore, with Crozier et al.'s (2013) notion in mind, a coach looking to build a high-functioning team must establish a culture where interpersonal skill and contagious energy are viewed as valuable teammate assets just as much as technical proficiency. In other words, coaches would be wise to create a culture where actions not documented on a scoresheet are recognized and praised just as much as actions such as goals, assists, or saves.

Keeping consistent with the view that it is important for coaches to praise all types of leadership skills, these findings suggest that coaches may be wise to appoint captains that exhibit skills that are not necessarily only task oriented. Specifically, findings from the current study indicated that the inclusion of player characteristics, such as starter status, captain status, squad leader status, and team tenure, impacted teammate perceptions of overall leadership. Perhaps selecting a non-starter, or a player who lacks the technical proficiencies of their peers as a captain but thrives in either interpersonal skill or contagious energy would send a very clear message that these types of leadership skills also are highly valued. Specifically, Muceldili and Erdil (2015) found team cohesion to be significantly impacted by contagious energy supporting the need to reward this type of leadership behavior.

Limitations and Future Research

The current study was not without its limitations. The current study used one team, which was also a relatively new program that had yet to graduate any players. Team specific contexts, such as winning percentage, also were not taken into account. Specifically, the team studied here had a winning percentage the previous season of .41. One question to consider is, would the players have valued task leadership behaviors more if the team performed better on the field of play? While this is a limitation of the current study, future researchers may expand this assessment by strategically including teams with varying winning percentages to determine if on-field/court success impacts players' perceptions of leadership.

While this provided an interesting view of emerging athlete leadership on a new team, the findings may not be completely generalizable to more established teams. The fact that this was a team sport setting also means these findings are not likely generalizable to individual sport settings. As noted in the review of literature, the sample was 100% female; future research investigating gender-specific versus mixed-gender sports (e.g., track and field) may yield interesting findings. Finally, leadership setting was not assessed. Respondents simply were asked how much the team relied on each player for each of the three leadership behaviors (technical, interpersonal, and contagious energy). What is not known is the context in which raters envisioned the ratee. This is especially important for interpersonal and contagious energy leadership behaviors. Were the raters envisioning these behaviors only during team sanctioned activities (games, practices, weight training)? Or, were raters environing how each of their teammates demonstrated interpersonal and contagious energy behavior away from team sponsored events? Future research on this paradigm could provide valuable insight.

Finally, a logical extension to this research would be to better understand the optimal collection of teammates who exhibit strengths in each of these three areas. How much of a team needs to be strongest at interpersonal behaviors versus contagious energy or technical behaviors? Is there an optimal blend? Is there a minimum threshold for each behavior that significantly impacts overall team chemistry and performance? These and other directions would provide further valuable insight into team leadership.

References

Baayen, R. H., Davidson, D. J., & Bates, D. M. (2008). Mixed-effects modeling with crossed random effects for subjects and items. *Journal of Memory and Language*, *59*, 390-412.

Bales, R. F., & Slater, P. E. (1955). Role differentiation in small decision-making groups. In T. Parsons, & R. F. Bales (Eds.), *Family, socialization and interaction process*, (pp. 259-306), Glencoe, IL: Free Press.

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*, 1-48.

Becker, A. J. (2009). It's not what they do, it's how they do it: Athlete experiences of great coaching. *International Journal of Sports Science & Coaching*, *4*, 93-119.

Borgatta, E. F., Bales, R. F., & Couch, A. S. (1954). Some findings relevant to the great man theory of leadership. *American Sociological Review*, *19*, 755-759.

Bucci, J., Bloom, G. A., Loughead, T. M., & Caron, J. G. (2012). Ice hockey coaches' perceptions of athlete leadership. J*ournal of Applied Sport Psychology, 24*, 243–259.

Chelladurai, P. (1990). Leadership in sports: A review. *International Journal of Sport Psychology, 21*, 328-354.

Chelladurai, P., & Riemer, H. A. (1998). Measurement of leadership in sport. In J.L.Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp. 227-253) Morgantown, WV: Fitness Information Technologies.

Chelladurai, P., & Saleh, S. D. (1980). Dimensions of leader behavior in sports: Development of a leadership scale. *Journal of Sport Psychology*, *2*, 34-45.

Collins, R. (2004). *Interaction ritual chains*. Princeton, NJ: Princeton University Press.

Cope, C. J., Eys, M. A., Schinke, R. J., & Bosselut, G. (2010). Coaches' perspectives of a negative informal role: The 'Cancer' within sport teams. *Journal of Applied Sport Psychology*, *22*, 420-436.

Cotterill, S. T., & Fransen, K. (2016). Athlete leadership in sport teams: Current understanding and future directions. *International Review of Sport and Exercise Psychology*, *9*, 16-133.

Crozier, A. J., Loughead, T. M., & Munroe-Chandler, K. J. (2013). Examining the benefits of athlete leaders in sport. *Journal of Sport Behavior*, *3*, 346-364.

Dobersek, U., Gershgoren, L., Becker, B., & Tenenbaum, G. (2014). The cohesion–performance relationship in sport: a 10-year retrospective meta-analysis. *Sport Sciences for Health*, *10*, 165-177.

Dupuis, M., Bloom, G. A., & Loughead, T. M. (2006). Team captains' perceptions of athlete leadership. *Journal of Sport Behavior, 29*, 60.

Errington, L. (2015). NCAA Report: Lacrosse is fastest growing college sport. *USA Lacrosse.* Retrieved from http://lauderdalelacrosse.com/ncaa-report-lacrosse-is-fastest-growing-college-sport/

Fransen, K., Decroos, S., Broek, G. V., & Boen, F. (2016). Leading from the top or leading from within? A comparison between coaches' and athletes' leadership as predictors of team identification, team confidence, and team cohesion. *International Journal of Sports Science & Coaching, 11*, 757-771.

Fransen, K., Delvaux, E., Mesquita, B., & Van Puyenbroeck, S. (2018). The emergence of shared leadership in newly formed teams with an initial structure of vertical leadership: A longitudinal analysis. *The Journal of Applied Behavioral Science, 54*, 140-170.

Fransen, K., Van Puyenbroeck, S., Loughead, T. M., Vanbeselaere, N., De Cuyper, B., Broek, G. V., & Boen, F. (2015). The art of athlete leadership: Identifying high-quality leadership at the individual and team level through social network analysis. *Journal of Sport & Exercise Psychology, 37,* 274-290.

Gallo, C. (2016, November). Hall of fame QB Steve Young on leadership, character and conviction. *Forbes*. Retrieved from https://www.forbes.com/sites/carminegallo/2016/11/02/hall-of-fame-qb-steve-young-on-leadership-character-and-conviction/#8865a6e1d7fa

Holmes, R. M., McNeil, M., & Adorna, P. (2010). Student athletes' perceptions of formal and informal team leaders. *Journal of Sport Behavior, 33*, 442–465.

Hox, J. J., Moerbeek, M., & Van de Schoot, R. (2017). *Multilevel analysis: Techniques and applications*. Routledge.

Kao, S. F., & Tsai, C. Y. (2016). Transformational leadership and athlete satisfaction: the mediating role of coaching competency. *Journal of Applied Sport Psychology*, *28*, 469-482.

Klonsky, B. G. 1991. Leaders' characteristics in same-sex sport groups: A study of interscholastic baseball and softball teams. *Perceptual and Motor Skills, 72*, 943–946.

Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2016). lmerTest: Tests in linear mixed effects models. Retrieved from https://CRAN.R-project.org/package=lmerTest

Lewis, G. H. (1972). Role differentiation. *American Sociological Review*, *37*, 424-434.

Loughead, T. M., Fransen, K., Van Puyenbroeck, S., Hoffmann, M. D., De Cuyper, B., Vanbeselaere, N., & Boen, F. (2016). An examination of the relationship between athlete leadership and cohesion using social network analysis. *Journal of Sports Sciences, 34*, 2063-2073.

Loughead, T. M., & Hardy, J. (2005). An examination of coach and peer leader behaviors in sport. *Psychology of Sport and Exercise*, 303–312

Loughead, T. M., Hardy, J., & Eys, M. A. (2006). The nature of athlete leadership. *Journal of Sport Behavior*, *29*, 142-158.

Lüdecke, D. (2018). *sjstats: Statistical Functions for Regression Models (Version 0.16.0)*. doi:10.5281/zenodo.1284472, https://CRAN.R-project.org/package=sjstats.

Moran, M. M., & Weiss, M. R. (2006). Peer leadership in sport: Links with friendship, peer acceptance, psychological characteristics, and athletic ability. *Journal of Applied Sport Psychology*, *18*, 97-113.

Moreno, M., Harwell, M., Guzey, S. S., Phillips, A., & Moore, T. (2016). Complex applications of HLM in studies of science and mathematics achievement: Cross-classified random effects models. *School Science and Mathematics*, *116*, 338-351.

Müceldili, B., & Erdil, O. (2015). Cultivating group cohesiveness: The role of collective energy. *Procedia-Social and Behavioral Sciences*, *207*, 512-518.

NCAA. (2018a). *2018-2019 NCAA Division I Manual*. NCAA.

NCAA (2018b). *Sports Sponsorship and Participation Rates Database*. Retrieved from http://www.ncaa.org/about/resources/research/ncaa-sports-sponsorship-and-participation-rates-database.

Pearce, C. L., & Sims, H. P. (2000). Shared leadership: Toward a multi-level theory of leadership. In Beyerlein, M. (Ed.), *Advances in interdisciplinary studies of work teams* (pp. 115-139).

Price, M. S., & Weiss, M. R. (2013). Relationships among coach leadership, peer leadership, and adolescent athletes' psychosocial and team outcomes: A test of transformational leadership theory. *Journal of Applied Sport Psychology, 25*, 265–279. doi:10.1080/10413200.2012.725703

Rabe-Hesketh, S., & Skrondal, A. (2008). *Multilevel and longitudinal modeling using Stata*. STATA press.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Thousand Oaks, CA: Sage.

Rees, C. R. (1983). Instrumental and expressive leadership in team sports: A test of leadership role differentiation theory. *Journal of Sport Behavior*, *6*, 17-27.

Rees, C., & Segal, M. (1984). Role differentiation in groups: The relationship between instrumental and expressive leadership. *Small Group Research, 15*, 109-123

Salas, E., Grossman, R., Hughes, A. M., & Coultas, C. W. (2015). Measuring team cohesion: Observations from the science. *Human Factors, 57,* 365-374.

Slater, P. E. (1955). Role differentiation in small groups. *American Sociological Review*, *20*, 300-310.

Todd, S. Y., & Kent, A. (2004). Perceptions of the role differentiation behaviors of ideal peer leaders: A study of adolescent athletes. *International Sports Journal*, *8*, 105-118.

Table 3.
Estimates from Multilevel Models Predicting Overall Leadership

	Model 1					Model 2					Model 3				
Parameter	Estimate	*SE*	β	*t*	*p*	Estimate	*SE*	β	*t*	*p*	Estimate	*SE*	β	*t*	*P*
Fixed effects															
Intercept	-0.05	0.24		-0.21	0.83	-0.394	0.24		-1.64	0.09	-0.08	0.28		-0.29	0.74
Level 1															
Technical	0.300	0.032	0.276	9.3	<.001	0.286	0.031	0.262	9.11	<.001	0.24	0.04	0.22	5.89	<.001
Interpersonal	0.245	0.038	0.207	6.4	<.001	0.249	0.037	0.211	6.64	<.001	0.24	0.04	0.205	6.00	<.001
Contagious	0.324	0.038	0.273	8.6	<.001	0.333	0.037	0.28	8.89	<.001	0.32	0.04	0.267	7.87	<.001
Level 2															
Starter						-0.12	0.137		-0.86	0.39	-0.59	0.28		-1.85	0.06
Captain						1.33	0.314		4.2	<.001	1.15	0.85		1.35	0.17
Squad Leader						0.493	0.196		2.5	0.02	-0.24	0.52		-0.46	0.65
Redshirt Fresh						0.69	0.353		1.96	0.06	0.75	0.36		2.08	0.04
Sophomore						0.423	0.143		2.98	0.006	0.39	0.15		2.67	0.011
Redshirt Soph						0.287	0.233		1.22	0.23	0.34	0.24		1.41	0.17
Interactions															
Starter x Technical											0.1	0.06		1.67	0.09
Captain x Interpersonal											0.06	0.16		0.4	0.68
Squad Leader x Interpersonal											0.01	0.11		0.1	0.92
Captain x Contagious											-0.05	0.17		-0.3	0.76
Squad Leader x Contagious											0.13	0.11		1.16	0.24
Random effects															
Intercept variance between:															
Rater	0.187					0.187					0.2				
Ratee	0.266					0.079					0.08				
AIC			2510.5					2493.9					2497.5		
BIC			2543.5					2555.4					2583.3		

Notes:
1. All level 2 predictors are nested within the ratee factor. No characteristics of the rater other than a random intercept were included in the models
2. For tenure variables, all comparisons are made against true freshmen
3. Because all Level 2 predictors are binary, we do not present any standardized parameter estimates