ELSEVIER

Psychology of Sport and Exercise 8 (2007) 281–296

Psychology
OF SPORT AND EXERCISE

www.elsevier.com/locate/psychsport

Athlete leadership dispersion and satisfaction in interactive sport teams

Mark A. Eys[a,*], Todd M. Loughead[b], James Hardy[c]

[a]*School of Human Kinetics, Laurentian University, Sudbury, Ont., Canada P3E 2C6*
[b]*University of Windsor, Canada*
[c]*University of Wales Bangor, UK*

Received 1 June 2005; received in revised form 21 April 2006; accepted 29 April 2006
Available online 19 June 2006

Abstract

Objective: Athlete leadership on sport teams can be represented by an individual occupying a formal or informal leadership role within a team who influences a group of team members to achieve a common goal [Loughead, Hardy, & Eys, (2006). The nature of athlete leadership. *Journal of Sport Behavior*, 29, 142–158]. Previous research has suggested that individuals involved in sport view the presence of athlete leaders as a crucial component to the effective functioning of the team [Glenn & Horn, (1993) Psychological and personal predictors of leadership behavior in female soccer athletes. *Journal Applied of Sport psychology*, 5, 17–34]. The purpose of the present study was to examine, at both the beginning and end of a competitive season, the relationship between individual perceptions of athlete leader dispersion across three types of leadership functions (i.e., task, social, external) and satisfaction.

Method: Participants included 218 intercollegiate athletes from a variety of interactive team sports. At the beginning and end of their competitive seasons, athletes indicated who the task, social, and external leaders were on their respective teams and responded to four dimensions of the Athlete Satisfaction Questionnaire [Riemer & Chelladurai, (1998) Development of the Athlete Satisfaction Questionnaire (ASQ). *Journal of Sport and Exercise Psychology*, 20, 127–156].

Results: Those who perceived all three leadership functions to be represented to the same degree (i.e., higher number of leaders for all three functions, an average number of leaders for all three functions, or a lower number of leaders for all three functions) were more satisfied with their team's performance and

*Corresponding author. Tel.: +1 705 675 1151x1203; fax: +1 705 675 4845.
E-mail address: meys@laurentian.ca (M.A. Eys).

1469-0292/$ - see front matter
doi:10.1016/j.psychsport.2006.04.005

degree to which the team was integrated than those individuals who perceived an imbalance in the number of athletes engaging in those functions.
Conclusion: The relative number of leaders within sport groups is related to individual perceptions of satisfaction.

Keywords: Athletics; Peer leadership; Cluster analysis

Introduction

Athlete leadership on sport teams can be represented by an individual occupying a formal (i.e., prescribed by the organization) or informal (i.e., emerged over time via team interactions) leadership role within a team who influences a group of team members (i.e., a minimum of two team members) to achieve a common goal (Loughead, et al., 2006). While the majority of leadership research in sport has been conducted on formal leadership roles such as the coach or manager, anecdotal and empirical evidence provides support for the importance of leadership roles performed by athletes. A quote by Brent Barry of the National Basketball Association's Seattle Supersonics highlighted the importance of player leadership on a sport team:

> Barry is comfortable shepherding his teammates. "I really don't think the scoring mentality is in me…my job is to help guys along and pull guys aside, which is good for the team" (Thomsen, 2004, p. 84).

Several authors have noted that most individuals involved in sport view the presence of athlete leaders as a crucial component to the effective functioning of the team influencing variables such as structure, cohesion, and team motivation (Glenn & Horn, 1993; Todd & Kent, 2004; Yukelson, 1997). Recent empirical research has also highlighted the importance of athlete leadership in sport. For example, Loughead and Hardy (2005) found that athlete leaders exhibited social support, positive feedback, and democratic decision-making style leadership behaviors to a greater degree than coaches. Moreover, Glenn, Horn, Campbell, and Burton (2003) reported that the style of athlete leadership was related to trait anxiety and team climate (i.e., mastery and performance oriented) amongst elite adolescent female soccer players.

These examples aside, a good portion of this previous body of research has been devoted to clarifying the types of athlete leaders on sport teams. One method of classification has been based on the *functions* athlete leaders engage in. In summarizing previous literature (e.g., Carron, Hausenblas, & Eys, 2005; Kogler Hill, 2001; Mosher, 1979; Rees, 1983), Loughead, et al. (2006) noted that athlete leaders are involved in task related functions (e.g., assist the achievement of the groups goals/objectives), social related functions (e.g., help satisfy individual member psychosocial needs), and external related functions (e.g., representing the group at meetings and media gatherings). Similarly, the aforementioned quote by Brent Barry illustrates the task and social functions of athlete leadership.

Given the variety of functions athlete leaders fulfill, a number of studies have sought to determine the characteristics of these individuals (e.g., Glenn & Horn, 1993; Lee, Coburn, & Partridge, 1983; Loughead et al., 2006). Of particular relevance to the present investigation, Loughead, et al. (2006)

examined the characteristics of athlete leaders for the three functions discussed above; task, social, and external. Loughead and colleagues also made a distinction in regard to two types of athlete leadership: team and peer leaders. Team leaders were operationalized as those individuals who were identified as a leader by at least 50% of their team while peer leaders were those who provided leadership to at least two teammates. Overall, the results demonstrated that regardless of function, (a) team leaders were typically the formal leaders on the team (i.e., captain or assistant captain), (b) team and peer leaders were veteran members of their respective teams, and (c) athletic ability (i.e., being a starter) was an important prerequisite to being a team leader.

In addition to examining the characteristics of the team and peer leaders on a wide variety of interdependent sport groups, Loughead and colleagues (2006) also sought to determine the number of athlete leaders present on sport teams. Consequently, they calculated an athlete leader dispersion (Neubert, 1999), or the percentage of athlete leaders for both team and peer forms of athlete leadership. The use of dispersion values allows comparison across teams of varying size. Prior to the Loughead et al. (2006) study, Glenn and Horn (1993) stated that "Coaches generally believe that they need to have one or two individuals on the team who can motivate and direct their teammates" (p. 17). More specifically, Loughead, et al. (2006) demonstrated that the number of peer and team leaders on sport teams was dependent on the function they served, whereby, 35%, 47%, and 31% of teammates were considered *peer* leaders, while 15%, 11%, and 8% of teammates were considered *team* leaders with regard to task, social and external functions, respectively. It is important to note, however, that Loughead and colleagues did not propose that the above results reflected the *ideal* number of leaders to have on a sport team.

Ineffective leadership that does not conform to the needs of the situation and/or members of the group (e.g., having too many or too few athlete leaders) can have adverse effects on team functioning. For example, Glenn and Horn (1993) noted coaches believe that if the appropriate number of athlete leaders does not emerge, cohesion and motivation will be lacking on their teams. Similarly, Riemer and Chelladurai (1995) suggested that effective leadership is an important factor in an athlete's satisfaction. In fact, a relationship between these two variables has been established within the sport and exercise domains (e.g., Riemer & Chelladurai, 1995; Weiss & Friedrichs, 1986). Finally, seminal research by Chelladurai (1978) included athlete satisfaction as an important consequence of coaching behavior in his multidimensional model of leadership in sport. It is important to note however that only the *coach* leadership—satisfaction relationship has been examined to date.

Given that satisfaction is associated with the perceived socially constructed environment (Chelladurai & Riemer, 1997) for which athlete leaders are partially responsible in creating, the general purpose of the present study was to examine the relationship between individual perceptions of athlete leader dispersion and satisfaction. In other words, is the perceived number of athlete leaders present on a sport team related to the degree of satisfaction experienced by individual members?

Athlete satisfaction represents "a positive affective state resulting from a complex evaluation of the structures, processes, and outcomes associated with the athletic experience" (Chelladurai & Riemer, 1997, p. 135). Riemer and Chelladurai (1998) developed a comprehensive conceptualization of athlete satisfaction incorporating 15 dimensions that encompassed the entire athletic experience. However, for the purposes of the present study, four specific aspects of athlete satisfaction were identified to be pertinent to the issue of athlete leader dispersion. The first, *Satisfaction with Individual Performance*, evaluates the athlete's satisfaction with his/her

performance and goal achievement. *Satisfaction with Team Performance* represents the second dimension and is concerned with satisfaction regarding the goal achievement and performance of the group. The third dimension is termed *Satisfaction with Team Task Contribution* which measures the athlete's satisfaction with the leadership and guidance received from his/her teammates. Finally, the fourth satisfaction dimension utilized in the present study was *Satisfaction with Team Integration* and generally reflects the degree of satisfaction with the coordination of the team's efforts (Riemer & Chelladurai, 1998). The remaining dimensions within the ASQ were not utilized because it was felt that either (a) they were not relevant to the population in question (e.g., satisfaction with external agents) or (b) they were clearly related to leadership directed from the coach (e.g., satisfaction with strategy).

As there has been no previous research conducted on athlete leader dispersion and its correlates, no a priori hypotheses were specifically tested in the present study. However, it seemed reasonable to highlight three possibilities that might occur based on previous literature on group size and group member characteristics (cf. Carron et al., 2005). The first possibility was that having an increasing number of athlete leaders (as reflected by the dispersion statistic) will provide for a greater number of resources for individual athletes and thus will lead to greater satisfaction with their athletic experience. Conversely, it could be surmised that an increasing number of athlete leaders could result in negative experiences such as receiving conflicting information and clique formation; essentially "too many cooks in the kitchen". A final possibility may exist in that there is an ideal number of athlete leaders whereby only necessary but adequate leadership resources are provided leading to the greatest athlete satisfaction.

While the above discussion on the ideal number of perceived athlete leaders might be useful for examining one category of leadership functions (e.g., task functions), the present study examined three (i.e., task, social, and external). Therefore, multiple combinations of athlete leader dispersion values are possible. For example, some athletes may view their team as having a high number of athlete leaders in all three leadership functions, others may perceive a low number for all three, while others may perceive one of many other potential combinations (e.g., high number of task leaders, low number of social leaders, and a moderate number of external leaders). This issue had implications for choice of analysis and is discussed further in the results section.

Finally, the development of a competitive sport team is by its very nature dynamic. Consequently, the internal structure of a team is subject to change over the course of a season (cf. Carron et al., 2005). This had implications for the present study as the number of leaders could change on a team due to a variety of different factors (e.g., injury, drop-outs, suspension, group interactions, etc.). Therefore, the specific purpose of the present study was to examine, at both the beginning and end of a competitive season, the relationship between individual perceptions of athlete leader dispersion across the three types of leadership functions and satisfaction.

Method

Participants

The participants consisted of 218 varsity student athletes from two Canadian universities. There were 103 males (representing 6 teams) and 115 females (representing 7 teams) and the mean age of

the participants was 20.6 ± 2.06 years. The participants represented a variety of interactive team sports including soccer ($n = 56$; 2 male teams and 1 female team), lacrosse ($n = 37$; 1 male team and 1 female team), volleyball ($n = 38$; 1 male team and 2 female teams), ice hockey ($n = 21$; 1 female team), field hockey ($n = 19$; 1 female team), rugby ($n = 33$; 1 male team and 1 female team), and basketball ($n = 14$; 1 male team) and were members on their current team for an average of 2.13 ± 1.06 years.

Measures

Identification of athlete leaders and calculation of athlete leader dispersion

To identify those individuals on their team who were perceived to be task, social, and external athlete leaders, participants responded to three open-ended questions. Participants were asked to "List the names of team members (including yourself if applicable) you feel most strongly contribute to your team's task/social/external factors. That is, please list team members who do or have done at least one, some, or all of the following actions." Following these instructions a list of behavioral characteristics of task, social, and external leadership were provided to give the participants a frame of reference similar to those suggested by Kogler Hill (2001). Behavioral characteristics of task leaders included (a) helps focus the team on its goals, (b) helps to clarify responsibilities for teammates, (c) assists in decision making, (d) offers instruction to teammates when required, and (e) helps the team to perform to the best of its ability. Social leader characteristics included (a) contributes to team harmony, (b) ensures teammates are involved and included in team events, (c) helps solve interpersonal conflicts that may arise within the team, (d) offers support and is trusted by teammates, and (e) treats team members in a fair and consistent manner. Finally, characteristics of external leaders included (a) promotes the team within the community, (b) represents the team's interests in meetings with coaching staff or league organizers, (c) attempts to secure necessary or desired resources, support, and recognition for the team, (d) buffers team members from outside distractions, and (e) shares relevant external information with the team. Sufficient space was provided to the athletes to list the names of individuals who performed these tasks.

Individual athlete leader dispersion values were calculated following the recommendations by Neubert (1999). Specifically, individual athlete leader dispersion scores were calculated by dividing the number of athlete leaders each individual identified for task, social, and external leadership by the total number of members on their respective teams.

Athlete satisfaction

Athlete satisfaction was measured using the Athlete Satisfaction Questionnaire (ASQ) developed by Riemer and Chelladurai (1998). The full version of the questionnaire contains 56 items representing 15 dimensions that are scored on a 7-point Likert scale anchored at 1 ("not at all satisfied") and 7 ("extremely satisfied"). However, as noted previously, only four dimensions were deemed relevant for the purposes of the present study. Therefore, participants responded to 13 items representing the satisfaction dimensions of Individual Performance (3 items; e.g., "I am satisfied with the improvement in my skill level"), Team Performance (3 items; e.g., "I am satisfied with the team's overall performance this season"), Team Task Contribution (3 items; e.g., "I am

satisfied with the guidance I receive from my teammates''), and Team Integration (4 items; e.g., ''I am satisfied with the degree to which teammates share the same goal''). The ASQ is a comprehensive, conceptually derived, and psychometrically sound measure of athlete satisfaction which has been found to be useful across a number of settings (Riemer & Chelladurai, 1998). In the present study, all Cronbach α values (Cronbach, 1951) for the pertinent satisfaction dimensions (see Table 1) were deemed acceptable based on a suggested criterion value (>.70) by Nunnally (1978).

Procedures

Initial recruitment of athletes was made by contacting the head coach of each respective team. After approval was gained from the coach to approach his or her athletes, a meeting was arranged where the nature of the study was explained and consent was obtained. As noted previously, to obtain a greater understanding of the phenomenon of athlete leadership over the course of a competitive season, two data collection periods were conducted; early (within 3 weeks of the beginning of the competitive season) and late season (within 3 weeks of the end of the regular competitive season). Data collection took place prior to or following a practice session at the teams' practice facility. Participants were ensured their participation was voluntary, confidential, and that they may have access to the general results upon conclusion of the study.

As is common in research that utilizes more than one data collection period (Williams & Podsakoff, 1989), a moderate level of attrition was expected from early to late season. In fact, of the 218 athletes examined early in the season (Time 1), 139 were present for the second data collection period (Time 2) representing a 36% attrition rate. An examination of whether this level of attrition was systematic was conducted and is reported in the preliminary analyses of the results section.

Table 1
Means, Standard Deviations, and Cronbach α values for athlete leader dispersion and satisfaction variables for time 1 ($n = 208$) and Time 2 ($n = 131$).

	Time 1			Time 2		
Variable	Mean	SD	α	Mean	SD	α
Task leader dispersion (%)	18.75	8.39		16.33	7.72	
Social leader dispersion (%)	18.17	10.03		17.16	9.90	
External leader dispersion (%)	13.18	9.19		13.30	12.06	
Satisfaction with individual performance	4.67	1.15	.84	4.90	1.30	.90
Satisfaction with team performance	4.97	1.50	.91	4.72	1.81	.96
Satisfaction with team task contribution	5.03	1.15	.86	4.84	1.23	.92
Satisfaction with team integration	5.33	1.06	.86	5.15	1.36	.92

Note: Scores for athlete leader dispersion can range from 0–100%. Scores for satisfaction variables range from 1 (not at all satisfied) to 7 (extremely satisfied).

Results

Preliminary analyses

Prior to examining the relationship between the two main variables of interest a series of preliminary analyses were conducted. First, typical assumptions of multivariate analyses were tested for data collected at both time periods. Analyses of normality (e.g., skewness, kurtosis), linearity, and multicollinearity revealed that these assumptions were met at both times. However, an examination of univariate and multivariate outliers resulted in the removal of six participants from further analyses. In addition, due to the nature of the statistical analysis to be utilized in the present study (i.e., cluster analysis), four additional participants were removed due to missing data points. This process resulted in maintaining 208 participants for further analyses at Time 1 and 131 participants for Time 2.

A second preliminary analysis was conducted to determine if there were systematic explanations for the moderate attrition (36%) in participants found across time periods. A review of demographic characteristics demonstrated that those athletes who missed the second data collection period were similar to those who were present. More specifically, demographic information for those not completing Time 2 information was proportionally equivalent to the original Time 1 sample with regard to gender, age, sport type, and tenure on their respective teams. A one-way MANOVA was also conducted to determine if perceptions regarding athlete leader dispersion and/or satisfaction at Time 1 were significantly different between those who were present at both time periods and those who were not. This analysis was conducted to determine if any of the study variables could account for why individuals were not present at the second data collection period. More specifically, the main concern was to determine if dissatisfaction with the athletic experience was systematically responsible for participant absence. The MANOVA was significant, Wilks $\lambda = .92$, $F(7,200) = 2.61$, $p < .05$, indicating that there were differences between the two groups. However, examination of the univariate results indicated that only one dimension of Satisfaction (i.e., Team Task Contribution, $F(1,206) = 6.62$, $p < .05$) differed between the two groups and, in this case, the group that was absent at the second data collection period ($M = 5.29 \pm .95$) perceived greater satisfaction at Time 1 than the group that was present at both time periods ($M = 4.86 \pm 1.28$). Finally, bivariate correlations were compared between the whole sample at Time 1 with those correlations derived at Time 1 from only the 131 participants remaining at the end of the season. Overall, correlations were very similar between these two groups. Therefore, neither athlete leadership dispersion nor dissatisfaction were systematic reasons for the level of attrition.

Descriptive statistics

Descriptive statistics for the athlete leader dispersion and satisfaction variables for Time 1 and Time 2 are reported in Table 1. Individual perceptions of athlete leader dispersion reflected as a percentage (number of leaders each athlete perceived/team complement $\times$ 100%) indicated that on average the athletes perceived that 18.75%, 18.17%, and 13.18% of their teammates fulfilled functions related to task, social, and external leadership, respectively at Time 1. At Time 2 these

descriptive statistics remained relatively unchanged for task (16.33%), social (17.16%), and external leadership (13.3%).

With respect to individual perceptions of satisfaction, athlete responses were found to be moderately high at both the beginning and end of the season. At Time 1 these values ranged from 4.67 (Satisfaction with Individual Performance) to 5.33 (Satisfaction with Team Integration) while at Time 2 they ranged from 4.72 (Satisfaction with Team Performance) to 5.15 (Satisfaction with Team Integration) on a scale of 1–7 with higher responses indicating greater satisfaction.

Finally, bivariate correlations between all satisfaction and athlete leadership dispersion variables are presented in Table 2 for both Time 1 and 2. Intercorrelations among the satisfaction variables were moderate in nature and ranged from .41 to .70 at Time 1 and .45 to .81 at Time 2. In addition, intercorrelations for the athlete leader dispersion variables ranged from .27 to .48 and .09 to .59 at Time 1 and 2, respectively.

Cluster analyses

Prior to reporting the results of the cluster analyses, two reasons for why this type of analysis was chosen over others that could deal with multiple independent and multiple dependent variables (e.g., multivariate multiple regression, canonical correlation) are offered. The first reason, as noted by a number of authors (e.g., Tabachnick and Fidell, 2001), was that analyses like canonical correlation maximize variability between sets of variables, potentially providing information on interactions, but are often extremely hard to interpret. The second reason was that these types of analyses maximize linear relationships and, as noted by Tabachnick and Fidell in relation to canonical correlation, ‘‘if the relationship is non-linear, the analysis misses some or

Table 2
Bivariate correlations between Athlete Leader Dispersion and Satisfaction variables

Variable	1	2	3	4	5	6	7
1. Task leader dispersion	—	.48** (.40**)	.27** (.17)	−.09 (−09)	−.25** (−.25**)	−.08 (−.10)	−.19** (−19*)
2. Social leader dispersion	.59**	—	.39** (.29**)	−.10 (.00)	−.15* (−.09)	−.04 (−.02)	−.16* (−.08)
3. External leader dispersion	.09	.23**	—	.01 (.11)	.09 (.18*)	.06 (.11)	.09 (.21*)
4. Individual performance sat.	−.03	−.03	.10	—	.42** (.49**)	.41** (.50**)	.41** (.47**)
5. Team performance sat.	−.10	−.01	.05	.54**	—	.48** (.52**)	.70** (.68**)
6. Team task contribution sat.	.06	.12	.17	.48**	.58**	—	.63** (.67**)
7. Team integration sat.	−.10	−.02	.01	.45**	.81**	.72**	—

Note: $N = 208$. sat = satisfaction. Correlations for Time 1 are presented in the upper right portion of the table whereas correlations for Time 2 can be found in the lower left portion. Bracketed correlations at Time 1 represent results utilizing the 131 participants remaining at Time 2.
$^{*}p < .05$, $^{**}p < .01$.

most of it'' (p. 180). Our 3 possible a priori hypotheses that were generated highlighted the potential for either a *linear* (i.e., more or less is better) or non-linear relationship (i.e., optimum number, inverted U). Thus, for the above reasons in addition to the applicability of cluster analysis to the purposes of the present study, two cluster analyses were performed; one for Time 1 and another for Time 2.

Cluster analysis is a statistical procedure that groups participants based on their responses to pre-selected criterion variables. In the present study, participants were grouped based on their perceptions regarding (a) task athlete leader dispersion, (b) social athlete leader dispersion, and (c) external athlete leader dispersion. The initial goal was to create an appropriate number of groups that maximized within group consistency/homogeneity and between group heterogeneity in regard to the criterion variables. This procedure could be likened to a median or tertiary split procedure but is more complex given the involvement of multiple variables. Although a relatively new technique, cluster analysis has been utilized successfully in prior sport psychology research, especially in the goal orientation literature (e.g., Harwood, Cumming, & Fletcher, 2004).

The steps involved in the identification of the cluster groups were those suggested by Hair et al. (1995). The first step was to convert the raw scores into z-scores and screen the data for missing values and outliers. This procedure for the removal of outliers was outlined above in the preliminary analyses section. The next step was to generate athlete leader dispersion clusters/groups utilizing a hierarchical clustering method. Specifically, Ward's method of linkage and a Squared Euclidean distance were employed to determine the number of potential groups. Additional information regarding the advantages of these two measures can be obtained from Harwood et al. (2004) and Aldenderfer and Blashfield (1984). Based on the inspection of a graphical representation of potential group membership (i.e., a dendogram) ranging from two to five clusters, it was concluded that a 5 cluster solution best fit the data at both time periods.

The final step in this process was to validate the suggested 5 cluster solutions. In order to do this, non-hierarchical (e.g., K-means) cluster analyses were employed. These analyses utilized the cluster centers determined from the hierarchical analyses conducted previously and determined new cluster groups. Based on the similarity of the final cluster centers (compared with the original cluster centers) and the interpretability of the cluster groups, it was concluded that the five cluster solutions were appropriate at both time periods (see Table 3 for the means, standard deviations, and z-score values of the five clusters in relation to the three criterion variables). An additional examination of the validity of the solution utilized a random sample of 67% of the participants to determine if these individuals would be re-classified into the same clusters. At Time 1, 131 of 147 (89%) participants tested were re-classified in a similar fashion to the total sample; while at Time 2, 92 of 93 (99%) participants tested were re-classified correctly. Compared to previous research (i.e., 85% reliability; Harwood et al., 2004), these results indicated support for the stability of the five cluster solution in the present study.

Interpreting the cluster solutions

Athlete leader dispersion groups were interpreted based on the values presented in Table 3. A criterion z-value of $\pm .50$ was utilized in a similar fashion to previous research (e.g., Hodge & Petlichkoff, 2000) to indicate higher ($z > .50$), moderate ($-.49 < z < .49$), and lower scores ($z < -.50$) on the dispersion values for the purpose of interpretation. For example, Time 1 Cluster 5 had z-score values of 1.14 (higher task leader dispersion), 1.83 (higher social leader dispersion),

Table 3
Cluster membership values for criterion variables at Time 1 and Time 2

Clusters		Task leader dispersion			Social leader dispersion			External leader dispersion		
		M	*SD*	*z*	*M*	*SD*	z	*M*	*SD*	*z*
Time 1	*n*									
1 (LLL)	65	11.20	2.82	−.90	10.50	4.86	−77	6.65	4.41	−.73
2 (MMM)	58	15.23	3.79	−.40	17.37	4.84	−01	15.81	4.04	.38
3 (HHH)	17	25.08	6.10	.83	25.22	7.26	.84	31.00	4.66	2.21
4 (HMM)	45	25.78	5.28	.91	16.64	6.39	−.10	8.61	5.05	−.49
5 (HHM)	23	27.60	7.41	1.14	34.29	7.20	1.83	16.39	6.13	.45
Time 2	*n*									
1 (LLL)	41	9.47	2.72	−.88	9.53	3.74	−.76	7.61	4.05	−.50
2 (MMM)	53	15.43	2.69	−.09	15.22	2.88	−.17	12.67	4.88	−.04
3 (HHH)	12	23.60	3.17	.98	21.98	4.99	.54	19.94	3.26	.56
4 (HMM)	9	30.44	3.77	1.88	16.53	3.10	−.03	11.89	5.32	−.11
5 (MHM)	16	17.16	3.99	.13	28.04	3.65	1.18	13.25	5.86	.01

Note: Raw scores for Athlete Leader Dispersion can range from 0–100%. Cluster interpretation notation: L = Low, M = Moderate, H = High. The order of the letters refers to Task, Social, and External leadership, respectively.

and .45 (moderate external leader dispersion). Accordingly, at Time 1, Cluster 1 contained athletes perceiving a lower dispersion of leaders for all three functions, Cluster 2 contained athletes perceiving a moderate dispersion of leaders for all three functions, Cluster 3 contained athletes perceiving a higher dispersion of leaders for all three functions, Cluster 4 contained those who perceived a higher dispersion of leaders for task functions but moderate dispersions for social and external leadership, and Cluster 5 was as described above. Time 2 clusters were interpreted in a similar fashion with one exception: Cluster 5 contained athletes who perceived a moderate dispersion of leaders for task and external functions and a higher dispersion for social leadership.

To ensure that the groups were significantly different from each other to warrant the labeling above, a MANOVA with univariate follow-up tests was conducted for both time periods. Time 1 results indicated a strong multivariate effect, Wilks $\lambda = .06$, $F(12,532.09) = 84.67$, $p < .001$, $\eta^2 = .61$, and univariate analyses demonstrated that the groups differed significantly in perceptions of task leader dispersion, $F(4,203) = 106.06$, $p < .001$, $\eta^2 = .68$, social leader dispersion, $F(4,203) = 82.73$, $p < .001$, $\eta^2 = .62$, and external leader dispersion, $F(4,203) = 110.05$, $p < .001$, $\eta^2 = .68$. Time 2 results were similar at a multivariate level, Wilks $\lambda = .05$, $F(12,328.37) = 55.56$, $p < .001$, $\eta^2 = .62$,

and for the univariate follow-up tests for task, $F(4,126) = 120.18$, $p < .001$, $\eta^2 = .79$, social, $F(4,126) = 91.73$, $p < .001$, $\eta^2 = .74$, and external leadership dispersions, $F(4,126) = 18.17$, $p < .001$, $\eta^2 = .37$. Post-hoc tests demonstrated support for the labeling utilized (i.e., higher, moderate, lower) at both times. It should be noted that the terms higher, moderate, and lower are relative in as much as the original dispersion values ranged between 9.47% and 34.29%, all of which would likely be considered low on a 0–100% scale.

Athlete leader dispersion and athlete satisfaction

Table 4 reports the satisfaction values for each cluster. A MANOVA was conducted at both times to determine if the clusters differed significantly in perceptions of satisfaction. At Time 1, the multivariate analysis was significant, Wilks $\lambda = .86$, $F(16,611.65) = 2.00$, $p < .05$, $\eta^2 = .04$, indicating general differences in satisfaction between the clusters. Univariate analyses revealed

Table 4
Satisfaction scores for athlete leader dispersion clusters at Time 1 and Time 2

Clusters		Satisfaction with individual performance		Satisfaction with team performance		Satisfaction with team task contribution		Satisfaction with team integration	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Time 1	*n*								
1 (LLL)	65	4.84	1.02	5.0545	1.47	5.11	1.11	5.42	.91
2 (MMM)	58	4.70	1.02	5.2445	1.37	5.16	1.89	5.6345	1.02
3 (HHH)	17	5.12	1.30	5.225	1.27	5.37	1.17	5.69	1.14
4 (HMM)	45	4.47	1.30	4.25	1.46	4.70	1.20	4.91	1.12
5 (HHM)	23	4.25	1.01	3.90	1.32	4.83	.98	4.87	1.11
Time 2	*n*								
1 (LLL)	41	4.71	1.30	4.52	1.91	4.49	1.30	5.01	1.25
2 (MMM)	53	4.98	1.29	5.044	1.86	5.13	1.20	5.394	1.42
3 (HHH)	12	5.44	1.43	5.17	1.26	5.36	.98	5.564	.93
4 (HMM)	9	4.63	1.66	3.19	1.33	4.15	1.23	3.94	1.63
5 (MHM)	16	5.02	1.00	5.19	1.67	4.58	1.13	5.42	1.05

Note: Scores for Athlete Satisfaction can range from 1 (not at all satisfied) to 7 (extremely satisfied). Superscript numbers represent significant group differences. Cluster interpretation notation: L = Low, M = Moderate, H = High. The order of the letters refers to Task, Social, and External leadership, respectively.

that the clusters differed specifically with regard to Satisfaction with Team Performance, $F(4,203) = 6.33$, $p < .001$, $\eta^2 = .11$ and Satisfaction with Team Integration, $F(4,203) = 4.90$, $p < .001$, $\eta^2 = .09$. With regard to Satisfaction with Team Performance, follow-up Tukey HSD tests indicated that Cluster 4 had significantly lower satisfaction values than Clusters 1 and 2, while Cluster 5 had significantly lower satisfaction than Clusters 1, 2, and 3. On the other hand, with regard to Satisfaction with Team Integration, both Clusters 4 and 5 were significantly less satisfied than Cluster 2.

At Time 2, the multivariate effect for cluster was also significant, Wilks $\lambda = .81$, $F(16,376.41) = 1.66$, $p < .05$, $\eta^2 = .05$. Similar to Time 1, univariate analyses demonstrated that clusters differed with regard to Satisfaction with Team Performance, $F(4,126) = 2.66$, $p < .05$, $\eta^2 = .08$ and Satisfaction with Team Integration, $F(4,126) = 2.95$, $p < .05$, $\eta^2 = .09$. Follow-up Tukey HSD tests revealed that members of Cluster 4 had significantly lower Satisfaction with Team Performance than Cluster 2 and significantly lower Satisfaction with Team Integration than Clusters 2 and 3.

Discussion

The purpose of the present study was to examine the relationship between the perceived number of athlete leaders present on a sport team (i.e., athlete leader dispersion) across three types of leadership functions and satisfaction at the beginning and end of a competitive season. Based on suggestions by Kogler Hill (2001), the three specific leadership functions examined were termed task (e.g., helps clarify responsibilities for teammates), social (e.g., helps solve interpersonal conflicts that may arise), and external (e.g., promotes the team within the community) leadership. Utilizing perceptions of these three leadership functions as independent variables, clusters were formed with the intention of examining these groups in relation to perceptions of satisfaction. In general, five groups were formed that included those individuals who perceived (a) a relatively high number of leaders across all three functions, (b) a relatively average number of leaders across all three functions, (c) a relatively low number of leaders across all three functions, and (d) an uneven number of leaders across functions (two groups).

In addition to the descriptive analyses found in the results section, two additional observations should be communicated with regard to the general and consistent pattern of results based on information found in Table 3. First, those individuals who perceived a relatively equal number of leaders across all three functions seemed to indicate greater satisfaction than those who perceived a relatively unequal number of leaders. Second, examining only those individuals with balanced perceptions, a consistent pattern seemed to indicate that a greater number of peer leaders on the team would be related to greater satisfaction. However, as post-hoc analyses indicated, these groups did not significantly differ from one another. In addition, bivariate analyses at Time 1 (at least those that are significant; see Table 2) seemed to indicate that the relationship is actually negative (i.e., having less leaders is related to greater satisfaction).

While no specific a priori hypothesis was offered, three possibilities were suggested with regard to the potential relationship between perceptions of athlete leader dispersion and satisfaction. These possibilities argued that greater satisfaction would be related to a higher number of leaders (i.e., more resources available), a lower number of leaders (i.e., more centralized leadership), or

that there would be an optimum number of leaders (i.e., a sufficient but only necessary number of leaders). In fact, the results of the present study did not support any of these possibilities but provided an interesting insight into the potency of athlete leadership on sport teams. Generally, it was found that those individuals who perceived a relatively balanced number of leaders across the three functions (i.e., task, social, and external) indicated greater satisfaction, regardless of whether those numbers were higher or lower. More specifically, those who were grouped in clusters that perceived all three functions to be represented to the same degree (i.e., a higher number of leaders for all three functions, an average number of leaders for all three functions, or a lower number of leaders for all three functions) were more satisfied with their team's performance and the degree to which the team was integrated than those individuals who perceived an imbalance in the number of athletes engaging in those functions.

This is not the first demonstration of the possible desire of athletes at this level of competition (i.e., intercollegiate) to have an equal representation of task and social aspects in their group environment. Hardy, Eys, and Carron (2005) asked athletes to identify potential disadvantages of developing high cohesion on sport teams. One of the main issues athletes brought forward was that the group's environment and performance could be compromised if there was an inordinate amount of focus on either task or social aspects (i.e., an imbalance between the two). For example, if the group's focus is completely on task-related aspects (e.g., winning) then perhaps individual enjoyment will be greatly reduced. Conversely, if social priorities dominate then the task-related goals of the group may not be achieved. Taken together, the results of the present study and the cohesion investigation by Hardy et al. suggest that there is a desire on the part of the athletes to participate in a group environment that can properly attend to and balance both task and social elements.

Strength and consistency of cluster groupings

Three issues should be highlighted with regard to the strength and consistency of the results found in the present study. First, the strength of the univariate differences between cluster groups for Satisfaction related to Team Performance and Team Integration were small. More specifically, the explained variance (i.e., effect sizes) ranged from 8% to 11%. That this is the case should not be surprising given that Riemer and Chelladurai (1998) noted athlete satisfaction is influenced by a number of different individual and team variables. For example, Eys, Carron, Bray, and Beauchamp (2003) recently found that athlete satisfaction was related to the degree to which athletes understood their role responsibilities on interactive sport teams. In addition, several studies have found that coaches also influence athlete satisfaction (cf. Chelladurai & Riemer, 1998). In light of the numerous factors that affect athlete satisfaction, the fact that perceptions of athlete leader dispersion alone explained approximately 10% of the variance highlights the relative importance of the issue.

A second issue that may have influenced the strength of results (and more specifically the statistical significance of some post-hoc tests) was the unequal distribution of participants in the clusters (see Table 3). For example, with regard to perceptions of Satisfaction with Team Integration at Time 1, it can be observed that cluster 2 (MMM; Mean = 5.63) statistically differs from the unequal clusters 4 and 5. However, cluster 3 (HHH; Mean = 5.69), with a numerically higher perception of satisfaction than cluster 2 did not differ statistically from the uneven clusters

for this dimension of satisfaction. This is likely due to the fact that cluster 2 contained 58 individuals while cluster 3 contained 17 individuals.

The third issue that should be highlighted is that the present study demonstrated a similar pattern of results at the beginning and end of the athletes' competitive seasons. From a validity standpoint, this is encouraging as it supports the suggestion made previously that a balance of leadership across functions seems to be important. Another consistent finding across time periods was the saliency of two satisfaction dimensions. At both times, perceptions of Satisfaction with Team Performance and Satisfaction with Team Integration were significantly different among the groups.

Impact of the quantity of athlete leadership on satisfaction

Given the discussion above regarding the desire to maintain a healthy balance between task and social aspects in the sport environment, it is not surprising that those individuals who perceived a balance in athlete leadership had greater Satisfaction with Team Performance (i.e., the team's task-oriented goal achievement) and Team Integration (i.e., the team's coordinative capabilities). However, surprisingly, a dimension that was not salient was Satisfaction with Team Task Contribution. This particular dimension reflects satisfaction with the leadership and guidance received from teammates (Riemer & Chelladurai, 1998). Consequently, it might have been expected that those who perceived a more favorable leadership scenario (i.e., appropriate leadership balance) would be more satisfied in this regard.

One explanation for the prior result may be a limitation of the present study in that only the *quantity* of athlete leaders was examined and not the *quality* of leadership provided by those individuals. To be more specific, the number of perceived athlete leaders on the team might influence individual perceptions regarding group processes such as coordination and group performance. As was found in the present study, athlete leader dispersion seems to play a role in the perceptions of these facets of satisfaction with the athletic experience. However, quality of leadership could more likely influence feelings of satisfaction with respect to perceptions related to the individual such as the amount of guidance provided specifically for the athlete. An examination of perceived athlete leader effectiveness in relation to satisfaction might provide additional insight into this issue.

Interpretation of athlete leadership dispersion values

Another cluster analysis related issue that should be mentioned is the utilization of the terms 'higher', 'average', and 'lower' athlete leadership dispersion. It should be noted that in all cases the dispersion values were below 20% and that this terminology was relative within each type of leadership function. For example, at Time 1, a lower leadership categorization for task dispersion was centered on the value 11.20% while the central value for lower external leadership dispersion was 6.65%. Researchers and practitioners interpreting the present results should be aware that a balanced approach to athlete leadership seems to suggest a relatively equal amount of task and social athlete leaders with a lower number of external leaders (see Table 3 for examples of athlete leader dispersions for the present study).

Implications

Given the exploratory nature of the present study, it would be premature to suggest definitive prescriptions regarding the degree of athlete dispersion on sport teams. However, one major implication of the present study is that it provides support for the importance of athlete leadership in an interactive sport team environment. This study follows a relatively limited number of investigations of this phenomenon that typically have described the functions and characteristics of these leaders (e.g., Glenn & Horn, 1993; Loughead, et al., 2006; Todd & Kent, 2004). The present study suggests that the *amount* of athlete leadership, as displayed by the relative number of perceived leaders, is related to individual level cognitions (i.e., satisfaction). From an applied perspective, what can be gleaned from the emerging body of literature on athlete leadership is that coaches should be aware of its (task, social and external) functions and potential to influence their teams. Consistent with Yukelson's (1997) suggestions regarding team building, coaches should consider what strategies they might employ to develop athlete leadership within their teams (e.g., captains serving specific functions on teams). Moreover, the present findings suggest that emphasis should be placed on fostering balanced athlete leadership.

From a research perspective, it is clear that further investigation of athlete leadership is warranted as this might allow greater guidance for practitioners and coaches about leadership within sports teams. Although the present study's findings are consistent with theorizing by Chelladurai (1978) who suggested a coach leadership–athlete satisfaction relationship, future research might consider the association between athlete leadership and performance, Chelladurai's alternative consequence of leadership. Examination of relationships between the *quantity* of leaders and other individual (e.g., competitive state anxiety) and team level constructs (e.g., cohesion) could provide additional support for the importance of ensuring adequate leadership resources within sports team. In the case of the latter, Carron et al. (2005) suggested that "a major correlate of cohesion is leadership" (p. 251). It is also suggested that the quality of the leadership provided by the athletes for each other should be investigated further. Loughead and Hardy (2005) demonstrated that athlete leaders provide unique leader behaviors for their teams in conjunction with those provided by the coach. In sum, future research could examine how the proper provision or absence of athlete leadership affects both individual and team level correlates as well as the overall performance of sports teams.

References

Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Newbury Park: Sage.

Carron, A. V., Hausenblas, H. A., & Eys, M. A. (2005). *Group dynamics in sport* (3rd ed). Morgantown, WV: Fitness Information Technology.

Chelladurai, P. (1978). *A contingency model of leadership in athletics*. University of Waterloo, Canada: Unpublished doctoral dissertation, Department of Management Sciences.

Chelladurai, P., & Riemer, H. A. (1997). A classification of the facets of athlete satisfaction. *Journal of Sport Management*, *11*, 133–159.

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.

Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297–334.

Eys, M. A., Carron, A. V., Bray, S. R., & Beauchamp, M. R. (2003). Role ambiguity and athlete satisfaction. *Journal of Sports Sciences*, *21*, 391–401.

Glenn, S. D., & Horn, T. S. (1993). Psychological and personal predictors of leadership behavior in female soccer athletes. *Journal of Applied Sport Psychology*, *5*, 17–34.

Glenn, S., Horn, T., Campbell, W., & Burton, D. (2003). Interactive effects of perceived coach and peer leadership styles on young athletes' psychosocial status and perceptions of team motivational climate. *Journal of Sport and Exercise Psychology*, *25*, S7.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1995). *Multivariate data analysis with readings* (3rd ed). New York: Macmillan.

Hardy, J., Eys, M. A., & Carron, A. V. (2005). Exploring the potential disadvantages of high team cohesion. *Small Group Research*, *36*, 166–187.

Harwood, C., Cumming, J., & Fletcher, D. (2004). Motivational profiles and psychological skills use within elite youth sport. *Journal of Applied Sport Psychology*, *16*, 318–332.

Hodge, K., & Petlichkoff, L. (2000). Goal profiles in sport motivation: A cluster analysis. *Journal of Sport and Exercise Psychology*, *22*, 256–272.

Kogler Hill, S. E. (2001). Team leadership. In: Northouse, P. G. (Ed.), Leadership: Theory and practice (2nd ed., pp. 161–187). Thousand Oaks, CA: Sage.

Lee, M. J., Coburn, T., & Partridge, R. (1983). The influence of team structure in determining leadership function in association football. *Journal of Sport Behavior*, *6*, 59–66.

Loughead, T. M., & Hardy, J. (2005). A comparison of coach and peer leader behaviors in sport. *Psychology of Sport and Exercise*, *6*, 303–312.

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

Mosher, M. (1979). The team captain. *Volleyball Technical Journal*, *4*, 7–8.

Neubert, M. J. (1999). Too much of a good thing or the more the merrier? Exploring the dispersion and gender composition of informal leadership in manufacturing teams. *Small Group Research*, *30*, 635–646.

Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.

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.

Riemer, H. A., & Chelladurai, P. (1995). Leadership and satisfaction in athletics. *Journal of Sport and Exercise Psychology*, *17*, 276–293.

Riemer, H. A., & Chelladurai, P. (1998). Development of the Athlete Satisfaction Questionnaire (ASQ). *Journal of Sport and Exercise Psychology*, *20*, 127–156.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.

Thomsen, I. (2004). Get Brent. *Sports Illustrated*, *100*(3), 83–84.

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

Weiss, M. R., & Friedrichs, W. D. (1986). The influence of leader behaviors, coach attributes, and institutional variables on performance and satisfaction of collegiate basketball teams. *Journal of Sport Psychology*, *8*, 332–346.

Williams, L. J., & Podsakoff, P. M. (1989). Longitudinal field methods for studying reciprocal relationships in organizational behaviour research: Toward improved causal analysis. *Research in Organizational Behavior*, *11*, 247–292.

Yukelson, D. (1997). Principles of effective team building interventions in sport: A direct services approach at Penn State University. *Journal of Applied Sport Psychology*, *9*, 73–96.