Development and Evaluation of a Team Building Intervention with a U.S. Collegiate Rugby Team: A Mixed Methods Approach

Amber M. Shipherd
Eastern Illinois University

Itay Basevitch
The Florida State University

Kelly Barcza Renner
Franklin University

Kamau Oginga Siwatu
Texas Tech University

Abstract

The researchers conducted a two-phase mixed methods study to identify team cohesion weaknesses in a collegiate rugby team and to determine if, and how, an innovative short-term sport psychology intervention could facilitate cohesion. A Performance Enhancement Consultant (PEC) spent the first 16 weeks of the season with a U.S. collegiate club rugby team collecting quantitative and qualitative data on team cohesion. Based on the initial findings, the researchers selected a challenge activity as an ideal way of addressing the team's multiple cohesion shortcomings in a single day workshop. Following the intervention, the PEC collected quantitative and qualitative data at two different times: approximately one week following the intervention and approximately ten weeks following the intervention. Data revealed significant immediate and long-term increases in team cohesion following the intervention. Additionally, athletes noted the intervention (a) provided them with effective techniques to utilize while performing together, and (b) utilized an innovative design.

Introduction

Players, coaches, and other practitioners have often stated that team cohesion positively affects performance (Carron, Colman, Wheeler, & Stevens, 2002; Loughead & Hardy, 2006). While most team building interventions aim to enhance team performance by improving team processes (Hardy & Crace, 1997), Carron and Spink (1993) created a team building framework in which team cohesion is the outcome variable of primary interest. The focus of this study was to enhance team cohesion through a short-term team building intervention.

The sport and exercise psychology literature defines cohesion as: "a dynamic process that is reflected in the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" (Carron, Brawley, & Widmeyer, 1998, p. 213). There are two types of cohesion: task and social cohesion. Task cohesion is a group having a common goal or task that they are striving for, while social cohesion is the motivation of a group of individuals to maintain and develop social relationships among each other (Razafimbola, 2009).

Developing team cohesion is a dynamic process that involves numerous factors. Carron (1982) developed a conceptual framework of team cohesion that practitioners frequently apply to the sport and exercise setting. Researchers identified the following factors as antecedents contributing to cohesion: environmental, personal, leadership, and group (Carron, 1982). Environmental factors consist of elements such as the organizational system and the size of the group. Widmeyer, Brawley, and Carron (1990) conducted a study of the effects of group size on cohesion and found an inverse relationship between group size and cohesion. As the group size increased, perceptions of cohesion decreased. Work output, anxiety, task-motivation (i.e., completion of group's tasks), and affiliation motivation, or establishing and maintaining happy relationships are personal factors. Individuals who perceive their team to have high task cohesion also display a higher work output (Loughead & Hardy, 2006). Leadership factors consist of leader behavior and leadership style. Multiple studies have found a positive relationship between positive coaching behaviors and leadership style and both task and social cohesion (Loughead & Hardy, 2006; Price & Weiss, 2013). Finally, group norms, roles, stability of the group, and productivity are group factors that contribute to cohesion. Numerous studies have addressed the importance of establishing group norms and roles to increase cohesion (Benson, Eys, Surya, Dawson, & Schneider, 2013; Eys & Carron, 2001; Martin, Paradis, Eys, & Evans, 2013). Thus, the literature on cohesion in sports teams has identified cohesive teams as having clear and unambiguous roles, well-defined group norms, common goals, a group identity, effective communication, group synergy, shared responsibility and accountability, trust, and respect (Martin et al., 2013; Razafimbola, 2009; Yukelson, 1997).

Team building is one of the most effective methods of putting group dynamics theory and research, specifically team cohesion, into practice (Gill & Williams, 2008; Martin et al., 2013). Yukelson (1997) proposed a model for a direct approach to team building, consisting of an assessment stage, education stage, brainstorming stage, and culminating in the implementation stage. Yukelson recommends that, to conduct a more complete needs assessment, the consultant should conduct observations and interview coaches, players, and support personnel to gather

information about the team. The education stage should consist of helping the athletes, coaches, and support personnel gain an understanding of both sport psychology and team cohesion. Yukelson then suggests the next stage be a brainstorming stage involving the sport psychology consultant, athletes, coaches, and support personnel to develop awareness of what the team needs to become more cohesive and more successful. Finally, the involved parties implement the plan to improve cohesion as they have outlined in the brainstorming stage.

Research indicates a positive relationship between cohesion and athletic performance, although the strength of this relationship is unclear. Carron et al. (2002) conducted a meta-analysis with 46 articles on team cohesion in sport, and found a significant moderate-large relationship between performance and both task and social cohesion. Carron et al. (2002) also found a positive relationship between performance and both task and social cohesion. These findings imply that team cohesion interventions should target both task and social cohesion.

In an attempt to explain the relationship between cohesion and performance, Carron and Chelladurai (1981) claimed that type of sport could mediate the effect of cohesion on performance. They contended that the relationship between cohesion and performance is positive and stronger in highly interactive teams (e.g., basketball, soccer, football, volleyball, rugby). Voight and Callahan (2001) conducted team building interventions with two separate National Collegiate Athletic Association (NCAA) Division 1 women's soccer teams. Athletes in the study evaluated the direct team building approach that Yukelson (1997) proposed very highly. Additionally, athletes reported increases in both individual and team performance following the team building intervention. Therefore, the researchers elected to implement a direct approach to team building, following Yukelson's model, with the team in this study.

Research often has found short-term team building interventions in sport to be less effective than long-term interventions, but often the circumstances or resources do not allow practitioners or researchers to implement a comprehensive long-term intervention (Weinberg & Williams, 2001). Therefore, the researchers were particularly interested in exploring whether utilizing an innovative design could improve the effectiveness of short-term team building interventions.

Purpose

The researchers had multiple purposes for conducting this research, based on Newman, Ridenour, Newman, and DeMarco's (2003) typology of research purposes. One purpose was to inform the team's athletes and coaching staff of the team's weaknesses in cohesion. Another aim was to measure change in team cohesion by testing if a short-term team building intervention targeting the cohesion weaknesses the Performance Enhancement Consultant (PEC) identified from Phase 1 could increase team cohesion both immediately following the intervention and at the end of the season. The final purpose was to add to the knowledge base of team building intervention effectiveness, and improve practice and influence change in developing and implementing short-term team building interventions. The studies accomplished these purposes through the following research questions:

1. To what extent do the quantitative and qualitative data converge to identify the weaknesses in team cohesion and facilitate the design of the intervention?
2. Can a short-term sport psychology intervention utilizing the Team Building Race design affect team cohesion in a U.S. collegiate club rugby team?
3. How does a short-term sport psychology intervention utilizing the Team Building Race design affect team cohesion in a U.S. collegiate club rugby team?
4. In what ways do the qualitative data help explain the quantitative results?

Method

The PEC, who is a certified consultant through the Association of Applied Sport Psychology (AASP) and has more than seven years of experience consulting with highly interactive teams, including rugby, began working with the rugby team at the beginning of its season. After meeting with the new coach, the PEC decided to spend the first 16 weeks collecting data regarding team cohesion via observations, interviews, and additional quantitative measures. The PEC then reserved the second 16 week period, which was the most competitive part of the team's season, for implementing services deemed necessary following the initial data collection period.

Research Design

The researchers determined a two-phase embedded design was the most appropriate for this study (Creswell & Plano-Clark, 2006). They selected a mixed methods approach to gain a more comprehensive picture of cohesion weaknesses, enhance the validity of the findings by checking the results of the quantitative data against the results of the qualitative data, and guide the development of the intervention. Collecting both quantitative and qualitative data separately allowed the researchers to combine the strengths of the quantitative and qualitative approaches, while minimizing the weaknesses associated with each method (Creswell, 2009). Additionally, the design of Phase 2 allowed the researchers to "simultaneously ask confirmatory and exploratory questions and therefore verify and generate theory in the same study" (Teddlie & Tashakkori, 2009, p. 33). Results from the quantitative data allowed the researchers to determine if a short-term team building intervention could facilitate team cohesion. The qualitative component then allowed the researchers to better understand and interpret how the intervention increased team cohesion, and why certain aspects of team cohesion increased more than others.

Participants

Nineteen male collegiate rugby players on one team and the team's coach participated in this study. Athletes were between the ages of 18 and 23 (M = 19.5) and reported having between 0 and 7 years of experience competing in rugby (M = 2.3). Two athletes held formal leadership positions on the team, ten athletes were returning to play from the previous year, and nine athletes were in their first season with the team. The coach had more than four years of playing and coaching experience, but was in his first season as head coach of this team. The researchers utilized pseudonyms to ensure the anonymity of the participants.

Phase 1

Quantitative Data Collection

Procedures. Following Institutional Review Board (IRB) approval, all 19 athletes completed the Group Environment Questionnaire (GEQ; Carron, Widmeyer, & Brawley, 1985) during a team meeting towards the end of the first 16-week period.

Instrumentation. The researchers selected the GEQ to measure team cohesion, as it is currently the best measure of cohesion in sport (Loughead & Hardy, 2006), and typically researchers and practitioners alike use it to measure cohesion in Carron and Spink's (1993) team building framework. The GEQ is an 18-item self-report measure that contains four different aspects of cohesion: individual attractions to the group-task (ATG-T), group integration-task (GI-T), individual attractions to the group-social (ATG-S), and group integration-social (GI-S) (Carron et al., 1985). Athletes respond to GEQ items on a 9-point Likert scale anchored by 1 (strongly disagree) and 9 (strongly agree), so higher scores represent stronger perceptions of cohesion (Carron et al., 1985). Numerous studies have examined the psychometric properties of the GEQ and have found both high reliability and validity (e.g., Brawley, Carron, & Widmeyer, 1987; Eyes & Carron, 2001; Li & Harmer, 1996; Widmeyer, Brawley, & Carron, 1990).

Qualitative Data Collection

Procedures. The PEC collected qualitative data via ten observations during eight practices and two games, and seven face-to face interviews with six athletes and one coach. The PEC deemed an ethnographic perspective the most appropriate because the purpose of this study was to inform constituencies of the cohesion weaknesses in this particular group of athletes.

Observations. The PEC took a participant as observer role while conducting observations, thus the observation role was secondary to the role of consultant (Creswell, 2009). Observations took place on the team's rugby field, for both practices and games. The coach was aware of the specific purpose for conducting the observations. However, the PEC only told the athletes that the PEC would be observing practices and games to gather information to improve the team's performance. Furthermore, to reduce social desirability bias, the athletes did not know the purpose of the observations was to gather information regarding team cohesion. Eight practice observations lasted approximately one hour and took place over the span of two months. The PEC conducted two observations during the team's games: These observations lasted approximately two hours each and took place two weeks apart. During practice observations, the PEC sat on the bleachers next to the team or stood on the field with the team, and wrote extensive field notes. During game observations, the PEC wore the same attire as the coach, and stood on the sideline with the team, writing field notes. The protocol for the field notes consisted of multiple pages of notes divided into segments for descriptive notes, reflective notes, and demographic information (Creswell, 2009).

Interviews. The PEC conducted seven interviews with six athletes and one coach. Interviews with the players lasted between 15 and 40 minutes (M = 25.1), and the interview with the coach lasted one hour. The PEC used stratified purposive sampling to ensure she conducted interviews with veterans and novices, starters and non-starters, and leaders and non-leaders. The researchers utilized informal conversation interviews to begin building rapport with

the athletes and coach and to ensure spontaneous responses (Patton, 2002). The PEC conducted interviews with athletes before, during, or after practice on the rugby field. The PEC conducted interviews out of hearing distance from other athletes and the coach to protect confidentiality. The PEC was simultaneously conducting short meetings with players' in the same setting to build rapport. Thus, the PEC did not reveal the topic of the interview to other athletes or to the coach. The interview with the coach took place on the rugby field after a practice. Interviews began with an open-ended question, such as, "Please tell me about the team this season," and responses led to follow-up questions more specific to team cohesion, such as, "Can you give an example when the team was not able to perform well together?" or "What do you mean when you say the team is divided?" The PEC did not tape-record or videotape the interviews so athletes would feel more comfortable disclosing information. However, the PEC did take extensive notes, and thus paraphrased answers. Finally, the PEC recorded direct quotations only when possible and necessary.

Results and Discussion

Quantitative. The researchers screened the quantitative data using SPSS v17.0; there were no missing values or outliers identified, nor were there violations of normality. Following the data screening, the researchers calculated descriptive statistics to examine the data and identify potential patterns. Means and standard deviations of the four GEQ subscales were on the low end of the 9-point Likert scale (see Table 1).

Table 1
Phase 1 and 2 Descriptives for GEQ Subscales

Subscale	Phase 1		Phase 2 Time 1		Phase 2 Time 2	
	M	SD	M	SD	M	SD
GIT	3.96	0.97	4.92	0.81	6.76	0.5
GIS	5.07	1.38	6.07	1.25	7.46	0.82
ATGT	2.85	0.74	5.92	0.46	7.25	0.44
ATGS	3.04	1.11	5.03	0.78	7.26	0.5

Qualitative. The PEC analyzed field notes and interview notes using the constant comparative method to determine the cohesion weaknesses of this particular collegiate rugby team. The PEC separated the text into meaningful units of information, and examined the data for similarities and differences and then separated text into categories or themes (Teddlie & Tashakkori, 2009). This process continued until the PEC grouped all text segments into themes with maximum between-theme variation and minimum within-theme variation. Once no new categories emerged, the PEC assumed saturation.

The researchers established trustworthiness through member checking, triangulation of data sources, and investigator triangulation (Teddlie & Tashakkori, 2009). The researchers performed member checking by asking each participant they interviewed to read over the PEC's notes from the interview to verify that the PEC had recorded and interpreted correctly what the interviewee had intended to say. In addition, they triangulated the data sources by collecting data

from multiple data sources (i.e., multiple interviews and observations). Both the PEC and a doctoral student independently analyzed the data, and then discussed and agreed on the themes to accomplish investigator triangulation. The independent analyses revealed a high degree of consistency with respect to development of themes, and the researchers resolved disagreements by questioning and challenging the appropriateness until they reached an agreement. Finally, the researchers recorded thick descriptions of context to "provide evidence for the transferability of interpretations and conclusions from QUAL investigations" (Teddlie & Tashakkori, 2009, p. 213).

Following these data analyses, the researchers compared results from both the qualitative and quantitative data. The GEQ, observations, and interviews all revealed the team exhibited weaknesses in both task and social cohesion. Specifically, the researchers identified the following themes from the data as significant weaknesses: leadership, communication, role incongruity, and lack of team identity and goals.

Leadership. All six athletes interviewed identified the lack of strong leadership as a team weakness. The coach, as well as four of the six athletes the researchers interviewed, described this weakness in leadership as resulting from the team composition, pointing out that the team consisted of many new players and very few veteran athletes. Younger athletes also described how they felt there were no veteran athletes they could look up to and emulate on the team. The PEC also observed a lack of strong leadership was a recurring theme as well. The PEC noted that during team huddles in both practices and games, athletes frequently looked around at each other, as if waiting for someone else to begin speaking, or give instructions. During practices, athletes would rarely offer to help new teammates learn the game or style of play, unless directed to by the coach. The PEC also observed that when mistakes occurred during either practices or games, the leaders did not attempt to motivate the athletes to continue putting forth effort.

Communication. Another theme that all six athletes and the coach identified as a significant team weakness was lack of effective communication. During games, athletes described when one teammate attempted to pass the ball to another teammate, two teammates then tried to catch the ball at the same time, and the other team recovered the ball. The PEC also observed several instances during games when an athlete would attempt to pass the ball without looking to another teammate, only to find the teammate was in another location on the field, resulting in another mistake. Additionally, in both games, the PEC observed athletes arguing with each other over which plays to run during games, and any verbal communication the PEC overheard taking place on the field was typically negative, such as "No! How could you drop that pass?" Only one in approximately every ten comments heard in practices or games were either positive or instructional.

Role incongruity. During the interview, the coach indicated that other than the team captain, athletes did not have specific roles on the team. He suggested the veteran athletes should "know their role." Both veteran and rookie athletes stated they were not aware of what their role was within the team in general, and many athletes said they were not aware of their role even on offense, on defense, or in specific game plays. The PEC observed the coach giving different athletes the same roles and responsibilities during specific plays in seven of the eight practices the PEC observed. Athletes described this as "very confusing." Ryan, a veteran athlete said it was difficult to keep track of what everyone was supposed to be doing in every play, when every time a specific play was practiced, he was supposed to be doing something different. Rookies also indicated they felt confused because, when the coach substituted them during

games, the coach would instruct the player frequently to play a different position, making it challenging for them to learn the game and the responsibilities of any given position.

   Lack of team identity and goals. The coach described the team goal as making it to Nationals. However, all six athletes the researchers interviewed indicated that not everyone on the team seemed to be 'on the same page.' Ryan and Mike, two veteran athletes, described how they felt some of the new athletes to the team were not concerned with winning at all and did not understand the importance of being the best team in the state. Kevin, one of the younger athletes, said some of the team leaders told him and some of the other rookies that the focus this year would be to work on skill development. Yet another rookie, Andrew, stated the team did not have a goal at all. Finally, Brent, a veteran athlete described the team make-up as "a bunch of guys, not really a team."

   Once the researchers identified weaknesses in team cohesion, the PEC met with coaches, athletes, and consulted with several other PECs as well to brainstorm the needs of the team to become more cohesive and more successful. With the limited resources available, the PEC planned one full day to implement a brief team building intervention with the entire team at the very start of the second 16-week period. Throughout the remainder of the second 16-week period, the PEC planned to continue to meet with athletes on an individual basis to provide consulting services as necessary.

Intervention Development

   The coach expressed he wanted the intervention to be fun, not feel like a workshop and performed in an environment outside of the rugby field. Therefore, the researchers chose the design, named 'the Team Building Race,' as an ideal way to address multiple areas of weaknesses in a single day workshop (Barcza et al., 2009). The PEC chose the specific activities during the workshop to target the weaknesses a group of PECs with years of both playing and consulting experience with highly interactive teams identified from Phase 1. The researchers previously utilized the chosen activities in various past team building workshops or interventions. The PEC's chosen activities represented obstacles and challenges the team was likely to face during its competitive season (Janssen, 1999). The PEC put athletes into scenarios and situations targeting team weaknesses that required them to work together and overcome their weaknesses to be successful at the task. Previous research indicated that challenge activities, such as ropes courses or the Team Building Race of this study, provide coaches and athletes with insight about themselves and force teammates to communicate and work together under pressure to handle obstacles and adversity in a shortened timeframe (Janssen, 1999). Activities such as the Team Building Race increase teammate interaction outside of their sport environment (i.e., practices or games) and promote team bonding and togetherness, which is an important aspect of the group environment (Paradis & Martin, 2012).

   The team's PEC, along with several other sport psychology graduate students with experience working with athletes, led the different activities. One graduate student served as the activity leader for each activity and led semi-structured discussion questions and topics for his or her activity. The activity leaders asked any additional follow-up questions or other related questions they deemed necessary. The PEC also instructed activity leaders to take field notes during or after each group completed the activity, with specific focus on the task and social cohesion topics the PEC previously identified as cohesion weaknesses.

At the beginning of the day, the PEC split the athletes into four groups of approximately five players in each group. The PEC purposely assigned athletes to groups so each group contained a mix of different positions (i.e., forwards and backs), a mix of playing status (i.e., starters and nonstarters), and evenly distributed team leaders among the different groups. The PEC then gave the groups the following instructions:

> "You will have six total stations to complete throughout the day today. Please complete the stations as quickly and accurately as possible. In just a moment, each group will be given an envelope with a map of the location of each station indicated by a dot, and a clue that will lead you to your first station. After successful completion of each station, you will be given an envelope with a clue to your next station."

A description of the stations the PEC used during the intervention is below. Each station ended with a discussion on how to apply the concepts and ideas learned to their rugby team.

Trust Obstacle Course

The researchers chose this station to target leadership and communication. They nominated one group member to be the group leader. They blindfolded the remaining group members, and instructed them to form a single file line and hold onto the shoulders of the person in front of them. The activity leader informed the athlete leader, standing in a stationary position outside of the obstacle course, to navigate the group successfully through the obstacle course.

Building with Roles

The researchers selected this station to target role congruity, leadership, and communication. The activity leader assigned each group member a role and gave each athlete an index card with specific instructions on how to build a block structure, according to their role. The different roles included captain, veteran, rookie, and substitute(s). The activity leader instructed the athletes to not discuss or share the information on their card with anyone else. The captain's card had the most detailed instructions and a picture of what the final structure should look like. The veteran's card included detailed instructions, but no picture. Both the rookie and substitute's cards included only very brief instructions. The substitutes began the activity only observing on the side, while the other group members attempted to build the structure. Halfway through the task, the activity leader instructed the captain and veteran that they both sustained an injury and must leave the activity. The substitutes took their places building the structure. The sport psychology graduate student leading the activity observed if the group members worked together to help each other complete the task, and if the two "injured" group members continued to help their teammates from the side.

Human Pedestal

The researchers selected this station to address communication, leadership, and role congruity. The activity leader instructed group members to lie down on their backs and form a circle with their feet in the middle and straight up in the air to form a pedestal. The activity

leader then placed a bucket filled with water on top of their feet. The activity leader instructed group members to take off the shoes of the teammate to their right without standing up, and without receiving assistance from any other group member. The activity leader instructed some groups that completed the task easily to then put their teammates' shoes back on in the same fashion.

Commitment Egg Relay

The researchers chose this station to address communication. The activity leader paired group members up and then gave the pairs separate instructions for the activity. The activity leader told one member from each pair that the activity was a competition and that the goal was to beat all the other pairs. The activity leader told the second member from each pair that they should complete the task with minimal commitment; they should not try very hard, should make mistakes frequently, but should not let their partner know they were trying to fail. The activity leader provided each partner with a spoon: The first partner ran up a hill carrying the egg behind his back and then transferred the egg to the second partner, who completed the same task.

Role Understanding through Artwork

The researchers selected this station to target role congruity. The activity leader provided group members pens, crayons, and paper, and instructed the athletes to draw a symbol or picture to represent best their role on the team. Upon completion, the activity leader then instructed group members to explain to the group why they chose to draw their image. The group then gave each member feedback about why the image best represented his role on the team, or why another image might be a better representation. The activity leader asked group members if they felt comfortable with their role on the team and understood their role on the team, and what they could each contribute to the team.

Team Goals and Identity

After successful completion of the fifth station, each group's final clue led them back to the location where they had begun the day, where the coach and PEC were waiting. At this point, the PEC led the whole team in a debriefing of the day's activities, primarily focusing on how they could apply the skills and concepts they learned in the activities to the sport of rugby. The PEC also aided the team in formulating concrete process and performance goals for the spring season. Last, the PEC discussed the importance of creating a team identity, and the team elected to create a team motto it repeated at the end of every huddle during both games and practices.

Phase 2

Quantitative Data Collection

Procedures. The PEC collected both quantitative and qualitative data at two different points in time. Data the PEC collected during Time 1 occurred approximately one week

following the intervention; data the PEC collected during Time 2 occurred approximately ten weeks following the intervention.

Questionnaire. All 19 athletes completed the GEQ during a team meeting in a classroom five days after the intervention (Time 1). The PEC again administered the GEQ to the athletes approximately ten weeks after the intervention, at the end of their spring season (Time 2).

Qualitative Data Collection

Observations. The PEC observed two practices during Time 1, within one week following the intervention. The PEC collected data for Time 2 during the last month of the team's season, between six and ten weeks following the intervention. The PEC observed nine practices and three games during Time 2 data collection. The PEC again took a participant as observer role while conducting observations on the team's rugby field for both practices and games. The PEC did not tell the athletes the observations were specifically to gather data regarding team cohesion. The PEC's practice observations lasted approximately one hour, and the PEC's game observations lasted approximately two hours each. The PEC completed the same observation protocol as in Phase 1.

Interviews. The PEC interviewed four players during Time 1, within one week following the intervention. The PEC collected the data for Time 2 during the last two weeks of the team's season, between 10 and 12 weeks following the intervention. During Time 2, the PEC conducted face-to-face interviews with 8 players and 1 coach. The PEC's interviews with athletes lasted between 15 and 45 minutes ($M = 28.4$), and the interview with the coach lasted 30 minutes. The PEC used stratified purposive sampling to interview only athletes whose scores on the GEQ reflected the largest or smallest increases in team cohesion. Additionally, the PEC used stratified purposive sampling to select veterans and novices, starters and non-starters, and leaders and non-leaders. The PEC utilized the general interview guide approach to keep the interviews focused on the topic of team cohesion, but to allow the PEC more flexibility and to still maintain a conversational tone (Patton, 2002). The PEC conducted athlete interviews before, during, or after practice on the rugby field. The PEC's interview with the coach took place on the rugby field after a practice. The PEC's interviews with the athletes during Time 1 began with the question, "Have you noticed any changes within the team?" The PEC then asked athletes follow-up questions, such as, "What do you think contributed to these changes?" The PEC's interviews with athletes during Time 2 began with the question, "Tell me about the team at this point in the season." The PEC then asked follow-up questions to attempt to understand and clarify how and why the team cohesion had improved, such as, "What do you think led to the better communication?" or "How have the relationships between players improved?" The PEC did not tape-record or videotape interviews to help the athletes feel more comfortable disclosing information, but the PEC took extensive notes, paraphrased most answers, and recorded direct quotations only when possible and necessary.

Results

Quantitative. The researchers screened the quantitative data using SPSS v17.0 and did not identify missing values, outliers, or any violations of normality. Following the data screening, the researchers calculated mean scores for all four factors of the GEQ. See Table 1 for means and

standard deviations of the GEQ subscales. The researchers conducted a MANOVA to test the effect of the intervention on cohesion over time. Results revealed a significant time effect on cohesion (see Figure 1) $F(8, 104) = 24.90$, $p < .001$. Follow-up univariate ANOVAs also revealed significant differences across time on GIT, $F(2, 54) = 62.88$, $p < .001$, GIS, $F(2, 54) = 19.91$, $p < .001$, ATGT, $F(2, 54) = 305.37$, $p < .001$, and ATGS, $F(2, 54) = 122.32$, $p < .001$.
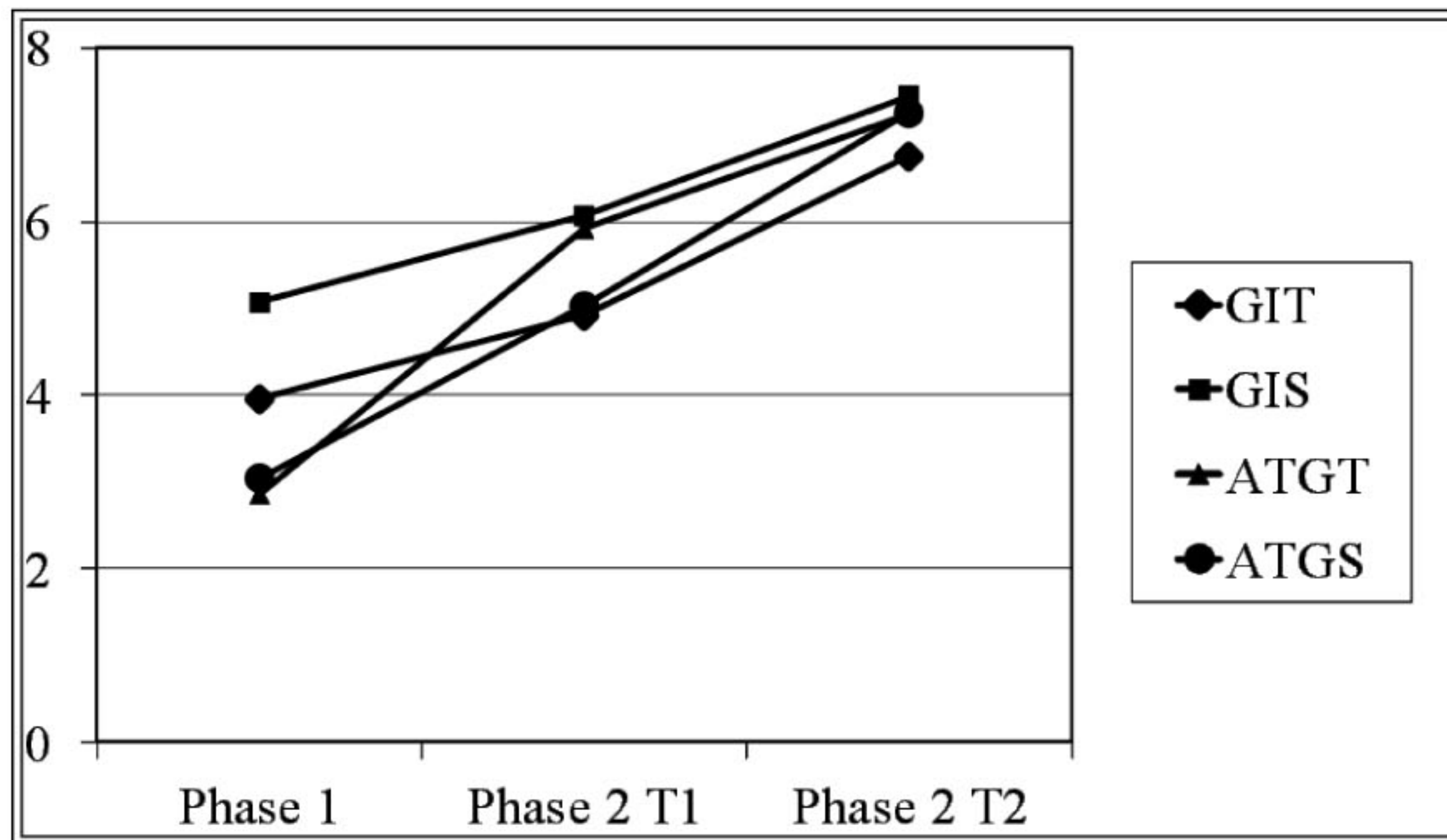

Figure 1. GEQ means by factor across Phase 1, Phase 2 Time 1, and Phase 2 Time 2.

Qualitative. The researchers again analyzed the qualitative field notes and interview notes using the constant comparative method. As in Phase 1, the researchers conducted member checking, triangulation of data sources, and investigator triangulation, and provided thick descriptions of context to determine trustworthiness. The GEQ, observations, and interviews revealed the team increased in both task and social cohesion. Specifically, the following themes emerged as significant changes resulting from the intervention: effective communication, strategies to recover from mistakes, better understanding of roles, and clear team goals. Another theme that emerged through the interview was the effectiveness of the intervention design.

Effective communication. In interviews one week following the intervention and at the end of the season, athletes described how the intervention provided them with more effective means of communicating with each other, especially while under pressure. In an interview one week after the intervention, Chris, a veteran athlete, described how previously the team communicated by yelling at each other. He said the team attempted to use more instructional comments during practice scrimmages, such as, "Everyone shift left." Chris said when he felt himself getting frustrated at a teammate for making a mistake on the field, instead of yelling, he would take several deep breaths to calm himself, then walk over to the athlete individually and try to help him understand what could be done differently or better the next time to avoid that mistake. The PEC heard instructional comments more frequently than negative comments in eight of the nine practices and in all three games the PEC observed at the end of the season. Another rookie, Steven, noted that, while the team had improved a lot from the workshop, there

was still a long way to go. Steven said communication amongst teammates became more positive and instructional, but that communication from the coach to the athletes was still overwhelmingly negative.

Strategies to recover from mistakes. Prior to the intervention, the PEC observed several occasions during both practices and games, in which one mistake then led to either more mistakes being made or to one athlete yelling at another athlete. In a practice one week after the intervention, the PEC noticed a rookie athlete dropped a ball during a critical play that could have led to a try (i.e., a score) against his team. Ryan, one of the veteran athletes ran up to the rookie, handed him the dropped ball, and said, "It's cool, just make sure your hands are out and ready next time. Let's just restart right here." When the PEC asked Ryan about this incident after practice, he said that in particular, the 'Human pedestal' activity from the intervention had made him aware that before he yelled at a teammate for doing something wrong, he should put himself in the teammate's shoes and consider what feedback would be the most effective to remedy the situation. Two other veteran athletes also described using breathing techniques they learned during the Human Pedestal station to calm themselves when they felt frustrated with a teammate. Ten weeks after the intervention, the PEC also observed multiple instances in practices when a veteran player called for a huddle following a mistake before running the next play. In an interview at the end of the season, the coach also indicated that, while he still observed mistakes, he felt there were fewer occasions when one athlete's mistake would lead to "everyone making mistakes."

Better understanding of roles. Four rookie and two veteran athletes the PEC interviewed at the end of the season also believed the intervention led to a better understanding of everyone's role on the team in general. In an interview one week after the intervention, the coach said he did not realize the importance of giving each athlete a role and making each athlete feel as if they brought something to the team. At the next practice, the PEC observed the coach designating specific roles and responsibilities to the veteran athletes, such as, "On defense, I want you calling all the plays." The coach did not give rookie athletes specific roles, but when interviewed, they said the veteran athletes helped them to understand the best way they could contribute to the team. Adam, a rookie athlete, described how prior to the intervention he was not sure what he could contribute to the team because he was not a starter, but that several activities during the intervention and several conversations with veteran athletes helped him have a better understanding of how he could help, even from the bench.

Clear team goals. The PEC observed both the team captain, Eric, and another veteran athlete, Chris, monitoring and reminding teammates of the team goals at practices. Additionally, three of the rookie athletes stated they felt comfortable and more prepared, knowing the direction the team was heading and what is necessary to get there. In an interview one week following the intervention, the coach also discussed how he felt that working backwards from the team's ultimate goal of reaching Nationals and setting the process goals really made a difference in the amount of effort the athletes were putting into every practice. He stated, "The guys knowing what needs to be done every day seems to be holding them more accountable." Mark, a rookie athlete, also said that setting the process goals enabled himself and his teammates to know clearly what was expected of them on a daily basis.

Fun design. Athletes also reported that the design of the intervention helped make the day seem more fun for them. Three of the four athletes interviewed one week following the intervention indicated that when the coach first told them they would need to arrive on campus

on a Saturday for an 'event,' they were afraid they would be doing something tedious, such as watching film all day long. The athletes described that they were still wary once they arrived on campus and heard they would be participating in team building but that they were intrigued after the PEC explained the design and purpose of the workshop. They also said the workshop was very fun to participate in, and they would like to participate in a workshop the PEC designed more often. Jake, a veteran athlete, stated the intervention was very enjoyable because it appealed to their competitive side, yet teammates had to work together in activities other than rugby. Furthermore, five athletes the PEC interviewed during Time 2 indicated having more fun with each other outside of rugby and that socializing with each other outside of rugby functions made them like their teammates better as friends. Dan, a rookie athlete, even said he thought the whole workshop was "just for fun," until the PEC debriefed the team at the end of the day and he realized what he and his teammates had learned that they could then use on the rugby field.

Discussion

One purpose of this study was to inform constituencies, primarily the coaches and athletes of a particular U.S. collegiate men's rugby team, of the team's weaknesses in cohesion, in order to develop an effective intervention targeting the team's weaknesses in cohesion. The researchers addressed this purpose through research question one: To what extent do the quantitative and qualitative data converge to identify the weaknesses in team cohesion and facilitate the design of an intervention for a U.S. collegiate rugby team? Results from the GEQ, observations, and interviews the PEC collected during Phase 1 all revealed the team exhibited weaknesses in both task and social cohesion. Specifically, the researchers identified the following as significant cohesion weaknesses: leadership, communication, role incongruity, and lack of team identity and goals. The researchers selected the Team Building Race design of the intervention as an ideal way to address these multiple areas of weaknesses in a single day workshop, and the researchers chose the specific activities to target the identified weaknesses.

Another purpose of this study was to measure change in team cohesion, by testing if a short-term team building intervention targeting the team's cohesion weaknesses the PEC identified from Phase 1, could increase team cohesion both immediately following the intervention, and at the end of the season. The researchers accomplished this purpose through research question two: Can a short-term sport psychology intervention utilizing the Team Building Race design affect team cohesion in a U.S. collegiate club rugby team? The researchers noted significant immediate and long-term increases in team cohesion (see Figure 1) from the data. While it is not definitive that changes in cohesion were due to the intervention, both coach and athletes attributed the increased cohesion to the intervention. The cohesion increase and qualitative results provide support that the intervention at least partially contributed to the increased cohesion.

Although both coach and all athletes the PEC interviewed at the end of the season still attributed increases in cohesion to the intervention, other variables could have influenced or contributed to the changes in cohesion. For example, several athletes sustained injuries during the season, and while they were still a part of the team and continued to attend during practices and games, they were not participating during practices or games. In addition, the team's PEC continued to work with several athletes individually throughout the season, which could have provided those athletes with some skills or techniques they utilized with the rest of the team.

Since the PEC knew the design of the study and the overall intent and hypotheses, it is possible the PEC could have been unintentionally biased when observing the team interactions to focus on situations that demonstrated more cohesion. Another limitation was that the interviews were not tape recorded or videotaped. Although the PEC performed member checking to ensure she had correctly recorded and interpreted what the interviewees had said, it is possible the PEC missed or incorrectly interpreted some interview information.

Martin, Carron, and Burke (2009) found that team building interventions lasting less than two weeks had a non-significant impact on team cohesion, yet the single day team building intervention utilized in this study did significantly increase team cohesion. However, it is important to note this study, similar to other team cohesion in sport intervention studies, utilized a single team pre-post design and did not include a control group. Despite the lack of a control group, team cohesion studies in sport utilizing either a single team pre-post design or a quasi-experimental design have produced moderate, positive effect sizes (Martin et al., 2009). Although it is difficult to separate intervention effects from natural development, single team pre-post and quasi-experimental designs remain a common format, especially for practitioners in real-world settings (Barker, Mellalieu, McCarthy, Jones, & Moran, 2013). One reason this short-term intervention worked so well with this team could be because of the large number of new and young players on this team, as opposed to a team that has been together for a long period of time.

An additional aim was to add to the knowledge base of team building intervention effectiveness, and improve practice and influence change in developing and implementing team building interventions. The researchers addressed this purpose with research question three: How does a short-term sport psychology intervention affect team cohesion in a U.S. collegiate rugby team?; and research question four: In what ways do the qualitative data help explain the quantitative results? The qualitative data revealed many of the changes in team cohesion appeared to be the result of the skills and techniques the athletes and coach acquired during the intervention.

Researchers and practitioners often have found sport psychology techniques positively impact athlete and team performance (Weinberg & Gould, 2011). One reason this short-term intervention might have been so effective with this team was because sport psychology services were such a novel concept for the athletes. Nonetheless, the athletes who participated in the short-term sport psychology intervention were able to learn and utilize numerous techniques through this short-term intervention, such as goal setting and arousal regulation.

Athletes also reported the design of the intervention helped make the day seem more fun for them. Therefore, it is possible the Team Building Race design could have contributed to the effectiveness of the intervention. Researchers and practitioners found team building interventions focusing on psychological skills training produce more positive results than do team building interventions focused on interpersonal relations, or team building interventions focused on a combination of psychological skills training and interpersonal relations training (Martin et al., 2009). The Team Building Race design researchers utilized in this team building intervention primarily focused on aspects of psychological skills training. Athletes also reported enjoying the competitive nature of the intervention and how the intervention involved activities other than rugby. Numerous college football teams have utilized competitive activities other than football for successful team building (McCallum, 2001, as cited in Weinberg & Gould, 2011). Future studies should incorporate a control group and continue to investigate the effectiveness of this

Team Building Race design for a short-term team building intervention with other highly interactive teams.

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About the Authors

Amber M. Shipherd, Ph.D., is an Assistant Professor in the Department of Kinesiology and Sports Studies at Eastern Illinois University. Dr. Shipherd holds a doctoral degree in educational psychology and sport and exercise psychology from Texas Tech University, a master's in educational psychology and sport and exercise psychology from Florida State University, and a bachelor's in human development from the University of California – Davis. She has more than seven years of performance enhancement consulting experience with teams and individuals and is a certified consultant with the Association for Applied Sport Psychology. Dr. Shipherd's

research interests revolve around athlete self-efficacy development, sport injury prevention and rehabilitation, and peer leadership development.

Itay Basevitch, Ph.D., is with the Department of Educational Psychology and Learning Systems at the Florida State University. Dr. Basevitch's research interests revolve around perceptual-cognitive skills (e.g., anticipation and decision-making, perception of attention and exertion, and the link between psychological and physiological variables in sport and exercise settings. Dr. Basevitch is a certified consultant with the Association for Applied Sport Psychology and has several years of experience serving as a performance enhancement consultant with teams and athletes.

Kelly Barcza Renner, Ph.D., is an adjunct professor with Franklin University in Columbus, Ohio. She holds a doctoral degree in educational psychology from Florida State University, a master's in counseling from West Virginia University, and a bachelor's degree in psychology from Miami University. Dr. Barcza Renner swam competitively for Miami University and currently provides counseling and performance enhancement consulting services to teams and individuals in Ohio.

Kamau Oginga Siwatu, Ph.D., is an associate professor of educational psychology in the Department of Educational Psychology and Leadership at Texas Tech University. Dr. Siwatu holds a doctoral degree in educational psychology from the University of Nebraska – Lincoln, a master's in educational psychology from Florida State University, and a bachelor's in psychology from California State University, Dominguez Hills. Dr. Siwatu's research agenda focuses on issues related to teaching, learning, and diversity in K-12 educational settings.

Discussion Questions

1. How could this type of team building intervention be applied to the business setting or with younger team members?

2. What are the challenges to implementing short-term team building interventions such as this?

3. What other activities could be utilized to address the team's weaknesses?

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