Private Instant Message Groups, Cohesion and Performance in Sport: A Mixed Methods Case Study

by

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Abstract

Online communication has been related to positive and negative outcomes for users outside of sport, but there is no known work looking at the effects of online communication in team-based sports. Therefore, this mixed methods case study explored how online communication impacted a team and their cohesion and performance over a season. A quantitative phase measured cohesion and online communication networks among teammates to examine the potential relationship between the two. A qualitative phase of interviews followed. Abductive analysis aimed to first compare the findings from interviews to other research in the field and second, to generate themes unique to the experience of the participating team. Themes of organized communication, inclusion and tension (or lack thereof) among teammates emerged and help to answer the research questions. Strengths, limitations, future directions and actionable findings are discussed to move this topic forward in the field of sport psychology and sociology.

List of Abbreviations Used

app	Application (software for a mobile device or smart phone)
ATG-S	Individual Attraction to the Group – Social
ATG-T	Individual Attraction to the Group – Task
GEQ	Group Environment Questionnaire
GI-S	Group Integration – Social
GI-T	Group Integration – Task
LSS	Leadership Sport Scale
MPC	Mental Performance Consultant
P#	Participant Number

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Chapter 1: Introduction

For decades there has been research and debate over whether and how much cohesion impacts performance (see Carron, Bray, & Eys, 2002). Cohesion is the tendency for a team to stick together as they pursue their goals and social needs and can change for better or worse as a competitive season progresses (Carron & Hausenblas, 1998). Numerous researchers have shown that cohesion is related to a host of positive outcomes for teams, including greater success (Carron, Bray, et al., 2002), higher collective efficacy (Kozub & McDonnell, 2000), greater adherence to team norms (Benson, Bruner, & Eys, 2017; Gammage, Carron, & Estabrooks, 2001; Prapavessis & Carron, 1997), lower state anxiety (Eys, Hardy, Carron, & Beauchamp, 2003), and lower jealousy (Kamphoff, Gill, & Huddleston, 2005). The relationship between cohesion and performance is of particular relevance to this study. While cohesion has traditionally been thought to have a reciprocal relationship with performance (as one improves so does the other), some research proposes a directional relationship that differs by sex, suggesting that male athletes develop cohesion after performing well together and that female athletes require cohesion in order to perform their best (Carron, Colman, Wheeler, & Stevens, 2002; Eys et al., 2015; Navarre, 2011; West-McMaster, 2004). It is currently unclear as to why these findings have emerged and how stable they may be. If the suggested directional relationships are representative, then factors that might build or break down cohesion on a team should be well understood. This will help ensure coaches and athletes have the best knowledge to manage their team environment (cohesion) and consequently their performance.

Carron and Hausenblas (1998) stated that there are internal factors that will bring and keep a team together such as an individual's attraction to the group goals and social environment, as well as their perception of how integrated the group is socially and as they pursue their goals. These authors also highlight external factors that can play a role such as societal, geographic and demographic factors, as well as contractual obligations. Online communication among teammates may be an unexamined external factor impacting cohesion on a team, and potentially even the team's performance. Since communication through online mediums is growing and pervasive, it is important to study its potential impacts on sport. While online communication occurs in many formats, both public and private, I chose to limit the scope of this thesis to private online communication between teammates through instant messaging due to the growing popularity of this approach to communication, the potential for private messages to both help and hurt relationships due to their exclusivity, and a gap in research looking at how private communications effect a team.

For over a decade, the most popular approach to online communication among young adults has been instant messaging (Kim, Kim, Park, & Rice, 2007). Instant messaging (IM) allows for synchronous communication online where messages can be sent and received in real time. While IM was initially done on a home computer with wired access to the internet, the growth of mobile phones that can access wireless internet have shifted the way many communicate (Anderson, 2015). IM often happens through various social media sites like Facebook or Instagram (among many others), typically through that site's application (app) added to an individual's smartphone. The use of social media sites generally requires the creation of a user profile and encourages users to

add “friends” or “followers” who also have a profile, in order to build their online network. Typically, these online connections will be reflective of offline relationships (Lee & Perry, 2004), although “friending” someone online does not always mean that an offline relationship exists (Pollet, Roberts, & Dunbar, 2011). Some research has found that females access social media and use IM for relationship maintenance more often than males (Lenhart, 2015; Ramirez & Broneck, 2009). Additionally, studies on the effects of social media and IM use have cited both positive and negative outcomes for both sexes. Some positive outcomes include the ability to strengthen current bonds with important others and the ability to maintain a long-distance relationship through communication online (Anderson, 2015; Desjarlais & Joseph, 2017; Lenhart, 2015; Ramirez & Broneck, 2009; Valkenburg & Peter, 2007). Additionally, online communication may ease oral communication anxieties for some (Neo & Skoric, 2009). On the other hand, some negative outcomes can include arguments or jealousy within existing relationships enhanced by a lack of contextual information available when communicating online (Anderson, 2015; Cohen, Bowman, & Borchert, 2014; Lenhart, 2015; Neo & Skoric, 2009).

IM can be sent between two social media friends or to a private selection of friends, with no limit on the number of people in a group or the number of conversations in which a user can engage. For example, a group of five friends offline could start up a private IM group through their preferred social media app including all members. Additionally, three or four of them could start a separate conversation, excluding the other(s). With a group of only five, it is possible to have up to 16 private IM groups including at least three of the original group members. In a team environment, the

number of athletes can range from four to 25 (or more). Team sports open up the possibilities of numerous private IM groups among teammates.

Private online subgroups may impact teams in a variety of ways. In a survey of American teens, twenty nine percent said they had argued with friends about something that happened online or via text message (Anderson, 2015). Private IM groups may also make cliques among the team more pronounced, by emphasizing who is "in" and who is "out" during offline interactions and inciting feelings of jealousy among group members (Cohen et al., 2014). Private IM groups could also be used to vent about disagreements happening offline in practices or games. While this might be beneficial for some, it might also enhance fault lines on the team and divide athletes (Martin, Wilson, Evans, & Spink, 2015). However, from an athlete's perspective, not all subgroups are detrimental to a team (Martin et al., 2015). It is possible that private IM groups can help subgroups of athletes bond and strengthen existing bonds. These bonds could then help overall team performance (Martin et al., 2015). Research has shown that IM supports intimate personal disclosure, which could explain the improved bonds (Neo & Skoric, 2009). Thus, it appears that there are benefits and drawbacks for all users.

The current reality is that many competitive athletes in North America own a smartphone (Anderson, 2015). Additionally, they are likely to use social media sites and IM services for relationship maintenance, perhaps more often if they are female (Lenhart, 2015; Ramirez & Broneck, 2009). It is currently unclear whether the use of private IM groups among athletes is impacting cohesion or performance. Taken together with the suggestion by some researchers that cohesion may be required to elicit the best

performances in female athletes, it is important is to explore and describe any impacts from the athletes' perspectives.

When a topic is unexplored, qualitative work can be a logical first step (Creswell, 2014; Patton, 2015). Qualitative research allows those affected by a phenomenon to express what is important to them and may expose variables that an outsider or investigator would not have predicted as being important to the topic (Patton, 2015). For this reason, similar topics in sport psychology have been pursued through a qualitative lens. For example, while subgroups and cliques are common and often seen as inevitable in sport, they have been largely under-investigated. Early work in sport psychology (Eitzen, 1973) framed cliques as having a negative impact on a group's likelihood of achieving success. Since then, little has been done in the area other than to discourage their development (Yukelson, 1997). Thus, a few years ago qualitative work was done to explore and update our perceptions of social subgroups on a team through athlete (Martin et al., 2015) and coach perspectives (Martin, Evans, & Spink, 2016). Through semi-structured interviews, these authors were able to shine a light on how subgroups are perceived by both athletes and coaches. Some of what emerged were insights into how coaches aim to manage subgroups and cliques through athlete selection (Martin et al., 2016), and that not all athletes see subgroups as detrimental to team functioning (Martin et al., 2015). This shows how qualitative work can open future research areas and expand our understanding of phenomena by exploring and exposing what is important to those affected.

To begin to address how the use of private IM groups may impact cohesion and performance, I chose to complete a case study with one team over the course of their

season. For this particular case study, qualitative interviews may not be enough to describe what is occurring in the team environment over the season. According to Cattell (1948) there are three aspects with which groups should be described. These three aspects are what he calls group syntality, population traits, and characteristics of internal structure. According to Cattell, group syntality (sometimes called group locomotion, and an influential concept in the development of the definition of cohesion) describes what the group can achieve through its existence as a group. In sport, consistent successful performances (i.e. winning) is what most teams strive to achieve. A population trait describes the group by stating an average tendency or demographic variable. In this case, cohesion can represent a population trait of the team chosen. Lastly, internal structure refers to the networks and relationships within the group. I chose to study online networks, specifically any private IM groups that may exist among subgroups or cliques on the team. I used Cattell's approach to describing a group as well as a pragmatic philosophy to design a mixed methods case study. Pragmatism is often distinguished by pluralism (a *both/and* approach to what constitutes as valid data), fallibilism (a belief that truth changes over time with the emergence of new information) and utility (useful application of research findings). A pragmatic approach aligns well with mixed methods research, which aims to maximize the benefits and minimize the inherent drawbacks within quantitative and qualitative research, thereby providing a more complete description of a phenomenon and avenue forward (Creswell, 2014; Patton, 2015). I chose to use an explanatory sequential mixed methods design, which begins with a quantitative phase of data collection that is analyzed and informs a subsequent qualitative phase of data collection. The qualitative data is then analyzed on its own before all data is

integrated and interpreted to best describe the case at hand and answer the research questions. This approach is ideal when there are well-established elements (i.e. cohesion, performance) that may be affected by an unexplored variable (private IM groups among subgroups or cliques on a team; Creswell, 2014).

Many athletes are able to connect with one another in ways that were not possible even a few decades ago when initial cohesion-performance theories were being established, therefore it is important to research potential effects of private IM groups on teams in regard to this relationship. It has also been suggested that females may require team cohesion to perform their best, and that they are likely to use social media and IM as forms of relationship maintenance more often than males. Currently, no known studies have looked at how IM is affecting athletes, specifically female athletes who compete together on a team. While the current study does not aim to measure or confirm the sex/gender differences proposed in previous work, the preference was to examine a female team since past research pointed in this direction.

Purpose

The purpose of this mixed methods case study was to explore athlete experiences with online communication (through private IM groups) and any perceived impacts on their perceptions of cohesion and individual or team performance outcomes.

Chapter 2: Literature Review

In the following chapter, I expand on each of the topics highlighted in the introduction, beginning with online communication through IM and the positive and negative impacts it can have for users. Next, I will review cohesion, including what researchers currently understand and propose about its relationships with performance. While the work done on cohesion is vast, I have selected key articles that align best with what is found in literature on online communication in order to speculate on potential links between these topics.

Online Communication

The growth of smartphone ownership, wireless internet access and social media sites have shifted many conversations online (Anderson, 2015; Kim, et al., 2007). Online communication comes in many forms such as sending emails, posting comments to forums or accounts, and communicating through a social media profile by way of open and private IMs to one or many. The use of different mediums of communication appears to fluctuate depending on a person's age, occupation, and the closeness of the relationship (Kim et al., 2007). Kim and colleagues (2007) found that working adults use email and phone most for work exchanges, and reserve text messages and IM for family. A similar pattern of use emerged for university students where they used email to communicate with professors or fellow students for project work, and text and IM to communicate with those they have close relationships. The authors also found a significant relationship between the age of users and their frequency of IM use, such that younger respondents preferred using IM. Considering this study is over a decade old,

university student preferences may have shifted, and potentially toward the preference for IM use for more communication needs.

Social media sites can be a popular platform for IM conversations. Surveys show that young women are using social media sites more than young men (Lenhart, 2015) and that the presence of women on social media sites more than doubled between 2008 and 2013 ("It's a woman's [social media] world", 2013). While public comments, tags and "likes" are common uses of social media, this study is focused on the private communication that happens online between a select group of teammates (subgroup) since IM is typically used as a "group talking tool" (Kim et al., 2007, p. 1202) and others have argued it is often used for relationship maintenance (Ramirez & Broneck, 2009).

Ramirez and Broneck (2009) had university students answer questionnaires regarding IM use and how it may function to maintain existing relationships. They found that females used IM for relationship maintenance more than males, and that there was no significant difference between the amount of time spent in an IM conversation between differing types of relationships. Interestingly, the divide occurred with the *frequency* of conversations, with romantic partners and best friends having the highest frequency, followed by friends, acquaintances and then family. Most of the IM conversations happened between physically distant partners (87%). Additionally, a majority of participants said that to maintain a relationship, IM was used most, followed by email, home phone and cell phone.

Communicating with close others through IM can have numerous benefits to users. One of the main reasons people choose to use IM is to maintain close relationships as mentioned (Lee & Perry, 2004; Lenhart, 2015; Ramirez & Broneck, 2009). One way

that online communication can foster close relationships is through intimate personal disclosure or sharing important personal details with others online. For some, sharing online may be preferred as it can ease oral communication and social anxieties (Neo & Skoric, 2009). These two may have a reciprocal relationship as well, where disclosure of personal information online also improves disclosure face-to-face (Desjarlais & Joseph, 2017).

Using social media sites and IM appears to help young adults feel more connected to one another, since over half will message their friends daily (Lenhart, 2015). Carron and Hausenblas (1998) noted that increased contact time between athletes can improve social cohesion. In the context of a team, athlete bonding and improved social cohesion are generally seen as positive outcomes and are encouraged by coaches (Martin et al., 2016; Yukelson, 1997). While these bonds may only exist within a subgroup on the team, athletes do not always see this as a negative thing and have said that this can sometimes improve the outcomes of the team (Martin et al., 2015). Indeed, if conversations between those who have closer bonds support positive team normative behaviors (norms) such as being prompt, training hard in the off season, or coordinating team outings, this may be helpful to overall team functioning.

While Neo and Skoric (2009) argued that communication through IM can ease social anxieties, they also noted that a preference for interaction online was predictive of compulsive IM use and negative outcomes for users. Some negative outcomes for teams could include arguments among athletes, as nearly a third of teens said they argued with friends about something that happened online or via text messaging (Anderson, 2015). Arguments could stem from interactions within the team, such as a disagreement with the

coach's approach to a practice or game but could also revolve around interactions and relationships outside of the team such as past, present or potential romantic partners (Martin et al., 2015). Arguments, if not resolved in an effective way may lead to divisions on a team and result in distractions to athletes while practicing or playing (West-McMaster, 2004, Yukelson, 1997). Additionally, higher uses of social media have been shown to be positively related to sport anxiety by way of disrupting athlete concentration before and during events (Encel, Mesagno, & Brown, 2017).

Jealousy could also result from private IM group conversations. Cohen and colleagues (2014) presented a hypothetical situation to university students and had them rate anticipated feelings of jealousy. The scenarios involved communication between a romantic partner and another person with whom the romantic partner may have been or could be involved. The authors modified the publicity of the message in their scenarios to see if anticipated jealousy would differ if a message to the other person was posted publicly (on someone's Facebook wall for example) or privately. They found that private messages significantly increased feelings of jealousy because of their exclusivity (Cohen et al., 2014). While this work was done in the context of a romantic relationship, Ramirez and Broneck (2009) found that students message their best friends as much as they do their romantic partners. What this could indicate is that if an athlete knows that he/she was not included in a private or exclusive conversation, he/she may become jealous and this could negatively impact his/her relationships with others. Indeed, over half of young adults said a negative outcome of using social media sites and IM was finding out about events they were not invited to before or after the event happened (Lenhart, 2015). This

highlights the importance of studying private IM group conversations as opposed to public posts, comments, or "likes".

The studies reviewed here demonstrate that communication online through IM can have a host of both positive and negative impacts on users. We also know very little on the impact of private IM group usage on small groups such as sport teams. While there are potential effects from public online interactions as well, I chose to limit the scope to only include private IM groups interactions. Next, I will review what is currently understood about cohesion as it relates to performance.

Cohesion

Research on cohesion spans a variety of disciplines such as social, educational, military, organizational, and sport psychology. In the field of sport psychology, both a working definition of, and a tool to measure, cohesion emerged in the mid 1980s (Carron, Widmeyer, & Brawley, 1985). Cohesion has been defined as "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" (p. 3, Carron, Brawley, & Widmeyer, 1997). This definition of cohesion was based on previous work in group dynamics (Cattell, 1948; see Carron et al., 1985) and combined two key ideas about groups. Cohesion was initially thought of as the development and maintenance of the group with a primary focus on the social relationships and closeness of group members. This ignored the purpose of the group's existence however, which is often to accomplish some task or objective. This purpose has been called group locomotion, or group syntality (Cattell, 1948). Thus, the definition for cohesion in sport

incorporated the tenets that cohesion is multidimensional, dynamic in nature, affective (has a social component), and instrumental (purposeful and task-driven).

The conceptual model for cohesion thus includes two dimensions and states that cohesion should capture individual and group level perceptions as well as social and task components (Carron et al., 1985). Individual perceptions include those things that attract an individual to join and remain in a group and can relate to social or task aspects of the group. Group level perceptions are in fact an individual's perception of how integrated or united the group is concerning the social and task aspects of that group. Taken together, these two dimensions result in four factors in overall cohesion. These dimensions are also represented in a cohesion measurement tool, the Group Environment Questionnaire (GEQ, Carron et al., 1985): Individual Attractions to the Group - Social (ATG-S), Individual Attractions to the Group - Task (ATG-T), Group Integration - Social (GI-S), and Group Integration - Task (GI-T).

Carron and colleagues (1985) stated that their conceptual model of cohesion, as measured by the GEQ, should account for most of the internal reasons that a group will be cohesive or not, although they highlighted that there may be other external factors. These include situational, societal, geographic, and demographic factors (Carron & Hausenblas, 1998). Situationally, a team may stick together due to contractual obligations in professional sport, or in cases where no contract exists, due to societal or personal beliefs that quitting is undesirable. Geographically, the proximity of athletes can increase the frequency of interactions between them, fostering social cohesion. Demographically, individuals tend to form bonds with others who are like them.

Cohesion research in sport is well established and many important team variables are related to it. For instance, teams higher in cohesion tend to have greater success (Carron, Bray, et al., 2002), higher collective efficacy (Kozub & McDonnell, 2000), greater adherence to team norms (Benson et al., 2017; Gammage et al., 2001; Prapavessis & Carron, 1997), and exhibit lower state anxiety (Eys et al., 2003) and jealousy (Kamphoff et al., 2005). In the following paragraphs, I will review the work that is focused on performance and comment on how private IM group conversations could play a role based on the evidence that exists.

Cohesion-performance.

Perhaps the most relevant relationship to team cohesion for the current study is that with success and good performances. Carron, Bray and colleagues (2002) assessed task cohesion and performance at the end of the season for basketball and soccer teams. Task cohesion was measured in the final two weeks of the season, and performance was measured by winning percentage over the course of the season. The authors found a significant, positive relationship between task cohesion and team performance. However, this result only relates the two variables and tells us little about whether the teams felt cohesive because they were finishing a successful season, or whether their strong cohesion resulted in a successful season. Results could have been stronger if they had cohesion and performance scores from earlier in the season to show if one directional relationship was stronger. The data, while giving an optimistic picture of the cohesion-performance relationship, are incomplete and so a more complete description could shed light on this relationship.

Grieve, Whelan and Meyers (2000) tested the cohesion-performance relationship and aimed to show whether it was reciprocal or directional. They created an experimental design to build off of previous correlational work by organizing a 3 on 3 basketball tournament for psychology students. For this experiment, they manipulated task cohesion in half of the teams, with the other half receiving a social cohesion manipulation. Teams that underwent the task cohesion manipulation spoke to one another about their preferred position and playing style and proceeded to set goals together for the tournament. By manipulating cohesion in this way, they aimed to show whether task cohesion led to performance. Those who had the social cohesion manipulation had time to talk to one another about the year and type of program they were in, and other non-sport related topics. These participants were then "reassigned" to another team right before competing, therefore negating any effect of the social cohesion manipulation. Participants played two games and did not switch teams after the first game. This allowed them to also measure whether performance affected cohesion. Participants completed a shortened version of the GEQ before the first game, after the first game, and then after the second game. They found that performance in games had a greater effect on cohesion after games than did cohesion before games on performance in games. That is, winning teams were more cohesive and losing teams less cohesive after games.

Interestingly, these authors chose to give half of the teams a social cohesion manipulation, but rather than contrasting this approach with the task cohesion manipulation, they broke up these teams and had the task cohesion teams play against newly formed teams. They also did not measure social cohesion at any stage. This could have been an opportunity to see if social cohesion had a similar or different relationship

with performance. This highlights the importance of measuring cohesion as a whole in order to see where changes may result when undertaking interventions. Regardless, the results support what one of the first meta-analyses on cohesion and performance found, that cohesion relates strongly to performance (Mullen & Copper, 1994).

Mullen and Copper (1994) completed one of the first meta-analyses examining the cohesion and performance relationship. They analyzed 49 studies covering several types of groups, including eight sport-specific studies. They found a small and significant relationship between the two constructs and noted that performance contributed to cohesion more than cohesion contributed to performance, although both directions made significant contributions. They stated that task cohesion explained performance better than did social cohesion. Of interest is that the cohesion-performance relationship came out strongest in sport teams, followed by military groups, non-sport/non-military groups and lastly, ad hoc groups formed for laboratory research. The studies included in the review were conducted before private IM groups existed in their current state, so it is unclear to what extent they hold true as online communication has become common among all types of teams.

In 2013, another meta-analysis of varied groups including 10 sport-specific studies attempted to confirm and expand the results of Mullen and Copper's work (Castaño, Watts, & Tekleab). They found significant effects between performance and overall cohesion, and these effects remained when cohesion was separated into social or task cohesion. Thus, both types of cohesion had a significant relationship with performance. No significant differences were found between types of groups (sport, military, business, academic and ad hoc lab groups), which contrasts with Mullen and

Copper's findings. Additionally, the cohesion-performance relationship was not significantly impacted by the study design (cross-sectional vs. longitudinal), level of measurement (aggregated data vs. group level) and performance measures (objective vs. subjective). Additionally, while online communication through IM was well established as a form of communication at the time of this review, they did not include it as a potential factor.

Carron, Colman and colleagues (2002) also extended the work of Mullen and Copper (1994) by focusing on sport-specific studies in their meta-analysis. They examined 46 papers from 1967-2000, a substantial difference between what was used in the mixed group meta-analyses of their colleagues. They found a moderate-to-large effect size for the cohesion-performance relationship and examined potential moderators. Like Castaño and colleagues (2013) and different to Mullen and Copper (1994), they did not find any significant differences between the type of cohesion measure (social vs. task vs. overall), directionality (cohesion to performance vs. performance to cohesion), type of sport (interactive vs. coactive), level of competition (recreational to competitive), design (correlational vs. experimental), or measure of performance (self-report vs. behavioral). They did find, however, that the type of study (i.e., refereed vs. unpublished studies) and the sex of the participants emerged as moderators of the relationship. Of importance to this study is that the cohesion-performance relationship was significantly stronger in females compared to males. This finding has led to other research looking at potential interactions between sex, cohesion and performance.

Eys and colleagues (2015) took a qualitative approach to explore the potential sex difference in the cohesion-performance relationship. They interviewed Canadian and

German coaches who worked with both male and female athletes in all levels of sport. They highlighted that most coaches, before discussing potential differences between the sexes, wanted to state that they deemed cohesion as being important to team sports for both sexes, that level of competition may be a factor and that as a coach you must adjust to the personalities on the team each season. Beyond this, a majority did mention that they felt social cohesion was more important to their female teams. One coach discussed how seeing an opposing team that appeared more socially cohesive before competition could be more intimidating for female teams. The interviews also alluded to females achieving better performances once they develop social cohesion, with male athletes developing social cohesion after successful performances. This qualitative work may not be representative of all male and female teams; however, it does show that some coaches perceive differences when working with both sexes. It also offers no insight into why coaches perceived what they did, but rather, describes what these coaches felt impacted their team performance.

West-McMaster (2004) also suggested that social cohesion may influence female performances more than male performances. Her study examined male and female university hockey teams. Athletes completed a questionnaire package that included the GEQ (Carron et al., 1985) and questions regarding demographics and performance assessments. Athletes completed the questionnaires at a practice approximately three quarters of the way into the season so that cohesion and a performance pattern could be established and assessed. Performance was measured objectively (winning percentage) and subjectively (perceptions of how the athlete and the team performed). The results indicated that high cohesion was related to better performance (in both assessments) for

both sexes. West-McMaster also found that low cohesion was more strongly related to poor performances for the female athletes. One of her explanations, which was influenced by her prior experiences on a university hockey team, was that poor relationships may have distracted female athletes in competition more than males.

Lastly, findings by Navarre (2011) support low cohesion affecting females more than males. Navarre interviewed American coaches of National Collegiate Athletic Association (NCAA) Division III soccer athletes. For coaches to be included, they had to be currently coaching both male and female teams and have at least two years of experience doing so. This resulted in 15 interviews. Navarre found that coaches all acknowledged that sex differences were strongly influenced by gender norms in our culture and society, but that they still perceived their female athletes to be more relationship focused, more open to coaching and feedback, and more attracted to being led rather than being driven by the coach. In contrast, the coaches felt that male athletes prioritized competition, hierarchy and drive from them. These coaches said that they felt positive relationships among the team (social cohesion) helped both male and female athletes, but that negative relationships (low social cohesion) seemed to hurt females more than males. Of interest is that coaches also mentioned that they noticed female athletes becoming more like male athletes in competitive orientation over their years of coaching, indicating that some of the differences noticed may be more reflective of current social norms rather than any inherent biological difference between sexes.

What the cohesion-performance studies and meta-analyses indicate overall is that there is positive relationship between the variables amidst a variety of measurement approaches. Additionally, while meta-analyses to date generally support the performance-

cohesion direction, other evidence suggests this may be the opposite for female teams, which warrants further research in the area. Based on what is currently understood about cohesion and performance, along with the reported predominance of females in social media and IM use, exploring what female athletes have to say about the use of private IM group and the impacts on themselves or their team is an important place to start. This brings me to the main and specific research questions that guided this study and the corresponding hypotheses I aimed to test. While it is unconvential to include hypotheses for qualitative-driven research questions (i.e., questions 3 and 4 below), I included them here to support the mixed methods approach of answering each question with integrated data (DeCuir-Gunby & Schutz, 2017).

Primary Research Question

In what ways does communication through private IM groups impact athletes and their team over a competitive season, specifically regarding their perceived cohesion and performance outcomes?

Specific research questions.

1. Do athlete perceptions of cohesion change over the course of the season?
2. Does the frequency of athletes' private IM group use with their teammates relate to their perceptions of cohesion?
3. Does communication with teammates through private IM groups impact athletes' perceptions of cohesion throughout the season?
4. Does communication with teammates through private IM groups impact athletes' or their team's performance throughout the season?

Hypotheses

1. Cohesion will change over the course of the season, such that if the team has had a successful season, they will be more cohesive post-season, and if they have not had a successful season, they will be less cohesive post-season.
2. Athletes who have a higher frequency of communication with teammates through private IM groups will perceive higher levels of cohesion than those who spend less or no time in these online groups.
3. Athletes will express the varying ways that communication through private IM groups impacted their perceptions of cohesion throughout the season.
4. Athletes will express the varying ways that communication through private IM groups impacted personal and team performance outcomes throughout the season.

Chapter 3: Methods

In this study, I used an explanatory sequential mixed methods design, which began with a quantitative phase of data collection, followed by a qualitative phase before integrating all data to test the hypotheses and answer the research questions. In this chapter, I introduce how Cattell's (1948) approach to studying groups and a pragmatic philosophy informed the decision to use this design. I then describe the phases of this mixed methods case study in alignment with the reporting standards put forth by the American Psychological Association (Levitt et al., 2018). This begins first with describing the quantitative phase, followed by the qualitative phase including ethical considerations for each. Lastly, I describe my approach to data analysis.

Methodology

Cattell (1948) stated that the ideal of social psychology would be to predict group behaviors and outcomes by knowing their internal structure and the demographics of the group. He argued that a group was best described by these three aspects which he called group syntality, population traits, and characteristics of internal structure. Group syntality describes the effect of the group, or what they can accomplish by being and working as a group. This is especially salient in competitive sport since teams come together with one outcome in mind, which is to perform well and win as much as possible. Thus, performance was chosen to represent group syntality in this study. Next, population traits aim to show the "personality" of the group through describing one or more of the group's average traits. These traits could be demographic or measured constructs and should relate to what you are trying to predict in group syntality. In this study perceived cohesion was chosen to represent a population trait that can be measured because of the

positive relationship with performance outlined in the literature review. Lastly, characteristics of internal structure refer to the relationships or networks within a group that affect its functioning. Internal structure can show the unity, or lack of, in a group differently than average population traits do. I chose to represent internal structure with a graph of the social networks that exist online through communication in private IM groups, or group chats. This process is described more fully in the data collection section. Each of these three aspects can be described qualitatively. However, by also gathering quantitative data on each, I was able to obtain a more complete picture of the team involved in the case study.

The collection and use of both qualitative and quantitative data to answer one or more research questions is often a part of a pragmatic approach to research. Pragmatism, sometimes called American pragmatism, began as a school of thought in the United States in the mid to late 1800s. It emerged as an idea among philosophers in Massachusetts after the American Civil War, mainly in reaction to idealism as "a road to objective and impersonal standards" (Ormerod, 2006, p. 892). Charles Peirce (1839-1914) is credited for being the initial voice of pragmatism, although it was made popular in 1907 by William James (1842-1910) and saw continued discussion through John Dewey (1859-1952) until the 1930s and 1940s where discussion fell off (Ormerod, 2006). The lectures and writings of these three make up what is known as classical pragmatism, with more current authors on the topic known as neo-pragmatists (Johnson, de Waal, Stefurak, & Hildebrand, 2017). Interestingly, each of them had differing ontological and epistemological views (Ormerod, 2006). Peirce supported logic and a positivist view of truth and right knowledge, believing in objective and impersonal standards to predict

outcomes. Interestingly, James had more of a subjective view of truth and what was real. James was a psychologist and asserted that truth was not something uncovered by impersonal study, but rather something personal that was invented in each individual's mind and sometimes agreed upon between individuals (Omerod, 2006). James also shared some beliefs with Dewey, who agreed that truth comes from our psychological experience (Gale, 2004). Dewey shared the view with Peirce that experimental research is necessary for approaching a better understanding of what is true. Further reading on these philosophers and others show how pragmatism as an overarching philosophy is somewhat fragmented (Forster, 2018). Still, there are a number of themes or beliefs that distinguish pragmatism from other philosophical approaches.

While these classical pragmatic philosophers seem to take either a positivist or constructivist approach, they do converge on certain beliefs. One distinguishing belief of pragmatists is the rejection of dualism which asserts an *either/or* view onto the world. Pragmatism is known for its pluralist view, viewing data from a *both/and* perspective and asserting that all data can have value in the practice of predicting outcomes in specific contexts, even though researchers may prefer one type of data. There is an acknowledgment that a diversity of information is best when aiming to describe problems and predict outcomes. Thus, while some pragmatists may hold more positivist views, they would not reject subjective data when it could add to the successful prediction of an outcome and vice versa. This ties pragmatism most strongly to mixed methods research, which aims to maximize the benefits and minimize the inherent drawbacks within each approach, thereby providing a more complete description of a phenomenon (Creswell, 2014; Patton, 2015).

Pragmatists also assert that truth is fallible and is best understood in context. They acknowledge that those things that we claim as being true change over time and that the truth and our resulting actions should be updated as we gather more data. Thus, to align with a pragmatic approach, the description of the team includes as much detail as possible to set the context while still protecting the privacy of the participants. I also present the results in a way that does not state them as general fact, but as being true for this team during the competitive season where data collection took place. Detail and context also support the trustworthiness of qualitative work, which can help readers judge its utility (Creswell, 2014; Patton, 2015).

The utility of research findings is another theme in a pragmatic philosophy. A pragmatic view is that theory should be created in service of action rather than simply for the sake of generating new knowledge (Patton, 2015). Consistent with this view, I write about actionable findings in the discussion of this thesis so that readers are equipped with different ways to move forward whether they be mental performance consultants (MPCs), coaches, athletes or researchers.

Quantitative Phase

Recruitment.

Upon ethical approval (Appendix A) and a conversation with a head coach (Appendix B), a university team competing in the 2018-2019 academic year was approached for participation. The introduction to the study was done early in their competitive season (see Appendix C). The choice to work with one team as a case study related to the mixed methods approach taken and the scope/timeline for completion of the project.

Participants.

All athletes on the team were invited to participate, and efforts were made to ensure athletes who were not in attendance when data were first collected could still participate if they wanted to. No exclusions were made for athletes who had sustained an injury or who had no playing time as they still contributed to the online and offline environment of the team. All athletes were female and over the age of 18. Participating athletes represented the full spectrum of positions in their sport.

Procedure.

Upon the head coach's approval to approach the team, we established a timeline for data collection based on their competitive season and availability (Appendix D). A meeting with the athletes was held after a practice at the beginning of their season. Two dates and times were selected based on when a majority of players could be there, as every day some athletes would be missing because of different class schedules. These first meetings took place after at least one week of practicing and playing together in the competitive season, but before three weeks of their competitive season had passed. The coach introduced me as a researcher and then left as I outlined the major components of the study as per the athlete recruitment script (Appendix C). Athletes were asked to spread out in the space provided and time was given to read through and complete the consent form (Appendix E) and GEQ (Appendix F). I was available for questions during this time, however, none were asked.

After the season was completed, I contacted the head coach and set up two other times to meet with the team. These took place one week after their final competition, and then two weeks later in an attempt to ensure all participating athletes were reached. I

invited athletes to participate even if they had missed the first dates of data collection. There were two reasons for this: first, to provide the most complete picture possible for the online networks which were being measured post-season, and second, to help maintain privacy within the team regarding participation or lack-of. I re-introduced myself and debriefed the team on the full purpose of the study, as outlined in the debriefing script in Appendix G. Participating athletes then completed the GEQ for a first or second time, as well as the private IM group survey (Appendix H). They were free to ask questions and leave when done. Those who were not participating were asked to appear as though they were by marking an X beside each question rather than circling an answer or completing the survey. This was requested as another way to protect athlete privacy while being in the same room as one another. Regardless of participation status, all athletes were provided a $5.00 gift card as a thank you for their time.

Ethical considerations.

As sport teams are relatively small groups that tend to be tightly knit, it is challenging to maintain anonymity for those athletes who choose to participate or not. Indeed, during the quantitative phase, anonymity was not guaranteed, as athletes were told about the study amongst their peers (but without the coach present). However, athlete data were confidential. This was achieved through the de-identification of data to protect athlete privacy. All athletes were randomly assigned a participant number, and these are used where necessary in reporting the results. Additionally, demographic information about the head coach is left out and percentages are used in the results section rather than stating the number of participants so as to not identify the team as a whole.

Measures.

Group Environment Questionnaire.

The Group Environment Questionnaire (GEQ) is the most used measure of cohesion in an athletic context. Carron and colleagues (1985) developed it based on their conceptual model of cohesion, which includes the four factors described in the literature review: Individual attraction to the group – task (ATG-T), individual attraction to the group – social (ATG-S), group integration – task (GI-T), and group integration – social (GI-S). These four factors are represented through 18 statements in a questionnaire: ATG-T (4 items; e.g., "I'm unhappy with my team's level of desire to win"), ATG-S (5 items; e.g., "For me, this team is one of the most important social groups to which I belong"), GI-T (5 items; e.g., "Our team is united in trying to reach its goals for performance") and GI-S (4 items; e.g., "Our team would like to spend time together in the off season"). Participants ranked their agreement to the statements on a Likert scale from 1 (*strongly disagree*) to 9 (*strongly agree*). Reverse scored questions were adjusted before the total score was summed and averaged, and higher scores represented higher perceptions of cohesion. Elsewhere, authors used the top and bottom tertiles of resulting scores to signify high or low levels of a continuously measured construct (Eys et al., 2003). I chose to classify scores in this way, resulting in high (>6.34), moderate (6.34 to >3.67) and low (3.67 to 1) scores. The paper introducing the GEQ (Carron et al., 1985) demonstrates internal consistencies ranging from .64 to .76 when measured with two groups of athletes. Brawley, Carron and Widmeyer (1987) also confirmed concurrent, predictive and construct validity over the course of three studies. Since then, the GEQ has

been used in a large body of research and been shown to be valid and reliable (Carron, Eys, & Martin, 2012).

Private instant message group survey.

Modeled from, and consistent with social network analysis data collection (Lusher, Robins, & Kremer, 2010), the private IM group survey included a list of all athletes on the team and three columns (Appendix H). The survey asked about the frequency of private IM group conversations with each other athlete on the team. There were three choices: never, less than four days per week, and more than four days per week. This cut-off distinguished low from high frequency communication. While communication may have changed from week to week, athletes were instructed to choose one of these options based on what they thought was most representative of their communication online over the season. Based on work by Ramirez and Broneck (2009), it was thought that the frequency of IM conversations with someone could distinguish the closeness of the relationship, with higher frequencies relating to best friends and romantic partners and lower frequencies relating to friends or acquaintances.

Data analysis.

Quantitative data analysis consisted of testing two hypotheses to help guide decision making in the qualitative phase. To test the first hypothesis that perceptions of cohesion change over the course of the season such that successful teams will be more cohesive post-season and less successful teams will be less cohesive post-season, I ran a dependent *t* test to determine any changes from pre- to post-season. GEQ scores were also integrated with the social network data to test the second hypothesis.

The second hypothesis stated that athletes who had a higher frequency of communication with teammates through private IM groups would perceive higher levels of cohesion, compared to those who spent less or no time communicating in these private online groups. To test this hypothesis, I integrated individual cohesion scores into two network graphs representing high and low frequency of communication online. To do this, I colored the nodes in the graphs to match the score of the athlete, which I describe more thoroughly in the results section. I then did a simple visual analysis to see if any patterns emerged.

Visual analysis of a network graph involves looking at the orientation of the nodes, and any patterns in the links or holes between them. Links between nodes in the network graphs signify that an athlete stated that they communicated with another athlete at the represented frequency and a hole, or absence of links, shows where athletes answered "never". The network graphs are directional, which means that arrowheads show the direction of the answer on the survey. However, white nodes were not included in this visual analysis, as they represented athletes who chose not to participate. Other participants indicated a connection with these athletes on their personal surveys. Thus, white nodes had incoming arrows and no outgoing arrows. Mismatched answers did occur, where one athlete stated that they communicated with a fellow athlete more than four days per week, while the other indicated they communicate less than four days per week. Specific scenarios like these were not followed up on in the interviews in order to protect athlete privacy.

I visually inspected the high and low frequency network graphs as shown in Figures 1 and 2 in the results section and looked for any trends in cohesion scores in

relation to clusters of athletes, links between clusters, or holes in the network. I also looked for any athletes who stood out for having a high or low number of connections. This simple analysis helped guide interview decisions.

Qualitative Phase

The purpose of the qualitative phase of data collection was to learn about and describe team member experiences during the season in relation to private IM groups, cohesion and performance. I completed a thematic analysis (Braun & Clarke, 2006) of all the data relative to the intent of the deductive and inductive approaches (which I expand on later). Repeated conversations with my research assistant and supervisor helped ensure the findings were thourough and trustworthy.

Interviews happened in two phases. The first phase included a semi-structured interview with the head coach, which added to the quantitative data in helping guide decisions regarding who to talk in more depth among the athletes. The second phase was to interview participating athletes in either a semi-structured or structured format as described below under ethical considerations. The two hypotheses for the qualitative phase stated that the athletes would talk about the varying ways in which communication online through private IM groups affected their perceptions of cohesion as well as personal and team performance outcomes over the season.

Ethical considerations.

To protect privacy in the qualitative phase, all those participating in the quantitative phase were invited to complete an interview, although there were select athletes to which I intended to speak in more depth in relation to the study research questions. There were two athlete interview guides (see Appendices K & L) with

identical initial questions in order to make it more challenging for an athlete to single anyone else out in the final written report. The semi-structured interviews were longer and were reserved for key athletes identified by their GEQ scores, the simple analysis of the network graph and the head coach interview as standing out for some reason. These key athletes may have been individuals who reported to spend the most or least time engaging with other athletes through private IM groups, had the highest or lowest cohesion scores, or who were identified by the coach as someone whose social habits or performance stood out in some way. This is known as purposeful sampling, as cases were chosen because they are assumed to be different or represent a unique perspective (Creswell, 2014; Patton, 2015).

Participants and procedure.

Coach interview.

To begin the qualitative phase of data collection, I invited the head coach to participate in an interview. No demographic information is shared to help protect the coach's privacy. The coach completed a consent form as per Appendix I. This interview happened in person in a private office space, lasted a half hour, and helped guide athlete selection for semi-structured interviews in addition to what was seen in the quantitative data. The format for the head coach's interview was semi-structured as per Appendix J. My questions were about athlete roles and perceived levels of sociability and performance over the season. This interview also included questions about anything they may have noticed in practices or games from online communication between athletes, and any other thoughts on the interaction of online communication among athletes, cohesion and performance. The interview with the coach also helped me understand the

context of the team and season before interviewing athletes and was not used for deductive or inductive analysis. The coach was provided with a $10.00 gift card as a thank you for their time.

Athlete interviews.

Qualitative data collection continued with the athletes on the team as mentioned previously. The consent form completed during the quantitative phase outlined the full study to athletes, therefore no further consent for this phase was required. Some indicated on their post-season forms that they did not want to complete an interview, and so they were not contacted to do so. I scheduled interviews between 5 and 11 weeks post-season with athletes who consented to completing one. At this point, the assumption was made that any unreturned messages represented an athlete who no longer wanted to complete an interview. No one contacted me after this cut-off wanting to participate. Just over half of the team participated in an in-person interview.

I aimed to talk to 30% of the team through semi-structured interviews covering questions about online communication, cohesion and performance with those who represented the highs or lows or unique perspectives on these. Unfortunately, I did not capture the full spectrum of perspectives I had wanted since some athletes declined participation in the interview portion of the study. Those who participated did represent high and moderate cohesion scores. They also had both more and less high-frequency connections with teammates. Some who were identified through the coach interview regarding performance or connection with others on the team were not interviewed as they were either not participating or later declined an interview. Altogether, 15% of the team completed the longer, semi-structured interviews (Appendix K). These interviews

lasted 30-45 minutes. The athletes represented in this group did not have any knowledge of their "selection" before or after their interview and this was intentional to protect theirs and others privacy.

Fourty percent of the team completed the shorter, structured interview, which lasted 10-25 minutes on average, with one lasting 40 minutes. These interviews had the same introductory and transition questions as the semi-structured interview and no questions about online communication (Appendix L). Some athletes discussed IM and group chats at their own volition as a response to the introductory or transition questions. Because of this, the data from some of the structured interviews were used to answer the research questions related to online communication (research questions 3 and 4). Braun and Clarke (2006) state that when conducting a thematic analysis, a researcher may choose to use all relevant information across the data corpus (all data gathered) in relation to the resesarch question(s).Thus, when answering whether and how online communication impacted cohesion and/or performance, I used data from anyone who mentioned online communication in their interview responses.

Interviews were completed in person in a private office space located in a campus building that was familiar to the participants. They were audio recorded to ensure accuracy when transcribing and using quotes. One of the structured interviews was deleted in the process of moving the audio file to a storage device. This occurred immediately after the interview ended and the athlete had already left. I typed up what I remembered from the conversation and sent this to the athlete who confirmed the content was correct. No quotes are used from this interview, but it was used to support other themes that emerged in the data set since the athlete confirmed the content in the

interview summary. All other interviews were transcribed verbatim and sent to athletes for review. Transription included non-verbal changes in conversation such as pauses, laughter, coughing and actions taken during the interview. When a participant paused briefly mid-sentence, I captured this with an elipsis connected to the text. Elipses are also used in APA formatting to indicate where a few words have been removed from a quote and these are separated from the text by a space on both sides. If there was a longer pause of a few seconds, I added [pause]. This often occurred when they were considering what to say or how to continue. I also attempted to capture intonation by using question marks when a participant's voice inflected upward at the end of a sentence or mid-sentence as this happened often. Thus, question marks do not necessarily indicate that the participant asked me a question during their response but instead reflect how they spoke.

Participants had one week to review the transcription upon receiving it to make any changes (additions, redactions, clarifications). Two athletes completing the structured interviews chose to make minor changes and clarifications upon re-reading their interview transcipts. No one asked to have their data removed entirely. Data analysis for the interviews began one week following the last interview. Corden and Sainsbury (2006) highlight that many experienced researchers complete light edits of verbatim quotations to enhance readability and ensure the content of the response is the focus for the reader. They also noted that there are a variety of standards that exist regarding editing and over-editing; thus, a writer should be open and transparent about the process they used to alter common gramatical errors, pauses or repetitions in everyday speech. When presenting quotes in the results, I removed some repetitive uses of the words "uhm" and "like" as well as a few stuttered or mumbled words to improve readability. The word "like"

remains in many of the quotes where it is not overly distracting in order to maintain the integrity of how the athlete answered. I also left in pauses as these are less distracting to read and do not detract from the content of the quotes.

Data analysis.

Both Patton (2015) as well as Braun and Clarke (2006) suggest that the first step in thematic data analysis includes the researcher familiarizing themselves with the data. To do this, I completed all the interviews, and was therefore familiar with their overall content of what was asked and discussed. Transcription is another way to become familiar, and so I transcribed 80% of the athlete interviews while my research assistant transcribed the other 20%, which I later reviewed and edited to ensure consistency in formatting. This took place within 1 to 3 days of each interview. When editing the research assistant's transcriptions, I listened to these interviews while reading the transcripts and re-formatted components such as pauses and intonation to be consistent with the transcriptions I had done. I analyzed the data set consistent with analytic induction (Patton, 2015), which begins with deductive analysis followed by inductive analysis. Next I outline the process for generating the initial codes, which is the second step in thematic analysis (Braun & Clarke, 2006).

Deductive analysis involves comparing the data to existing theories or to the research that informed the study, looking for convergence or divergence (Patton, 2015). The research assistant and I had an identical excel spreadsheet with all text in the first column with cells separating the natural divides in the conversation (questions and answers). The top row of this spreadsheet had short codes that represented the research that informed the study. We separately analysed the text at an explicit level, which

ensures that the text truly reflects the code given (Braun & Clarke, 2006). The overarching questions we considered while examining the interviews during this phase were “Does this text support what we currently understand about the research that informed this study?” or “How does this differ …?” Selections of text that agreed with previous research findings were coded with a 1, and the text that went against this was coded with a 0. If we felt the text spoke to a topic but were unsure in what way, the text was coded with a 3 and we later discussed these selections and came to a consensus regarding its code. After coding one interview, we met and discussed the process, then continued coding the remaining interviews separately. The coding we completed for all interview data was then jointly discussed. After review, some sections of text did not warrant the codes they were initially assigned as the text itself did not explicitly reflect the code. For example, we looked for any text that discussed the concept of jealousy among athletes based on the exclusivity of private IM groups (Cohen et al., 2014). One selection of text was given a code by the research assistant indicating that it represented jealousy among teammates. When discussing codes together, we later determined that the athlete’s response did not mention jealousy and could be interpreted in other ways, thus removed the code representing jealousy. Through our discussions, we gained consensus on over ninety percent of codes. This was an iterative process that involved immersion in the data set and multiple meetings. This process occurred over approximately one month.

Next, we separately analyzed the interviews in an inductive fashion, aiming to generate new explanations or results from the data. The overarching questions we considered at this time were “What stands out from these interviews that has not been examined before in the literature?”, “How are these athletes experiencing the constructs

at hand?" and "What are they saying that might help answer the research questions?". Coding was broad to begin, and the coding schemes differed between both of us once we met to discuss. That being said, the content reflected in the codes was very similar, so we selected one coding scheme and used this as a framework for our discussion of the fit of the codes. We discussed the inductive codes until consensus was reached. I later brought all the data under a given code together in another spread sheet and re-read the selections of text to ensure they still fit. I then began thinking about how to organize these codes into larger themes and made decisions based on personal reflection and discussions with my supervisor. This aligns with Braun and Clarke's third, fourth and fifth steps in thematic analysis: searching for themes, reviewing themes and naming themes (2006). The final step in Braun and Clarke's (2006) thematic analysis is to produce the report of your findings in a concise, logical, coherent and interesting manner, which is what I present in the study's results section.

The combination of deductive and inductive analysis helped confirm, disconfirm and expand the current understanding of the research that informed the study and added to the unique and actionable findings as discussed later.

Mixed Analysis

Patton (2015) argues that quantitative and qualitative data analyses are often not fully integrated in mixed methods research, since they are typically presented in separate sections in the final report. He makes the analogy that they exist like two infants building sandcastles in a sandbox; both may be aware of the other's existence, but they are not truly interacting. In the explanatory sequential design, however, it is assumed that the two types of data are integrated at some level, since the qualitative data relies on quantitative

findings. Beyond this initial integration, however, each of the research questions are addressed in the results section with *any* related quantitative or qualitative findings. In the discussion section, I relate the findings to other research in the field.

Conclusion

In this chapter, I outlined the methodology behind the study design by describing Cattell's approach to describing and studying groups as well as a brief history and my use of a pragmatic philosophy. I then outlined the methods for testing the hypotheses and answering the research questions. I described the quantitative phase, including steps taken to recruit participants, a description of those who were asked to and who chose to participate, the procedure followed, and the approaches to quantitative data analysis. Next, I outlined the qualitative phase, which began with an interview with the head coach, followed by semi-structured or structured interviews with participating athletes. The data analysis for the qualitative phase included each of the six steps in Braun and Clarke's (2006) approach to thematic analysis as outlined. Step one was familiarizing myself with the data. Step two was to generate codes in an analytic inductive fashion, beginning with deductive analysis followed by inductive analysis. Multiple exposures to the data set helped find the selections of text that related to reviewed research (deductive) and unique themes for this team (inductive). The third, fourth and fifth steps included searching for, reviewing and naming the themes, which I outline next in the results section. I also highlighted that the results section would include an integrated description of the findings regarding each research question and corresponding hypothesis, and that a final interpretation related to other research would be included in the discussion.

Chapter 4: Results

Cohesion

The first research question examined whether perceptions of cohesion change over the course of a season. I hypothesized that cohesion would increase after a successful season and decrease after an unsuccessful season. The team involved in this case study had a moderately successful season based on season standings, articles written about the team and coach and athlete interviews, which reflected the variability in performance from week to week.

Three-quarters of the team participated in the pre-season measurement of cohesion via the GEQ, and 80% participated in the post-season measurement since some were not present at the pre-season measurement dates and still wanted to participate. Athlete GEQ scores were calculated individually. Negatively worded questions were reverse scored and then the sum and mean were calculated. Cohesion was classified as being high (>6.34), moderate (6.34 to >3.67) or low (3.67 to 1) based on the average of the pre-season and post-season score when both were available. On this team, no participating athletes scored low on the GEQ based on this criterion. Some athletes have only one score (pre- or post-season). The mean pre-season score for these athletes was 7.31 (*SD* = 1.24), and the mean post-season score was 7.16 (*SD* = 1.42), representing a change of -0.15. A dependent t-test was run comparing pre-season to post-season scores to answer the first research question: Do athlete perceptions of cohesion change over the course of the season? Only the data from athletes with both pre- and post-season scores was used for the dependent t-test. No significant changes in cohesion appeared from pre- to post-season in these athletes, $t(16) = 1.75$, $p = .13$. Athlete interviews did not suggest

anything different, as no athletes discussed major shifts in any one aspect of cohesion during the season, although most mentioned gradual changes to the group's integration over the season (GI-S and GI-T), which is outlined in the results of the deductive analysis.

Social Networks

Cohesion scores were integrated into the high and low frequency network graphs (see Figures 1 and 2) to help answer the second research question: Does the frequency of an athlete's private IM group use with their teammates relate to that athlete's perceptions of cohesion? I hypothesized that athletes who have a higher frequency of communication with teammates through private IM groups will perceive higher levels of cohesion than those who spend less or no time in these online groups. Had the hypothesis been supported, visual analysis would have shown more connections coming from the black nodes (high cohesion) in the high frequency graph compared to the grey nodes (moderate cohesion). Visual inspection of the high frequency network graph did not support this hypothesis as there were athletes with moderate cohesion scores who had more high frequency connections (P2 and P14) than some of the athletes scoring high on cohesion (P1, P24 and P26).

Figure 1 shows the high frequency network (messaging more than four days per week on average), while Figure 2 shows the low frequency network (messaging less than four days per week on average). In both network graphs, arrows indicate the direction of responses such that the arrow points from the respondent to those with whom they said they interacted online in a private IM. Data was graphed in NetDraw (Borgatti, 2002). NetDraw creates an initial graph of the nodes and connections but their positions have no

meaning: they are spead out to show connections as efficiently as possible. This original graphing of the high and low frequency networks showed no obvious subgroups or trends (black nodes with more connections, grey nodes with fewer connections). The shape of the network graph shown here was created after data integration to best reflect the subgroups that emerged in the interviews (primarily by year) without compromising athlete privacy. The shape and the location of nodes in its current orientation are consistent between high and low frequency network graphs. I chose to do this so that visual comparison could be done more easily between the graphs. Because of the purposeful configuration of the nodes and incomplete data set, there may be some other subgroups that fail to be evident in these graphs.

When visually inspecting the network graphs, it is important to remember that they are incomplete for a few reasons. White nodes were chosen to represent athletes who did not participate and therefore have no GEQ score to report. White nodes also have only incoming arrows since others stated that they communicate with these athletes, but they did not provide any responses. Additionally, some participants only had one GEQ score. These participants are indicated in the network graphs by asterisks (*) and the available GEQ score was used to indicate high or moderate cohesion. The mean GEQ score was used for athletes who had two scores (pre- and post-season).

From visual inspection of Figure 1, it is apparent that there are two individuals who are centrally located with an abundance of outgoing and incoming arrows. This shows that they reported a high frequency of communication through private IM groups with nearly all of their teammates and that their teammates also named them as someone they communicated with at a high frequency. Thus, these two athletes stood out as being

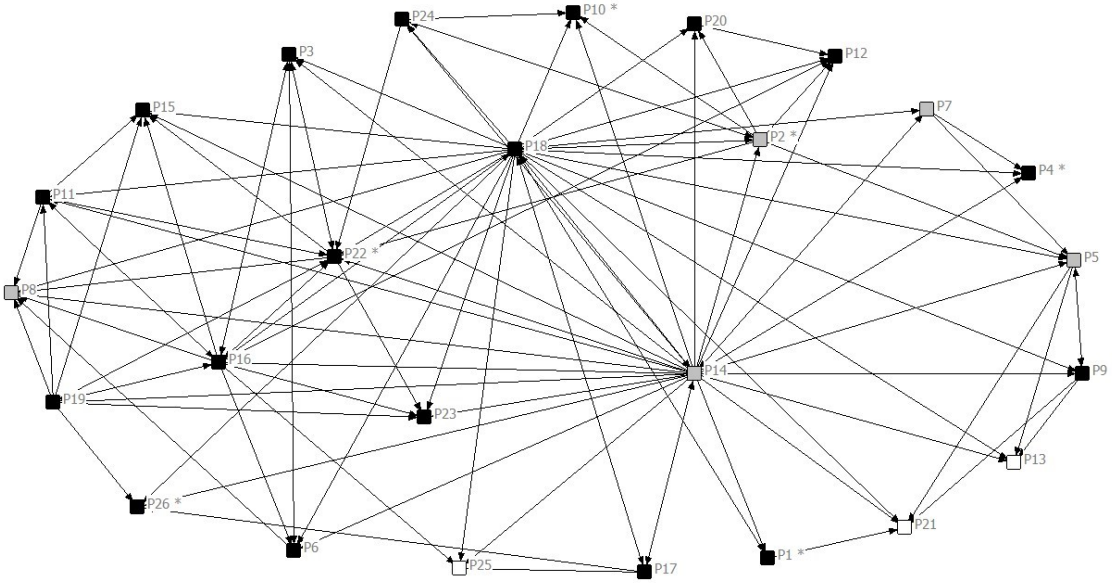

Figure 1. High frequency network graph. Arrows point from the respondent to those they said they interacted with online in a private IM group more than four days per week. Cohesion scores are represented by color: high (black) and moderate (grey). Asterisks (*) represent athletes with one score. White nodes represent athletes who did not participate.

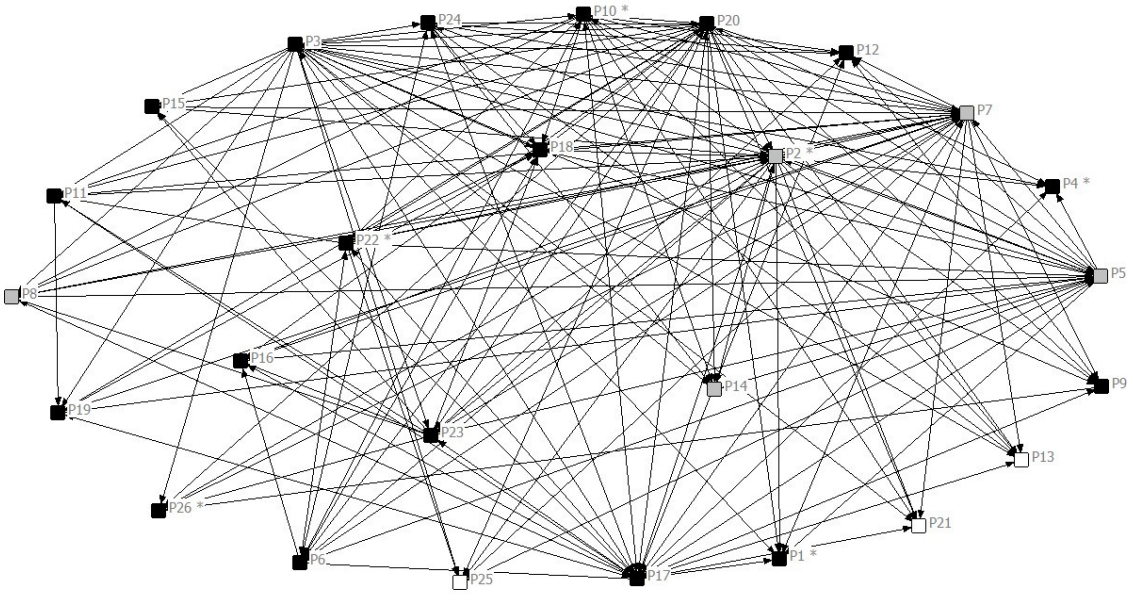

Figure 2. Low frequency network graph. Arrows point from the respondent to those they said they interacted with online in a private IM group less than three days per week. Cohesion scores are represented by color: high (black) and moderate (grey). Asterisks (*) represent athletes with one score. White nodes represent athletes who did not participate.

highly connected to their team and this was considered when selecting athletes for the semi-structured interviews.

In contrast, Figure 2 shows a much denser low frequency network graph. This means that participating athletes reported low frequency communication with a more of their teammates, which is consistent with what emerged in athlete interviews as I discuss later in the inductive theme of organized communication. No obvious subgroups or relationships with cohesion emerged in the initial or reconfigured low frequency network graph.

Athlete Interviews

Originally, one third of the athletes were selected for the longer, semi-structured interviews while all other participating athletes were asked to complete a shorter, structured interview. Over half of the team completed an interview, with 15% completing the longer, semi-structed version (Appendix K) and the remainder completed the shorter, structured version (Appenfix L). Each of them has portions of their interview represented in the deductive analysis and inductive themes, but not all are represented with quotes. One interview was deleted in the process of moving the audio file to a storage device. No quotes are used from this interview, but I did use it to support other themes that emerged in the data set since the athlete confirmed the content in the interview summary. In the following sections, I review the results of the deductive and inductive analysis to answer the third and fourth research questions.

Deductive analysis.

Online communication.

Younger people are theorized to use IM for online communication more often than their older counterparts (Kim et al., 2007), and some research suggests that females use IM for relationship maintenance more often than males (Ramirez & Broneck, 2009). Through deductive analysis we could not find support for younger people using IM more often since participants were not diverse in age. One comment was made that could be perceived as support for this theory: "there's like an email chain that [head coach] has and that's how [head coach] mainly communicates to us? But for us… as a team… I'd say it's just more over text…" (P3). However, no other athletes mentioned any perceived differences between their use of IM and anyone older than them. Because all participants were female, nothing can be said about whether females use IM more often than males. Regarding relationship maintenance, I did find support for athletes using IM in this fashion. Nearly half of the athletes interviewed mentioned that they use private IM groups (also sometimes referred to here as group chats) to keep in touch and plan things with their closest friends, as is reflected in inductive themes later on.

Intimate personal disclosure has also been theorized to be a positive outcome of IM use, where individuals share important personal details online (Desjarlais & Joseph, 2017), presumably because they feel less communication anxiety (Neo & Skoric, 2009). There was some support for this, with a few athletes mentioning information that had been shared over IM that could count as being important personal details, although no one explicitly mentioned a reduction in communication or other anxiety. Some athletes also mentioned that group chats allow other, more quiet athletes to have their "voice

heard over text" (P20). Additionally, the idea that face to face interaction is supported by intimate personal disclosure online was mentioned by one athlete when they discussed how knowing what was going on between close friends helped them modify their behavior in person.

Some researchers have also found that IM is typically used as a group talking tool (Kim et al., 2007). This was supported in the data, with a majority of the athletes referencing group chats (full team and smaller groups), one of whom (P20) also added, "and then… like, there's obviously one on one conversations."

Possible negative effects of IM use are thought to be arguments based on things that happened online (Anderson, 2015) or jealousy, perhaps from finding out that certain details were shared in an exclusive way over IM (Cohen et al., 2014). Another thought is that social media use before competition can distract athletes (Encel et al., 2017). There was little support for these ideas in what participating athletes shared. To the contrary, a few athletes mentioned how arguments could be happening elsewhere, or in younger teams, but were not happening in any major way for them. For instance, regarding arguments happening in group chats, or about something that happened in a group chat, P5 said, "I don't know if it, at the university level if that's actually happening. Because people are pretty aware of what they're saying at this age." Also, while Encel and colleagues (2017) found that social media can distract athletes when used within a two-hour window before competition, athletes said it was mainly used as a conversation starter, especially around the start of the season. Additionally, P20 talked about the use of smartphones before games:

> I think some people … do check their phones? Like… before games, or they're on their phones if they just wanna listen to music or something like that …. I think it's more of a… general… known rule… that… that's probably not the best thing to do. [A]nd it's just nice to look like you're more focused… on the game. Like if you're going on [a break], and [head coach]'s having a chat with us… and you're on your phone…like, that's not great [laughs].

P5 mentioned a brief argument happening online before a practice and that knowing about it by being in that private IM group, "probably would have like… benefited the effort [laughs]" since they would already know why certain people were avoiding one another that day and would accommodate with different pairings for drills and not bring it up in person. P20 also said group chats were "not distracting… maybe helping just to like, motivate more…" since some athletes mentioned sending funny and motivational messages to the team before practices and games.

Cohesion.

Cohesion in sport is theorized to be a multidimensional construct consisting of four factors including individual attractions to the group's social environment (ATG-S) and task (ATG-T), and perceptions of how integrated the group is socially (GI-S) and toward the task (GI-T; Carron et al., 1985). While cohesion was asked about in the interviews, fewer athletes talked about their individual attractions to the group's social environment or task (29% and 14% respectively). On the other hand, nearly every athlete talked about their perception of the group's integration socially and toward the task (100% and 93% respectively).

Social integration of the group (GI-S) was discussed by each athlete, likely because of the interview question: "Can you describe anything you felt helped bring your team together this season?" While some mentioned task-related conversations in response to this question, many mentioned social team bonding activities. From what athletes shared, there appeared to be numerous ways that this team integrated socially as the season progressed. Coach-led activities early in the season (e.g., team trip to the beach) and athletes adding one another on social media and to the team group chat got things started. Athletes highlighted the importance of spending non-sport time together. For example, P2 said, "I think it's a good thing… 'cause it's [away from the competition space] and everyone's more relaxed… and there's not a competitive environment? So it really brings everyone together…" The most frequently mentioned ways that this team spent time together were team dinners and parties. They said that social relationships developed over time by interacting a lot as exemplified by P6: "team parties, yeah [laughing] …those were fun… uhm… and even just like, having practice every day made us really close too and just seeing each other every day." P16 also talked about the many ways that teammates got together and added "Everybody was always super nice? …but as the season went on and we could begin to know each other better? it just like, got even closer." Study hall for younger players, rides to and from events, and watching their sport together (on TV or streaming online) also gave these athletes time to interact and get to know one another and become closer throughout the season.

Participants also mentioned the increased frequency of discussions of performance-related goals and team strategy among athletes as the season progressed.

P24 explains the increase in GI-T-related conversations by improvements in GI-S and overall communication compared to the previous season:

> Uhm, we were so much closer this season than we were last season…And I don't know if it's because… some players left and new players came in? …and that's just the way it was? But, we just had a lot more like, team activities… like we hung out together a lot more outside of practice… and I think we communicated together a lot better… not even just [in competition], but outside of games and practices as well? Like, we just talked about a lot more things… and what we want out of the team and out of the season… and that kind of stuff? Which we didn't really do that much last year…? So I think that helped us a lot throughout the season.

Similarly, P2 said, "I think it's just whenever you would see, a teammate… you'd talk about [our sport] or whatever… probably more amongst people that know each other better on the team, … there's those conversations." P16 talks about teammates sharing goals with the team: "it was just like, everyone goes around the room, like 'what's our goals for tomorrow?'… like 'what's our goals for the end of the season?' 'what do we need to do to prepare for that?'" The conversations, while happening among athletes, also appeared to be prompted by the head coach:

> [head coach] would come in and … we would talk about the game and then she would say, 'alright you guys… obviously want to have your own team meeting' … and then she would leave the room and then we would talk about it ourselves. So she would always… start things off… (P20).

A few athletes talked about how the head coach brought in a successful coach from another sport to speak to the team mid-season, which also helped increase the frequency of conversations around performance. Regarding this meeting, P20 says:

> So he pretty much came in and told us to respect every opponent? But also in practice to come out and be aggressive and do those things … and you can't get offended or angry if someone wants to hit you or something… 'cause that's what's gonna happen in a game.

Lastly, athletes mentioned that having leaders who promoted a message like, "we refuse to lose" (P15) later in the season helped the development of GI-T and commitment to keeping energy high until the end of the game, which was lacking earlier on. One athlete mentioned that this message should have come up earlier "it was talked about a little too late during the season … we tried to implement it, but it takes time to fully buy into that kind of thing?" (P18).

Cohesion-performance.

As outlined in detail in the literature review, some aspects of the cohesion-performance relationship are still debated although it has been researched extensively in and outside of sport. Quantitative research generally supports that performance is a stronger predictor of cohesion than cohesion is of performance (Carron, Colman et al., 2002; Mullen & Copper, 1994). No support for this emerged in the interviews, as no athlete on this team mentioned feeling more cohesive after successful performances.

Some qualitative work has suggested that cohesion is a stronger predictor of performance in female athletes, while performance is a stronger predictor of cohesion in male athletes (Carron, Colman et al., 2002; Navarre, 2011). Because no male athletes

were involved, nothing can be said to support a sex-related influence on the cohesion-performance relationship. There were, however, discussions around how the team becoming more integrated (GI-S and GI-T) contributed to their performance improvements. P6 mentioned an improvement after a performance-related discussion: "We got better after we had that meeting… and after we talked about being more aggressive and having a different mindset." P11 also talked about how GI-T helped:

> It's just good to be in an environment where… you have people who are pushing you to do your best. And in practice, if you're not playing well and somebody says something about it, it's not 'cause they're trying to hurt your feelings, it's just 'cause they know your potential. And they've seen you at your best? so they just want you to do the best that you can.

Some athletes also remarked how other teams were perceived as being more socially cohesive and that they felt that impacted that other team's performance (P3): "I know the boys' team… they do a lot? outside of [sport]… they go out and actually hang out with each other more often than we do. And they had a really good season this year. They improved a lot since last year…" Similarly, some perceived that rival schools were closer socially and that they felt the closeness impacted performance. P12 talks about a rival school: "They're all super, super close. And I think it shows [in competition]? And it translates [in competition]?" but she also added that "I don't think there's a specific way that you can impose on a team that will make them bond more and win more? Honestly, I think each team has their own thing." One athlete implied that relationships helped their performance over the season (P10):

> Getting to know your teammates. If… I like them outside of [our sport] and practices, I think that makes me more comfortable to play with them. And then I know them better and how they *play*… what they're *like*… it also helps when you're getting mad at someone... they know that you're not… doing it to attack them… you know they just want to… both of you to be better.

Again, it appeared from the interviews that some believe that if they had higher GI-S, they would perform better (P16): "We think improving the social game will improve our overall game [in competition]?"

Lastly, West-McMaster (2004) suggested that low cohesion is more strongly related to low performance for females. From the cohesion scores and interviews, it appears that the team perceived moderate to high levels of cohesion throughout the season, while performance fluctuated. No athletes attributed losses to a lack of cohesion in their interviews, but rather, to a lack of aggression in competition. The lack of aggression appeared to be addressed when the coach from another sport came in and spoke with the team mid-season, and the team continued to have discussions about how they needed to be more aggressive in practice and play.

Inductive analysis.

Inductive analysis of the interviews resulted in dozens of codes between the research assistant and I, which were narrowed down to three themes with four subthemes each (see Table 1).

Table 1

Themes and subthemes generated in inductive analysis

Theme	Subtheme
Organized Communication	Logistics
	Use of different platforms
	Ease of IM to inform team
	Communication hierarchy
Inclusion of Teammates	Social media as a conversation starter
	Full team group chat
	Subgroups by year, but not exclusive
	IM supports face to face interactions
Tension	No tension
	No known tension
	Tension elsewhere
	Sources of tension

Note. IM = Instant messaging.

Organized communication.

Logistics.

The first theme of organized communication was reflected in a tendency for athletes to mention how use of IM among the team helped them stay organized and communicate important and sometimes changing information to one another quickly. The first subtheme of *logistics* was discussed by over half of athletes interviewed, and P5 said: “definitely, logistics are huge?" Athletes mentioned using IM to organize information among themselves: rides, times to arrive/depart, locations, workout schedules, team meal information, and team clothing orders. When discussing how IM was used, P20 said a message in the full team group chat might include questions such as “‘oh, do you want this hoodie’… or ‘do you want it in grey or black?’” and later “what you’re bringing to…dinner or something… that’s… a common one too”. P5 also describes how polls and the ability to *like* posts in the Facebook Messenger app were

used to informally survey teammates: "'like' this message if you're going to this training session, this training session, or this training session.' So it's an easy way for other people to look and see too, 'okay who's going at this time' and stuff." Lastly, P18 laughed while describing what she felt differentiated a university team chat from a high school team chat:

> In university, we're just putting in our group chat what we need to do. There's not really conversations going on about other people or anything. It's just 'practice is at five' [laughs] It's really not entertaining! [laughs].

Use of different platforms.

The second subtheme of organized communication was reflected in a tendency for athletes to mention different uses for different platforms. While group chats on many social media apps can be given a name, tag or label to ensure you know the content discussed within them, this team reported keeping certain types of conversations to certain apps. For example, P1 said "iMessage is more for just, casual social stuff, and then Facebook is for like, team things." To second that, P12 said "well the group chat is over iMessage?" and later "I think also we have a Facebook group but that's more for if we have pictures about shirts or shorts that we wanna show or have a poll on which one we want. That's what we would do." The most detailed description of the use of each platform came from P16 who stated:

> So iMessage was mostly used during season, because it was like 'oh, like bring this to the [place of competition]' or 'who has this' or like, 'game time's here, everyone show up at this time' and then… our snapchat was pretty much just [laughs] people hanging out and just sending funny

> snapchats to each other… and then the Facebook mostly was used when we were doing fundraising, or like, when we had the [event] here … and we were doing [volunteer work], and like you… we could use polls and stuff on there so you could sign up for different shifts and you can say 'oh, we're having a team dinner, this is what I'm gonna bring' so you can sign up for what you're gonna bring, and… so that's pretty much what Facebook was used for. But iMessage was like, the big one.

Ease of IM use to inform team.

The third subtheme of organized communication emerged because athletes mentioned how easy it was to use IM to inform the team all at once. This subtheme included logistical messages, but also those about social events and bigger changes to the team. For example, P10 was discussing the full team group chat: "...it usually happens in pre-season… and just, it's a way to communicate, like, uhm what color are we wearing for practice, like what time do we have to be here… so… it's just pretty easy that way." P18 talked about the ease of getting the whole team out socially:

> It's easy, like if someone's going out like, at nighttime… and they could be like "hey guys, I'm going out" …like we can come hang out all together… you can let everybody know at one time, so like, nobody's left out.

Communication hierarchy.

The final subtheme of organized communication was the use of a communication hierarchy, functioning similar to a phone tree before email and text messaging capabilities existed. This subtheme emerged when an athlete (P18) mentioned that the leadership group on the team had a separate group chat with the coach so that they could

relay important messages to the rest of the team: “a lot of it is like, ‘meet in the lobby at this time’ like, or ‘there’s food in this room’ or, ‘if you need something go here’ …it’s kind of relaying all of the information from our coach? ‘Cause our coach, uh, [coach name] gives it to the captains and they let everybody know.” This was confirmed by another athlete, who when listing the group chats they were involved in mentioned: “one with like, the leadership group and [head coach].” Other quotes supporting this theme are not shared here as they identify others and could compromise athlete privacy.

Inclusion of teammates.

The second theme that emerged was labeled inclusion of teammates because of the tendency for athletes to mention ways in which they ensure others are included in pre-season, during the competitive season and in transition from one year to the next. In this theme, athletes talk about using social media, Instagram in particular, as a way to get to know one another early on. They also shared how a lot of IM happens in a full team group chat, and while there are natural subgroups by year (online and offline), these are not necessarily problematic. Lastly, athletes described how IM supported face to face interactions among teammates.

Social media as a conversation starter.

The first subtheme under inclusion of teammates emerged around the utility of social media. Athletes mentioned adding new teammates on social media as a way to make a first connection and to serve as a conversation starter. P5, when discussing why they would add others said, “And then social media ‘cause I wanna start that relationship with them and see what they’re up to and see what they’re interests are… Kind of like, a conversation starter.” P20 discussed similar uses of social media, Instagram specifically:

"Maybe Instagram just to like… …see what they're doing… or… I don't know, it's more of like, a social thing… so if something comes up I'm like, 'oh hey' and then it's like, a topic of conversation I guess." One participant (P1) also mentioned how friending over social media lessens the awkwardness of initial conversations at the start of the season:

> It would definitely like, bring us like, closer… not as awkward to talk… because obviously getting to know someone right away… like, you don't know them, so it's kinda awkward just chatting with them… but I think being friends with them [on social media], and starting to… interact would be more comfortable and an easier transition coming into the team.

Full team group chat.

The second subtheme under inclusion of teammates is called *full team group chat*. While I was initially interested in hearing about how online subgroups may impact cohesion and performance on a team, nearly half of those interviewed mentioned that there was a full team group chat to ensure communication and inclusion. It became apparent that one athlete was not in one of these (the iMessage group) because her smart phone was an Android while others had iPhones. However, multiple athletes made mention of ensuring this teammate stayed in the loop about team developments: "…we just like, text her separately" (P1) and "someone will like, always text her and say 'Oh this is going on…'" (P5).

Support for the full team group chat subtheme came from P20, who said:

> We wanted to make sure that everyone's on like… the text message group, or … the snapchat group just to make sure a) they know what's going on and b) no one's being excluded. 'Cause definitely no one wants that to happen.

P12 similarly expressed, “Everyone is kinda like, really considerate as to everyone ‘here’s what’s happening’. You know... like, no one’s kinda left out. So I kinda like that, yeah.” P18 also mentioned that the team group chat doesn’t appear to be dominated by certain voices:

> I feel like… in our group chat … like everybody’s kind of … wants to participate in it? It’s not just a couple core people that only talk in the group chat? …which is kind of nice… and shows that everybody’s kind of involved and it … I feel like it shows everyone’s comfortable with each other.

And finally, regarding social get togethers, P5 said, “for the most part if there’s a party it’s staying in the main group chat.”

Subgroups by year, but not exclusive.

The third subtheme under inclusion of teammates highlights that the main division of subgroups on this team is by year: “with university, I found it was more of an age dynamic I guess on the team?” However, athletes also mentioned that these were not exclusive or impenetrable groups. P2 says, “It’s mostly like, year… but we still talk to each other like, everyone for sure. [E]veryone’s more close to their year specifically.” P20 echoes this by saying, “it’s like years that are close together? But then there’s still overlapping for sure.” One athlete made the distinction that the subgroups are not cliques, which tend to have a negative connotation (P11): “you do tend to get your own sort of, I don’t want to call them cliques, but you naturally are drawn to people who are similar to you and your own age.” And lastly, P24 talks about how they spend most of their time with those in the same year, but also talk to others:

> I definitely talk to the girls in my age group more than the other girls…? Just because we're always together… But I also talk to the other girls who are a year older than me… I've hung out with some of the girls a year younger than me and had conversations with them.

IM supports face to face interactions.

The fourth and final subtheme under *inclusion of teammates* demonstrates how IM between teammates supported face to face interactions. IM was sometimes the source of inside jokes later brought up in person and also acted as a tool to organize getting together. It was also mentioned that less participation online did not hurt in person interactions. P18 says about jokes, "If someone made a joke in the group chat, it'd just be talked about in practice." Regarding getting teammates together, P16 said, "We have a lot of group chats… we have snapchat group chats, and message, and Facebook… and [laughing] we have it all. So yeah, we… pretty much everything is just like 'hey anyone want to come over tonight?'". P12 also mentioned how a lack of interaction online does not hurt face to face interactions:

> I don't think everybody always says something? But I don't think it has an impact, as in… a way that, if someone doesn't say something in the group chat, then they're not … included in physical like, practices or when we're all together. I don't think it has an effect?

Tension.

The final theme to emerge from the interviews relates to tension. On this team, however, the most represented subtheme was that there was no tension, followed by statements suggesting there may have been tension, but the athletes were not aware of it.

Some athletes also discussed examples of tension on other teams that reinforced for them that they were on a close and cohesive team. Lastly, some athletes mentioned occasional sources of tension, which differed among teammates.

No tension.

The first subtheme under tension was labeled *no tension* and was mentioned in nearly half of athlete interviews. When asked about the presence of any rifts or disagreements during the season, even ones that lasted for only one practice or game, responses like this one from P2 capture the essence of the no tension subtheme: "Uhm? I'm trying to think. Not really, honestly? Like… [pause] …not that I can think of." Similarly, P12 said, "On this team, I don't think there's ever any problems." One participant, P11 mentioned that they felt if anything arose, it was handled by discussion: "Uhh… I'm trying to think of any examples… [pause]… For the most part, our team was pretty good whenever we have like a problem, we just sorta go back into the dressing room and talk it out."

No known tension.

The second subtheme under tension was called *no known tension* because a third of interviewed athletes mentioned that there could have been rifts or disagreements present, but they were not aware if so. P20 said, "I've never heard of any problems… I'm sure there are problems… but yeah [laughs] not that I've heard of." Another player made a similar comment, "I'm typically a pretty happy person, so like if there were rifts, I probably wouldn't even know." Lastly, P15 said they'd never been involved in any rifts with other players but couldn't speak for others:

> Uhm...? I can't think of anything major… I mean, for me… sometimes… I can't really speak for other players? On the team? If they're having rifts or disagreements with one another but, uh, for me personally I… never… had any rifts or disagreements with anyone?

Tension elsewhere.

The third subtheme under tension was labeled *tension elsewhere*. This reflected the knowledge of tension on other teams and the recognition that those things did not happen on this team in their competitive season. One player (P20) shared her thoughts on how gossip is common elsewhere:

> It's unfortunate that people do talk behind each other's backs sometimes about play and stuff… but I don't think anyone's ever actually had an issue with it. Like, we're actually a very… close and respectful team to each other? And I know other teams that are not like that.

P18 mentioned a friend's team and speculated that there could be exclusionary group chats there:

> I haven't heard of anybody having a really negative, a negative experience, like, at their school. I know my friend goes to school in [another country] …. [event happened] And she was ostracized from the team and nobody would talk to her? So I have a good feeling that there was a separate group chat without her there…

Lastly, P12 speculated that another team's group chat would not be so inclusive or friendly to those who were quiet on the team, although it is unclear if she is referring to being quiet online (not participating in the group chat) or in person: "I can't even imagine a [other school] group chat, 'cause we didn't have one… but … the people who would

have been quiet would have been the ones who would have been like, kinda stepped on I guess?"

Sources of tension.

The fourth and final subtheme under tension was called *sources of tension*. Some athletes did bring up minor tensions that surfaced during the season over playing time, feedback in practice and living arrangements. One participant mentioned that there was usually tension among athletes when the starting lineup was shared before competition: "[head coach will] put up the starting line up, so I think it's just like… from walking, it's from walking out of the meeting onto the [competition area]? It's just… a little tense I think? ...between everyone [laughs]… Yeah." Regarding feedback in practice, P1 guessed that it was a potential source of tension:

> Uhm.... uh, maybe if something was said in practice, or… I don't really... know a certain example, but I'm just thinking … maybe if someone said something in practice… but they took it a wrong way.

Lastly, P12 mentioned that living situations were a source of tension for some on the team that were sometimes discussed over IM: "Uhm, I never had any issues, with any players. Uhm, I would say probably the biggest thing that happened would be… living situations?"

Impact of Private IM Groups

The abductive analysis of athlete interviews provided an initial answer to the third and fourth research questions, which asked if athletes' communication with teammates through private IM groups impacted their perceptions of (a) cohesion, and (b) individual or team performance outcomes throughout the season. I hypothesized that I would hear

about the varying ways that private IM group use impacted both. From the data gathered through athlete interviews, I argue that cohesion and performance were positively impacted by conversations online and outline the findings that support this argument.

Cohesion scores were already high for this team from the start of the season but not so high as to experience a ceiling effect at postseason, and thus could have further improved among the team. From the deductive analysis, it became clear that athletes felt that group integration had improved over the season for various reasons outlined earlier. Thus, for this team, the existence of online subgroups (private IM groups) did not appear to negatively impact cohesion. In fact, scores remained high despite most athletes mentioning their participation in online subgroups by year and their knowledge (or assumption) of the existence of other subgroups online among the team. This is likely due to the reported inclusivity of teammates despite the existence of such subgroups. Athletes mentioned that adding new teammates on social media and to the full team group chat helped them build relationships early on. Additionally, they mentioned that those early connections supported face to face interactions, that a lack of participation online did not hurt face to face interactions, and that group integration (first social, then task) was positively influenced by this.

Performance was discussed in athlete interviews as something that fluctuated throughout the season. There appeared to be an increase in performance toward the end of the season based on what athletes said, however, some athletes felt this improvement happened too late to have a meaningful impact on their ranking. While nothing was explicitly stated in interviews regarding private IM groups having a direct, positive impact on performance, it appears that there were indirect effects. The theme of

organized communication best exemplifies the potential contribution of private IM groups to individual and team performance. Private IM groups on this team helped ensure that athletes arrived on time, allowed them to communicate when running late, helped them organize rides, ensured they knew what to wear, and were even a place for motivational comments before games. Some athletes said that private IM groups were not distracting in practices or games, and that if anything, they often helped. Private IM groups afforded some athletes the insider knowledge that close friends were arguing over something, which allowed them to adjust their actions in practice by choosing different partners and not bringing up the argument. This was mentioned to be helpful with effort at practice. Thus, it is plausible that when used in a positive, task-oriented manner, that private IM groups could support or improve performance in practice at a minimum, and potentially in competition as well. In the discussion, I integrate these findings with other research to help situate this work within the field of sport psychology and aid the reader in understanding its delimitations, strengths, limitations and applicability.

Chapter 5: Discussion

The purpose of this mixed methods case study was to explore athlete experiences with online communication (through private IM groups) and any perceived impacts on their cohesion and individual or team performance outcomes. Four research questions and corresponding hypotheses were examined through the collection of both quantitative and qualitative data. The goal of the research is to initiate a discussion about the ways in which instant messaging, especially that done through large and small private IM groups, can impact a team's cohesion and performance. I begin by discussing cohesion on this team and what other researchers have found that may help explain the results. I then discuss online communication with this team, its changing nature over time and contexts, and what others can take from what was seen in this study. Lastly, I outline the delimitations, strengths and limitations of this work, discuss future directions and conclude by addressing actionable findings for researchers and applied practitioners in the field of sport psychology.

Changes in Cohesion

Cohesion over time.

In the current study, I found little change in cohesion over the course of the season from both an individual and team level. This emerged from both quantitative and qualitative analyses. However, in interviews, athletes hinted at subtle increases in the group integration aspects of cohesion, which were not reflected in the overall GEQ scores. One possible explanation for this comes from work done by Bourbousson and Fortes-Bourbousson (2017). They measured task cohesion (ATG-T and GI-T) and other variables on a daily basis in a basketball team in order to explore their dynamic nature

and interactions. Previous longitudinal work on cohesion had only gathered four measurements in a single season (Gioldasis, Stavrou, Mitrotasios, & Psychountaki, 2016), where their study gathered 107 measurements over a four-month period. Analysis of changes and interactions between variables was done through auto-regressive integrated moving average calculations. This involved regression-based time series modelling and analysis. Time series modelling plots changes in a variable in equally spaced points in time to analyse dependencies, or causal links, in the series. A lack of dependency in the series shows that fluctuations that appear are random. What Bourbousson and Fortes-Bourbousson found, was that both ATG-T and GI-T fluctuated over the season. Their analysis of these changes showed that fluctuations in ATG-T over the season were nothing more than random noise around a stable value, while the fluctuations in GI-T, which also moved around a stable value, were meaningful and were impacted by previous values (showed dependency). Thus, they concluded that individual attractions were a more stable aspect of cohesion, while group integration fluctuated meaningfully based on day to day events. This was one of the first in-depth longitudinal studies of cohesion and may provide an explanation for the qualitative finding that athletes mentioned improvements in group integration over the season, and rarely mentioned individual attractions to the task or social environment (please see Appendix F for GEQ statements that relate to each of the four aspects of cohesion). It could be that athletes did not mention individual attractions because these were stable over the season, and that the changes in group integration were more salient to them. Future studies should expand on these findings to investigate whether certain aspects of cohesion are

more stable than others, and possible explanations for this, which could impact the delivery of teambuilding programs aiming to enhance cohesion.

Overall, the result of a non-significant change in cohesion from preseason to postseason in the quantitative analysis brings up new questions regarding our understanding of the construct and its relationship with performance. Similarly, the qualitative findings hinted at changes that did not appear quantitatively. This also deserves future mixed methods research on cohesion to determine if differences between quantitative and qualitative findings are consistent in other teams, or if this result is unique to the team in this study. For applied practitioners, the qualitative findings may prove more useful if they are aiming to improve either task or social integration on a team.

What athletes said impacted GI-S and GI-T.

In discussing cohesion, athletes mentioned things they felt contributed to the group's integration more than referencing individual attractions to the task or social relationships. It appeared that a number of initiatives early on and throughout the season contributed to GI-S, such as adding new teammates on social media to get to know them better and facilitate face to face conversations, the creation of a full team group chat, and team get-togethers outside of sport organized by both the coach and athletes (trip to the beach, dinners, parties). Other researchers have found that social-oriented communication improves social cohesion (Harden, Estabrooks, Mama, & Lee, 2014), and a team building review found improving interpersonal relations to be one of four effective strategies for improving team functioning (Klein et al., 2009).

Other strategies mentioned by Klein and colleagues (2009) to improve team functioning include goal setting, role clarification, and problem solving. Consistent with what athletes shared in interviews, this team spent more time talking about performance goals toward the end of the season and leaders on the team embraced a "we refuse to lose" mentality that some athletes felt supported their group's integration toward the task and improved performance. Each athlete also spoke about their formal or informal roles on the team in response to the introductory questions of the interview. Roles appeared to be clear and, based on responses, to be one of the head coach's priorities throughout the season. Lastly, it appeared that one of the head coach's strategies may have enhanced problem solving among athletes: bringing up observations from competition and then having athletes talk and find solutions among themselves. Thus, it appears that the team involved in the current case study benefitted from each of these team building strategies even if these happened later in the season. Some athletes did mention that they had plans to carry these lessons forward and begin similar conversations around performance goals earlier in the next season.

Antecedents to Cohesion.

Following an ethnographic study regarding cohesion in a soccer team over a season, Holt and Sparks (2001) recommended that future research focus on what builds cohesion. The present study aimed to examine if online communication (through private IM groups) would be a possible antecedent to cohesion and if so, what impact it might have. Through inductive analysis of athlete interviews, it appeared that the use of private IM groups among athletes did not diminish the high cohesion they experienced early in the season. In fact, athletes mentioned perceiving a modest improvement to some aspects

of cohesion (group integration), in part due to connections and interactions happening online. Other researchers have looked at antecedents to cohesion and found a variety of contributors (Harden et al., 2014; Seugnmo Kim, Magnusen, & Andrew, 2016; Vincer & Loughead, 2010). Alignment between the findings of these studies and those of the current study are discussed in the following paragraphs.

Harden and colleagues (2014) measured three proposed antecedents to cohesion in minority women during a six-month physical activity intervention: communication, cooperation and competition. Participants met monthly (six times) and discussed challenges with engaging in regular physical activity, goals for their smaller and larger groups, and what they had accomplished. They found that socially oriented communication paired with friendly competition best predicted increases in GI-S. This was replicated with GI-T, but with task-oriented communication and friendly competition. This aligns with what athletes in the current study shared regarding improvements in communication over the season and an increased competitive attitude. Harden and colleagues (2014) did not find a significant relationship between cooperation and cohesion but speculated that the combination of communication and competition may have accounted for the role of cooperation. The importance of cooperation may also have been lower in the exercise groups in Harden and colleagues' study, whereas it would be presumably higher for sport teams where athletes need to cooperate in order to achieve their team performance goals.

Research by Seugnmo Kim and colleagues (2016) also examined antecedents to, and consequences of, group integration in intercollegiate student-athletes. They hypothesized that horizontal communication (between teammates) would impact group

integration, which would then improve feelings of commitment to the team. Horizontal communication included measures of positive conflict, negative conflict, distinctiveness and acceptance. They found three significant impacts on group integration. Acceptance, or appreciative and thoughtful communication between teammates, especially in person, had a positive relationship with GI-T and GI-S. Positive conflict also had a positive relationship with group integration, but only GI-T. On the other hand, negative conflict had a negative relationship with both GI-T and GI-S (Seugnmo Kim et al., 2016). This aligns with the current findings, which included themes of inclusion (acceptance) and no tension (negative conflict). Athletes in the current study consistently mentioned how they ensured all of their teammates were included in online communication, and that this inclusion online enhanced face to face interactions. While one subtheme that emerged from interviews was sources of tension (negative conflict) for some athletes on this team, these were often discussed as not being significant or as having been addressed by discussion among teammates (positive conflict).

Lastly, Vincer and Loughead (2010) looked at athlete leadership impacts on cohesion through the use of the Leadership Sport Scale (LSS; Chelladurai & Saleh, 1980). The LSS was initially developed for coaches but is also used with athlete leaders and includes measures of training and instruction, democratic leadership, autocratic leadership, social support and positive feedback. What they found was that an athlete leader's focus on training and instruction, as well as social support, helped improved cohesion. This aligns with the findings that athlete-led conversations around performance and team strategy appeared to improve GI-T. Also consistent with Vincer and Loughead's (2010) findings was that a relationship with teammates outside of sport

(social support), appeared to support GI-S early on and throughout the season. Next, I discuss online communication with this team and the challenges with measuring its frequency to represent voluntary communication between athletes. I then discuss the changing nature of online communication over time and contexts, and what others can take from what was seen in this study.

Online Communication

Roles and voluntary/involuntary communication.

In the present study, I hypothesized that the frequency of online communication between athletes would be related to cohesion (Ramirez & Broneck, 2009). This was not supported by visual analysis of the high frequency network graph, and one reason may be that patterns of online communication have changed over the years and so the measurement of frequency was too broad to find a relationship with cohesion. Indeed, there were athletes with high cohesion who had fewer high frequency connections with teammates than other athletes with moderate cohesion scores (see Figure 1). It may be that some athletes with moderate cohesion used IM with their teammates on a higher frequency because of a perceived or assigned leadership role on the team. Athletes did discuss their formal and informal roles as part of the interviews, and some identified that they saw themselves as leaders or connectors on the team, although this was not formally requested of them. To these athletes and those who had formally assigned leadership roles, high frequency communication with teammates may have felt or been necessary. Thus, high frequency online communication (through IM) may not be related to cohesion in this study as it may have been capturing both voluntary and involuntary communication among teammates. The study by Ramirez and Broneck (2009) examined

relationship maintenance, which may indicate voluntary communication between close others. IM may now be used for much more than voluntary communication with those we are closest with, and future research should be more specific in how it measures the use of IM, dividing its uses between task and socially-oriented communication, as well as voluntary and involuntary communcation.

Changing patterns of communication.

Over the years, research on online communication demonstrates changes in how young adults connect and communicate (Kim et al., 2007; Shin & Song, 2011). Kim and colleagues (2007) found that types of communication were distinguished by mediums. For example, they found that university students tended to use email to communicate with professors or fellow students for project work while text and IM were used to communicate with those with whom they had close relationships. This echoes the findings of Shin and Song (2011) who looked at whether the amount of time spent communicating would impact the cohesion of student groups and their performance on an assignment. Through questionnaires, they measured the amount of face to face communication versus that done through a computer (email, online bulletin boards, etc.) in 42 groups of 6-8 students. They found that students communicated about social matters most when face to face and about their class project most through email and other online means (Shin & Song, 2011). While I did not ask athletes in the current study about how they communicated with their professors or fellow students, some comments made in the interviews suggested that they prefer to do as much communicating as possible via IM, including with their coaches when possible. This is supported by the subtheme of using different platforms for different communication needs (i.e., Facebook Messenger for

logistics, iMessage for some logistics and casual conversation, and SnapChat for fun and close connections). When instrumental communication is mostly confined to email, as it may be for some, then one or two apps to maintain social connections via IM could suffice. However, if nearly all communication happens via IM, then one solution to organize types of conversations could be the use of multiple apps, keeping instrumental and social conversations separate as this team appeared to do.

Unique online communication needs.

Other teams or groups who do a majority of their communicating via IM may have a different pattern of app use. While the app that houses the conversation may seem inconsequential since all are within a few taps on a typical smartphone, each social media or IM app has different features and associations which may attract specific types of conversations (Phua, Jin, & Kim, 2017; Vaterlaus, Barnett, Roche, & Young, 2016; Yang, Brown, & Braun, 2014). For example, Yang and colleagues (2014) completed focus group interviews with young adults in 2008 and found that there was a consistent sequence of progressive interaction online with new friends or significant others. They found that interaction began by adding one another on Facebook, followed by chatting over IM, and finally progressing to conversations over their personal cell phone. These authors also noted that a violation of this order could compromise the progression of a relationship in its early stages (Yang et al., 2014). In another study, Vaterlaus and colleagues (2016) completed individual interviews with young adults and found that SnapChat was used with the participants' closest friends as a way to connect. Additionally, Phua and colleagues (2017) found that Twitter was more often used to expand a network compared to becoming closer with one's current network. They found

that a middle ground could be found with Instagram, which is for some both a network expander and a place to connect with current friends (Phua et al., 2017). Like Twitter, Instagram allows users to follow public figures and other non-personal accounts, and thus may be (for some) a more surface way to initiate a relationship. This supports what was found in athlete interviews in the current study.

As apps upgrade and are modified in their available features and popularity, it is likely that usage will shift as well. In the present study, athletes mentioned that Instagram was used as a way to get to know one another and start conversations in person early on in the season. Facebook Messenger was used for many logistical conversations because you can "like" a message (which can communicate that you have read it or that you are attending the event mentioned) and create polls and see who has answered. They also mentioned using iMessage for both casual conversations and logistics as well as SnapChat for fun and funny messages to one another. What coaches and athletes can take from this is that there is not one correct way to communicate online within a team. However, finding a way to ensure athletes keep in touch about the task and social aspects within and outside their sport may support the group integration aspects of cohesion throughout the season.

Impacts of Online Communication

Online communication & cohesion.

To date, no known research has looked at potential impacts on cohesion via private online communication, although other antecedents have been studied as mentioned (Harden et al., 2014; Seugnmo Kim et al., 2016; Vincer & Loughead, 2010). Thus, this study begins to address a gap in the literature. From the results of this study

and other research on antecedents to cohesion, it is plausible that private online communication can impact an athlete's perceptions of cohesion. The impact that such communication has may be dependent on (a) whether new online connections follow a progression consistent with current trends in youth culture (Yang et al., 2014), (b) what types of groups emerge online and whether they impact face to face interactions, and (c) what is being communicated in these groups (Harden et al., 2014; Seugnmo Kim et al., 2016; Vincer & Loughead, 2010).

On this team, it appeared that a majority of the communication began by following current trends in online connection, with athletes initiating connection over Instagram in order to help start conversations face to face and adding new players to a full team group chat. Once connected online, athletes said that most of the conversation stayed in the full team group chat rather than being exclusive in private IM groups. Conversations in private IM groups did happen, and from what athletes shared this was most often between teammates in the same year of university. This separation was discussed as being natural and was a way for athletes to build and maintain relationships forged during the first year in this new university sporting environment. Many athletes also mentioned that despite these known subgroups, face to face interactions were not so exclusive, as conversations and friendships existed between years as well. Private IM groups also appeared on a temporary basis between some athletes, existing solely to organize logistical information such as ride sharing. The team group chat was said to have existed on multiple apps to help keep topics of conversation separate, as athletes also mentioned using IM for positive and inclusive conversations around the task and social elements of the season.

Overall, it appears that the use of private IM groups among existing subgroups within the team has the capacity to create or diminish cohesion but may instead act as a tool that reinforces what is happening face to face within that team (i.e., friendships, arguments). If a team is already cohesive, then connections and online communication in large and small groups may help maintain this. This would most likely be true if early online connections follow a progression consistent with current trends in youth culture as suggested by Yang and colleagues' study (2014). Additionally, if private IM groups exist among subgroups on the team as they did here, then perceptions of cohesion for those outside of the online subgroups may be maintained by ensuring those in the online subgroups remain inclusive when interacting offline. Lastly, online communication may be most likely to improve cohesion when it focusses on positive task and social conversations like training and instruction, social support, and acceptance of others (Seugnmo Kim et al., 2016; Vincer & Loughead, 2010).

Online communication & performance.

Interestingly, early research on the impact of computers in work groups showed little relationship between electronic communication and group productivity (see Levine & Moreland, 1990). Since then, some research has shown that the amount of time spent in task-related conversations online between students related to their subsequent performance as measured by the grade they received on a class project (Shin & Song, 2011). From the results of this study, it appeared that any impacts on performance from online communication were indirect, as no athlete mentioned an explicit example of how things online impacted performance. However, they did mention a number of ways in which online communication in large and small groups impacted group integration

(social and task). Task cohesion appeared to be impacted through the use of private IM groups as athletes could help ensure that others arrived on time, communicate when running late, organize rides, ensure others knew what to wear and where to meet, and even motivate others before games. Some athletes said that private IM groups were not distracting in practices or games, and that if anything, they often helped. While others have found that use of smartphones to check social media in the hours before competition may disrupt athlete concentration (Encel et al., 2017), an athlete in this study stated that on this team, most were using smartphones during their warmup to listen to music, not to check social media.

One pattern that I saw across athlete interviews was that some felt that improvements in social relationships supported task-oriented conversations in their team, and performance in their own and other teams. A few felt that improvements in their "social game" would translate to better performances in competition. An article in Harvard's Business Review stated that researchers in MIT's human dynamics lab found that social time accounted for more than 50% of the positive changes in a work group's communication patterns (Penter, 2012). However, they noted that social gatherings were not necessarily enough to ensure changes in communication, but rather, a manager or consultant needed to find ways to allow and ensure that "strangers" in the group interact. They did this by rearranging the layout of cubicles and other furniture in a mid-sized American company (Penter, 2012). In sport, the coach, captain, or leadership team can help ensure connections between senior and newer members are happening early in the season. A recently published study by McEwan (2019) also supports this proposed progression:

> Athletes who perceive that members of their team work effectively together appear to have a greater feeling of unity around their team's task purposes, which in turn, predicts the extent to which they are satisfied with that team's performance. (p.10)

Thus, it appears that online communication has the potential to support social integration, which may support task-related conversations and indirectly support performance outcomes, although future research should explore this possible progression.

Delimitations, Strengths, & Limitations

For the present study, I chose to employ an explanatory sequential mixed methods design, which is ideal when there are well-established elements (i.e., cohesion, performance) that may be affected by an unexplored variable (private IM groups among subgroups or cliques on a team; Creswell, 2014). This design included an initial quantitative phase of data collection and analysis, which informed a subsequent qualitative phase that was analyzed on its own before the integration of all data to answer the research questions. This design also speaks to Cattell's (1948) argument that groups are best described by three aspects: their average characteristics, internal networks and the outcomes they achieve by being a group. Due to the intensive nature of this design and in order to keep my project in scope, I chose to seek answers to my research questions by completing a case study. This choice is both a delimitation and strength of the research. The use of a case study for informing others about a topic has its limitations. Cases are bound by a specific context, some of which had to be omitted in order to protect the privacy of the participants. However, I aimed to provide enough salient information for the findings to be useful to other researchers, mental performance

consultants (MPCs), coaches and athletes when thinking about the role and impact of large and small private IM groups on their team. Therefore, while I do address some actionable findings later, generalizations cannot be made from this case to others as each team and its situation differs and full contextual information is not available.

Case studies including mixed data allow for more depth on a topic, which is a strength of this study. I felt this was important given that there is no known research on potential impacts of private online communication in sport teams. Culver, Gilbert and Sparkes (2012) reviewed a decade of qualitative work in sport psychology and noted that a majority of studies used semi-structured interviews. In response to this, they suggested that researchers aim to pair this information with other data in order to triangulate findings and paint a clearer picture for readers. Using Cattell's (1948) approach to describing groups, I was able to gather and integrate information on a population trait (cohesion) of this team and its internal network (online). This information did not support the second research question looking at the frequency of online communication between teammates and their cohesion scores, but did help select athletes to talk to in more depth to learn more about how interactions online impacted cohesion and performance. Future studies looking at social uses of technology in sport could benefit from taking a mixed methods approach using other combinations such as surveys and observations, or perhaps longitudinal designs including repeated interviews and quantitative data collection.

Another strength of this study is the mixed analysis including both deductive and inductive analysis of athlete interviews. This allowed me to not only compare the data to existing literature in a systematic way, but to also generate themes from the data that are unique to this team. The deductive analysis highlighted where the current study's data

supported other theories and findings, and where it did not. Deductive findings also contributed to the ability to answer the research questions and brought up some new ways of looking at cohesion in teams such as the possibility that cohesion in teams is built in a predictable sequence (GI-S influences or supports the development of GI-T). Inductive analysis on the other hand, allowed me to describe the unique themes from this case: organized communication, inclusion of teammates and tension (or lack thereof). There were many consistencies with other research including that two of the themes (organized communication and inclusion) relate to what others have referred to as task and social (Carron et al., 1985), or instrumental and social elements (Yang et al., 2014). This connects the inductive findings to a larger body of research while also describing the experiences of this team over their competitive season.

Lastly, a strength of this study lies in having provided enough description of the case and findings while simultaneously protecting participants' privacy and confidentiality. An unfortunate commonality among technology-related research is that it rarely mentions when the data were collected. As technology and our uses of it advance quickly, knowing the exact year of data collection makes a difference in how findings are interpreted. Without compromising the privacy of the team involved in this case study, I chose to include the academic year of data collection so that future readers can better interpret these findings based on current technology and societal context. With a wealth of information available online about university sports, team rosters and stats, and even athlete social media accounts or news coverage, it is a challenge to provide enough information without identifying those who were gracious enough to provide it. I feel that aim was achieved here.

No study is without limitations, and there are two that were predictable for this project. The first limitation comes from the use of incomplete network data. Lusher and colleagues (2010) note that analysis of a network graph is most accurate with a complete data set, in that all members of a group are represented. Accuracy issues may arise if athletes do not participate or choose to remove their quantitative data before it is analyzed. As noted, the entire team was not represented in any phase of the project as some athletes opted out from the beginning, while others opted in or out at different phases of data collection. This was predicted to be a likely outcome, and informed other decisions made, like choosing to complete a simple visual analysis of the network graphs. While more complex statistics can be run on network graphs, they are not necessarily accurate or valid with an incomplete network and could thus provide misleading findings. As an exploratory study with a small sample, visual analysis was deemed to be adequate. As mentioned in the results section, even visual analysis of an incomplete network is limited. Some athletes had no cohesion scores to report, and others did not participate in the private IM groups survey, so had incoming arrows (others said they connected with these athletes) but none that were outgoing. Therefore, a clear and complete picture of the online networks within this team was not obtained. Further, the network graphs did not distinguish between social or task-oriented communication, or messages that were perceived to be voluntary or involuntary (necessary for one's role on the team), which may have impacted the ability to distinguish a relationship between the frequency of online communication between teammates and their cohesion scores. Future research should continue to use network graphs while including more specific variables of interest.

The second limitation lies in the process of completing interviews. Private IM groups are generally exclusive for a reason, and some athletes may have withheld information regarding the true benefits and drawbacks of using these online groups to converse with one another. In an effort to mitigate this, I took measures to ensure athletes felt comfortable sharing their experiences with me. I completed interviews in a quiet and private space and at a time that was convenient for them. In each interview, I reminded the participant that all information would remain confidential through de-identified quotes and data presentation. I also completed member checks, allowing athletes one week from when they received their transcribed interview to make changes if they felt this was necessary. Only a few used this option to make minor edits, and no one removed their data entirely, which could be seen as evidence that they were comfortable with what they shared in the process and that they didn't leave anything relevant out.

Future Directions

Future research can build off of these findings in a number of ways. First, continued exploration into the dynamic nature of cohesion can help move our understanding of this important construct forward. Surprisingly few studies have examined the supposed dynamic nature of cohesion in teams (Bourbousson & Fortes-Bourbousson, 2017; Carron et al., 1985; Gioldasis et al., 2016). An in-depth longitudinal study by Bourbousson and Fortes-Bourbousson (2017) found that both ATG-T and GI-T fluctuated over 107 measurements during a basketball team's four-month long season. They found that fluctuations in ATG-T were random noise while the fluctuations in GI-T were meaningful and were impacted by previous values. They concluded that individual attractions were a more stable aspect of cohesion, while group integration fluctuated

meaningfully based on day to day events. In the present study, few athletes talked about their individual attractions (less than 30%), while nearly every athlete interviewed talked about group integration (over 90%). Thus, there may be aspects of cohesion which are stable while others are dynamic, and future research should explore this possibility.

Second, the use of frequency of online communication to represent the closeness of a relationship may not be specific enough as patterns of online communication change over time. This decision was informed by work that examined relationship maintenance between close others (Ramirez & Broneck, 2009). Thus, Ramirex and Broneck were potentially measuring voluntary social communication. IM may now be used for much more than voluntary social communication with friends, as young adults may prefer to use it for task-related communication as well, some of which may be involuntary based on their role on a team (perceived or assigned). Therefore, future research should be more specific in how it measures the use of IM, including voluntary and involuntary dimensions, and perhaps also breaking it into task and social uses.

Third, while gathering social network data has its inherent challenges, it provides a unique look at a team's internal structure. The study of networks through social network analysis is highly relevant to sports teams as closed systems and can provide different information about a group or phenomenon than the description of average characteristics (Cattell, 1948). Anderson and Warner (2017) compared cohesion in volleyball team as measured by the GEQ and by social network analysis (indicated by the density of connections in the network graph). They found that both measures contributed different information to the understanding of how cohesive a team was and how that cohesion related to the teams' performances. Thus, there is the possibility of advancing

our knowledge of team cohesion as well as other topics in sport psychology by taking a social network approach.

Fourth, a finding that emerged in the current study was that although performance fluctuated over the season, athletes stated that the team saw increased group integration socially and toward the task. Some also mentioned that they felt this helped performance, although others felt it was too late in the season for that improvement to have an influence. Some athletes alluded to improved relationships helping them engage in task and performance related conversations, along with prompts from their coach and a successful coach from another sport. Looking at the larger themes of what athletes said, I speculate that private IM group conversations, along with the full team group chat and other offline strategies supported GI-S, which may have together helped performance-related conversations happen and improve GI-T, which then may have helped performance. Therefore, I suggest that private instant messaging groups within a team, both large and small, may have an indirect impact on performance through social and task cohesion. Additionally, while I explored private connections online, future research could look at potential impacts of public online communication such as comments, "likes" and "tagging" social media friends on team cohesion and performance. These topics should be pursued in future research since online communication of all forms is pervasive, growing, and research in other fields shows that it can impact life offline in positive and negative ways (Anderson, 2015; Cohen et al., 2014; Desjarlais & Joseph, 2017; Lenhart, 2015; Neo & Skoric, 2009; Ramirez & Broneck, 2009; Valkenburg & Peter, 2007). In sport, successful performance is a highly valued outcome. Therefore, any

contributors to its achievement can assist MPCs, coaches and athletes as they seek performance improvements.

Lastly, this thesis explored online communication, cohesion and performance in a female team. Given that this research occurred with one team, it not possible to confirm or deny any of the suggested sex differences in the cohesion-performance literature (Carron, Colman et al., 2002; Eys et al., 2015; Navarre, 2011; West-McMaster, 2004). However, it is worth reiterating that coaches who highlighted differences between female and male athletes also mentioned that differencees in competitive orientation were shrinking (Navarre, 2011). Thus, past findings about gender and sex differences may hold less predictive value and future research should aim to capture evolving athlete behaviours and needs.

Actionable Findings

What can readers take from this study and apply to their teams regarding online communication, cohesion and performance? First, the comments from athletes regarding those aspects that appeared to support group integration can be implemented on teams after assessing cohesion and determining that group integration is an area for improvement. For example, regarding social group integration early in the season, adding someone as a social media friend or to a follower list can serve as a tool to get to know one another initially. In some cases, the account they prefer may give you an indication about how they want to interact or the information they want to share. Athletes on this team noted that Instagram was used to see what others like and what they are interested in, which helped start in-person conversations. On the other hand, apps like SnapChat are often reserved for the closest social relationships for young adults in recent years and

have been found to be used to have fun when bored, to send a quick message, or to make plans (Vaterlaus et al., 2016). Coach or MPC awareness of who is connected with whom online (and through which apps) may give them a sense of existing networks and their uses. Asking key athletes about their experiences online with teammates may open the door to this information if it is not obvious from overhearing conversations or observing athlete interactions. While a coach or MPC may not explicitly ask what apps are being used and why, they could ask if interactions pose any concerns which may need further action. It is important to note that the use and association between certain types of relationships with certain apps can change quickly, so it is also important to be aware of which apps are currently being used and for what purpose. Pew Research Centre publishes articles regularly about pop culture (among other topics) and so it can be a valuable resource if a reader is feeling disconnected from current trends in the use of technology (see www.pewresearch.org).

Second, athletes in this study mentioned that team and small group conversations about performance-related goals helped them integrate towards the task (i.e., uniting in trying to reach team performance goals, communicating freely about each athlete's responsibilities in competition; see Appendix F for more examples), and that this helped their performance even though it occurred later in the season. Athletes mentioned that initiating these conversations earlier in the season would have been beneficial and may have allowed them to achieve a higher ranking in their league play. Additionally, coaches may choose to follow a similar approach to the one that appeared to be taken here, which is to highlight performance goals and observations and leave this with the athletes to figure out solutions together. This approach may begin slowly as athletes learn to

communicate with one another effectively but can be enhanced by providing them with guidelines or expectations for the conversations. Naturally, the successful outcome of an approach like this depends on the leadership within the athletes on the team and the follow up done with the coach after said meetings. If athlete leaders focus on the social support of teammates as well as training and instructional feedback in both online and offline environments, research has shown they can impact their team's cohesion (Vincer & Loughead, 2010). Some coaches may find that working with team captains so that they can work with their teammates is a suitable approach given the context of the athletes on their team.

Third, while it can be seductive to hear about and apply what worked for one team, it is important to consider the specific context of anyone's current team (Navarre, 2011; Yukelson, 1997). Indeed, one athlete explicitly mentioned in the current study that she felt there was not "one way" a coach could make their team bond to ensure they won more. Qualitative work with a rugby team by Wagstaff, Martin, and Thelwell (2017) found that the influence of subgroups and cliques could grow in times of winning or losing. Recall that the team in this mixed methods case study had a moderately successful season and thus were not in either extreme, which may have masked potential effects of the subgroups present on the team. While this research may appear to offer other actionable findings for readers in practical and research-driven ways, the need to consider context is key before applying the findings elsewhere. For an MPC or other outsider aiming to impact cohesion or performance, building rapport with the coach and athletes is essential to tailoring and delivering an effective intervention (Martin, Cowburn, & MacIntosh, 2017; Yukelson, 1997). Additionally, for MPCs and coaches, involving

athletes in the creation of a team mission statement as well as the performance goals and resulting behaviors that make it real can help focus and integrate athletes (Martin et al., 2017). For a practical guide with outlined steps, see Martin and colleagues (2017) intervention description.

Lastly, for researchers, this team appeared to have high cohesion and many athletes noted positive ways that online communication either directly or indirectly impacted their season. At the same time, a few athletes noted that not all teams are like this. Other teams may have issues with group dynamics that are not captured here. Thus, continued exploration with teams who exhibit conflict or gossip may add to our understanding of ways in which online communication can impact offline variables such as cohesion and performance.

Conclusion

This mixed methods case study aimed to explore athlete experiences with online communication (through private IM groups) and any perceived impacts on their cohesion and individual or team performance outcomes. There were four research questions that were addressed using both quantitative and qualitative data. Findings indicated that the participating team had high levels of cohesion early on in their season and that these remained high after a moderately successful season. Interviews supported this, but also added some nuance where athletes talked about increases in the group's integration toward the end of the season. While I aimed to explore a potential relationship between cohesion and higher frequencies of private IM group use between athletes, no clear relationship emerged. Also, since a number of athletes discussed the regular use of a full team group chat, it is unclear whether they were including this in their private IM group

survey completion. This may be due to the fact that IM no longer represents voluntary, social communication between close others (Ramirez & Broneck, 2009), but rather, includes both involuntary and task-related communication. Thus, recommendations for future research include more specific measurement of online communication that captures task and social communication as well as voluntary and involuntary communication. This could be accomplished by looking at internal networks or average characteristics (i.e. average amount of days/time spent communicating in each category). In an exploratory fashion, the current study also inquired about whether online communication impacted athlete perceptions of cohesion and their individual or team performance outcomes. For the participating team, it appeared that the use of large and small private IM groups helped maintain or build social cohesion. Some athletes also mentioned that they felt increases in social cohesion were one of the things that facilitated task-oriented communication and increases in group integration toward the task. Some also stated that improvements in both social and task cohesion contributed to performance improvements later in their competitive season, and thus aimed to make improvements in these earlier in their season next year. Therefore, from the available data, I suggest that private IM groups did not hurt cohesion or performance and may have directly and indirectly contributed to their maintenance or improvement. Others should be cautious in applying these findings to other teams and consider contextual factors that may result in different outcomes with other teams. The broader purpose of the study beyond answering the four research questions was to start a discussion regarding the ways in which instant messaging, especially IM done through large and small group chats, can impact a team's cohesion and performance. As research progresses, the

development of guidelines for MPCs, coaches and athletes may provide a useful way to improve a team's group dynamics and performance.

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Appendix A: Research Ethics Board Approval

DALHOUSIE UNIVERSITY
Research Services

Social Sciences & Humanities Research Ethics Board
Letter of Approval

July 16, 2018

Tina DeRoo
Health\School of Health and Human Performance

Dear Tina,

REB #: 2018-4499
Project Title: Private Instant Message Groups, Cohesion and Performance in Female Sport

Effective Date: July 16, 2018
Expiry Date: July 16, 2019

The Social Sciences & Humanities Research Ethics Board has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on *Ethical Conduct for Research Involving Humans.* This approval will be in effect for 12 months as indicated above. This approval is subject to the conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,

Signature covered for FGS formatting

Dr. Karen Beazley, Chair

Appendix B: Recruitment Script - COACH

"Hello, my name is Tina DeRoo, and I am a master's student from Dalhousie University studying Sport Psychology. I am calling to ask about working with your team this season for my master's thesis. Is this something I can give you more information about?"

If no,

"Alright, well thank you for your time and I hope you have a successful season ahead."

If yes,

"The project aims to look at team cohesion and performance in athletes. In particular, I would like to see if athletes are experiencing any effects in practices or games from private conversations had online with other players.

(An example if needed for clarification: the private Messenger *groups you can start with friends on* Facebook*.)*

"The study would involve a few visits with the team as a whole at the start and end of the season where those who agree to participate would complete questionnaires assessing their perceptions of team cohesion. In addition to this, I would like to give them another questionnaire at the end of the season asking them about which of their fellow players they are connected with online, and who they are sending private instant messages with. Lastly, I would like to complete interviews with yourself and the players individually, a few weeks or months after the season end, to add detail beyond what the questionnaire can tell me about cohesion on the team. The interview with you would include questions about the athletes, team performance, what you noticed in practices and games over the season, and any final thoughts on the interaction of online conversations, cohesion and the team's performance. The interviews with the athletes (those who agree to talk to me) will help us understand what goes on online, how it is positively and/or negatively affecting the team, and what we can do about it in the future. I won't be able to share any specifics with you about those interviews but am happy to share the summary at the completion of the project should you want to see it. That would be around June of 2019. Some research is showing that cohesion, especially social cohesion, is more important for female athletes, which is why we feel this project is of importance right now. There is nothing I can find that talks about how online conversations might be impacting teams' offline interactions and performance. Is this something you would be interested in having your team participate in?"

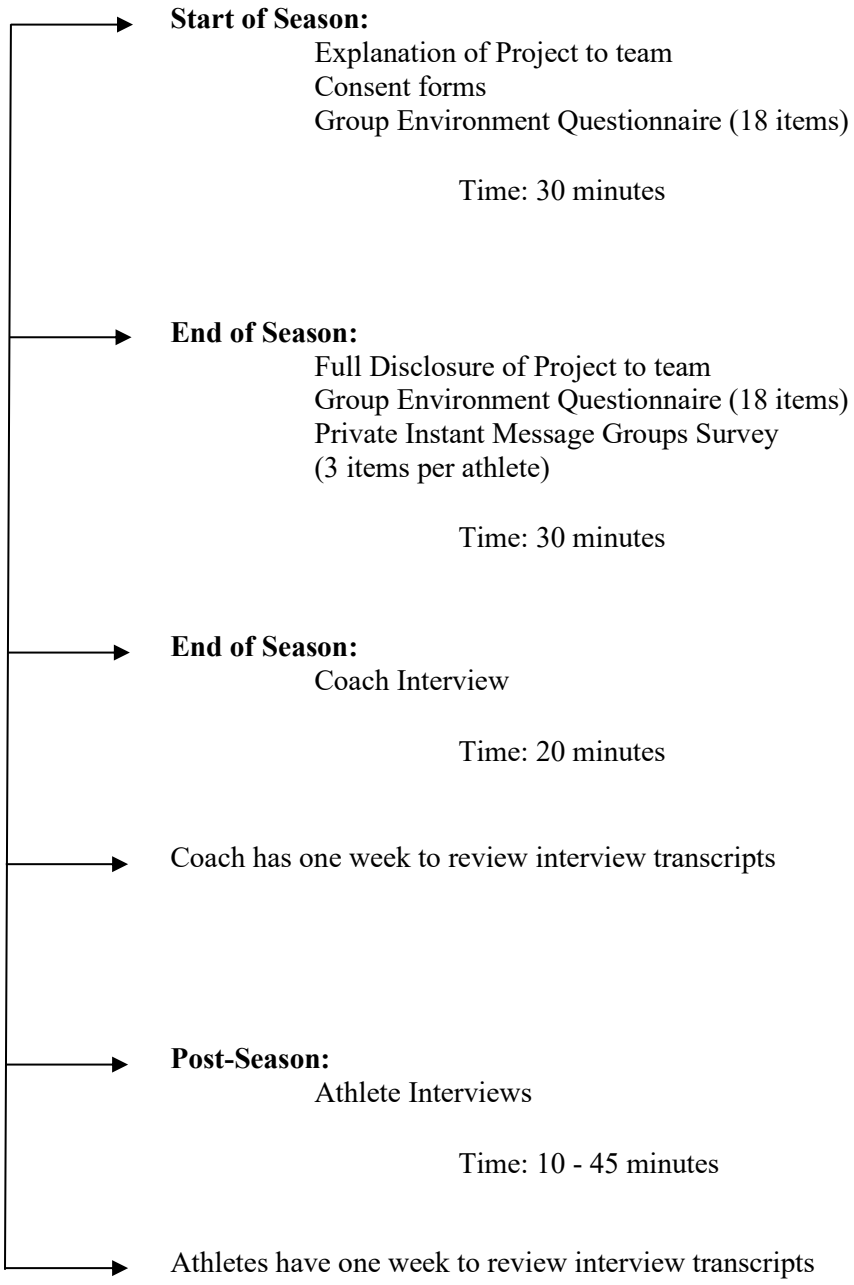
Appendix C: Recruitment Script - ATHLETE

Head Coach to introduce me to the team but will leave the room for recruitment script so that they do not know who chose to participate or not.

"Hi everyone. Thank you for having me here at your team meeting and congratulations for making the team this year. I am here to tell you about my research project of which I would like each of you to be a part of. The project looks at cohesion in sport. Cohesion is essentially the glue that holds you all together as you work toward your team goals and social needs. It has been found over the years to be very important to team performance. As the consent form will outline, there are a few parts to this study. Firstly, today you will have an opportunity to review the consent form and complete a questionnaire measuring your perceptions of cohesion. Next, I will be back at a team meeting at the end of the season to have you fill out the same cohesion questionnaire and an additional survey regarding communication on the team throughout the season. Lastly, I would like to interview each of you to hear what you have to say about cohesion and performance throughout the season. These interviews won't be set up until after the season, and I will be sure to fit them in around your schedule, as I know you are all students and have different deadlines. The cohesion questionnaire for this first part of the study is attached at the back of the consent forms I will hand out. I'll give you all some time to read through the consent form, and if you have any questions or want clarification on any part of it, let me know. And, although it says so in the consent form, I want to remind you that you are under no obligation to participate, and your choice to participate or not will not affect your season, status, playing time, or anything else. Thank you and here are the forms."

Hand out package with consent form and GEQ. Time to read through, sign and complete ~ 15-20 minutes.

Appendix D: Quantitative & Qualitative Data Collection Timeline



Appendix E: Consent Form - ATHLETE

CONSENT FORM

Project title: Cohesion and Performance on a Team

Lead researcher:
Tina DeRoo
Dalhousie University
Masters of Kinesiology Candidate
tina.deroo@dal.ca
306-716-4611

Other researchers:
Dr. Lori Dithurbide (Supervisor)
Dalhousie University
School of Health and Human Performance
Associate Professor
lori.dithurbide@dal.ca
902-494-2477

Introduction:
We invite you to take part in a research study being conducted by me, Tina DeRoo, a student at Dalhousie University as part of my Master of Science in Kinesiology program. Choosing whether or not to take part in this research is entirely your choice. There will be no impact on your playing time over the season or treatment by the coach if you decide not to participate in the research. The information below tells you about what is involved in the research, what you will be asked to do and about any benefit, risk, inconvenience or discomfort that you might experience.

You should discuss any questions you have about this study with myself, Tina DeRoo. Please ask as many questions as you like. If you have questions later, please contact me.

Purpose and Outline of the Research Study:
This study aims to understand the role of cohesion on a team. Cohesion is like the glue that holds a team together as they strive towards their goals. Previous research has shown that cohesion is linked with good performances.

Participation in this study involves the completion of a questionnaire that assesses cohesion at the start and end of the season. Additionally, at the end of the season, participants will be asked to complete an additional questionnaire about how they

communicated with one another throughout the season. Further instructions will be given at this time. Lastly, all players will be invited to participate in an interview after the season is complete to gain a better understanding of how relationships may have impacted performance. These interviews may last anywhere from 20 to 60 minutes depending on the conversation that arises and will be scheduled at a time and location convenient for the participant. The intent is to gain a better understanding of the team as a whole.

Who Can Take Part in the Research Study:
You may participate in this study if you are a member on this team during the 2018 - 2019 season. All players, regardless of playing time or injury status are welcome to participate.

What You Will Be Asked to Do:
At the start of the season (today), those who choose to participate will be asked to complete a paper questionnaire that assesses team cohesion. The questionnaire includes 18 statements which you will rank agreement with on a scale from one to nine and is assumed to take no more than 20-30 minutes of your time. In fact, it may only take 5-10 minutes to complete. This questionnaire gives us a score that represents your perceptions of cohesion.

At the end of the season, those participating will be asked to complete the same paper questionnaire assessing team cohesion. As mentioned, participants will be asked to complete an additional questionnaire regarding communication at the end of the season, which will be described in more detail at this time. Completion of both surveys is assumed to take no more than 20-30 minutes.

In the weeks and months following the end of the season, I will contact those participating in the study for an interview. The interview will be set up at a time and location that is convenient for you as a participant. Interviews are meant to add detail to what is assessed through the paper questionnaires, and may last anywhere from 20 to 60 minutes, depending on what conversation arises.

Possible Benefits, Risks and Discomforts:
Participation in this research might not benefit you directly. One possible benefit of your participation is contributing to our knowledge regarding teams. Greater knowledge of how cohesion impacts performance on teams may help coaches and athletes maximize their cohesion and performance in the future.

The questionnaire to be completed covers general statements about interactions with teammates, and most will not have any sensitivity to its content. It has been used for over 30 years with many teams. There are no known risks for participating in this part of the research beyond being bored. However, you will be offered breaks as necessary while completing the questionnaire to reduce these risks.

While some individuals find that interviews provide closure and an opportunity to process events in the past, it is entirely possible that the process could bring back thoughts, feelings or memories that are uncomfortable to you, the participant. I will aim to make the interview as safe and comfortable as possible, including allowing you, the participant, to choose an appropriate time and location, and allowing for breaks at any time as deemed necessary. I will also remind you, the participant, at the start of the interview that you are free to not answer any question or stop the interview at any time should you feel this is necessary. Not answering a question or stopping the interview at any time will not impact your reputation, playing time or future status as a player. All interview content will remain confidential and will not be reported back to the coach or other players.

Compensation / Reimbursement:
To thank you for completing all parts of the study, after the interview, regardless of its length, we will give you a prepaid credit card for $5.00.

How your information will be protected:
Privacy:
Your information will be protected in that all players are invited to partake in the study, however, completion (or not) of paper questionnaires will not be anonymous, as other teammates may see you completing the forms (or not). Any answers provided on the paper questionnaires will remain confidential (not shared with anyone, including your coach and other players), and one week after your interview, they will be de-identified (such that your name will be replaced with a letter and number code like "P3"). Up until and after this time, paper data will be stored in a locked filing cabinet, in a locked office which can only be accessed by my supervisor. Similarly, all players will be invited to take part in an interview, and your coach and other players will not know if you have participated in an interview or not. Interviews will be recorded and transcribed to best capture participant thoughts, ideas and quotes. Any quotes being used in print or oral presentations will be discussed using participant codes (as above). The transcript documents will be stored on a password protected computer in a locked office.

Confidentiality:
It is possible that your teammates may notice your participation (or lack of) during the completion of the paper questionnaires, so during this phase of data collection we cannot guarantee anonymity. Beyond this, information about you will not be disclosed in any way other than through de-identified analysis. When writing up results or presenting, some information may be altered to protect your identity. As the lead researcher, I will be the only person to know that you have agreed to participate in an interview and will not mention this to other players or coaches. Only myself and my supervisor will have access to paper and computer files with questionnaire or interview data.

Data retention:
Information that you provide to us will be kept private. Only the research team at

Dalhousie University (myself as the lead researcher and my supervisor as described above) will have access to this information. I will describe and share the findings in a final written thesis, and my supervisor and/or I may share findings through presentations, public media, journal articles, or workshops. We will be very careful to only talk about group results and de-identified quotes so that no one will be identified. This means that you will not be identified in any way in our reports. The people who work with us have an obligation to keep all research information private.

If You Decide to Stop Participating:
Because there are multiple parts to this study, your decision to leave it (stop participating) will have different results depending on when you choose to do so and inform the lead researcher. If you decide to stop participating after completion of the first cohesion questionnaire, but before the second cohesion questionnaire, you can also decide whether you want any of the information that you have contributed up to that point to be removed or if you will allow me to use that information. After completing both cohesion questionnaires and the communication survey at the end of the season, data will be analyzed to help guide interviews. At this point you will not be able to remove your questionnaire data but may leave the study by declining the interview portion. If you decline the interview portion, no further data will be collected from you. If you complete an interview, you will have one week to review your interview transcript (what was said) and decide during that time if you want me to edit or remove your interview data. One week after your interview is complete, all of your data (paper questionnaires and interview transcripts) will be fully deidentified and coded, and final data analysis will begin, thus you cannot remove your interview data beyond one week from the time of the interview.

How to Obtain Results:
You will obtain a summary of the final results in June of 2019. This summary will include group-level, generalized information.

Questions :
We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact me, Tina DeRoo (306-716-4611 or tina.deroo@dal.ca), or my supervisor Dr. Lori Dithurbide (902 494-2477 or lori.dithurbide@dal.ca) at any time with questions, comments, or concerns about the research study (if you are calling long distance, please call collect). We will also tell you if any new information comes up that could affect your decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact Research Ethics, Dalhousie University at (902) 494-1462, or email: ethics@dal.ca (and reference REB file #2018-4499).

Appendix E (cntd)

Signature Page

Project Title: Cohesion and Performance on a Team

Lead Researcher:
Tina DeRoo
Dalhousie University
Masters of Kinesiology Candidate
tina.deroo@dal.ca
306-716-4611

I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I understand that I have been asked to take part in multiple questionnaires and one interview that will occur at a time and location acceptable to me, and that my interview will be recorded. I understand direct quotes of things I say may be used without identifying me. I agree to take part in each phase of this study. My participation is voluntary and I understand that I am free to withdraw from the study after each phase, with differing results for the data contributed up to that point in time as outlined in the consent form. I understand that I have one week after my interview is completed to edit or remove my interview data from the study.

_____	_____	_____
Name	Signature	Date

Appendix F: Group Environment Questionnaire (GEQ)

This questionnaire is designed to assess your perceptions of your team. There are no wrong or right answers, so please give your immediate reaction. Some of the questions may seem repetitive, but please answer ALL questions. Your personal responses will be kept in strictest confidence.

The following statements are designed to assess your feelings about YOUR PERSONAL INVOLVEMENT with this team.

Please CIRCLE a number from 1 to 9 to indicate your level of agreement with each of these statements.

1. I do not enjoy being a part of the social activities of this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

2. I'm not happy with the amount of playing time I get.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

3. I am not going to miss the members of this team when the season ends.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

4. I'm unhappy with my team's level of desire to win.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

Appendix F (cntd)

5. Some of my best friends are on this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

6. This team does not give me enough opportunities to improve my personal performance.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

7. I enjoy other parties rather than team parties.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

8. I do not like the style of play on this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

9. For me, this team is one of the most important social groups to which I belong.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

Appendix F (cntd)

The following statements are designed to assess your perceptions of YOUR TEAM AS A WHOLE. Please CIRCLE a number from 1 to 9 to indicate your level of agreement with each of these statements.

10. Our team is united in trying to reach its goals for performance.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

11. Members of our team would rather go out on their own than get together as a team .

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

12. We all take responsibility for any loss or poor performance by our team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

13. Our team members rarely party together.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

14. Our team members have conflicting aspirations for the team's performance.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

Appendix F (cntd)

15. Our team would like to spend time together in the off season.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

16. If members of our team have problems in practice, everyone wants to help them, so we can get back together again.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

17. Members of our team do not stick together outside of practice and games.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

18. Our team members do not communicate freely about each athlete's responsibilities during competition or practice.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

Appendix G: Debriefing Script - ATHLETE

"Hi everyone. Thank you for having me back here with your team. Today is where you will complete the second measure of cohesion and the communication survey if you are participating in the study. It is identical to the questionnaire completed back in (month of pre-season). The next part of the study asks about your communication online with your fellow teammates. At the start of the season I told you the study was about measuring team cohesion, which is true. What I hadn't told you in (month of pre-season) is that I am also interested in how your communication habits online during the season may have impacted your cohesion and performance. By completing this next part of the study, you are allowing all of your questionnaire data to be used in the final report, as I will be removing names from the surveys and coding each one later today so that no one can be identified. On the second survey, you will see a list of all teammates and three options for each person. For the purposes of this part of the study, all I want to know is if you talked to each player listed through a private IM group on any social networking site (some are listed for examples, see Appendix E), and if so, how frequently? There are options for four or more days per week and three or less days per week. If this changed over the course of the season, think about the second half of the season and put your best guess down as to how often you messaged this person through a private IM group during that time. It is okay if you messaged them through different sites, as I am more interested in the frequency. I want to reiterate that your right to privacy is still important to us, and being that we are again in a group setting I will ask that you spread out throughout the room and refrain from discussing the project among yourselves. Similar to the first meeting, if you had chosen not to participate at the first meeting, you can mark an X beside the questions and outside of the grid beside each name, so no one will know whether you chose to participate or not. I will also remind you that the consent form outlined different times throughout the study where you could decline further participation. Thus, if you do not want to participate in this next phase you are not required to. Please also refrain from talking if you finish early, so that others will have a chance to complete if they have chosen to do so. When completed, you can fold in half and I will collect the surveys. Thank you again. As mentioned in (pre-season month) and in the consent form, I am also wanting to complete interviews with each of you to learn more about these topics from your perspectives. You can expect to hear from me over the phone or in an email in the coming weeks to set up a time and location for your interview. If you have any questions for me or my supervisor about the next part of the study, do not hesitate to ask today, or later over the phone, or through email. Our email addresses are included on the consent form. Good luck with the rest of your semesters and I look forward to speaking with you in the coming months."

Appendix H: Private Instant Message Groups Survey

Name: _____

Preferred Contact Information (for interview): _____

Social Network Site: Instagram, Facebook Messenger, WhatsApp, etc.
Private: Not a public message, comment or message board
DM: Direct Message (through a social network site)
IM: Instant Message (through a social network site)

Player Name	**During the season** I was in a private DM or IM group with this player **Yes?** Mark an X and select frequency in other columns. **No?** Leave the other columns blank.	**During the season** I communicated with this player through a private DM or IM group ***less than 4 days per week***	**During the season** I communicated with this player through a private DM or IM group ***4 or more days per week***
Player 1	x	x	
Player 2	x	x	
Player 3	x		x
Player 4			
Player 5	x		x
Player 6	x		x
etc.			

Appendix I: Consent Form – COACH

Project title: Cohesion and Performance on a Team

Lead researcher:
Tina DeRoo
Dalhousie University
Masters of Kinesiology Candidate
tina.deroo@dal.ca
306-716-4611

Other researchers:
Dr. Lori Dithurbide (Supervisor)
Dalhousie University
School of Health and Human Performance
Associate Professor
lori.dithurbide@dal.ca
902-494-2477

Introduction:
We invite you to take part in a research study being conducted by me, Tina DeRoo, a student at Dalhousie University as part of my Master of Science in Kinesiology program. Choosing whether or not to take part in this research is entirely your choice. There will be no impact on your reputation or future employment if you decide not to participate in the research. The information below tells you about what is involved in the research, what you will be asked to do and about any benefit, risk, inconvenience or discomfort that you might experience.

You should discuss any questions you have about this study with myself, Tina DeRoo. Please ask as many questions as you like. If you have questions later, please contact me.

Purpose and Outline of the Research Study:
This study aims to better understand the role of online communication and its potential impacts on cohesion and performance within a team. Cohesion is like the glue that holds a team together as they strive towards their goals. Previous research has shown it is important for teams to be cohesive, as it has been linked with good performances. No known studies have explored how communication online may impact cohesion and/or performance within a team.

Participation in this study involves an interview at the end of the season. The interview may last anywhere from 20 to 40 minutes depending on the conversation that arises, and will be scheduled at a time and location convenient for you. The primary purpose of your

interview is to help guide the lead researcher in the interviews with participating athletes. A secondary purpose of your interview is to understand what you experienced with regards to communication online within the team and results in practices and competitions. Your interview will help understand the context to the team and allow for a more full description of the team in the final written thesis.

Who Can Take Part in the Research Study:
You may participate in this study if you are the head coach of this team during the 2018 - 2019 season.

What You Will Be Asked to Do:
In the month following the end of the competitive season, the lead researcher will contact you for an interview. The interview will be set up at a time and location that is convenient for you. The interview is meant to add detail to what is assessed through the paper questionnaires given to the athletes, and may last anywhere from 20 to 40 minutes, depending on what conversation arises.

Possible Benefits, Risks and Discomforts:
Participation in this research might not benefit you directly. One possible benefit of your participation is contributing to the researchers' knowledge regarding online communication within teams. Knowledge of how online communication relates to cohesion and performance may prompt future research on the topic and help other coaches and athletes maximize their cohesion and performance in the future.

While some individuals find that interviews provide closure and an opportunity to process events in the past, it is entirely possible that the process could bring back thoughts, feelings or memories that are uncomfortable to you. The lead researcher will aim to make the interview as safe and comfortable as possible, including allowing you to choose an appropriate time and location, and allowing for breaks at any time as deemed necessary.

The lead researcher will also remind you at the start of the interview that you are free to not answer any question or stop the interview at any time should you feel this is necessary. Not answering a question or stopping the interview at any time will not impact your reputation or employment. All interview content will remain confidential and will not be reported back to the players, or other coaches or staff.

Compensation / Reimbursement:
To thank you for permitting the lead researcher to approach your team for participants, and regardless of your participation, we will give you a prepaid credit card for $10.00.

Appendix I (cntd)

How your information will be protected:
Privacy:

Being that you are the only coach, any comments or quotations included in the written thesis will be included only with your agreement and approval, which will gathered through conversations or emails as the writing of the thesis begins. If there are comments or quotations that you feel compromise your privacy and you do not want them included, they will either be written in a general way that does not point to you as the source of information or not be included altogether. Your players and others connected to the team will not need to know if you have participated in an interview or not. The Interview will be recorded and transcribed to best capture your thoughts, ideas and quotes in the event that they are included. Any approved comments or quotations being used in print or oral presentations will not be attached to your name, but rather a participant code. The transcript documents will be stored on a password protected computer in a locked office.

Confidentiality:
As mentioned, information provided by you will not be disclosed in the written thesis in any way other than through de-identified analysis (a participant code) if you have approved that it can be included. When writing up results or presenting, some information may be altered to protect your identity, like making comments generic and writing in a way that does not point to your participation. The lead researcher and supervisor will be the only people to know that you have agreed to participate in an interview if you choose to keep your participation private, and they will not mention this to other players, coaches, staff or the general public. Only the lead researcher and supervisor will have access to paper and computer files with interview data.

Data retention:
Information that you provide to us will be kept private. Only the research team at Dalhousie University (the lead researcher and supervisor as described above) will have access to this information. I will describe and share the findings in a final written thesis, and my supervisor and/or I may share findings through presentations, public media, journal articles, or workshops. We will be very careful to only talk about group results and de-identified quotes so that you cannot be identified unless you agree to include any comments or quotations, in which case you will be assigned a participant code for writing purposes. This means that you will have the option to not be identified in any way in our reports. The people who work with us have an obligation to keep all research information private.

If You Decide to Stop Participating:
If you complete an interview, you will have one week to review your interview transcript (what was said) and decide during that time if you want us to edit or remove your interview data. One week after your interview is complete, your interview transcripts will be deidentified and coded, and final data analysis will begin, thus you cannot remove

your interview data beyond one week from the time of the interview. As mentioned, when writing for the final thesis begins, the lead researcher may ask you about including certain comments or quotations. You have the right to not be identified and can decline inclusion of your statements in any identifiable way.

How to Obtain Results:
The team will obtain a summary of the final results in June of 2019. This summary will include group-level, generalized information, with no names or identifying information included.

Questions:
We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Tina DeRoo (306-716-4611 or tina.deroo@dal.ca), or Dr. Lori Dithurbide (902 494-2477 or lori.dithurbide@dal.ca) at any time with questions, comments, or concerns about the research study (if you are calling long distance,
please call collect). We will also tell you if any new information comes up that could affect your decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact Research Ethics, Dalhousie University at (902) 494-1462, or email: ethics@dal.ca (and reference REB file # 2018-4499).

Appendix I (cntd)

Signature Page

Project Title: Cohesion and Performance on a Team

Lead Researcher:
Tina DeRoo
Dalhousie University
Masters of Kinesiology Candidate
tina.deroo@dal.ca
306-716-4611

I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I understand that I have been asked to take part in one interview that will occur after the competitive season at a time and location acceptable to me, and that my interview will be recorded. I understand direct quotes of things I say may only be used if I agree to this, and that any comments of quotations will be de-identified. I also understand that I do not have to agree to including any identifiable comments or quotes in the final thesis or future presentations and publications, and that my participation can be private (only known to the lead researcher and supervisor). I agree to take part in this study. My participation is voluntary and I understand that I am free to withdraw from the study. I understand that I have one week after my interview is completed to edit or remove my interview data from the study.

_____	_____	_____
Name	Signature	Date

Appendix J: Semi-Structured Interview Guide - COACH

(Includes 13 total questions)

Introduction:

Hi (coach name), as you know I am a researcher in sport psychology who is interested in understanding team cohesion and performance in teams. I would firstly like to thank you for allowing me to work with your players and for your participation in this interview. For today, I would like to talk about your experiences with this season's (sport) team. If at any time you do not want to answer a question or continue with the interview, we can stop and you may withdraw your responses without any consequences. So you know, I will be recording and transcribing the interview so I can be sure to represent your views as accurately as possible in the results. Keep in mind that any information shared regarding specific players, performance levels or other insights about the team will not be shared in the final written document should their mention compromise our ability to keep your data private and/or confidential. Information regarding players will mainly help decide who to talk to in more depth about the topic, should they agree to an interview. Once the transcription is complete, I will send it to you and you will have one week to review it and make any changes or additions to what you said. You can also choose to remove your information from the study during the week after the interview. As for our conversation today, it will last at least 20 minutes, but depending on what you would like to share, can take up to 40 minutes. I have some questions I would like to discuss, however if these questions prompt any stories or ideas that you feel are important to the topic, please share. The interview style and order of questions is flexible, so we will address things as they come up. Again, you are welcome to decline answering any questions you want to, and we can stop the interview at any time. Do you have any questions for me before we get started?

Introductory Questions:

1. To start out, can you tell me about yourself, including your age, how many years you have coached (sport) and how long you have been coaching this team for?

2. Thank you, can you also share any formal roles assigned to your players during the past season?

(Should they ask, formal roles can include: captain, forward, goalie)

3. Are there any informal roles you saw emerge among players at any point during the season?

(Should they ask, informal roles can include: player motivator, player who cracks jokes,

social event organizer, someone who stirs up drama/discord among players, etc.)

Transition Questions:

Thank you, that gives me a better sense of the team structure. As you know I will be inviting the players to complete interviews as well. I would like to ask more in-depth questions of those players who represent different views on the topics at hand.

4. Can you share with me the names of any players who stand out to you as being either more or less social than others on the team?

5. Thank you, can you also share with me the names of any players who stand out to you as having better or worse performance than others on the team?

Key Questions:

As I mentioned earlier, I am interested in team cohesion and performance. More specifically, I would like to understand how online conversations among players may be affecting cohesion and performance.

(Should they ask, 'online conversations' refers to private instant message groups on social networking sites. While the coach may not know details regarding any/all private groups online, they may have experienced impacts from these groups in practices or games.)

6. Can you give me any examples of times where you felt online conversations among players impacted your practices?

(Should they ask, "impacts" may be positive, neutral or negative, and relate to the social environment or physical outcomes such as communication among teammates, level of focus/distraction, mood, effort in practice, etc.)

7. Can you give me any examples of times where you felt online conversations among players impacted your games or tournaments?

(Should they ask, "impacts" may be positive, neutral or negative, and relate to the social environment or physical outcomes such as communication among teammates, level of focus/distraction, mood, effort in games, etc.)

Additional questions, should they be relevant to the discussion:

8. In times where you noticed a positive effect from online conversations, was there anything you can recall doing differently or saying to the team?

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9. In times where you noticed a negative effect from online conversations, was there anything you can recall doing differently or saying to the team?

10. Do you know if your assistant coaches noticed these same impacts?

11. Was there ever conversation among coaching or administrative staff regarding online conversations among players? If so, can you share with me what you remember talking about?

Ending Questions:

12. Based on your experiences as a coach with this team, do you feel it is possible for online conversations to *not* impact the team's cohesion or performance?

As I understand from our conversation, the key points from your perspective include (highlight key points from the interview for confirmation).

13. Now that I have asked you the main questions, is there anything you feel is relevant to add to help me understand the impact of online conversations among players on team cohesion and performance over the season?

Concluding Statement:

That concludes the interview. Thank you very much for your time and input. As mentioned, your interview helps provide context for the team environment and guide interviews with those athletes who agree to talk to me. I would like to remind you that any information regarding specific players, performance levels or other insights about the team will not be shared in the final written document should their mention compromise our ability to keep your data private and/or confidential. Additionally, I won't be sharing any details regarding athlete interviews with you at any point to protect their privacy. Thank you again.

Appendix K: Semi-Structured Interview Guide - ATHLETE

(Includes 15 total questions)

Introduction:

Hi (player name). I am a researcher in sport psychology who is interested in understanding team cohesion and performance in athletes. I would firstly like to thank you for your participation in this interview and in each of the other phases of this project. For today, I would like to talk about your experiences with this season's (sport) team. If at any time you do not want to answer a question or continue with the interview, we can stop and you may withdraw your responses without any consequences. So you know, I will be recording and transcribing the interview so I can be sure to represent your views as accurately as possible in the results. Keep in mind that any quotes will be de-identified, meaning your name will be replaced with a letter and number combination such as "P3". Once the transcription is complete, I will send it to you and you will have one week to review it and make any changes or additions to what you said. You can also choose to remove your information from the study during the week after the interview. As for our conversation today, it will last at least 20 minutes, but depending on what you would like to share, can take up to an hour. I have some questions I would like to discuss, however if these questions prompt any stories or ideas that you feel are important to the topic, please share. The interview style and order of questions is flexible, so we will address things as they come up. Again, you are welcome to decline answering any questions you want to, and we can stop the interview at any time. Do you have any questions for me before we get started?

Introductory Questions:

1. To start out, can you tell me about yourself, including your age, how many years you have played (sport) and how long you have been on this team for?

2. Thank you, can you tell me what your main role on the team was this last season?

(Should they ask, roles can be formally assigned such as a team captain, or informally acquired such as player motivator, player who cracks jokes, social event organizer, someone who stirs up drama/discord among players, etc.)

Transition Questions:

Thank you. That gives me a better sense of where you fit within the team. As I mentioned, I am interested in better understanding team cohesion and performance in teams.

3. Can you describe anything you felt helped bring your team together this season?

   a. Was there anything that helped you specifically bond with other players?

4. Can you describe anything you felt caused rifts between teammates this season, even if only for one practice or game?

   a. Was there anything that caused rifts with other players for you personally, even if only for one practice or game?

5. Can you describe to me, in your words, how your team performed over the course of the season?

6. What changes in performance did you notice throughout the season, and how would you explain those changes?

Key Questions:

Thank you, that helps me understand your sense of team cohesion beyond what was measured in the questionnaires, and what you noticed about your team's performance over the season. I would like to ask some more specific questions now regarding private online conversations among players, and how these may have affected team cohesion and performance.

(Should they ask, 'online conversations' refers to private instant message groups on social networking sites. While the athlete may not know details regarding any/all private groups online, they may have experienced impacts from these groups in practices or games.)

7. Thinking back to the start of the season, about how many players on the team were already friends with you on your favorite social networking sites?

8. Can you tell me what influenced your decision to add a player to your friend list?

   a. About what time in the season did you add other players as friends online?

   b. Did this change anything between you and this/these player(s)?

9. Can you describe any examples of teammates you chose *not* to add to your friend list and what influenced that decision?

   a. Was there a time where you blocked or unfriended someone, even if only for a short period of time?

10. What do you think are the main benefits of sending private instant messages to a select group of teammates?

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11. What do you think are the main drawbacks of sending private instant messages to a select group of teammates?

12. Can you tell me roughly how many separate private instant message groups (among teammates) you are a part of?

13. Can you give me any examples of times where you felt private online conversations among players impacted your practices?

    a. What was it about these conversations that brought about these outcomes?

    b. Can you describe anything you can recall doing differently or saying because of this?

(Should they ask, "impacts" may be positive, neutral or negative, and relate to the social environment or physical outcomes such as communication among teammates, level of focus/distraction, mood, effort in practice, etc.)

14. Can you give me any examples of times where you felt online conversations among players impacted your games or tournaments?

    a. What was it about these online conversations that brought about these outcomes?

    b. Can you describe anything you can recall doing differently or saying because of this?

(Should they ask, "impacts" may be positive, neutral or negative, and relate to the social environment or physical outcomes such as communication among teammates, level of focus/distraction, mood, effort in games, etc.)

Ending Questions:

15. Now that I have asked you the main questions, is there anything you feel is relevant to add to help me understand real or potential impacts of private online conversations on team cohesion and performance over the season?

Concluding Statement:

That concludes the interview. Thank you very much for your time and input. As mentioned, your interview helps me better understand how private online conversations impact cohesion and performance on teams. This information may help coaches and athletes maximize their cohesion and performance in the future. I will not be sharing anything with other players or

your coach from our conversation today. If any quotations from this interview are used in the final written document or in presentations, your name will be replaced with a letter and number combination such as “P3”. I will type up the transcripts from our conversation today and send these to you for your review. You have one week to review, make changes, add or remove any information you feel necessary. Beyond this time, data analysis will begin. Thank you again.

Appendix L: Structured Interview Guide - ATHLETE

(Includes 8 total questions, none of which mention online conversations among athletes)

Introduction:

Hi (player name). I am a researcher in sport psychology who is interested in understanding team cohesion and performance in athletes. I would firstly like to thank you for your participation in this interview and in each of the other phases of this project. For today, I would like to talk about your experiences with this season's (sport) team. If at any time you do not want to answer a question or continue with the interview, we can stop and you may withdraw your responses without any consequences. So you know, I will be recording and transcribing the interview so I can be sure to represent your views as accurately as possible in the results. Keep in mind that any quotes will be de-identified, meaning your name will be replaced with a letter and number combination such as "P3". Once the transcription is complete, I will send it to you and you will have one week to review it and make any changes or additions to what you said. You can also choose to remove your information from the study during the week after the interview. As for our conversation today, it will last at least 20 minutes, but depending on what you would like to share, can take up to an hour. I have some questions I would like to discuss, however if these questions prompt any stories or ideas that you feel are important to the topic, please share. The interview style and order of questions is flexible, so we will address things as they come up. Again, you are welcome to decline answering any questions you want to, and we can stop the interview at any time. Do you have any questions for me before we get started?

Introductory Questions:

1. To start out, can you tell me about yourself, including your age, how many years you have played (sport) and how long you have been on this team for?

2. Thank you, can you tell me what your main role on the team was this last season?

(Should they ask, roles can be formally assigned such as a team captain, or informally acquired such as player motivator, player who cracks jokes, social event organizer, someone who stirs up drama/discord among players, etc.)

Transition Questions:

Thank you, that gives me a better sense of where you fit within the team. As I mentioned, I am interested in better understanding team cohesion and performance in teams.

3. Can you describe anything you felt helped bring your team together this season?

   a. Was there anything that helped you specifically bond with other players?

4. Can you describe anything you felt caused rifts between teammates this season, even if only for one practice or game?

   a. Was there anything that caused rifts with other players for you personally, even if only for one practice or game?

5. Can you describe to me, in your words, how your team performed over the course of the season?

6. What changes in performance did you notice throughout the season, and how would you explain those changes?

7. Based on your experiences as a player on this team, can you tell me what you think makes the biggest impact on a team's cohesion or performance over the season?

Ending Questions:

8. Now that I have asked you the main questions, is there anything you feel is relevant to add to help me understand teams and their cohesion and performance over the season?

Concluding Statement:

That concludes the interview. Thank you very much for your time and input. As mentioned, your interview helps us better understand how cohesion impacts performance on teams may help coaches and athletes maximize their cohesion and performance in the future. I will not be sharing anything with other players or your coach from our conversation today. If any quotations from this interview are used in the final written document or in presentations, your name will be replaced with a letter and number combination such as "P3". I will type up the transcripts from our conversation today and send these to you for your review. You have one week to review, make changes, add or remove any information you feel necessary. Beyond this time, data analysis will begin. Thank you again.