THE ROLE OF PERCEIVED SOCIAL SUPPORT, TOUCH, AND EFFICACY BELIEFS IN TEAM SHARED MENTAL MODELS

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ABSTRACT

The collective understanding and expectations of a team, known in the literature as Shared Mental Models (SMMs), is reinforced through a strong emotional and supportive environment. The purpose of this study is to observe instances of supportive touch and to measure the association between touch, perceived social support, and efficacy. This study observed videos of athletes during competitive events for instances of touch that are not related to the stratagem of the sport. The results illustrate a positive correlation between early season touch and early season performance. Touch frequency in the early portion of the season is positively associated with early season performance in volleyball. Simple linear regression analysis revealed how early season touch predicts early season volleyball performance. This finding is a conceptual replication of a study conducted on the National Basketball Association in 2010. The limitations, including small sample size and poor video quality are discussed. Furthermore, the role of support, touch, and efficacy in team shared models are described. Future directions include expanding the touch code methodology to test other areas outside of sport and testing larger sample sizes for greater generalizability.

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CHAPTER 1

INTRODUCTION

Team Success Through Social Support

Sport preparation at the elite level (at the collegiate level or above) often requires complete emersion into the craft. Sport is a mental endeavor as much as it is a physical one. Becoming excellent at sport at a high level demands that the athlete condition the body and the mind. It often requires total bodily conditioning and exertion, sometimes demanding the elite athlete to focus deep attention to the most basic of human movements. This deep focus means athletes sharpen the mind to react appropriately to the conditions in the high-pressure moments of the sport (Friesen et al., 2013). Individual sports, such as singles tennis or golf, involve great mental strength as much as physical. However, team sports, such as basketball or volleyball, while physically demanding, include the added barrier of team cognition. Each player on a team has their own understanding of abilities and strategy. If teams have a unified, shared understanding of what is expected from their performance, then team functioning is improved.

Mental acuity is important in all sports, but perhaps more so in team sports, which necessitate a greater shared understanding of the group. Team success means working together as one, which can be mentally very challenging. Teams, like any other group, must overcome obstacles to success through practice and communication. Well practiced teams, especially those at the collegiate level or above, must develop physical skills and

shared mental understandings fostered by communication (Eccles & Tran, 2012). Teams often understand the crucial component to strong communication is connecting on a deeper social or emotional level. Emotion plays a strong role on performance and is influenced by a team's sense of mental connection (Lane, 2013). A team, therefore, must reconcile differences, build a shared understanding through communication, provide support in times of failure, and underscore team success.

Social Support

Building mental strength may mean drawing from a network of important others in our lives. Athletes have several influencing people around them that are able to provide social support when team obstacles arise. Taylor (2011) defines social support as information from others that one is loved and cared for, esteemed and valued, and part of a network of communication and mutual obligations. According to Taylor, social support is the perception that one can turn to others in need. Social support is the knowledge that there are others that value and care for you. It is often understood in differentiated categories based on how the support is given or received. Under the domain of social support is informational support, instrumental support, and emotional support (Taylor, 2011). Informational support occurs when someone provides information on how to cope with a stressful event. Instrumental support occurs tangibly by means of goods (e.g., money or food) and services (e.g., caring for someone who is injured) provided by the social network including friends, family, and co-workers. Emotional support is reassurance that one is valued, which can be done explicitly by stating support or implicitly by means of non-verbal communication such as a hug. Merely believing that support is available when needed is beneficial. Knowing that friends or family are a

source of support can reduce physiological symptoms of stress (Smith, Ruiz, & Uchino, 2004). Feeling cared for and supported within our network is valuable to who we are and how we react to the world around us.

Our ability to work together and overcome barriers to success comes from the people around us. Researchers of social support have suggested that a network of people provide social support in three distinct groups. These three distinct sources of support are family, friends, and significant others (Zimet, Dahlem, Zimet, & Farley, 1988). Therefore, social support could come from a variety of people in our lives. The feeling of support can be reinforced multiple times and can come in numerous ways. Research tends to focus on verbal expressions of emotion and support (e.g., Wieselquist, Rusbult, Foster, & Agnew, 1999). Support can be provided, non-verbally through touch, yet so few articles (e.g., Hertenstein, Keltner, App, Bulleit, & Jaskolka, 2006) discuss any relationship between touch and the communication of support, and no research discusses the relationship between touch, support, and sport performance. We tend to feel positively about whom we touch and those who touch us, which may be an important factor in teams overcoming adversity.

Touch and Emotion

People on teams have varying opportunities to provide support and physically touch. Touch is important for group interaction because it is a source of comfort in times of failure, it is a sign of approval in times of success, and it demonstrates social support. Touch rewards positive feelings of trust by stimulating pleasure centers in our brain through the release of oxytocin (Gallace & Spence, 2010). It is a way to decrease emotional distance between others and it facilitates a group's sense of support of one

another (Wieselquist et al., 1999). People share touch in a variety of ways and use touch to build support in relationships.

Touch is a powerful sense, it is communicative, and it is important in building support and deeper shared understanding in small groups and interpersonal relationships (Seger, Smith, Percy, & Conrey, 2014). Unlike other senses, touch is bidirectional. If one is touching the body of another human, then they are being touched as well. Touch has meaning not often conveyed in other forms of communication. For example, touch can be supportive in times of need, demonstrate friendship, affiliation, love, or it can express joy or approval when successful events occur (Hertenstein et al., 2006). When we experience touch with others, we tend to feel positively about those around us, which is a crucial factor to feeling and developing team connectivity.

Touch as a Predictor of Performance

Emotions and support are important components of any sport performance. Touch is a way to help control our emotions and provide support in the high-pressure situation of a sporting event. Researchers have used observations of touch during sporting events as a way to predict individual and group performance on tasks. For example, Kraus, Huang, and Keltner (2010) viewed videos of players of the National Basketball Association (NBA) during the 2008-2009 season and coded touch as an early predictor of performance late in the season. They hypothesized that touch early in the NBA season predicted individual and team performance later in the season. Additionally, researchers expected that touch predicted improved team performance by enhancement of cooperative behaviors between teammates. To test these hypotheses, researchers watched 294 NBA players from all 30 teams and coded touch communication during an early

season game. Coders recorded the occurrence and duration of each touch as well as cooperation exhibited. The coding procedure was based on a past method of coding touch, was reliable, and coders agreed on 83.1% of all touches.

Individual performance was assessed using the win score statistic, which is a number including a variety of on-court events that are both positive and negative. Team performance was measured by using offensive and defensive efficiency numbers as well as an assist to turnover ratio and other statistics. Touch significantly predicted individual performance and overall team season performance. This study links touch in an indirect way to season performance. It states that early season touch indicates team cooperation, which predicts performance across the season (Kraus et al., 2010). Cooperation is defined behaviorally and could mean a variety of on court actions (e.g., talking to teammates during the game or passing the ball to someone on the team who is less heavily defended). The researchers do not look at any relationship between touch and the associated emotions or support conveyed. An important understanding of sport performance could be gleaned by understanding how touch is related to support.

Shared Mental Models

An encompassing theoretical understanding of team interactions, shared understanding, emotion, and communication has been suggested to be Shared Mental Models (SMMs) (Cannon-Bowers, Salas, & Converse, 1993). SMMs are organized knowledge that enables humans to form basic understandings of the systems to which they belong. It allows people to form accurate explanations and expectations of the tasks in which they are involved. It has not been traditionally discussed in the literature as utilized by sports teams until Rouse, Cannon-Bowers, and Salas (1992). Many of the

articles analyzing Shared Mental Models with reference to teams often discuss work teams such as in education (e.g., Johnson, Kahlil, & Spector, 2008), business (e.g., Zhou & Wang, 2010), or military (e.g., Marks, Zaccaro, & Mathieu, 2000) but little research has been conducted analyzing sports teams. In response to researchers using SMMs to further understand sports teamwork at the emotional and mental levels, Cannon-Bowers and Bowers (2006) wrote a directive article discussing potential uses and directions for future research of SMMs in sport psychology.

Researchers Filho, Gersgoren, Basevitch, Schinke, and Tenenbaum (2014) conducted a season long, qualitative case study of a women's volleyball team captain. They explain that according to Eccles and Tenanbaum's (2004) conceptual framework of coordination in team sports, SMMs have three overarching themes: affective, cognitive, and behavioral. SMMs have a social component and team performance is influenced by shared knowledge developed during team interactions. These interactions could be implicit, explicit, verbal, or nonverbal forms of communication and planning. Improving team performance and coordination may be achieved through task specific (i.e., each unique format for performing a collective task) and team related knowledge (i.e., the team shared understanding of strategy) (Eccles & Tenanbaum, 2004). Although this article discusses the individual perspective of the development of team shared understandings and affective states, it does not expand to the team as a whole. Furthermore, the authors make occasional mention of the use of touch to symbolically communicate affection and emotional support via handshakes, high-fives, or other tactile forms. However, they do not consider touch in their analysis as a source of important non-verbal communication related to team shared knowledge and performance.

Mohammed, Ferzandi, and Hamilton (2010) observed that shared emotional states are associated with the quality of cognitive information sharing in working teams. They suggest that further research should be conducted in the area of SMMs to determine other indicators of team effectiveness such as team creativity, adaptability, emotion, commitment, satisfaction, support, and emergent states such as cohesion.

Shared Mental Models, with regard to sports, are a collective understanding of the roles and expectations of each member of the team. Shared understandings can look varied across every team, may be expressed verbally or non-verbally, be explicit or implicit, and are the actions prior to, during, and post an event that provide social support and improved task understanding. All these variables and perhaps others lead to team success and efficiency (Eccles & Tenenbaum, 2004). Colloquially, it may be referred to as "team chemistry," and each team's shared mental model may look different. Each team can be examined by sources of communication, presence of social support, perceived efficacy, and thus indirectly, overall performance. With communication and support at hand, researchers have suggested a broad concept of efficacy beliefs that gauge the athletes' perception of the effectiveness of the team (Gershgoren, 2012). Tied to efficacy beliefs is the emotion associated with team support. As defined by Bandura (1997), self-efficacy has an affectivity component, which could come from the support of others. As applied to team sport, efficacy beliefs have three major branches (i.e., self-efficacy, other efficacy, and collective efficacy) that dictate the overall team and individual feelings of being capable of surmounting the task (Gershgoren, 2012). Therefore, SMMs, having a broad definition, are flexible to interpretation and provide a

great opportunity to observe a variety of teams and sports as they develop and execute strategies that improve a team's unique sense of belonging and understanding.

In the following paragraphs, greater time is given to defining and discussing each of the major variables mentioned. Examples are judiciously provided with many of the items discussed and are meant to aid in understanding the broad theoretical concept of SMMs and their application to sports teams. The importance of team communication is elucidated, thus providing a background based in research for sport. Logically, this leads to an emphasis on the communicative sense of touch, how it has been studied thus far, and how it is related to a sense of team social support. This study operationalizes touch to mean any intentional physical contact between athletes not related to the strategic physicality of the sport. Finally, efficacy beliefs and each of its components under the conceptual SMMs' understanding of sport are discussed.

Social Support & Touch

Communication and shared understandings look different between teams because every team is different and varies in level of efficacy beliefs. The opportunity to explicitly communicate and coordinate varies by sport and by team, and therefore a well-developed team that understands each member's skills, contributions, and roles is indicative of a team with high SMMs (DeChurch & Mesmer-Magnus, 2010; Giske, Rodahl, & Høigaard, 2015). Teams with higher levels of interdependency often require quick decision-making, great adaptation given the current situation, and therefore frequent use of implicit forms of communication. In a qualitative study (Gershgoren, Filho, Tenonbaum, & Schinke, 2013), the coach of an elite soccer team identified several components of their team's SMMs that included both verbal and non-verbal

communication. Verbal communication was identified as discussion of strategy, while non-verbal communication was mentioned as a form of emotional support done by players and coaches to improve team chemistry and reinforce cooperation.

Social support is an important factor in team development and is influenced by team communication. Teams provide social support in a variety of ways including touch. Touch is described as subtle communication and can signal closeness of a relationship. Under the right conditions, touch can increase cooperation and compliance (Kurzban, 2001). Touch creates a platform for trust to stand, and it does this by triggering neuroendocrines in the brain, which create a positive internal psychological state that facilitates support (Dunbar, 2010). Furthermore, the brain is capable of differentiating between pleasurable or painful forms of touch, and neutral tactile sensations (Gallace & Spence, 2010). Different areas of the orbitofrontal cortex are stimulated by painful or pleasant touch. In relation to social situations, such areas as the insular cortex might be an important part of a system that controls our emotional, hormonal, and affiliative responses to touch (Gallace & Spence). When we experience touch with others, activation in the brain arouses positive feelings of connection with those around us, which could be useful in building trust and support.

Perceived social support, in athletic endeavors, can be defined by the feeling of belonging to the team. Researchers of perceived social support have identified several significant factors related to the feeling of social support (Zimet et al., 1988). Perceived social support includes the belief that someone is available to go to for help in the time of need, the belief that one can turn to others to talk with about joys and sorrows, and other variables resulting in the feeling that important others are available as reliable sources of

help and confidence (Zimet et al.). For the purpose of this study, the factors outlined in the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al.) will be extrapolated and transferred to the context of team sports.

Efficacy Beliefs

Underscored in SMMs is an individual's sense of self-efficacy, other efficacy, and collective efficacy (Gershgoren, 2012). This is important to a team's sense of belonging. It is built on team support and it is believed to have an indirect effect on team performance (Gershgoren). Self-efficacy refers to how effectively the individual on the team feels they can perform to the best of their ability (Bandura, 1997). For example, an athlete that is outwardly confident in their ability to perform in the high-pressured situation of the competitive event may have high self-efficacy. Other efficacy is the individual feeling that other people on the team are able to perform at optimal levels. For example, a show of support, perhaps through touch, could be an indication of an athlete feeling confident in the other athletes on the team. Collective efficacy is the belief that the entire team (including the coach) is able to execute a task appropriately. This is the belief that the team as a whole is united as one and working together for the same cause. For example, teams (athletes and coaches as well) hug in large huddled masses in a particularly successful outcome and this may be indicative of the collective belief of efficacy.

The Current Study

To date, non-verbal communication as a supporter of a team's SMMs has been minimally analyzed (e.g., Eccles & Tenenbaum, 2004) and no studies include the sense of touch as a source of social support on teams. Touch is an emotional and supportive

sense, which communicates shared ideas when explicit social cognition is inhibited in the high-pressure circumstance of sport performance. No research on touch and SMMs has been systematically conducted, and therefore is the purpose of this study. This study coded videos for frequency, reception, location, and antecedent (positive, neutral, or negative) of touch experienced by the athletes on the team. No hypothesis is made with regard to these categorical variables related to how people experience touch, but the information is provided to describe the events as they happened in the context with which they occurred. Additionally, perceived support and efficacy beliefs were gauged through a questionnaire as described in the methodology.

Hypothesis 1

As part of a conceptual replication of the research discussing the relationship between touch and the performance of players of the NBA (Kraus et al., 2010), it is hypothesized that similar results will occur. Touch frequency positively correlates with performance. It is expected that early season touch frequency will predict late season performance in women's volleyball.

Hypothesis 2

Implicit communication via touch is used to provide social support during team success, and console one another in time of team failure, thus building a greater sense of SMMs within the team. It is expected that the frequency of touch in both early and late season is positively correlated with, and predicts perceptions of, early and late season social support.

Hypothesis 3

It is expected that both early and late touch frequency are positively correlated with and predict early and late season efficacy beliefs about the self, others, and the collective team.

CHAPTER 2

METHOD

Participants

Participants for this study were student athletes of California State University, Fullerton (CSUF). The women's volleyball team was recruited through the athletic department. Through the cooperation of the head coach, Ashley Preston, the team was informed of the nature of this study, the expectations as participants were explained to them, the voluntary nature of the study was described, and consent was obtained. Each of the following survey sections described below was taken at two times during the season. One was taken early in the season on September 3, 2015 and again 11 weeks later in the late portion of the season on November 19, 2015.

Measures

Demographics

Demographic information was asked of all student athletes including: the last four digits of their campus wide identification number, age, sex, ethnic background, major, current collegiate level (e.g., freshman, sophomore, junior, or senior), jersey number, length of time on the team in months, and position played on the team.

Social Support

A modified version of the Multidimensional Scale of Perceived Social Support (MSPSS) was used (Zimet et al., 1988). The current version of this social support scale

includes 12 items that ask participants to rate statements indicating the perceived presence of supportive others in their lives on a scale ranging from very strongly disagree (1) to very strongly agree (7). For example, the statement, "I can talk about my problems with my friends." is rated by participants on the scale described earlier. In this study, the items appear the same, with the exception that the perceived presence of others was made clear to the athletes participating in the study that it refers to others on the team, rather than in their life in general. For example the statement read, "I can talk about my problems with my team." The modified version of the MSPSS included nine questions. A total score is created for each participant and ranges from 9 to 63. The Cronbach's coefficient alpha for the scale is reported at .88, thus indicating a good measure of internal reliability. Test-retest reliability is reported at .85 for participants that were tested two to three months later (Zimet et. al., 1988). The Cronbach's coefficient alpha for the early and late measurement in the current study are .986 and .988 respectively. The test re-test reliability, which was conducted between the early and late season measurements is .71, which is an acceptable level.

Efficacy Beliefs

The subscale of the Shared Mental Model for Teams Questionnaire (SMMTQ) was used to measure efficacy beliefs (Gershgoren, 2012). This subsection of 12 items asked athletes about three parameters of efficacy and includes self-efficacy, other efficacy, and team efficacy. All items of the SMMTQ are statements about a variety of components of a team. Athletes were asked to rate on a scale from not at all (1) to very much (5) the perceived amount of each component the team possesses. For example, statements regarding self-efficacy, other efficacy, and team efficacy respectively, include,

"possess realistic beliefs about their own physical abilities," "trust in each other's abilities," and "believe in the team's ability to perform well." Much like the MSPSS, the efficacy belief measure was conducted early in the regular season and late in the regular season. A total score was created for each participant and ranged from 12 to 60. Cronbach's coefficient alpha for the entire efficacy subscale is reported at .91, thus indicating a good measure of internal reliability. Test-retest reliability is reported at .81 for participants that were tested two weeks later (Gershgoren, 2012). For the consent form and the full survey, please see Appendices A and B. The Cronbach's coefficient alpha for the early and late measurement in the current study are .986 and .976, respectively. The test re-test reliability, which was conducted between the early and late season measurements, is .82.

Performance

Performance for this study was measured with several statistics gathered from the CSUF volleyball statistical website (Cal State Fullerton Athletics, n.d.). A performance index has been created of positive statistics (those increasing the likelihood of CSUF winning) and negative statistics (those decreasing the likelihood of CSUF winning) with number of sets (s) played as a weight. The positive statistics are kills (k), digs (d), serving aces (sa), and total blocks (tb). The negative statistics are errors (e), ball-handling errors (bhe), serving errors (se), receiving errors (re), and blocking errors (be). A performance index has been created for the averages of early season performances and includes the first 14 regular season games, while the averages of late season performance index includes the last 14 regular season games. Both performance indices have been

standardized with standardized z-scores. The following formula is used to calculate each performance index:

$$\frac{(k + d + sa + tb) - (e + bhe + se + re + be)}{s}$$

Touch

Touch was counted and coded by trained research assistants and categorized based on the antecedent (positive, neutral, or negative) occurring immediately before the act of touching. The physical location on the body was also be coded (e.g., hands, back, buttocks, and arm). Touch frequency is summed based on the number of touches depicted in the videos based on the coding procedure described below. Touch coding was done for two games in the 2015-2016 season. The early season game took place on September 5, 2015 and the late season game occurred 10 weeks later on November 13.

Touch Coding

Obtaining videos of both early and late games was facilitated by Dr. Meredith Basil, Director of Athletic Academic Services and by newly appointed women's volleyball head coach, Ashley Preston. As described earlier, trained research assistants, working independently and unaware of the full intention of this study, watched videos of two volleyball games and coded for instances of intentional touch not directly related to the physicality of the sport. For example, volleyball players touching in order to gain an advantageous position on the court or to execute a certain play were not counted as instances of supportive touch. In the event of physical altercations (disputes involving physical aggression) touch was not counted, as it is not a touch of support. Any instance

of touch not directly related to the physical athletic movements was coded at an exact hour, minute, and second within the video of the event as it occurred.

All antecedent events were coded as positive, neutral, or negative. For, example, if the CSUF women's volleyball team makes an error and touch is subsequently exhibited, then the antecedent is coded as negative. Conversely, if the team succeeds in some way and touch is subsequently exhibited, then the antecedent is coded as positive. Neutral touch may occur in passing events that have no connection to a positive or negative antecedent. For example, athletes often touch when substituting into the game. The antecedent to touch, moving from the bench to the court, has no positive or negative connotation, and is therefore neutral.

In addition to the time and antecedent of the touch, the location on the body was coded as well as whether the touch was given, received, or mutual. Research assistants watched all video on a computer, in a concealed room, separately. Percent agreement for the time was calculated for both early and late season and averaged 74.41% and 76.54% respectively. Interrater reliability for type (given, received, or mutual), antecedent (positive, neutral, or negative), and location (arm, hand, back, or buttocks) of the observed touch was calculated using Cohen's kappa. For early season ratings, the Cohen's kappa for type, antecedent, and location are, .706, .647, and .640 respectively. For late season ratings, the Cohen's kappa for type, antecedent, and location are, .826, .901, and .748 respectively. According to prior research utilizing categorical ratings, values of kappa from 0.40 to 0.59 are moderate, 0.60 to 0.79 are substantial, and 0.80 or above are outstanding (Landis & Koch, 1977).

The research assistants received specific instructions and thorough training on the touch coding process, general knowledge about indoor volleyball, and specific information about the CSUF team. Assistants were told the following: watch the video carefully, rewind, pause, and re-watch if necessary. Isolate every instance of purposeful touch, write the time that it occurs, whether the touch was given, received, or mutual, the antecedent, and location of touch exhibited. Isolate an individual, follow their action, and code the exact hour, minute, and second within the video through the duration of the video. Only include members of CSUF and no other team or patron. Do not work together. Do not cross-reference your observations with others. Do not show anyone else the video. This material is for observation and research purposes only. Do not post this material to the internet or any public venue. For a full list of instructions and training guidelines provided to the research assistants, please see Appendix C.

CHAPTER 3

RESULTS

Overview of the Results

The results section first discusses the descriptives of the data set and includes demographic information, social support, efficacy beliefs, performance, and touch. Each of the sections regarding measured variables contains a simple mean comparison between the early and late season measurements via a paired samples t-test. Second, the statistical assumptions of regression analysis are summarized and assessed. Next, the correlations between the predictor variable of touch and the outcome variables of support, efficacy, and performance are reported. Last, the results of the regression analysis model using an enter method are presented.

Descriptives

Demographics

Participants were all female, on the CSUF women's volleyball team, and the average age was 19.5 (*SD* = 1.12). All 17 members of the team were undergraduate student athletes. There were five freshmen, three sophomores, five juniors, and four seniors. Team members averaged more than a year on the team (*M* = 13.6 months, *SD* = 14.4). With such a large spread as indicated by the large standard deviation, it is important to note that many participants (seven out of the 17) were new to the team. At the onset of this study, these players had only two months' experience on the team and no

one had more than 36 months. Participants' university major varied greatly and included: communications (4), sociology (4), kinesiology (3), business (1), child and adolescent development (1), engineering (1), health science (1), psychology (1), and one participant was undeclared at the time. The ethnic identity of the participants was also diverse and included White, non-Hispanic (47.1%), Black/African American (23.5%), Hispanic/Latina (17.6%), Asian/Pacific Islander (5.9%), and Multi-race/ethnicity (5.9%).

Social Support

To reiterate, a modified version of the Multidimensional Scale of Perceived Social Support (MSPSS) was used (Zimet et al., 1988). This modified version included nine questions and total score ranged from 9 to 63. The average score for this scale by participants in the early season game was 48.63 (SD = 14.96). The late season game averaged 50.06 (SD = 15.63). A paired samples t-test was conducted comparing early and late social support and a non-significant finding was found, $t(14) = -.349$, $p > .05$. Perceptions of support do not differ between early and late season measurements.

Efficacy Beliefs

Efficacy beliefs were broken up into early and late season measurements and each had three subsections: self, other, and collective. Means and standard deviations for each are depicted below in Table 1 along with a total (sum of all the efficacy categories) efficacy score. A paired samples t-test was conducted comparing early and late efficacy in each of the three categories. A non-significant finding between early and late season self-efficacy was found, $t(14) = -1.304$, $p > .05$. Self-efficacy did not differ between early and late season. A non-significant finding between early and late season other efficacy was found, $t(14) = -1.284$, $p > .05$. Other efficacy did not differ between early

and late season. A non-significant finding between early and late season collective efficacy was found, $t(14) = -.968$, $p > .05$. Collective efficacy did not differ between early and late season.

Table 1. Means and Standard Deviations of Early and Late Season Measurements in Efficacy.

	Early Season *M* (*SD*)	Late Season *M* (*SD*)
Self-Efficacy	3.61 (1.04)	3.92 (0.83)
Other Efficacy	3.55 (1.07)	3.89 (0.79)
Collective Efficacy	3.48 (1.10)	3.73 (0.83)
Total	42.26 (12.65)	46.19 (9.68)

Performance

An early season and late season standardized performance index was created using the formula described earlier. Standardized z-scores were created for each of the early and late season performances. One player did not play throughout the season and therefore was not included in any performance index. The early season performance excludes one player that did not play in any of the first 14 early season games and ranged from -2.08 to 1.97. The late season performance index excludes one player that did not play for any of the last 14 late season games and ranged from -1.3 to 1.73. A paired samples t-test was done to assess the mean difference between early and late season standardized volleyball performance scores and a non-significant finding exists, $t(13) = .067$, $p > .05$. Standardized volleyball performance does not appear to change between early and late measurements.

Touch

Touch frequency for the early season game totaled 314 across all 10 players. The average number of touches counted for this game was 31.4 (*SD* = 12.46). Touch frequency for the late season game totaled 349 across all 10 players. The average number of touches counted for this game was 34.9 (*SD* = 15.29). Frequencies in each of the early and late season game for type, antecedent, and location are available in Table 2. In an effort to demonstrate differences in feelings associated with touch, a paired samples t-test was conducted between early and late season antecedent in all three categories. A non-significant finding occurred for positive antecedents, $t(5) = -.791$, $p > .05$, negative antecedents, $t(5) = .067$, $p > .05$, and neutral antecedents, $t(5) = 1.519$, $p > .05$. No differences for any of the antecedents exist between early and late season.

Table 2. Touch Frequencies of Early and Late Season Type, Antecedent, and Location

	Early Season N (Valid %)	Late Season N (Valid%)
Type		
Given	15 (5.03%)	29 (8.73%)
Received	1 (.34%)	12 (3.61%)
Mutual	282 (94.63%)	291 (87.65%)
Antecedent		
Positive	106 (38.55%)	129 (39.33%)
Neutral	113 (41.1%)	142 (43.29%)
Negative	56 (20.36)	57 (17.38%)
Location		
Hands	281 (93.98%)	296 (89.7%)
Back	5 (1.67%)	15 (4.55%)
Buttocks	10 (3.34%)	18 (5.45%)
Arm	3 (1%)	1 (0.30%)

Note. Totals and valid percent are only included in the values above when both coders agreed to the type, antecedent, or location.

Assumptions

The hypotheses described earlier call for simple linear regression analysis. This type of analysis has several statistical assumptions that must be met for the results to be valid. These assumptions are normality, independence of observations, linearity, homoscedasticity, and there should be no outliers present in the data. The following sections describe each statistical assumption, the assessment of these assumptions, and any needed modifications for potentially violating them.

Normality

Both the predictors and the outcome variables must be normally distributed. To check for normality of the variables in the regression model, a Shapiro-Wilk test of normality was conducted. None of the variables (including all of the predictors and the outcomes) in the regression model showed a significant deviation form a normal distribution (i.e. all values are greater than .05), thus the assumption of normality has been met. It is more likely that the results of the following analyses are valid rather than random.

Independence

Independence was assessed visually by examining the scatterplot of the residual standardized predicted values and the regression standardized residuals. With so few data points, it was challenging to point out any unusual issues with independence of observations. All of the scatterplots for all variables in the analyzed regression models appeared broad and random (i.e. they did not show a clear pattern). The assumption of independence is believed to be met because the scatterplots show a round or “birds nest” distribution.

Linearity

Linearity, like independence, is assessed by visually examining the scatterplots of the residuals. There did not appear to be any curved patterns in the scatterplots. This means that none of the variables had a curvilinear relationship and the assumption of linearity was met.

Homoscedasticity

The scatterplots of the residuals appeared to be a random array of data points and did not funnel out in any direction. The assumption of homoscedasticity has therefore been met.

Outliers

Looking at the box and whisker plots, most of the variables appeared free of noticeable outliers. Six of the variables had data points that could be considered substantially outside the mean of the entire data set. However, after calculating standardized z-scores for early season touch, late season touch, early season performance, early self-efficacy, early other efficacy, and early collective efficacy, no individual case exceeded an extreme score of ±3 and therefore, all were retained in the analysis.

Bivariate Correlations

Pearson's bivariate correlations were conducted for early and late season for total touch frequency, social support, efficacy beliefs in each of the three categories, and performance. Significant findings were found for several of the variables, which are summarized in Tables 3 and 4. Interestingly, a significant negative correlation exists between early season perceived social support and early season touch total $r = -.680$, $p < .05$. This means that the more touch players experienced in the early half of the season,

the less support they perceived, which does not support the second hypothesis that perceptions of support and touch frequency is positively correlated. Additionally, no significant correlations were found between early and late touch frequency and any support or efficacy variables. The correlational hypotheses between touch frequency, support, and efficacy were not supported. However, early touch frequency and early volleyball performance were significantly positively correlated, $r = .851$, $p < .01$. The higher the performance in volleyball, the more frequently touch was experienced in players early in the season, which partially supports the first hypothesis.

Table 3. Early Season Correlations of Touch, Support, Efficacy, and Performance

Variable	1	2	3	4	5	6	7
1. Total Touch	1						
2. Perceived Social Support	-.680*	1					
3. Perceived Efficacy Total	-.350	.823**	1				
4. Self	-.393	.842**	.991**	1			
5. Other	-.355	.781**	.983**	.972**	1		
6. Collective	-.288	.808**	.978**	.954**	.932**	1	
7. Performance	.851**	-.467	-.243	-.303	-.198	-.218	1

Note. *p < .05, **p < .01.

Table 4. Late Season Correlations of Touch, Support, Efficacy, and Performance

Variable	1	2	3	4	5	6	7
1. Total Touch	1						
2. Perceived Social Support	.037	1					
3. Perceived Efficacy Total	-.074	.527*	1				
4. Self	-.045	.573*	.983**	1			
5. Other	-.101	.459	.966**	.932**	1		
6. Collective	-.071	.504*	.972**	.940**	.895**	1	
7. Performance	.473	.394	.107	.097	.043	.168	1

Note. *p < .05, **p < .01.

Regression Analyses

Early Touch and Late Performance

It was hypothesized that early season touch frequency predicts late season volleyball performance. A simple linear regression was conducted to predict late season performance based on early season touch frequency. A non-significant regression was found, $F(1, 7) = 1.704$, $p = .233$ with an R^2 of .196. Volleyball performance is equal to -.679 + .037 (on the standardized performance index described earlier). If a significant result were found, one would expect the standardized volleyball performance index to increase by .037 for every touch experienced in the early half of the season. With a non-significant finding, the R^2 of .196 suggests that 19.6% of the variability in late season volleyball performance was explained by early season touch frequency. This finding does not replicate the earlier findings done in the NBA. However, the sample size of this regression ($N = 9$) is substantially smaller than the sample size ($N = 294$) of the previous study (Kraus et al., 2010).

Early Touch and Early Performance

Although, based on prior literature, it was not hypothesized that a linear relationship would exist between early touch frequency and early performance in volleyball, a significant relationship was found. As can be seen from Table 3 early touch significantly correlates with early performance, $r = .851$, $p < .01$. A simple linear regression was conducted to predict early season performance based on early season touch frequency. A significant regression was found, $F(1, 8) = 20.994$, $p = .002$ with an R^2 of .742. Early season volleyball performance is equal to -1.58 + .062 (standardized volleyball performance index). This indicates that as the number of touches in the early

season increased by one, early season volleyball performance on the standardized performance index increased by .062. The variability in early season touch explained 72.4% of the variability in early season volleyball performance. A linear regression fit line, visually depicting the model, is shown in Figure 1 below.

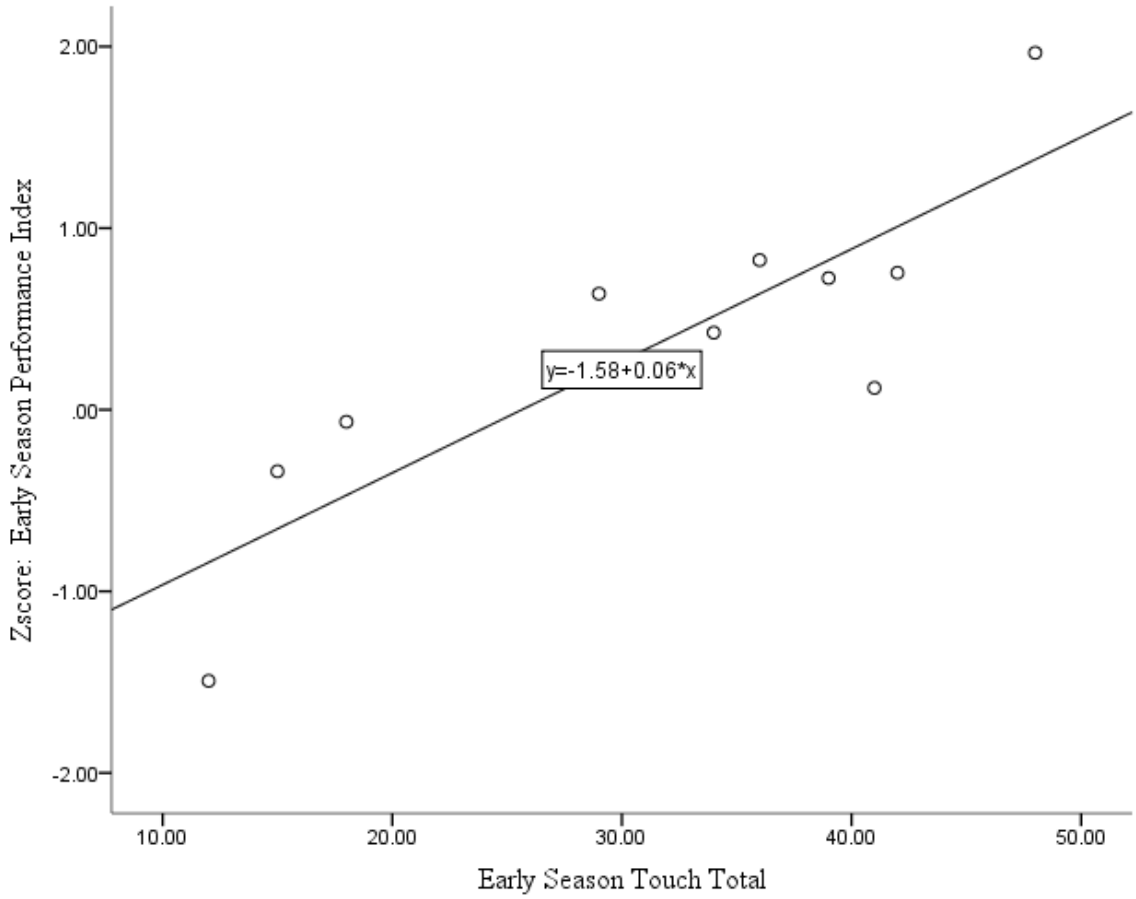

Figure 1. Early season touch frequency significantly predicts early season volleyball performance.

Touch Frequency and Support

It was hypothesized that early season touch frequency predicts early season perceptions of support. A simple linear regression was conducted to predict early season perception of support based on early season touch frequency. A significant regression

was found, $F(1, 7) = 6.032$, $p = .044$ with an R^2 of .680. Early season perceived social support was equal to 8.8 + -.112 (early season perceived social support). This indicates that as the number of touches increased in the early half of the season by one, the perceived support decreased by .112. The variability in touch explained 68% of the variability in perceptions of social support. However, the findings do not support the hypothesis. Though significant, the direction is the opposite of what was predicted. Participants' average perception of early season social support from their team was significantly negatively associated with touch. The implications of these findings are discussed in the next chapter.

It was hypothesized that late season touch frequency predicts late season perceptions of support. A simple linear regression was conducted to predict late season perception of support based on late season touch frequency. A non-significant regression was found, $F(1, 7) = .038$, $p = .852$ with an R^2 of .005. Late season perceived social support was equal to 6.411 + -.006 (late season perceived social support). Late season touch does not predict late season perception of social support.

Touch Frequency and Efficacy Beliefs

It was hypothesized that early season touch frequency predicts early season perceptions of self-efficacy. A simple linear regression was conducted to predict early season perception of self-efficacy based on early season touch frequency. A non-significant regression was found, $F(1, 7) = 1.281$, $p = .295$ with an R^2 of .155. Early season perception of self-efficacy was equal to 4.492 + -.034 (early season self-efficacy). Early season touch frequency does not predict early season self-efficacy.

It was hypothesized that early season touch frequency predicts early season perceptions of other efficacy. A simple linear regression was conducted to predict early season perception of other efficacy based on early season touch frequency. A non-significant regression was found, $F(1, 7) = 1.008$, $p = .349$ with an R^2 of .126. Early season perception of other-efficacy was equal to 4.443 + -.031 (early season other efficacy). Early season touch frequency does not predict early season other efficacy.

It was hypothesized that early season touch frequency predicts early season perceptions of collective efficacy. A simple linear regression was conducted to predict early season perception of collective efficacy based on early season touch frequency. A non-significant regression was found, $F(1, 7) = .633$, $p = .452$ with an R^2 of .083. Early season perception of collective efficacy was equal to 4.116 + -.026 (early season collective efficacy). Early season touch frequency does not predict early season collective efficacy.

It was hypothesized that late season touch frequency predicts late season perceptions of self-efficacy. A simple linear regression was conducted to predict late season perception of self-efficacy based on late season touch frequency. A non-significant regression was found, $F(1, 8) = .016$, $p = .903$ with an R^2 of .002. Late season perception of self-efficacy was equal to 3.964 + -.003 (late season self-efficacy). Late season touch frequency does not predict late season self-efficacy.

It was hypothesized that late season touch frequency predicts late season perceptions of other efficacy. A simple linear regression was conducted to predict late season perception of other efficacy based on late season touch frequency. A non-significant regression was found, $F(1, 8) = .083$, $p = .781$ with an R^2 of .010. Late season

perception of other-efficacy was equal to 3.932 + -.005 (late season other efficacy). Late season touch frequency does not predict late season other efficacy.

It was hypothesized that late season touch frequency predicts late season perceptions of collective efficacy. A simple linear regression was conducted to predict late season perception of collective efficacy based on late season touch frequency. A non-significant regression was found, $F(1, 8) = .040$, $p = .846$ with an R^2 of .083. Late season perception of collective efficacy was equal to 3.768 + -.004 (late season collective efficacy). Late season touch frequency does not predict late season collective efficacy.

CHAPTER 4

DISCUSSION AND CONCLUSION

Discussion

Interestingly, the correlational findings suggest components of efficacy and support are at least moderately positively associated. Some factor of efficacy, whether it is self, other, or collective, seems to be related to perceptions of social support among team functions. Perhaps the feeling that one is valued and cared for on the team (i.e., support) is a booster to efficacy at all levels. Although the literature suggests that trust (e.g., Dunbar, 2010) and support can be built upon from the non-verbal communicative sense of touch, no correlations in the expected direction are seen between touch frequency and perceptions of support or efficacy in this study.

One unexpected finding comes in the form of a significant correlation in the opposite direction than predicted. Early season touch frequency is moderately negatively correlated with early season perceptions of support. As players touched more, they tended to feel less support from their team. Although, it could be interpreted that players that were perceived by their teammates to be less connected to the team were touched more in an attempt to boost the feeling of social support in that player. Researchers Robinson, Hoplock, and Cameron suggest that people who reach out to touch feel support from others even when the receiver does not perceive the act as supportive (2015). Giving touch is usually done to make the recipient feel supported. In the case of early

season touch and its negative association to perceptions of support, players may have been reaching out to others to feel good about themselves even when the recipient did not feel supported (Robinson et al., 2015). The frequency of touch in early games may have been associated with poor volleyball performance, possibly creating negative feelings towards touch. As demonstrated in Table 2, touch in the early half of the season occurred more frequently after a positive event than it did after a negative event. The team seems to have rewarded events that increased the likelihood of winning and limited touch when negative events occurred. This suggests that with overall poor team performances in early games, positive touch did not occur frequently enough to generate a strongly supportive environment. Furthermore, support is thought to be needed in the right amounts, and that it is possible to have too little or too much (Brock & Lawrence, 2009). It could be that in the early season, players were still uncertain of how to provide needed support, how to gauge it in their teammates, and how much to provide through touch.

Related to the touch culture of the team is the significantly positive correlation between early touch frequency and early performance. Touch, for this team, seems to have been reserved for laudatory events. The best performers on the team experienced touch more frequently than poor performers. This would seem to be intuitive to feelings of support, but even with individual excellence, support may not have been felt because every game was lost and the overall team effort was substandard.

Furthermore, many of the predicted relationships between variables failed to show significant results. This may be due to the very small sample size, which can result in measurable variability of the outcome variable explained by variability in the predictor

variable, but may not yield significance. Limitations, including sample size, and coding issues are discussed in the next section.

Limitations

Sample Size

One pertinent limitation of this study is the small sample size. Only 17 players were on the 2015-2016 team. Generally, the team uses a team rotation of about 11 players, which means that a large portion of the team do not have touch coded for any of the observed games. Furthermore, some players may be in the rotation, but not frequently enough or not in the sampled sets and therefore do not have any touch frequencies. This does not mean that these players did not experience touch during the game, rather due to the lack of opportunity, they were not observed by coders. The players who are not coded may be different in how they perform in volleyball and how they communicate via touch. Players who are not coded are usually not top performers on their team, and therefore may touch in different frequency than others. Additionally, the issue of players not on the court during game time has resulted in a substantial portion of the team without a performance index for either the early, late, or both halves of the season. The small sample size in this data set may be the root of the inexact ability to asses for the statistical assumptions of regression and the lack of significant findings that could support the hypotheses. Future studies should look to increase sample size by including more teams.

Video Quality

Video coders often viewed videos with angles that could not clearly and consistently see what was occurring on the court. The quality of the videos was not

always clear enough to determine if touch actually occurred. Players on the bench are not often shown, and touch cannot be clearly seen, if it does happen at all. Furthermore, huddles, often occurring on the court, are not included due to the poor video quality resulting in angles that cannot truly capture all touches in small groups of people. Video tends to focus on the events occurring on the court, resulting in potentially skewed touch frequencies of starting and frequently utilized players on the team. Due to unreliable camera angles, not all instances of touch are coded. It may be possible to conduct a study that utilizes several cameras that isolate the individual action of the athlete, which would reduce issues with video quality and poor angles.

Generalization

The generalizability of the results is low because only collegiate level women's volleyball is examined. Given the time frame available to conduct this study, and the duration of the coding process for one team (more than seven months) obtaining and coding videos for additional teams would be tedious and very time consuming. Furthermore, the overall team performance does not generalize tow what is typical. The team lost every game and averaged only 12.5 points per set. With such a poor overall performance, generalizing to other teams is limited.

Implications for Future Studies

One strength of this study is the video coding methodology, which utilized a new systematic format for coding a variety of events in a competitive environment. It adds new rules that could be generalized to other sports or even other video coding protocol and includes starting at predetermined times, excluding timeouts and resuming when all players are back on the court, allowing for video coding to occur for up to one minute

after the event to allow for observable behaviors after the outcome, and includes several categorical codes of behaviors. Overall, this protocol adds to the available methodology by including new rules that are organized and easily trainable for research assistants.

Implications include utilizing the method of touch coding in other sports, and other areas for both men and women. This coding methodology could be implemented for many volleyball teams and other sports, thus increasing generalizability. Should significance be found, touch could be an indicator of perceived support on a team (sports or otherwise) and may even be a contributing factor in improving individual and team performance.

The Future Directions of SMMs

This study does partially support (in early season performance measurements) touch acting as a predictor of performance, which reflects the prior research (Kraus, Huang, & Keltner, 2010). Some authors have suggested that nonverbal communication such as touch should be studied as a source of team building and cohesion (e.g., Mohammed et al., 2010). Touch, in future studies with larger sample sizes, could be an indicator of positive feelings of support, efficacy, and strong communication among team members, which would place the sense of touch under the broad array of variables contributing to teams building a greater sense of SMMs. Perhaps, the future of studies measuring SMMs could look at the relationship between perceptions of support and efficacy as they show significant correlations in this study. Furthermore, studies should look to generalize by including a larger sample with men and women in areas other than sport. Including more teams would also minimize the limitations to generalizability due to overall sport performances that are either very low, as is the case for this team, or are

very high, as in a case for a team who wins every game. Possibly, a study could experimentally control for touch in a group activity that would require team effort for success.

APPENDIX A

CONSENT FORM

I have been asked to take part in a psychological research project investigating the relationship between social support, efficacy, and performance in sports. This research will involve answering several questions about my feelings towards my team. This research study will be conducted by Michael Baker and the research assistants from California State University, Fullerton (CSUF). It will take place in the Q lab in the Humanities and Social Sciences building on the CSUF campus.

If I agree to be in this project, I will be asked at three different times during the fall season to answer questions about my feelings of the team's support and ability. The brief survey includes demographic questions (e.g., campus wide identification number, age, sex, ethnic background, major, current collegiate level, jersey number, length time on the team in months, and position played on the team), support, and efficacy. Video recordings of my regular season games will be obtained by the researchers and used for measurement purposes only. The total amount of time expected to complete my participation is approximately 10 minutes.

There are no foreseeable risks in participation. My participation in this activity is voluntary. I am allowed to withdraw at any time for any reason and I may leave blank any questions on the survey if I feel uncomfortable answering. If I wish to not participate, I may select "No" at the bottom of this page.

If I have further questions about the study or wish to report a problem, I may contact Michael Baker via email at michaeljamesbaker@csu.fullerton.edu. I may also contact Dr. Kristin Beals by phone at (657) 278-3136 or via email at kbeals@fullerton.edu. For questions about my rights as a research participant, I may contact the CSUF Regulatory Compliance Coordinator at (657) 278-7640.

Research records will be kept confidential to the extent allowed by law. No participants will be identified by name. No participants will be required to answer any question that makes them uncomfortable. No survey, consent form, or observed data information that could identify an individual will be shared with anyone. All of the information collected from participants, including consent, survey, and observed information, will be kept in a computer that has a special password that only the researchers know about, and the computer is placed in a locked office at CSUF. One year after the study is completed, all data will be shredded. Video recordings of participants

will be saved on a memory card and transferred to a computer with a password, in a locked office, at CSUF. Once transfer is complete, the memory card holding the video will be formatted and all items will be deleted. One year after the study is completed, all files will be deleted.

I have carefully read the Consent Form. I am at least 18 years old, thus I am fully competent to sign this Consent Form. I understand that this form with my information will be kept by the researcher in a locked office and will be shredded after 1 year. By writing your name in the space below and selecting "Yes", I agree to the terms described above and to participate in this study to the best of my ability.

☐ Yes Signature_____Date_____
☐ No

APPENDIX B

SUPPORT AND EFFICACY MEASURE

What are the last 4 digits of your campus wide I.D.? _____

What is your age? _____

What is your sex?

- ☐ Male
- ☐ Female

What is your ethnic identity? Check only one. If multi-race/ethnicity, please specify. If other, please specify.

- ☐ Native or Alaskan American
- ☐ Hispanic/Latino
- ☐ Asian/Pacific Islander
- ☐ Black/African American
- ☐ White, non-Hispanic
- ☐ Multi-race/ethnicity_____
- ☐ Other_____

What is your major? _____

In what year in school are you?

- ☐ freshman
- ☐ sophomore
- ☐ junior
- ☐ senior

What is your jersey number? _____

How many months have you been on the CSUF women's volleyball team? (12 months is a year, 24 months is 2 years, 36 months is 3 years, 48 months is 4 years, and 60 months is 5 years). I have been on the volleyball team _____months.

What is your position on the team? _____

Please carefully read each statement on the left and rate your feelings towards **your team** using the scale on the right. Each statement applies to **your team**. It does **not** apply to life in general (e.g., family, your partner, or friends outside of volleyball).

	Very strongly disagree	Strongly disagree	Mildly disagree	Neutral	Mildly agree	Strongly agree	Very strongly agree
There is a special person on my team who is around when I am in need.	☐	☐	☐	☐	☐	☐	☐
There is a special person on my team with whom I can share my joys and sorrows.	☐	☐	☐	☐	☐	☐	☐
My team really tries to help me.	☐	☐	☐	☐	☐	☐	☐
I get the emotional help and support I need from my team.	☐	☐	☐	☐	☐	☐	☐
I have a special person on the team who is a real source of comfort to me.	☐	☐	☐	☐	☐	☐	☐
I can count on my team when things go wrong.	☐	☐	☐	☐	☐	☐	☐
I can talk about my problems with my team.	☐	☐	☐	☐	☐	☐	☐
My team cares about my feelings.	☐	☐	☐	☐	☐	☐	☐
My team is willing to help me make decisions.	☐	☐	☐	☐	☐	☐	☐

The following statements refer to **your team**. On a scale of 1 (Not at all) to 5 (Very much) to what degree do the players on **your team**:

	Not at all 1				Very much 5
Possess realistic beliefs about their own physical abilities.	☐	☐	☐	☐	☐
Trust in each other's abilities.	☐	☐	☐	☐	☐
Believe in the team's ability to perform well.	☐	☐	☐	☐	☐
Possess realistic beliefs about their own tactical abilities.	☐	☐	☐	☐	☐
Believe that each player can fulfill her role on the team.	☐	☐	☐	☐	☐
Believe in the team's ability to reach objectives.	☐	☐	☐	☐	☐
Possess realistic beliefs about their own technical abilities.	☐	☐	☐	☐	☐

	Not at all 1				Very much 5
Believe that each player is the right person within the team's composition.	☐	☐	☐	☐	☐
Believe in the team's ability to outperform other teams regardless of the other teams' skill level.	☐	☐	☐	☐	☐
Possess realistic beliefs about their own mental abilities.	☐	☐	☐	☐	☐
Believe that each player possesses the skills required to perform well.	☐	☐	☐	☐	☐
Believe in the team's ability to overcome difficulties and obstacles.	☐	☐	☐	☐	☐

APPENDIX C

TOUCH CODE INSTRUCTIONS

Watch the video carefully. Rewind, pause, and re-watch if necessary. Isolate every instance of purposeful touch, write the time that it occurs, whether the touch was given, received, or mutual, the antecedent, and location of touch exhibited. Purposeful touch includes, but is not limited to high-fives, fist bumps, handshakes, or pats on the back or shoulder. It does not include unintentional instances of touch such as bumping into someone else or any other accidental instances. Code for instance of touch not directly related to the physicality of the sport. For example, volleyball players touching in order to gain an advantageous position on the court or to execute a certain play is not counted as instances of purposeful touch. In the event of physical altercations (disputes involving physical aggression) touch does not count, as it is not a touch of support. Coding begins once the game begins and the initial serve occurs. Coding ends up to 1 minute after the final point.

Time: When within the video

- Isolate an individual. Use the volleyball website as an assistant: http://www.fullertontitans.com/sports/w-volley/index
- Follow their action, and code the exact **hour**, **minute** and **second** within the video through the duration of the video.
- It is possible to have several instances of touches at the same time.

For Example: If player 11 pats player 23 on the shoulder 14 seconds into the video, then code the time as 0 for the hour, 0 for the minutes, and 14 for the seconds.

Antecedent: What comes before the touch?

- Categorize each instance of touch based on the antecedent (**positive, neutral**, or **negative**) occurring immediately before the act of touching.
    - **Positive**: Something favorable happens in the game and players touch (e.g., the team scores a point).
    - **Neutral**: Neither positive nor negative (e.g., in passing greeting or substitution).
    - **Negative**: Something happens that is against the goals of the team (e.g., the opposing team scores a point).

Location: The physical location on the body

- The physical location on the body is also coded (e.g., back, shoulders, head, hands, buttocks, waist, etc.).

Type: How touch is experienced

- Include **given, mutual,** and **received** touch.

For Example: Given touch may occur if player 11 pats player 23 on the shoulder. Player 11 has **given** someone touch. Player 23 will be coded later after all instances for the isolated player has been coded. For player 23 the exact same time will be coded except the type will be coded as **received**.

Mutual touch occurs when both or multiple players reach out to touch one another simultaneously (e.g., high-fives).

Other: Other touches and maintaining confidentiality

- Due to unreliable camera angles, do not code touch during huddles.
- Do not include touch during timeouts or any events occurring off the court. Resume coding touch when all six players are back on the court.
- Include touch when a player helps another up from the ground after they have fallen.
- Only include members of CSUF and no other team or patron.
- Do not work together. Do not cross-reference your observations with others.
- Do not show anyone else the video. This material is for observation and research purposes only. Do not post this material to the internet or any public venue.

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