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THE RELATIONSHIP BETWEEN COHESION AND PERFORMANCE  
IN COMPETITIVE BOWLING TEAMS

THESIS

Presented to the Graduate Council of the  
University of North Texas in Partial  
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Steven H. Frierman

Denton, Texas

August, 1988

RLL

Frierman, Steven H., The Relationship Between Cohesion and Performance in Competitive Bowling Teams. Master of Science (Physical Education), August, 1988, 85 pp., 7 tables, references, 47 titles.

The purpose of this present investigation was twofold: to determine the relationship between cohesion and performance for successful and unsuccessful bowling teams and to investigate the internal consistency of items from the Group Environment Questionnaire. Subjects were 148 bowling teams (28 men's, 55 women's, 65 mixed--3-5 members each) from 14 different leagues. Results revealed that task cohesion (ATGT) in early, mid, and late season, as well as social cohesion (ATGS) in late season significantly differentiated between high/low cohesion teams. In addition, successful teams (i.e., league position) exhibited significantly higher levels of both task and composite cohesion. All cohesion scales, with the exception of ATGS in early season, revealed a moderate to high level of internal consistency.

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## CHAPTER I

### INTRODUCTION

Over the past three decades, the concept of group cohesion has grown from a modest display of loosely fitting ideals to a total group phenomenon, encompassing the binding together and the maintenance of relationships between group members (Schachter, Ellerstun, McBride, & Gregory, 1951). Perhaps the most commonly cited definition of group cohesion was the one advanced by Festinger, Schachter, and Back (1950) when they defined group cohesion as "the total field of forces causing members to remain in the group" (p. 274). Festinger et al. (1950) proposed two types of forces that act upon members to remain in the group: attractiveness of the group (the degree to which a group possesses a positive valence for its members) and means control (the extent to which the group serves to mediate important goals or objectives for its members). Despite this bidimensional perspective, Festinger et al. (1950) operationally defined cohesion in a restricted unidimensional manner--as the degree of interpersonal attraction present within groups. Although some researchers (i.e., Escovar & Sim, 1974; Gross & Martin, 1953) have criticized the methods of Festinger et al.

(1950), claiming the use of interpersonal attraction underrepresents the concept of cohesiveness, a number of authors have advocated some form of attraction (i.e., Deep, Bass, & Vaughan, 1967; Fielder, Hartman, & Rudin, 1952; Hornsfall & Arensberg, 1949) in their assessment of cohesion.

Recently, however, an attempt has been made to clarify the group construct by expanding the pre-existing nominal definition to include such factors as goal attainment in its operational measures. For example, Carron (1982) has suggested that cohesion is a dynamic process which is reflected in the tendency for a group to stick together and remain united in pursuit of its goals and objectives.

The relationship between cohesion and performance in sport has proven to be equivocal. For instance, studies by Arnold and Straub (1972), Klein and Christensen, (1969), Martens and Peterson (1971), and Widmeyer and Martens (1978) have all found cohesive basketball teams to be more successful than less cohesive basketball teams. Similarly, Ball and Carron (1976) in intercollegiate hockey, Petley (1972) with high school wrestlers, and Bird (1977) with intercollegiate volleyball teams also discovered the same results. In contrast, studies by Fiedler (1954) with high school basketball teams, McGrath (1962) using ROTC rifle teams, and Landers and Luschen

(1974) working with intramural bowling teams, concluded that teams' success and cohesion were inversely related.

One possible explanation for the inconsistent results stems from the inability of past researchers to determine causality between cohesion and performance (Williams & Hacker, 1982). That is, does cohesion lead to performance success or does performance success lead to cohesion? While some studies have supported causality from both directions (Bird, 1977; Carron & Ball, 1977; Landers & Crum, 1971; Peterson & Martens, 1972; Ruder & Gill, 1982), unexplained variables such as a team's previous history, coaching leadership, and talent factors have prevented researchers from making a definitive causal statement about cohesion and performance (Iso Ahola & Hatfield, 1986).

A second explanation for the confounding results involves the diversity of task demands confronting various sport groups. For example, studies investigating the relationship between cohesion and performance in interacting sports have generally found positive results (i.e., Carron & Ball, 1976; Martens & Peterson, 1971); however, other studies examining the identical relationship in a coaching environment have discovered negative results (i.e., Landers & Luschen, 1974; Lenk, 1969; McGrath, 1962). Reasons for these inconsistencies appear to be related to the nature in which the sport is



played in conjunction with the inconsistent operational measures of cohesion employed by numerous researchers. For instance, coaching tasks require little or no task interaction between teammates, thereby making it difficult to increase levels of cohesion during performance when operationally defined in terms of interpersonal attraction. In addition, no measures of task cohesion were assessed by any of the investigators studying cohesion in coaching groups. Thus, one can conclude that the relationship between cohesion and performance has been somewhat misrepresented. Possibly, the foregoing relationship existed between attraction and performance, rather than cohesion and performance.

One final explanation regarding the inconsistent findings between cohesion and performance in sport may be the extreme variability in which cohesion has been measured (Yukelson, 1984). Generally, the literature recognizes two ways in which cohesion has been assessed: selected patterns of behavior and questionnaires. Although a few researchers have employed certain behavioral indices (see Iso Ahola & Hatfield, 1986, for a detailed review), the primary method of assessment appears to be the questionnaire, namely the Sport Cohesiveness Questionnaire (SCQ) (Martens, Landers, & Loy, 1972). The SCQ is composed of seven items classified under the following three

categories: (a) sociometric measures; (b) direct individual assessment; and (c) direct team assessment of cohesion. Each one of these items, with the possible exception of teamwork, measures some type of attraction to the group itself (Carron, 1982).

Recently, Carron, Widmeyer, and Brawley (1985), in an attempt to unify both conceptual and operational measures of cohesion have developed an 18-item questionnaire, entitled the Group Environment Questionnaire (GEQ). The GEQ is comprised of four measures of cohesion: (a) individual attraction to group-task; (b) individual attraction to group-social; (c) group integration-task; and (d) group integration-social. It is based on a conceptual model of cohesion that distinguishes between the individual and the group and task versus social concerns.

In summary, the variety of conceptual and operational definitions of cohesion employed throughout the literature has caused a contradiction in the interpretation of results. The reliance of attraction as the primary method of assessment has made it increasingly difficult to compare studies across different subject populations; however, the introduction of the GEQ, although still in its infancy, marks one of the first attempts at measuring cohesion from a multidimensional perspective. Preliminary studies have been conducted by Brawley, Carron, and Widmeyer (1985),

although further investigation is still necessary (Carron et al. (1985).

#### Purposes of the Study

1. To determine the relationship between cohesion and performance for successful and unsuccessful coaching bowling teams by utilizing a multidimensional instrument for assessing cohesion, the Group Environment Questionnaire.

2. To investigate the internal consistency of items from the GEQ.

#### Limitations of the Study

One limiting factor in this present investigation was the inability to control for past team experience in leagues. Some teams might have been bowling together for the first time, while other teams might have had prior bowling experience bowling with each other. A second limiting factor was the difficulty in reducing outside practice of bowling. Generally speaking, league bowlers tend to practice their game outside of league restrictions.

#### Delimitations

A total of 148 bowling teams, consisting of 28 men's, 55 women's, and 65 mixed teams representing 14 leagues from 3 different bowling centers were the participants in this study. Leagues were comprised of the following three

categories: (a) men's handicap; (b) women's handicap; and (c) mixed (co-ed) handicap.

#### Definitions of Terms

1. Group: A collection of individuals who have relations to one another that make them interdependent to some significant degree (Cartwright & Zander, 1968).

2. Cohesion: A dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives (Carron, 1982).

3. Coacting Task: An independent action between group members performing the identical task in which the group product is achieved via a simple summation of individual groups member's effort (Carron, 1980; Landers & Luschen, 1974).

4. Handicap: An addition of points derived from a difference between an established base score and one's numerical ability level (average).

5. Mixed league: A group of teams composed of both male and female bowlers.

6. Total Wood: The accumulation of all knocked down pins, including handicap throughout the course of a competitive bowling event.

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## CHAPTER II

### REVIEW OF LITERATURE

#### General Definitions and Theoretical Interpretations of Group Cohesion

Over the past three decades, the concept of group cohesion has developed from a modest display of loosely fitting ideals, to a total group phenomenon, encompassing the binding together and the maintenance of relationship between group members (Schachter, Ellerstun, McBride, & Gregory, 1951). The technical term "cohesion" was introduced by Lewin (1947) when he emphasized two categories of forces associated with group participation: cohesiveness and locomotion. Locomotion refers to the purpose behind the group's existence, while cohesion represents a property that contributes to the unity and solidarity of a group. Group cohesion as Cartwright (1968) has claimed is a concept that has attained a central place in the theories of group dynamics.

Perhaps the most commonly cited definition of group cohesion was the one advanced by Festinger, Schachter, and Back (1950) in their housing study. They defined group cohesion as "the total field of forces causing members to remain in the group" (Festinger et al., 1950, p. 164).



Festinger et al. (1950) identified two major types of forces that act upon members to remain in the group: attractiveness of the group (the degree to which the group possesses a positive valence for its members) and means control (the extent to which the group serves to mediate important goals or objectives for its members).

Though Festinger et al. (1950) referred to cohesion as a bidimensional construct, their only operational measure of group cohesion was a single question asking residents to name their friends who lived inside and outside of their residential community (Cartwright, 1968). Thus, group cohesion was operationally defined in a restricted unidimensional manner--as the degree of interpersonal attraction present within the group.

Gross and Martin (1952) criticized Festinger et al.'s (1950) operational definition, claiming it focused on the individual as unit of reference rather than the group. They argued that it was conceptually more logical to consider cohesion as a resistance by the group to disruptive forces.

A second limitation in the Festinger et al. (1950) definition has been the inability and resultant difficulty in converting "the total field of forces" into operational terms (Carron, 1980). By utilizing "interpersonal attraction" as the only dimension involved in "the total

field of forces" the concept of group cohesion becomes underrepresented, causing a potential conflict between theoretical and operational perspectives (Escover & Sim, 1980).

In spite of these inadequacies, many researchers have advocated the use of attraction, namely "interpersonal attraction" and "attraction to the group" (i.e., Deep, Bass & Vaughan, 1967; Fieldler, Hartman & Rudin, 1952; Hornsfall & Arensberg, 1949) in their assessment of group cohesion. Consequently, the concept of attraction has been equated with cohesion. For example, Libo (as cited by Yukelson, 1984) was one of the first to investigate group cohesion as "attraction to the group" when he experimentally manipulated group attractiveness. He found that subjects in the high attraction condition tended to remain in their group longer than those subjects in the low attraction condition. Similarly, Lott and Lott (1965) defined cohesion as "that group property which is inferred from the number and strength of mutual positive attitudes among the members of a group" (p. 259). Finally, Cartwright (1968) in a comprehensive review of literature described two types of forces acting upon members to remain in a group: (a) forces that derive from group attractiveness and (b) forces whose source is the attractiveness of alternative memberships. Later, Cartwright (1968) proposed

that a person's attraction to a group is determined by four interacting sets of variables: (a) one's motive base for attraction; (b) the incentive properties for the group; (c) one's expectancy that group membership will result in beneficial or detrimental consequences; and (d) comparison level or outcomes provided by group membership. Thus, an individual's attraction to a group is composed of group characteristics as well as one's perception of how these characteristics contribute to one's needs and values.

Although various problems have accounted for the confusion associated with the conceptualization and subsequent measurement of cohesion, a number of authors have attempted to clarify the group construct in one of two manners: (a) separating cohesion from attraction and (b) refining the pre-existing nominal definition proposed by Festinger et al. (1950). One of the earliest attempts was made by Van Bergen and Koekebakker (1959) when they perceived cohesion to be the degree of unification of the group field, which emphasizes a closeness among group members, a homogeneous interpretation of events, or perhaps a bonding together in response to outside forces. They proposed that "attraction of the group" is the effect of the interaction of motives which work in an individual to remain in or leave the group. Thus, cohesion and attraction are presented as separate components.

More recently, Evans and Jarvis (1980) suggested that cohesion may be more than just "attraction to the group" and that researches should clearly separate the two concepts in their operational definitions and measurement techniques. They go on to define cohesion as a group phenomenon related to the achievement of group goals. Furthermore, they defined attraction to the group as the individual's degree of identification with the group's activities which includes an individual's sense of involvement in the group, feelings of acceptance, and desire for continued group membership (Evans & Jarvis, 1980).

Many researchers believe that the most accurate assessment of group cohesion stems from Bonner (1959) when he defined cohesion as "a system of interlocking roles initiated and sustained by standards either already existing or evolved by members of a group in the course of striving for a common goal" (Bonner, 1959, p. 69). Similarly, Carron (1982) suggests cohesion is a dynamic process which is reflected in the tendency for a group to stick together and remain united in pursuit of its goals and objectives. It is an adhesive property or force that binds group members together (Carron, 1980). Group cohesion contributes to a units potency and vitality, increasing the significance of membership for those who

belong to the group. It motivates members to succor to the group's welfare and it connotates a sense of loyalty, commitment, and family atmosphere among all group members (Carron, 1980; Cartwright, 1968).

It is important to note that Bonner (1959), Carron (1980), and Evans and Jarvis (1980) have included the concept of goal attainment in their conceptualization of cohesion. All three researchers emphasize the initiation of goals as a mediating variable in creating cohesiveness in groups. This findings is consistent with previous studies (i.e., Sherif, 1967; Raven & Rietsema, 1957) in which it has been reported than an important antecedent of cohesion is agreement on group goals.

In summary, the lack of clarity between conceptual and operational definitions of cohesion has made it increasingly difficult to compare results across studies in any meaningful way. As Cartwright (1968) notes, "the development of a measuring instrument cannot proceed much in advance of a basic understanding of the nature of the phenomena to be measured" (Cartwright, 1968, p. 95). Similarly, Albert and Eisman (1953) have pointed out that "the concept must precede the measurement and the more general and vague the conceptual definition, the more probable are questions of procedure and adequacy of operational definitions" (in Bonner, 1959, p. 141).

### Cohesion as a Bidimensional Construct

Numerous investigators have subscribed to the notion that cohesion is a bidimensional construct (Carron, 1982; Gill, 1977). As stated earlier, Festinger et al. (1950) referred to cohesion as a bidimensional construct when they defined two sets of forces contributing to the attractiveness of the group in and of itself, and forces which mediate the goals and objectives of the group. In a similar vein, Homans (1951) presented a bidimensional construct of cohesion when he also differentiated two categories of forces attracting individuals to a group: task forces and social forces. Task forces reflect an orientation toward group goals, group performance, and the task itself, while social forces represent an orientation toward harmonious interpersonal relationships. Although various investigators describe cohesion by employing a variety of terms (e.g., Mikalachki, 1969, social cohesion and task cohesion; Bass, 1962, affiliation motivation and task motivation) in essence they are referring to the same basic concepts of cohesion, namely social and task factors.

Perhaps the most widely referenced work on the bidimensional nature of cohesiveness was conducted by Hagstrom and Selvin (1965). They factor analyzed 19 items perceived to be relevant to group cohesiveness and discovered two underlying dimensions: social satisfaction

(satisfaction with group membership) and sociometric cohesion (friendship or interpersonal attraction). By conceptually distinguishing between these two types of cohesiveness, groups may be considered highly attractive without having intimate interpersonalities. Conversely, groups may lack interpersonal attraction, yet sustain a large proportion of members as mutual friends (Gill, 1977). Enoch and McLemore (1967) found empirical support for this notion when they divided attraction to the group into intrinsic attraction and instrumental attraction. This bidimensional perspective suggests attraction may reflect either friendship or personal preference for one another or attraction may be toward some goal which the group mediate for the individual (Yukelson, 1984).

More recently, the trend in the literature has been to focus on cohesion from a multidimensional perspective. For example, Donnelly, Carron, and Chelladurai (1979) have introduced a third type of force thought to influence group cohesion, namely a normative force which restrains an individual with the group. They conclude that a combination of individual and group factors such as interpersonal attraction, task attraction, and attraction to the group along with normative considerations coincide to contribute to group cohesiveness. Additionally, Carron and Chelladurai (1981) have found support for their view

that cohesion is a multidimensional phenomenon. A factor analysis of five individual measures located in a sport cohesiveness questionnaire developed by Martens, Landers, and Loy (1972), revealed the presence of two categorical factors including individual to group cohesion (i.e., sense of belongingness, value placed on group membership, and enjoyment with group participation) and group as a unit of cohesion (i.e., teamwork and closeness). Results indicated that perceptions of team cohesion are moderated by the nature of the sport task (i.e., independent versus interdependent tasks). Thus, cohesion seems to be a multidimensional construct as it relates to sport.

Similarly, Yukelson, Weinberg, and Jackson (1984), in an attempt to create a new cohesion questionnaire, accounted for four broad dimensions of team cohesion: (a) attraction to the group; (b) unity of purpose; (c) quality of teamwork; and (d) the perceived value of one's role on the team. According to Yukelson et al. (1984), the last three factors can be considered "task factors", however all four dimensions are somewhat independent of each other. This implies that the sport researcher needs to assess each dimension, thus inferring that group cohesion is a multidimensional phenomenon.



## The Relationship Between Cohesion and Performance

Over the past 30 years, researchers have been investigating the effects of cohesion upon sport performance with hopes of providing empirical support for the notion that high cohesive teams perform better than low cohesive teams. Through psychologists such as Cartwright (1968), Cattell (1948), and Shaw (1941), have developed hypotheses in favor of a positive cohesion-performance relationship, the sport literature is equivocal.

For example, studies conducted by Arnold and Straub (1972), Klein and Christiansen (1969), Martens and Peterson (1971), and Widmeyer and Martens (1978) have found highly cohesive basketball teams to be more successful than less cohesive basketball teams. Similarly, Ball and Carron (1976) discovered a positive relationship between mid-season cohesion and post-season performance in intercollegiate ice hockey teams. While investigating high school varsity wrestling teams, Petley (1972) discovered that members of winning teams were significantly more cohesive than members of losing teams. And, Bird (1977) found the same result with female intercollegiate volleyball teams, with coaches and players associated with winning teams perceiving greater within

team cohesion than losing teams. Finally, Landers and Crum (1971) concluded following their study on baseball teams that team cohesiveness was a necessary factor for team success.

In contrast, a number of studies have shown a negative or no relationship between cohesion and performance. While studying high school basketball teams, Fiedler (1954) found a negative relationship between cohesion and successful performance. McGrath (1962) came to a similar conclusion when he reported an inverse relationship between team success and interpersonal orientations in rifle teams. During a case study of German world class rowing teams, Lenk (1969) observed that rowing crews could be quite successful despite poor interpersonal relations and intense conflict. However, Lenk notes that extrinsic rewards or goals might have kept the team together and maintained optimal performance throughout competition. Finally, Landers and Luschen (1974) reported a negative relationship between cohesion and performance with intramural bowling teams. It should also be mentioned that Melnick and Chemers (1974) found no systematic cohesion-performance relationship in intramural basketball teams. As a result of these inconsistencies regarding the relationship between cohesion and performance in sport, the literature is marked by its equivocality.

One possible explanation for the inconsistent results stems from the inability of past researchers to determine causality between cohesion and performance (Williams & Hacker, 1982). That is, does cohesion lead to performance success or does performance success lead to cohesion? Primarily, researchers have investigated the relationship between cohesion and performance from one of two different perspectives: (a) cohesion to performance--cohesion measures preceding performance (i.e., Klein & Christiansen, 1969; Martens & Peterson, 1971; Stogdill, 1972; Vander Venden, 1971; Widmeyer & Martens, 1978) and (b) performance to cohesion--performance measures preceding cohesion measures (i.e., Bird, 1977; Landers & Crum, 1971; Peterson & Martens, 1972; Ruder & Gill, 1982). In addition, studies by Carron and Ball (1977), Landers, Wilkinson, Hatfield, and Barber (1982), and Williams and Hacker (1982) have examined the cohesion-performance relationship from both directions, with cohesion and performance being assessed at early, mid, and end parts of the season.

Although studies have supported causality from both directions, unexplained variables such as a team's previous history, coaching leadership, and talent factors have prevented researchers from making definitive causal statements about cohesion and performance (Iso Ahola & Hatfield, 1986). Unfortunately, the only way to discern

the causal effect of cohesion upon performance would be to experimentally manipulate cohesion. This would entail the removal and relocation of athletic teams from their natural environment (e.g., sports field) to a laboratory setting, thus minimizing external validity and generalizability to the real world (Iso Ahola & Hatfield 1986).

Evidence has now shifted however, to causality being circular in nature (Carron, 1980; Gill, 1977; Martens & Peterson, 1971). This would imply that performance affects later cohesion (i.e., Ruder & Gill, 1982) and the observed changes in cohesion are somehow associated with subsequent performance (Iso Ahola & Hatfield, 1986). Examples of this can be witnessed through the work of Nixon (1977) and Williams and Hacker (1982). Nixon (1977), while working with intramural basketball teams found a team's past success (success history) to reinforce conditions of cohesiveness-related variables (task orientation, interpersonal orientation, and group morale), making future success more likely. Similarly, Williams and Hacker (1982) found that initial high cohesiveness correlated with later success and satisfaction, and greater success in turn correlated with later high satisfaction and cohesiveness in women's intercollegiate field hockey. However, it is important to emphasize caution in interpreting any relationships between cohesion and sport

performance due to the variety of inconsistencies presented in the literature (Iso Ahola & Hatfield, 1986).

A second explanation for the confounding cohesion-performance results involves the diversity of task demands confronting various sport groups. Studies investigating the relationship between cohesion and performance in interacting sports have generally found positive results, while studies examining independent or coacting tasks have concluded that cohesion and performance are negatively related.

Although Landers and Luschen (1974) have suggested that cohesion is more likely related to team success within interacting sport teams than with coacting teams, this viewpoint is not without its problems. For instance, if one were to peruse the literature on cohesion in sport, they would be hard pressed to find more than a handful of studies exploring the relationship between cohesion and performance in a coacting environment. Specifically, studies by McGrath (1962), Myers (1962), Lenk (1969), and Landers and Luschen (1974) have all incorporated some form of attraction in their operationalization of cohesion, thus underrepresenting the concept to be explored. In addition, McGrath (1962) while working with ROTC rifle teams chose to divide groups according to scores on a "perceptual index" (i.e., the extent to which the individual saw

others as warm and supportive) and a "behavioral index" (i.e., the extent to which others saw their teammates as exhibiting positive interpersonal behaviors). These two measures are very similar and thus a strong possibility exists as to whether or not each team was accurately classified into high and low cohesive teams at the start of the study. Similarly, Lenk (1969) discovered an inverse relationship between interpersonal perceptions and performance of world class rowers, although these findings were based on a case study and should not be taken out of context. Lenk (1969) also notes that extrinsic rewards such as prestige, competition, and group goals might have confounded the overall results of the study.

Finally, Landers and Luschen (1974) conducted a study with intramural bowling teams and also found an inverse relationship between cohesion and performance, but failure to control for differences in ability (i.e., no handicaps) might have been the actual cause of their results. In addition, successful teams were able to relate the ability levels of their teammates more accurately than unsuccessful teams. Thus, one can conclude that teams might have had different motives for participation, however the decision to rely strictly upon measures of interpersonal attraction in assessing group cohesion severely limited the authors from making any definitive statements concerning the

relationship between task factors and cohesion in a competitive coaching environment.

A final explanation regarding the inconsistent findings may be the extreme variability in which cohesion has been measured (Yukelson, 1984). Generally, the literature recognizes two ways in which cohesion has been assessed: (a) selected patterns of behavior and (b) questionnaires. Although a few researchers have employed certain behavioral indices such as clique formation (Eitzen, 1973), locomotion factors (number of members leaving or remaining in a group; Libo, 1953; Vander Velden, 1971), patterns of team play (i.e., distribution of passes; Klein & Christiansen, 1969), and group interaction (Bakeman & Helmreich, 1975), the most widely endorsed method of assessment appears to be the questionnaire, namely the Sport Cohesiveness Questionnaire (SCQ) (Martens, Landers & Loy, 1972).

The SCQ is composed of seven separate items designed to obtain: (a) the degree on interpersonal attraction within the group; (b) personal power of influence; (c) value of membership; (d) individual sense of belonging to the team; (e) degree of enjoyment; (f) level of teamwork; and (g) the degree to which the team is closely knit. These questions can be neatly classified into three general categories: (a) sociometric measures (interpersonal

attraction and personal power of influence); (b) direct individual assessment (sense of belonging, value of membership, and enjoyment); and direct team assessment of cohesion (teamwork and closeness). Each one of these items, with the possible exception of teamwork, measures some type of attraction, either attraction between and among group members or attraction to the group itself (Carron, 1982).

Although the SCQ has been frequently employed throughout the literature (i.e., Arnold & Straub, 1972; Ball & Carron, 1976; Landers & Crum, 1971; Martens & Peterson, 1971; Peterson & Martens, 1972; Widmeyer & Martens, 1978) and it appears to have good face validity for sport teams, its reliability as well as construct validity remain untested (Gill, 1977). For example, studies using the SCQ have revealed that while direct measures of cohesion have supported a positive cohesion-performance relationship, sociometric or indirect measures of cohesion were not related to team performance. Additionally, Widmeyer and Martens (1978) factor analyzed all measures on the SCQ and found descriptive measures of cohesion (questions asking subjects to directly evaluate the team's cohesiveness) to be better predictors of team success than indirect or sociometric measures of cohesion. In fact, they found interpersonal attraction to be



unrelated to either of the two measures of cohesion which evolved from their analyses; descriptive cohesion and inferential cohesion.

This finding has been supported by other researchers (i.e., Arnold & Straub, 1972; Ball & Carron, 1976; Landers & Crum, 1971; Martens & Peterson, 1971) who discovered teamwork and closeness to be the best discriminating factors between successful and unsuccessful sport teams. Thus, if teamwork is to be synonymous with cohesion in sport, then interpersonal attraction does not appear to be a factor which accounts for performance success or improved team play (Carron, as cited by Yukelson, 1984).

Another related problem is that operational measures of cohesion based solely on attraction, fail to account for cohesiveness in situations characterized by negative affect (i.e., dissatisfaction, dissection, hostility). In short, the athletic world typifies numerous examples of sport teams where seemingly low levels of mutual attraction and high levels of tension do not lead to the breakup of the group or cause sufficient disruption in the team to detract from ultimate performance success (Carron, 1982). This point is highlighted by Anderson (1975) who showed that value similarity (i.e., interpersonal attraction) was an important determinant of group cohesion in informal social groups, however goal path clarity (i.e., consensus

on group task procedures) was strongly related to cohesiveness in task oriented work groups.

Recently, Carron, Widmeyer, and Brawley (1985), in an attempt to unify both conceptual and operational measures of cohesion as well as create a valid and reliable method of assessment for cohesion in sport have developed an 18-item questionnaire entitled the Group Environment Questionnaire, (GEQ). The GEQ is composed of four measures of cohesion designed to assess group member's perceptions of team cohesiveness. They include: (a) individual attractions to group-task (individual team member's feelings about their personal involvement with the group task, productivity, goals and objectives); (b) individual attractions to group-social (individual team member's feelings about personal involvement, desire to be accepted, and social interaction with the group); (c) group integration-task (individual team member's feelings about the similarity, closeness, and bonding within the team as a whole around the group's task); and (d) group integration-social (individual team member's feelings about the similarity, closeness, and bonding with the team around the group as a social unit).

The GEQ is based on a conceptual model of cohesion that distinguishes between individual and group and task versus social concerns. In addition, the model is divided

into two major categories; a member's perceptions of the group as a totality (group integration) and a member's personal attractions to the group (individual attractions to the group) (Carron et al., 1985). Thus, cohesion is treated as a multi-faceted concept, satisfying the long withstanding need for psychometrically sound instrument to assess group cohesion (Carron et al., 1985).

In sum, the formation of the GEQ represents a more concerted attempt to (a) operationalize constructs by independent methods; (b) separate previously confounded perceptions; (c) be generalizable to a large cross-section of sports; (d) have a form of reliability across samples; and (e) satisfy more than one form of validity. Presently, the GEQ is still in its infancy, and although preliminary investigations have been conducted, future research is necessary (Brawley, Carron, & Widmeyer, 1985).

Furthermore, there have been no studies which have employed the GEQ to assess cohesion within a coaching environment

Based on the limited research conducted in the area of cohesion and within a coaching environment, in addition to the vast amount of problems confronting past investigators, the purposes of this present investigation is twofold: (a) to determine the relationship between cohesion and performance for successful and unsuccessful bowling teams by utilizing a multidimensional instrument for assessing

cohesion, the Group Environment Questionnaire; and (b) to investigate the internal consistency of items from the Group Environment Questionnaire.

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## CHAPTER III

### METHODS

#### Subjects and Design

The members of 148 bowling teams consisting of 28 men's teams, 55 women's teams, and 65 mixed teams (3-5 members each) from 14 different leagues spanning three bowling centers in the Denton-Dallas area were the participants in the study. Leagues consisted of three categories (i.e., men's handicap; women's handicap, and mixed handicap), and play was organized into three separate divisions, one for each type of league. Handicaps were determined by calculating 80% of the difference between total team averages from a base or standard score of 200 per bowler. During head-to-head weekly competition, the difference between opposing team's combined averages (80% handicap + team average) were added to the team with the lower average. For example, if "TEAM A" has a combined total average of 700, and "TEAM B" has a combined total average of 600, the difference would be 100. Thus, "TEAM B" would be receiving an additional 100 pins per game. Ordinarily, the higher the level of team play within a given league, the lower the difference between opposing teams' overall averages.

## Instruments

### Assessment of Cohesion

Team cohesion was measured according to the Group Environment Questionnaire (GEQ) (Carron et al., 1985). The GEQ was developed from student, athlete, and professional input, along with a literature search from 29 different articles and studies on the topic of cohesion. All the responses from the four phases of inquiry were collapsed to form a "response pool" representing information regarding four constructs of cohesion: (a) group integration-task--(GI-T); (b) group integration-social--(GI-S); (c) individual attractions to group-task--(ATG-T); and (d) individual attractions to group-social--(ATG-S) in the form of 354 items.

Overall validity was determined through a battery of studies concerning the inspection of the GEQ's content, concurrent, predictive, and construct related validities. Content validity was assured through a protocol which required an 80% agreement across a range of items characteristics. The GEQ was ultimately reduced to 18 items that were broken down in the following manner: 4 items in ATG-T; 5 items in ATG-S; 5 items in GI-T; and 4 items in GI-S. Questions are on a 9-point scale, anchored at the two extremes by "strongly agree" and "strongly disagree." The score on any specific scale is computed by

obtaining the mean response for a subject from the pertinent items. A representative score for the total team is then derived by determining the mean response for all subjects tested in the group.

Concurrent validity was determined by the degree to which the GEQ corresponded with similar measures [Sport Cohesiveness Questionnaires (Martens, Landers, & Loy, 1972); Team Climate Questionnaire (TCQ) (Carron, 1986; Grand & Carron, 1982)] and a different [Sport-modified Bass Orientation Inventory (SBOI) (Ball & Carron, 1976; Bass, 1962)] measures. Results revealed that the GEQ was significantly correlated with other measures of the same construct at a level expected of a unique, but related measure. The predicted absence of the GEQ correspondence with measures of different constructs was also clearly supported by the majority of results (Brawley, Carron & Widmeyer, 1987).

The method used to examine the predictive validity was to consider the ability of the GEQ to accurately classify subjects into their natural groups with the consensus being that team members' responses to the GEQ would reflect the cohesion associated with their type of sport group or team relationship (duration of team membership). Thus, it was predicted that interdependent teams would possess greater levels of task cohesion, while social cohesion would be

determined in accordance with team longevity. That is, teams competing together for 3 or more years would score higher on the social scales of the GEQ than teams participating together for under 3 years. Results indicated that the GEQ accurately classified 74% of the athletes in terms of task characteristics (GI-T; ATG-T) and 62% of the athletes by means of the social scales (GI-S; ATG-S). In terms of construct validity, task cohesion scales were found to stimulate sufficiently extreme responses to obtain the predicted outcome of athletes of high and low perceived task cohesion (Brawley et al., 1987).

Reliability was assessed with respect to internal consistency through various analytical procedures. Two studies were undertaken with subjects of heterogeneous characteristics to accomplish this purpose (Carron et al., 1985). Results from a Cronbach's alpha demonstrated similarities between studies in all four components of the GEQ. For instance, correlations from studies 1 and 2 were .74 and .65 for ATG-T; .58 and .64 for ATG-S; .78 and .71 for GI-T; and .61 and .72 for GI-S, respectively.

By virtue of these studies, evidence is beginning to mount in favor of the GEQ possessing both reliability and validity. However, it must be taken into consideration that the overall development and assessment of the GEQ is

still progressing. More studies should be conducted to examine the relationship between perceived cohesion and other variables (Brawley et al., 1987).

#### Procedure

Prior to the start of the study, all subjects were handed a written description of the purposes and procedure of the study in addition to signing an informed consent of participation (see Appendix B). Subjects bowled three games each week for 12 consecutive weeks. Since individual teams were not all present at the same time prior to the start of the league, cohesion data were collected on the lanes approximately 5-10 minutes prior to the start of the third, sixth, and twelfth weeks of bowling, while team performance outcome was obtained at the sixth and twelfth weeks of bowling. This allowed the cohesion-performance relationship to be analyzed from both directions, much in the same way that Carron and Ball (1977) and Williams and Hacker (1982) did in their ice and field hockey studies, respectively. Teams were classified in accordance with the four scales of the GEQ during weeks 3, 6, and 12 as high or low attraction to group-task; high or low attraction to group-social; high or low group integration-task; and high or low group integration-social. In addition, a fifth scale was created, a composite cohesion index, which was comprised of the four GEQ scales. Classification of high



or low on each scale was determined by means scores for each scale, with team scores of one standard deviation above or below the mean signifying high or low cohesion for that given index. Performance was operationally defined in two ways: (a) as the amount of wins accumulated during weeks 1 through 6 and 7 through 12, with successful/ unsuccessful labels being determined in the exact manner as high/low cohesion; and (b) league position of teams after the week 6 and week 12 point in the season. In this instance, successful teams were categorized as the teams in the top three league positions, while unsuccessful teams were diagnosed as the teams situated in the bottom three league positions. Since some teams might or might not accumulate a large number of wins during either of their two performance trials, yet their league position may be relatively high (top three) or low (bottom three), depending on the balance of talent within the prospective leagues, it was felt that overall league position would accurately classify teams in terms of performance as well as win totals. For example, "Team A" may win 60% of their games, a relatively successful amount, yet they could be in eighth place in their league, whereas "Team B" won only 50% of their games but were in fourth place in its league.

Wins were determined by a weekly 4-point win system, with each team receiving one point for each game victory

and one point for the team with the highest total pin fall (sum of three games, including handicap). Each league provided two weekly standings sheets that positioned teams according to most wins and losses.

#### Analyses

In this study, a series of univariate analysis of variance techniques were employed to analyze the relationship among the variables cohesion and performance. Furthermore, post-hoc discriminant analysis, analysis of variance, and correlational analysis were used to explore significant univariate effects.

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## CHAPTER IV

### RESULTS

Post-hoc discriminant analysis, analysis of variance, and correlational analysis were used to explore significant univariate effects. To reduce the possibility of Type I error due to the number of ANOVAs conducted, the alpha level was set at .01.

#### Cohesion-Performance

To determine the relationship between cohesion and performance, a series of univariate ANOVAs were employed, using cohesion and performance interchangeably as both dependent and independent variables. In the first set of analyses, classification of high and low for each of the five cohesion variables (ATGT, ATGS, GIT, GIS, and Composite Cohesion) was determined by team scores of one standard deviation above or below the mean for each cohesion index. Since measures were taken at three different points in the season, there was a total of 15 separate 2 x 2 (high/low cohesion X trials) ANOVAs conducted for win totals. Results indicated significant cohesion main effects at the .01 level for the ATGT cohesion variable in early  $F(1,38) = 13.07, p < .001$ , mid

$F(1,42) = 11.02$ ,  $p < .002$ , and late season  $F(1,57) = 6.26$ ,  $p < .01$ . Additionally, ATGS cohesion in late season  $F(1,38) = 6.91$ ,  $p < .01$  was also significant. In all cases, highly cohesive teams achieved more wins than teams low in cohesion. Table 1 presents performance means and standard deviations for all 15 independent cohesion variables.

#### Performance-Cohesion

In the next set of analyses, bowling teams were classified as successful or unsuccessful based on four performance measures: (1) high/low win totals in weeks 1-6; (2) high/low win totals in weeks 7-12; (3) top three/bottom three league positions as of week 6; and (4) top three/bottom three league positions as of week 12. Consequently, a 2 x 3 (successful/unsuccessful performance X trials) ANOVA for each of the five cohesion variables (ATGT, ATGS, GIT, GIS, Composite cohesion) was rotated separately across all four performance measures. Results of the first ANOVA for wins in weeks 1-6 revealed a significant performance main effect  $F(1,43) = 13.31$ ,  $p < .001$ , with successful teams rating GIS cohesion ( $M = 27.39$ ) higher than unsuccessful teams ( $M = 22.06$ ). In the second ANOVA, (high/low win totals in weeks 7-12 X trials) no significant differences were found, however mean scores

Table 1  
 Performance Means and Standard Deviations for 15 Independent Cohesion Variable

Variable	Win Totals				Number of Teams
	High Cohesive Means	Teams SD	Low Cohesive Means	Teams SD	
Early ATGT	13.26*	3.02	10.69	3.35	40
Early ATGS	12.59	3.23	11.12	3.10	31
Early GIT	12.87	2.71	11.85	4.03	43
Early GIS	12.45	3.34	11.31	3.30	41
Early Composite	12.68	2.82	11.04	3.09	42
Mid ATGT	13.80*	3.03	11.82	3.47	51
Mid ATGS	12.80	3.62	12.39	3.74	44
Mid GIT	12.41	3.82	11.83	3.77	36
Mid GIS	12.74	3.62	11.89	3.54	45
Mid Composite	12.64	3.69	12.13	3.73	43
Late ATGT	13.46*	3.43	11.73	3.87	59
Late ATGS	13.80*	3.18	11.46	4.07	40
Late GIT	12.85	3.81	11.63	3.57	40
Late GIS	13.03	3.26	11.21	3.18	39
Late Composite	13.74	3.18	11.66	3.94	33

\* $p < .01$ .

were higher for successful teams on four of five dependent cohesion measures.

Table 2 indicates cohesion means and standard deviations for the performance factors of wins in weeks 1-6 and 7-12, respectively. The third and fourth univariate ANOVAs looked at performance in terms of the top three and bottom three league positions in each of the 14 leagues participating in the study at the week 6 and week 12 point of the season. Although mean scores were greater for successful teams on all five dependent cohesion measures at both the week 6 and week 12 part of the season, significant main effects were found only for the week 12 performance factor. Specifically, successful teams had a higher rating of ATGT  $F(1,29) = 9.36$ ,  $p < .005$ ; GIT  $F(1,29) = 6.92$ ,  $p < .01$ , and composite cohesion  $F(1,28) = 7.37$ ,  $p < .01$ , than unsuccessful teams. Table 3 lists cohesion means and standard deviations for the performance factors of week 6 and week 12 league position.

#### Correlational Analyses

It should be noted that in each operational breakdown of cohesion and performance different teams were assessed. In order to determine the relationship between the various measures of cohesion over time, Pearson Product correlations were calculated for each of the five cohesion scores during the three test periods; early, mid and late

Table 2  
Cohesion Means and Standard Deviations for Successful and Unsuccessful Teams in  
Weeks 1-6 and 7-12

Teams	ATGT	<u>SD</u>	ATGS	<u>SD</u>	GIT	<u>SD</u>	GIS	<u>SD</u>	COMP	<u>SD</u>
Successful (1-6) <sup>a</sup>	32.51	3.97	35.51	4.62	36.98	5.54	27.34*	5.35	32.90	4.04
Unsuccessful (1-6)	30.89	3.70	33.34	4.89	35.22	5.50	22.06*	5.69	30.34	3.92
Successful (7-12) <sup>b</sup>	32.89	3.20	35.73	4.14	37.94	4.55	24.26	4.92	32.66	3.01
Unsuccessful (7-12)	30.84	3.85	33.69	4.37	35.12	5.26	25.19	5.89	31.06	3.98

\* $p < .01$ .

<sup>a</sup>Number of teams in weeks 1- 6 = 46.

<sup>b</sup>Number of teams in weeks 7-12 = 37.



Table 3  
Cohesion Means and Standard Deviations for Week 6 and Week 12 League Position

Teams	ATGT	<u>SD</u>	ATGS	<u>SD</u>	GIT	<u>SD</u>	GIS	<u>SD</u>	COMP	<u>SD</u>
Top three (wk 6) <sup>a</sup>	32.68	3.93	35.56	4.60	37.29	5.39	27.17	5.50	33.00	3.95
Bottom three (wk 6)	30.40	3.67	32.47	5.46	33.42	5.85	22.50	6.78	29.72	4.59
Top three (wk 12) <sup>b</sup>	33.72*	3.98	36.11	4.62	38.89*	4.95	27.05	5.58	33.90*	3.70
Bottom three (wk 12)	30.30*	4.14	33.32	4.98	34.67*	5.52	24.65	6.55	30.57*	4.37

\* $\underline{p} < .01$ .

<sup>a</sup>Number of teams in weeks 1- 6 = 33.

<sup>b</sup>Number of teams in weeks 7-12 = 31.

season. The results are presented in Table 4. The highest degree of relationship occurred from mid to late season cohesion with the correlation for composite cohesion being .72. The relationship of composite cohesion early to mid season (.588) and early to late season (.505) was also significant. In fact, correlations from all individual cohesion measures reached significance ( $p < .01$ ) during each of the three time periods.

To more accurately determine the cohesion-performance relationship, correlational analyses must be examined from two directions: (1) influence of cohesion on performance success; and (2) influence of performance on cohesion. A test that will decide the degree to which cohesion influences future performance success is provided by a correlation between an early measure of cohesion with a later measure of performance (Carron & Ball, 1977; Widmeyer & Martens, 1978; Williams & Hacker, 1984). In this study, comparisons were made between early season cohesion and mid season performance; mid season cohesion and late season performance; and early season cohesion with late season performance. Correlations from all three time periods yielded very weak relationships for each of the five cohesion items, with the highest individual scales being ATGT ( $r = .2996$ ), occurring with early season cohesion and late season performance.

Table 4  
 Intercorrelations for Cohesion Measures During Early, Mid, and Late Season<sup>a</sup>

Cohesion Parameter	Early Season Cohesion with Mid Season Cohesion	Mid Season Cohesion with Late Season Cohesion	Early Season Cohesion with Late Season Cohesion
ATGT	.3981*	.5772*	.2625*
ATGS	.3568*	.5001*	.3051*
GIT	.5580*	.5769*	.5166*
GIS	.6829*	.7573*	.5827*
Composite Cohesion	.5878*	.7173*	.5053*

\* $p < .01$ .

<sup>a</sup>Number of teams = 88.

Table 5 presents intercorrelations for individual cohesion and subsequent performance measures.

To test the influence of performance on subsequent cohesion, correlations from mid season performance and mid season cohesion, mid season performance and late season cohesion were calculated. Once again, results revealed very weak relationships during the three time periods. In this instance however, the highest individual cohesion scale was GIS ( $r = .2908$ ) occurring from mid season performance with last season cohesion. Table 6 lists intercorrelations for performance and subsequent cohesion items.

#### Reliability

A final purpose of this investigation was to assess the reliability of the Group Environment Questionnaire, (GEQ). The procedure employed was identical to that of Carron et al. (1985) in their development of the GEQ, that being to measure the equivalence (i.e., internal consistency) by examining the covariance among all items of a scale simultaneously. The statistical indicant used to express this reliability was Cronbach's Alpha. Table 7 indicates alpha coefficients for each of the five GEQ scales. With the exception of the ATGS scale in early ( $r = .3504$ ) and mid season ( $r = .4820$ ), all scales revealed a

Table 5  
Correlations Between Cohesion and Subsequent Performance<sup>a</sup>

Cohesion Parameter	Early Season Cohesion with Mid Season Performance	Mid Season Cohesion with Late Season Performance	Early Season Cohesion with Late Season Performance
ATGT	.1401	.1294	.2996*
ATGS	.0902	.0904	.2154
GIT	.0731	.1346	.1768
GIS	.2332*	.0894	.0200
Composite Cohesion	.1690	.1361	.2052

\* $p < .01$ .

<sup>a</sup>Number of teams = 108.

Table 6  
 Correlations Between Performance and Subsequent Cohesion<sup>a</sup>

Parameter	Mid Season Performance with Mid Season Cohesion	Mid Season Performance with Late Season Cohesion	Late Season Performance with Late Season Cohesion
ATGT	.1545	.1719	.1591
ATGS	-.0369	.2844*	.2089
GIT	.1125	.1407	.1462
GIS	.1226	.2908*	.0980
Composite Cohesion	.1092	.2543*	.2114

\* $p < .01$ .

<sup>a</sup>Number of teams = 95.

moderate to high reliability during early, middle, and late season.

Table 7

Internal Consistency of the GEQ

Scales	Early Season	Mid Season	Late Season
ATGT	.6826	.7825	.8105
ATGS	.3504	.4820	.6426
GIT	.6436	.7446	.7192
GIS	.6999	.7188	.7868
Composite	.6533	.7790	.7970

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## CHAPTER V

### DISCUSSION

#### Cohesion-Performance Relationship

The results of the present investigation provide partial support for the premise that highly cohesive teams are more successful than teams low in cohesion, and that successful teams are more cohesive than unsuccessful teams. Results of the first series of univariate analyses revealed ATGT in early, middle, and late season, in addition to ATGS in late season were the only two independent cohesion scales to significantly differentiate between high/low cohesive teams, with mean scores for wins favoring the more highly cohesive units. In essence, teams that demonstrated a strong desire to win, similar feelings concerning group play (i.e., team order/line-up, style of play, etc.), and were united around performance goals and objectives throughout the course of the season had higher levels of productivity than teams having lower levels of cohesion regarding their personal involvement with group tasks, goals, and objectives. As for bowling teams high on ATGS cohesion in late season, these groups exhibited closer friendships with team members, greater

satisfaction with group involvement and a wish for continued interaction with teammates on a social basis.

Although these findings appear to be consistent with a number of past studies in which it has been found that high levels of cohesion are associated with performance success (Ball & Carron, 1976; Klein & Christensen, 1969; Landers & Crum, 1971) and/or greater levels of individual and team satisfaction (Martens & Peterson, 1971; Nixon, 1977; Williams & Hacker, 1982), it should be noted that these previous studies assessed the cohesion-performance relationship for interacting sports, whereas the present study evaluated bowling, a coacting sport. When one investigates the cohesion-performance relationships for task that require little or no physical interaction between teammates, the results become inversely related [see Carron (1982) or Gill (1976) for a comprehensive review]. It should be noted, however, that since all those studies assessed cohesion from a unidimensional perspective (i.e., interpersonal attraction), a relationship between task cohesion and performance was impossible. From a logical perspective, it seems obvious that teams who are out there to win, regardless of the type of sport would stand a better chance of succeeding than teams who hold little regard for performance outcome. As evidenced in Table 1, during early and mid season, bowling teams that possessed

high levels of ATGT cohesion were more successful (i.e., won more games). These teams had the desire to win; that was their goal or their purpose for participating. Conversely, teams who had either lower levels of task cohesion, and/or different motives for participating, were not as successful. Another possible explanation for these results lies within the use of the GEQ, a multidimensional cohesion assessment instrument, in conjunction with the introduction of handicaps. By using the GEQ, four separate measures of cohesion were obtained, thus creating a broader assessment of cohesion. In addition, the use of handicaps minimized ability differences between teams, permitting a truer, more accurate assessment of the cohesion-performance relationship to take place.

#### Performance-Cohesion Relationship

The next set of analyses looked at differences in cohesion between successful and unsuccessful teams. When teams were classified in terms of win totals, successful teams in mid season had a significantly higher GIS ( $\bar{M} = 27.34$ ) level of cohesion than unsuccessful teams ( $\bar{M} = 22.06$ ). Thus, winning teams felt a stronger alliance to remain united, a closeness, and a bonding within the team as a whole around the group as a social unit. More importantly, when bowling teams were categorized on the basis of league positions in late season, with top three

constituting successful and bottom three unsuccessful teams, major differences surfaced on the cohesion variables of ATGT, GIT, and composite cohesion.

In general, successful teams exhibited higher levels of overall cohesion than unsuccessful teams; however it was task cohesion (ATGT, GIT) that significantly differentiated between top three and bottom three league teams. This notion is supported by the work of Mikalachki (1969) who suggested that groups who are task-oriented tend to be more successful than groups who display low levels of task-orientation.

Another important finding was that social cohesion was also higher for successful teams as evidenced by a significant difference in composite cohesion scores, in addition to greater mean scores for ATGS and GIS variables in mid and late season. This finding contradicts the work of Landers and Luschen (1974), who found a negative relationship between cohesion (i.e., interpersonal attraction) and performance in bowling teams. It is important to remember that handicaps were not used to minimize ability differences in the Landers and Luschen study, and thus it can be questioned as to whether cohesion factors or ability differences were the major cause of their results. One must take note that bowling, although it is a coaching sport due to its inability to showcase

obvious task interaction, does display a level of cohesion sometimes illusive to non-participants. Variables such as communication, group size, and role differentiation, all of which have been documented as necessary antecedents of cohesion in team sports (Carron, 1984) can be equally justified in league bowling. For example, the ability of team members to provide necessary feedback during performance, whether it be compliments during good performance, words of encouragement during poor performance, or technical advice during crucial moments of competition, are all needed ingredients in league bowling. Evidence of this is supported by the results highlighted in Table 3. That is, at the end of the season, successful teams had a higher level of both social and task cohesion as compared to unsuccessful teams, thus inferring that a positive relationship between performance and cohesion exists.

#### Correlational Analyses

The results from the correlational analyses for the five cohesion scales over time demonstrated the highest degree of relationship between mid and late season cohesion with ATGT, ATGS, GIT, GIS, and composite cohesion yielding coefficients of .577, .500, .577, .757, and .717, respectively. Similarly, Carron and Ball (1977) in an almost identical design, measuring cohesion on three

separate occasions (early, mid and late season), found the greatest relationship between measures of cohesion to occur during this same time frame. Although Carron and Ball (1977) gave no explanation as to why cohesion was highest during mid to late season, it can be argued that early measures of cohesion tend to be inaccurate due to various social and task pressures such as getting to know and trying to make a good impression on teammates as well as trying to live up to performance expectations, thus delaying the potential growth of cohesion. However, as the season progresses to the midpoint, team members begin to know each other better. They have a greater understanding of individual and team potential, and thus they can devote a higher proportion of energy to the designated causes established by the team, albeit social or task factors. In addition, factors such as league position, ability and attitude of teammates, and level of competition within their respective league are made available to team members. Thus, teams can give a more accurate assessment of overall cohesion in mid and late season rather than early season because of the weeks of experience attained from early to mid season, along with the knowledge of performance and social/interpersonal feedback made possible at this point in time.

Correlational analyses indicated that cohesion and performance were significantly related to each other, although there was no causal predominance for one over the other. It should be mentioned that correlations were obtained for the total sample size rather than the extreme sample size at successful/unsuccessful and high and low cohesion teams. The coefficients which assessed the causal flow were extremely low in both directions (See Tables 5 and 6); however correlations of early season cohesion as a measure of ATGT was significantly related to late season performance. These findings are consistent with recent studies conducted by Williams and Hacker (1982) and Landers, Wilkinson, Hatfield, and Barber (1982), who although using cross lagged techniques to determine causality, found no definitive direction of causality between cohesion and performance.

#### Reliability

All cohesion scales, with the exception of ATGS in early season, revealed a moderate to high level of internal consistency with each alpha coefficient increasing from early to late season. A reason for the low alpha coefficient of ATGS cohesion in early season can be discussed in terms of the style of questions associated with the ATGS scale. (See Appendix A for a list of questions.) In general, these questions are trying to

determine how individual team members feel about their teammates, the importance of being part of a team and their social activities, and the emotion felt when faced with league commencement. Although some teams have bowled together for many years, other teams are either replacing members of past years or bowling together as a formal unit for the first time and therefore cannot assess how important a social event bowling is, or how they think they will feel about their teammates when the season ends. But, as can be seen in Table 7, as the season progresses, the ATGS scale increases its internal consistency, thus supporting the notion that individual questions from the scale are difficult to answer in the initial stages of the season. For the most part however, one can begin to feel comfortable with the overall reliability of the GEQ. The combination of results from this study along with the battery of tests conducted by Carron et al. (1985) support this conclusion.

It should be noted that an attempt was made to catalogue the length of term experience, however the failure of a large portion of teams to answer questions, in addition to the difficulty associated with determining the overall length of experience for teams employing one, two or even three new members made it hard to accurately assess.



### Recommendations

In the future, it would be interesting to see how team experience related to the reliability of the independent scales of the GEQ. Would the GEQ have a greater internal consistency for teams with longer participatory histories than with teams who are bowling together for the first time? And, what would this relationship be over the course of the season? In addition, future studies need to continue focusing on the cohesion-performance relationship from a multi-dimensional perspective, utilizing instruments such as the GEQ across a large cross-section of sports and subject populations in order to maintain a consistency between theoretical and operational processes. Although the results of this investigation suggest a positive cohesion-performance relationship, empirical support for these findings can only be gathered through future research. The recent development of a multidimensional cohesion assessment instrument presents one with the unique opportunity to re-examine the relationship between cohesion and performance, with hopes of continuing to clear up the inconsistencies of past research, while simultaneously creating an abundance of potential investigations. For example, although there continues to be an interest in gender differences in sport [i.e., achievement motivation (Birrell, 1977; Ryan, 1979);

psychological momentum (Weinberg, Richardson, & Jackson, 1981)] studies dealing with gender and cohesion in sport are practically absent from the literature. With the exception of the investigation conducted by Widmeyer and Martens (1978), in which the authors focused primarily on social cohesion only, there have been no other comparisons involving gender and cohesion within a sporting environment. Furthermore, the interest between ability differences in the cohesion performance-relationship along with issue of causality remain unresolved topics that warrant future exploration.

In conclusion, one must begin to consider the importance of cohesion in coaching sports such as bowling. The findings of this study suggest that both social and task cohesion played a major role in determining successful and unsuccessful bowling performance.

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APPENDIX A

GROUP ENVIRONMENT QUESTIONNAIRE

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## GROUP ENVIRONMENT QUESTIONNAIRE

Attraction to Group-Task Scale

1. I'm not happy with the amount of playing time I get.
2. I'm unhappy with my team's levels of desire to win.
3. The team does not give me enough opportunities to improve my personal performance.
4. I do like the style of play of this team.

Attraction to Group-Social Scale

5. Some of my best friends are on this team.
6. For me this is one of the most important social groups to which belong.
7. I do not enjoy being part of the social activities of this team.
8. I am not going to miss the members of this team when the seasons ends.
9. I enjoy other parties more than team parties.

Group Integration-Task Scale

10. Our team is united in trying to reach its goal for performance.
11. We all take responsibility for any loss or poor performance by our team.

12. If members of our team have problems in practice, everyone wants to help them so we can get back together again.
13. Our team members have conflicting aspirations for the team's performance.
14. Our team members do not communicate freely about each athlete's responsibility during competition or practice.

#### Attraction to Group-Social

15. Members of our team would rather go out on their own than get together as a team.
16. Our team members rarely party together.
17. Members of our team do not stick together outside of practices and games.
18. Our team would like to spend time together in the off season.

APPENDIX B

INFORMED CONSENT



## APPENDIX B

## INFORMED CONSENT

The purpose of this present investigation is to determine the relationship between cohesion and performance for successful and unsuccessful bowling teams. You will be asked to complete a questionnaire designed to assess various types of cohesion within your team at the week 3, 6, and 12 point in the season. I will be glad to answer any questions you have concerning any aspect of the study.

Data will be collected for both teams and individuals; however, all information will be held in the strictness of confidence. You may discontinue your participation in this experiment at any time without prejudice. There will be no physically, psychologically, or emotionally harmful effects in this experiment.

## USE OF HUMAN SUBJECTS

INFORMED CONSENT

NAME OF SUBJECT: \_\_\_\_\_

1. I hereby give consent to \_\_\_\_\_  
to perform or supervise the following investigational  
procedure or treatment:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. I have (seen, heard) a clear explanation and understand the nature and procedure or treatment; possible appropriate alternative procedures that would be advantageous to me (him, her); and the attendant discomforts or risks involved and the possibility of complications which might arise. I have (seen, heard) a clear explanation and understand the benefits to be expected. I understand that the procedure or treatment to be performed is investigational and that I may withdraw my consent for my (his/ her) status. With my understanding of this, having received this information and satisfactory answers to the questions I have asked, I voluntarily consent to the procedure or treatment designated in Paragraph 1 above.

	_____	_____
		DATE
SIGNED: _____	_____	SIGNED: _____
	WITNESS	WITNESS
		or
SIGNED: _____	_____	SIGNED: _____
	WITNESS	PERSON RESPONSIBLE
		_____
		RELATIONSHIP

Instructions to persons authorized to sign:

If the subject is not competent, the persons responsible shall be the legal appointed guardian or legally authorized representative.

If the subject is a minor under 18 years of age, the person responsible is the mother or father or legally appointed guardian.

If the subject is unable to write his name, the following is legally acceptable:

John H. (His X Mark) Doe and two (2) witnesses.

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