EXAMINING AGGRESSIVE BEHAVIOUR FROM A GROUP PERSPECTIVE

by

Kim Daleta Dorsch

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Abstract

The three studies that comprise this thesis provide a first attempt at examining the relationships between social cognitive variables (i.e., group norms and collective efficacy perceptions) and aggressive behaviour from a group perspective. More specifically, the objectives of this dissertation were (a) to develop and validate a theory-based measure of group-related perceptions of normative and collective efficacy beliefs concerning aggressive behaviour in sport, and (b) to examine the relationships between these group-based perceptions and actual aggressive behaviour of sport teams.

The purpose of Study One was to develop and validate a reliable instrument to measure the group-based normative and collective efficacy perceptions. Based upon a strong empirical and theoretical foundation, along with the active participation of ice hockey experts and athletes, a measurement tool was developed which (a) operationalized the constructs from a holistic perspective, (b) was multi-dimensional, and (c) possessed strong psychometric properties. Support for the validity and reliability of the measures was achieved from both a conceptual and statistical standpoint.

Study Two was designed to examine the hypothesis that prior performance of aggressive behaviour is predictive of both normative perceptions of and collective efficacy for aggressive behaviour. While these proposed relationships were theoretically based, they were not demonstrated in the present sample at this point in the competitive season. The major impact of Study Two, however, lies in the further validation of the group-based constructs. Because both the normative and collective efficacy perceptions were operationalized from a holistic perspective (i.e., an aggregation of the group's beliefs as a whole), it was necessary to show

that these beliefs were indeed reflective of a group-based measurement. Based on the levels of analysis approach outlined by Kenny and LaVoie (1985), it was found that strong support existed for the true group nature of the collective efficacy perceptions, whereas, the group approach to measuring normative perceptions was questioned. Thus, even though the proposed causal relationships were not supported, evidence was found which strongly supported a group-based measure of collective efficacy for aggressive behaviour. Further, this aspect of group functioning was shown to be independent and unique from other perceptions of task-related collective efficacy in ice hockey.

Study Three was designed to re-examine the causal relationships described in Study Two at a later point in the competitive season and, to examine the ability of collective efficacy for aggression beliefs to predict future aggressive behaviour. While unacceptable team aggression did not predict group perceptions any better than during the first eight weeks, the analysis of this second time period did show that collective efficacy for aggression was a significant predictor of actual aggression in ice hockey.

As an initial attempt to examine aggressive behaviour from a group perspective, the findings from these three studies reveal intriguing ideas for future research. Implications of the measurement protocol and analysis technique utilized in the study are discussed.

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Dedication

To those individuals who mean the most to me,

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Aggressive behaviour takes place at the personal level (e.g., spousal/child abuse), the societal level (e.g., gang and crowd violence), and the global level (e.g., war). Due to the pervasiveness and the serious negative consequences of this behaviour, a large number of organizations and institutions are attempting to reduce aggression. However, before any behaviour can be reduced, it must be understood. Subsequently, an extensive amount of research has been done in an attempt to explain the aggressive behaviour of individuals. For example, the moral development (Bredemeier, 1985; Bredemeier & Shields, 1986), frustration level (Brice, 1990; Widmeyer, Dorsch, & Sanzsole, 1995), and cultural background (McGuire, 1990) of individuals have been examined. In all of this research, the contribution of the group to which the individual belongs is largely ignored. This dissertation is an attempt to begin to fill this void by examining aggressive behaviour from a group perspective in one particular context, i.e., sport.

When studying behaviour of any kind from a group vantage point, many complexities arise. For example, many investigators of groups have recognized that (a) collective behaviour, including aggressive behaviour, is a complex, multifaceted construct, (b) groups have been defined in a myriad of ways, and (c) the group structure and complexity influences both individual and group behaviour. Consequently, with respect to aggressive behaviour, as soon as a group is involved the theories developed to explain individual aggression are insufficient to explain the causes, development, or functions of collective aggression (Groebel & Hinde, 1989). Therefore, it is worthwhile to briefly clarify how aggressive behaviour, a group, and related group constructs are defined for the purposes of this dissertation. These explanations will provide a frame of reference for the studies that follow.

Aggressive Behaviour

Before we can understand a behaviour we must come to a clear definition of the phenomenon. In order to achieve this understanding, an aggressive act is defined as any overt verbal or physical act which is intended to either psychologically or physically harm another person (Silva, 1980). However, aggressive acts do not occur in a social vacuum, as every interaction occurs within a social context. The influence of surrounding social context on perceptions of aggressive acts has been exemplified in the work of Mummendey and her colleagues (e.g., Linneweber, Mummendey, & Löschper, 1984; Mummendey, Linneweber, & Löschper, 1984; Mummendey, Bornewasser, Löschper, & Linneweber, 1982). The "bottom-line" of this research is that identical behaviours are viewed as being less aggressive in some situations (i.e., contexts) than in others. For example, harming another person to obtain money would be considered more aggressive than harming another person in situations of self-defense. For this reason, it is very important to specify the geographical context (i.e., the context surrounding the act) when discussing aggressive behaviour, as some intentionally harmful acts may be considered acceptable depending upon the geographical context in which it occurs (Dorsch, 1993).

A geographical context where aggressive behaviour has become virtually acceptable is sport (Bredemeier & Shields, 1986). While a great deal of competitive sport occurs at the individual level, the majority of athletes participate in some form of group or team competition (Widmeyer, Brawley, & Carron, 1992). Yet, as previously stated, most research examining aggression in sport has been conducted at the individual level. Therefore, the influence of the sport group on the performance of aggressive behaviour should not be ignored.

The Relationship of Group Perceptions and Aggressive Behaviour

Aggressive behaviour in sport has many forms, from uncontrolled, retaliatory violence to the use of aggression as a strategic aspect of the game (i.e., "instrumental" aggression). Within professional ranks, various teams have stood out beyond others as physically aggressive — the Oakland Raiders of the 1970s in football, the mid-1970s Philadelphia Flyers in ice hockey, and basketball's Detroit Pistons of the late 1980s. Stories about these teams often revolve around the "bone-breaking" tackles in football, or the knee to the groin in basketball. But in no sport is the aggressive behaviour of its athletes more noticeable than in ice hockey. Oftentimes the media affords as much attention to the fist fights and bench-clearing brawls as to the offensive and defensive performances of the teams. However as stated previously, little research has actually examined how membership in a group relates to the performance of aggressive behaviours.

What is a group? In order to understand the influence of a group on aggressive behaviour, it is important to establish exactly what is meant by a "group". A useful social psychological definition provided by Steiner (1972) states that a group is a collection of mutually responsive individuals. The behaviour of this collection of individuals is dependent upon (a) the demands of the task, (b) the relevant knowledge and skills possessed by individuals within the group (i.e., group resources), and (c) the ability of those members of the group to interact and coordinate their relevant resources (i.e., group process). A group's behaviour is additionally influenced by shared norms and values at least in matters of consequence for the group (Sherif & Sherif, 1969). Subsequently, sport groups, by virtue of the rules associated with playing a team sport, the distinctive skills each player possesses, the interactive nature of

most team sports, and the common motivational standards for behaviour, have more than a minimum set of characteristics that characterize a group (Paskevich, 1995). Given the collective and integrative nature of the group process, it would follow that the decisions and actions required in team sports would eventually lead to the development of a group culture.

Group culture refers to the common frame of reference which exists among members of a group (Levine & Moreland, 1991). Levine and Moreland (1991) emphasize two perspectives when discussing this concept. The first perspective views culture as "a set of thoughts that are shared among group members" (p. 258). These thoughts provide knowledge about (a) the group, including behavioral expectations for the group members, (b) the group members, including how group members' behaviour should be interpreted, and (c) the work the group does, i.e., how "we" should perform our work. Second, is culture as a "set of customs that embody the thoughts that group members share" (p. 258). These customs are behavioral manifestations of the thoughts shared among group members. Together, these two perspectives suggest that group members share a basic knowledge about their group that provides a common framework from which their experiences can and should be interpreted. These interpretations subsequently aid in guiding the group's behaviour in future situations.

Thus, a group is a complex structure involving many shared thoughts, feelings, and behaviours. Of specific interest to this dissertation is the knowledge shared among group members regarding their group's (a) behavioural expectations (i.e., group norms), and (b) collective ability to carry out group process (i.e., collective efficacy). A brief overview of these two aspects of the group culture is presented in the following paragraphs.

Group norms. Once in a group, group members often wonder what their fellow group members expect from them and what they can expect in turn from their fellow group members (Levine & Moreland, 1991). As a result, certain expectations regarding members' behaviour are created in the minds of group members which subsequently become the standards for behaviour that is expected of members of the group (Carron, 1988). These expectations, or group norms, reflect existing group values. Further, norms govern the behaviours of group members and represent the group's consensus about what is considered acceptable (Carron, 1988). These norms can be prescriptive, specifying which behaviours are considered appropriate for group members, or proscriptive, outlining behaviours considered inappropriate (Carron, 1988; Levine & Moreland, 1991). Although no absolute standard has been defined to determine when consensus is reached among group members, Shaw (1976) suggests that a group belief becomes a norm when more than 50% of group members accept it.

In the sport of ice hockey, many researchers (e.g., Cullen & Cullen, 1975; Faulkner, 1974; Vaz, 1977, 1979) have suggested that aggressive behaviour is accepted in order to achieve success at both the individual and team levels. Once so accepted, the performance of these behaviours then becomes expected, i.e., normative. Individually, the performance of rough, aggressive behaviour and illegitimate tactics are standards for the evaluation and recruitment of players into the system (Vaz, 1977). For example, players are recruited to teams not only on the basis of their possessing technical skills such as skating and passing, but also because of their ability to play rough and tough (Vaz, 1977).

At the team level, research has shown that aggressive behaviour is related to successful performance outcome. For example, Widmeyer and Birch (1984) linked the use of aggression

as a tactical strategy to performance outcome in the National Hockey League. They demonstrated that when such behaviour is exhibited early in a contest, it is strongly related to eventual successful game outcome. As aggressive behaviour becomes viewed as functional for team success, these behaviours become, not only accepted but also perceived as normative. Consequently, if a team decides to adopt aggressive behaviours as a strategy for their success, then the acceptability of such behaviour most likely becomes part of that team's normative belief structure and subsequently, the team's culture.

Collective efficacy. As aggressive behaviour becomes linked to successful performance outcome, and the performance of these behaviours becomes increasingly accepted, then it stands to reason that team members begin to develop perceptions of their team's ability to successfully execute these strategic behaviours. In other words, as is the case with any offensive or defensive skill in ice hockey, a team develops a sense of their collective competence in regards to their ability to perform aggressive skills (i.e., collective efficacy for aggression).

Collective efficacy refers to the group's shared belief in its ability to produce the desired outcomes (Bandura, 1986). In the case of aggressive behaviour, a team's sense of collective efficacy for performing these behaviours becomes important to understand as collective efficacy perceptions are purported to influence what the group chooses to do, the plans and strategies they develop, how much effort they put into their group endeavour, their persistence when collective efforts fail to produce quick results, their persistence when they encounter forcible opposition, and their vulnerability to discouragement (Bandura, 1997). Thus, a sense of collective efficacy for aggressive skills may be another group perception that is instrumental in the performance of these behaviours by ice hockey teams.

Dissertation Purpose

The purpose of this dissertation is to determine how certain group-based perceptions of aggressive behaviour relate to the performance of such behaviour. While there are many group perceptions which may affect behaviour, this dissertation focuses on group norms for aggression and collective efficacy. The main reason for examining these two group perceptions in conjunction with aggressive behaviour is that both concepts are linked to group motivation. Group norms motivate group members by developing expectations for behaviour and sanctions for not complying with these behavioural standards (Carron, 1988). Collective efficacy perceptions are purported to influence group members' choice of activities, amount of effort expended, and degree of persistence at a task (Bandura, 1986). Because the group perceptions of norms and collective efficacy influence motivation, it is likely that they also influence performance of various behaviours, including aggressive behaviour. Thus, the purpose of the three studies that follow is to examine the relationships between aggressive behaviour and these two group-based perceptions of such behaviour.

A logical first step in undertaking this research program is the development and validation of a sound psychometric tool to evaluate these constructs. Thus, Study One is devoted to developing and validating measures of group norms and collective efficacy in ice hockey with the specific focus relating these perceptions to aggressive behaviour.

In order to examine the relationships among normative and collective efficacy perceptions and actual team aggressive behaviour, a prospective study was conducted over the course of an ice hockey season. The data for the analysis of the research question pertinent to Studies Two and Three were drawn from part of a larger study examining relationships among

collective efficacy, group cohesion, group norms for aggressive behaviour, and group performance. The design of this longitudinal study was such that eight weeks had elapsed in the competitive season before the first assessment of group perceptions. The measure of aggressive behaviour was, however, determined from the start of the season until the first assessment period. Because of the time-based assessment of the constructs, Study Two examines team aggressive behaviour as a determinant of the group-based perceptions of aggressive behaviour. Finally, as the second assessment period was a further eight weeks into the season, the third study examines aggressive behaviour as a consequence of group-based perceptions of aggression.

STUDY ONE

Conceptual and Measurement Factors of Group-Based Perceptions of Aggressive Behaviour

The cornerstone of any good research lies in the measurement of its variables. While many reliable and valid inventories have been developed in the discipline of social psychology, the majority of these instruments are focused on the individual. Indeed, the amount of group-related research and sound inventories focusing on group beliefs can be considered insignificant when compared to those focused on the individual (Brawley, 1990; Carron, 1988, 1990).

While the group has been acknowledged as an important aspect to study, one of the reasons for this lack of attention could be the fact that defining an attribute of a group, such as a group belief or group perception, raises certain concerns that are not applicable when defining attributes of individuals (Gibson, Randel, & Earley, 1996). For example, when examining group beliefs (a) the construct must reflect the group as a whole, rather than the individual members as separate units, (b) the origin of the construct must reflect the processes that occur within the group, (c) agreement among members of a group with regard to the construct must be demonstrated, and (d) the construct must discriminate among groups (Bar-Tal, 1990). As the purpose of this study is to develop and validate a group-based collective efficacy and normative measure for the sport of ice hockey, the first two requirements stated above are the most pertinent to this discussion. However, before these two requirements can even be addressed, the initial step in the development of any measure, individual or group, is the presence of a firm theoretical or conceptual definition on which to base the operational definition of the construct.

In the case of collective efficacy, the concept was first introduced in the psychological literature by Bandura in 1982. At that time, he conceptualized collective efficacy as the belief in the ability of one's group to produce desired results. Later, this definition was reformulated to include the notion of a shared perception. Specifically, perceived collective efficacy was defined as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p. 477). However, these theoretical definitions do not lend themselves to empirical validation (Gibson, 1996). Consequently, Zaccaro, Blair, Peterson, and Zazanis (1995) revamped the definition of collective efficacy to emphasize the coordinative and integrative aspects of group functioning. Thus, collective efficacy was defined as "a sense of collective competence shared among individuals when allocating, coordinating, and integrating their resources in a successful concerted response to specific situational demands" (p. 309). This definition is useful for addressing the two criteria for the examination of group beliefs raised by Bar-Tal (1990) earlier.

First, with respect to the construct reflecting the group as a whole, there are two suggested approaches for measuring collective efficacy (Bandura, 1997; Zaccaro et al., 1995). These two measurement approaches involve the aggregation of group members' appraisals of (a) their personal capabilities for the particular functions they perform in the group, or (b) their group's capability as a whole. The measurement technique utilized depends largely on the degree of interdependence involved in the task the group is to perform. The instrument being developed for this study revolved around the highly interdependent tasks necessary for ice hockey team performance. In tasks such as these, the aggregation of individual efficacies would miss the key elements of interaction, coordination, and integration, so vital to group

performance and central to the definition advanced by Zaccaro et al. (1995). Therefore, perceptions of collective efficacy, particularly in highly interdependent sports must reflect the latter, more holistic, measurement approach. Furthermore, Lindsley, Brass, and Thomas (1995) recommend this measurement technique as there are certain cognitions that group members have which are distinguishable from the beliefs they hold as individuals. These cognitions are collective, group-based beliefs which arise from the individual's ability to cognitively consider the group as a whole (Lindsley et al., 1995). Consequently, for the purposes of this study, collective efficacy is operationalized from a group-level perspective, i.e., "Our team's confidence in our abilities".

The second concern when examining group attributes requires group beliefs to reflect the processes that occur within the group. Once again, the definition provided by Zaccaro et al. (1995) addresses this concern by referring to shared perceptions of competence when "allocating, coordinating, and integrating" the group's resources. Thus, as group behaviour is a product of many collective endeavours, the use of a multidimensional measure of collective efficacy is warranted. For example, Fleishman and Zaccaro (1992) delineated several functions that form the basis for collective action. Based upon these collective functions, Paskevich (1995) and Dorsch, Paskevich, Brawley, and Widmeyer (1995a) developed collective efficacy inventories for the interdependent team sports of volleyball and basketball, respectively. Subsequently, seven dimensions of collective efficacy were identified within these two highly interdependent sport settings. These aspects of collective efficacy assessed the team's confidence in task-specific (a) offensive skills, (b) defensive skills, (c) communication skills, and (d) motivation skills. Additional aspects of group functioning, similar to both sports, included

the team's confidence (a) in association with the loss of a key player, (b) to overcome obstacles in association with teammates, and (c) for general team issues. The strong psychometric evidence for the collective efficacy scales developed in these two interactive team sports suggests that collective efficacy is indeed a multidimensional group-level construct.

However, among the collective actions that are utilized to meet a given need, Steiner (1972) suggests that some are likely to be more productive than others, and a few, while remaining productive, may be utterly dysfunctional. Such is the case in ice hockey, where the empirical link has been made between successful performance outcome and team aggressive behaviour (e.g., Widmeyer & Birch, 1978). It has been suggested by many researchers (e.g., Cullen & Cullen, 1975; Faulkner, 1974; Vaz, 1977, 1979) that aggressive behaviour has become defined as functional for team success and has, therefore, become a strategy, just as important as any offensive or defensive tactic. Subsequently, another aspect of group functioning to consider when assessing perceptions of collective efficacy in hockey is the team's confidence in ability to successfully execute strategic aggression.

One further aspect of group functioning highly related to the performance of aggressive behaviours is the normative perception of such behaviour. Silva (1983) states that norms pertaining to deviant behaviours in sport have "become so important that participants in many sports must learn not only the written rules, but the unwritten or normative rules of their sport in order to be successful" (p. 438). Because these normative rules reflect existing group values, the group evaluates the individual's deviant (i.e., aggressive) behaviour and judges it to be acceptable or unacceptable. Consequently, because aggressive behaviour has become linked to successful team performance outcome in ice hockey, it may be judged as an acceptable

behaviour in certain situations (Dorsch, 1992, 1993). Due to the acceptance of strategic aggressive behaviour in ice hockey, it stands to reason a group norm regarding the acceptability of such behaviours will develop for most teams who choose to use this strategy. Therefore, keeping in mind that the construct must reflect the group's shared belief, this aspect of group functioning in ice hockey should be measured as well.

In summary, the purpose of this study is to develop and validate measures of collective efficacy in ice hockey, including collective efficacy for aggressive skills, and normative perceptions of the acceptability of aggressive ice hockey behaviours. Based on the suggestions of past researchers (e.g., Bandura, 1982, 1986, 1997; Bar-Tal, 1990; Zaccaro et al., 1995), the group-based perceptions developed in this study are an aggregation of group members' appraisals of their group as a whole, and reflect a number of group processes necessary for collective behaviour.

Method

Participants and Design

Forty-six ice hockey athletes representing three teams (two junior and one university, mean age =19.02 ± 1.89 years) volunteered to participate in this study. The athletes had spent, on average, 1.63 ± .90 years playing for their current team. Mean playing experience in organized ice hockey ranged from one to ten years with an average of 3.24 ± 2.63 years. The teams had been competing for an average of 7.87 ± 1.02 months, with 3.28 ± .89 practices per week. Since all three of the participating teams were in post-season play, they could be classified as successful at their respective level of competition. As the observation of natural groups was a major purpose of this field study, random assignment of individuals to groups was

not possible.

Measures

In this study, measures of collective efficacy and norms for physically injurious behaviours are developed for the sport of ice hockey. The development and subsequent validation of these measures are described below.

Validation process. A three step process was used in the development and validation of the normative and the collective efficacy measures. In developing both measures, the literature in psychology, sport, and group dynamics was searched to determine the theoretical and empirical bases from which to proceed with item development. Subsequent to the search of the literature, an initial list of ice hockey relevant normative and collective efficacy questions were constructed in response to the suggestions of previous researchers (e.g., Bandura, 1986, 1997; Dorsch et al., 1995a; Hodges & Carron, 1992; Feltz , Bandura, Albrecht, & Corcoran, 1988; Paskevich, 1995; Spink, 1990a, 1990b). The outcomes of this step for each scale are detailed in the appropriate section below.

Two steps were undertaken to content validate the newly developed inventories. Content validity refers to the sampling adequacy or the representativeness of the items in the instrument (Kerlinger, 1973). Thus, content validation involves judgment of the items according to their representativeness of the constructs of interest. Usually, judges are individuals who are considered "experts" in the designated field of study. However, keeping in mind Sherif and Sherif's (1969) plea to involve participants as "active agents" in the assessment procedure, the inventory was also taken to the target population for further judgment of item adequacy.

The expert judges, consisting of elite junior and university coaches, were sent the normative and collective efficacy questionnaire. This questionnaire included a paragraph at the beginning of each scale, briefly describing the intent of each scale along with instructions for further item assessment. The experts were asked to read each item and assess (a) the applicability of the question to the intended scale (i.e., Do teams of an elite nature use the skills and actions identified in the majority of their games?), and (b) if players at a junior or university level would be able to understand and readily answer the question (i.e., the clarity and language used). It was explained to the experts that the items were not meant to be all inclusive, but were attempts to offer examples that clearly represented the experiences of athletes and were meaningful to them. Any comments and suggestions from the experts were considered.

While it is a necessary step to obtain the experts' ratings of item relevance, the assumption that the intended sample perceives the selected items in the same manner as the expert raters cannot be made. For this reason, participants were involved as "active agents" in developing the assessment instrument (Sherif & Sherif, 1969). Therefore, in the final step of the validation process, junior and university level ice hockey athletes were shown the same questionnaire as the experts in an attempt to get their reactions and comments. Combining the responses of these athletes with the responses obtained earlier from the experts, a number of meaningful and salient items were finalized for each of the scales described below.

In summary, three steps were used in the development and content validation for each of the normative and collective efficacy measures. Initially, scale items were developed based on a search of the literature in psychology, sport, and group dynamics. Secondly, the applicability and clarity of the scale items were assessed by experts in the field of ice hockey. Finally, the

measures were taken to athletes, similar to future participants, in order to add content and confirm item meaningfulness and clarity. All measures are reported in detail in Appendix A.

Normative perceptions of physically injurious ice hockey behaviour. The operational definition of the normative perceptions of physically injurious behaviours in the sport of ice hockey was based upon the conceptual definitions of group norms (Carron, 1988), and aggressive behaviour (Silva, 1980). Carron (1988) states that a group norm represents the group's consensus about what is considered acceptable. Because aggressive behaviours can be, and often are, considered acceptable in the sport of ice hockey (Dorsch, McGuire, & Widmeyer, 1994), it stands to reason that a group perception regarding the acceptability of these types of behaviours will eventually emerge (Carron, 1988). However, a review of past literature suggests that a distinction exists between the acceptability of physically injurious behaviours and the acceptability of psychologically intimidating behaviours (Dorsch & Widmeyer, 1993; Houston, 1986). The findings from this previous research indicate that psychologically intimidating behaviours are considered more acceptable than the physically injurious behaviours. While it is important to take note of this finding, the problem is that the performance of psychologically intimidating behaviours is extremely difficult to measure. The indices used to measure aggressive behaviour in sport reflect those behaviours with the potential to physically injure. To increase correspondence with the measurement of actual aggressive behaviours, only the data related to the acceptability of physically injurious behaviours were analyzed.

Further, Dorsch (1993) demonstrated that physically injurious acts are viewed as more acceptable in certain situations than in others. For example, while an act of slashing is usually considered an aggressive act (cf., Dorsch, 1992, 1993; McGuire, 1990; Widmeyer & Birch,

1978), the same act may be considered less aggressive when the actor's intent can be justified, i.e., to stop a scoring chance. Dorsch (1993) asked ice hockey athletes to indicate when potentially physically injurious behaviours were considered acceptable. Based on the results of that study, eight scenarios were developed to assess the acceptability of physically injurious behaviours in ice hockey. Participants were asked to rate how often, in general, their team believed physically injuring an opponent was acceptable in various situations on a 0 ("Never acceptable") to 100 ("Always acceptable") scale. An item representative of this scale is "In general, our team believes it is acceptable (all right, okay) to attempt to physically harm (INJURE) opposing players in order to stop a scoring chance". The mean of all eight items was calculated to give an overall perception of the normative acceptability of physically injurious behaviours (NORMS).

Collective efficacy. The operational definition of collective efficacy relied heavily on conceptual definitions provided by Bandura (1997) and Zaccaro et al. (1995) and past research of Paskevich (1995) in volleyball and Dorsch et al. (1995a) in three-on-three basketball. As a result, seven aspects related to overall collective efficacy were defined. These were the team's confidence in its ability to perform offensive and defensive physical task skills, to communicate, to be and remain motivated, to overcome the loss of a key player, to overcome obstacles in association with teammates, and to cope with general issues. Based upon past research of the skills used in ice hockey (e.g., Vaz, 1977, 1979), an eighth scale was added in order to examine the team's confidence in its ability to perform strategic aggression. Participants were asked to rate their team's confidence in their ability to perform various aspects of the game of ice hockey on a 0 percent ("No confidence") to a 100 percent ("Complete confidence") scale.

Each scale is described briefly below. For more complete detail in the development of the collective efficacy scales, with the exception of the collective efficacy for aggression scale, see Paskevich (1995).

1. Collective efficacy for aggressive skills. As has been previously noted, the use of aggressive behaviours is often viewed as functional for team success. Therefore, like any offensive or defensive skill, team members may come to have a collective perception of their team's ability to perform these aggressive skills. Collective efficacy for aggressive skills is, therefore, defined as "a belief shared among members of a team for their ability to inflict physical and/or psychological harm to their opponents" (Dorsch, Widmeyer, Paskevich, & Brawley, 1995b). However, as with the normative perceptions scale, in order to increase the correspondence between measures, the item in the collective efficacy for aggression scale which dealt with the teams' efficacy to psychologically intimidate their opponents was deleted from further analysis. Thus, a representative item of the resulting scale is "Generally speaking, our team's confidence in our ability to physically injure the other team is ___". The mean of this four-item scale represented collective efficacy aggression (CEAGG).

2. Task collective efficacy. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to jointly perform certain ice hockey skills under game and practice conditions. Division of this scale into subcategories of offense (n items = 16) and defense (n items = 8) was undertaken for further analyses. A representative item of these two scales is "Generally speaking, our team's confidence in our ability to generate scoring opportunities while short-handed is ___". The mean of the sixteen offense-related questions and the mean of the eight defense-related questions formed the collective efficacy offense

(CEOFF) and collective efficacy defense (CEDEF) scores respectively.

3. Communication collective efficacy. This scale was designed to assess an athlete's perceptions of their team's confidence in the team's ability to effectively communicate with team members and coaching staff during games and practices. A representative item in this scale is "Generally speaking, our team's confidence that we can effectively communicate to each other during a power play is ___". The mean of this 14-item scale represented communication collective efficacy (CECOMM).

4. Motivation collective efficacy. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to either increase, remain, or become motivated during games and practices. A representative item is "Generally speaking, our team's confidence that we don't give up if we are losing a game is ___". The mean of this 13-item scale represented motivation collective efficacy (CEMOTIV).

5. Collective efficacy to overcome the loss of a key player. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to play at their present level during the occurrence of injury, illness, or suspension of a key player on the team. Thus, a representative item on this scale is "Generally speaking, our team's confidence that we can still perform at the same level of play without our best goalie is ___". The mean of this three-item scale represented collective efficacy to overcome the loss of a key player (CEKEY).

6. Collective efficacy to overcome obstacles in association with teammates. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to successfully deal with common obstacles to team success that arise within an ice hockey season. For example, a representative item is "Generally speaking, our team's confidence in our ability to

deal with the fatigue of road trips is ___". The mean of this 11-item scale represented collective efficacy to overcome obstacles (CEOBST).

7. Collective efficacy for general items. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to pursue normal functions that arise within the context of an ice hockey season. A representative item in this scale is "Generally speaking, our team's confidence that we have set realistic goals is ___". The mean of this 8-item scale represented general collective efficacy (CEGEN).

Procedure

The participants were administered the normative and collective efficacy questionnaire at a time neither immediately before nor after a competition to avoid competition specific biases. The questionnaires were administered by the researcher or, if not possible, the coach of the team. If the latter protocol was used, then each coach was provided with a questionnaire administration instruction sheet (appendix B). Participants were verbally assured of the confidentiality of their responses. To ensure this confidentiality, each player was instructed to return the completed questionnaire in a sealed envelope that was provided by the researcher. All questionnaires were completed in a 20- to 30-minute time frame and were returned in the sealed envelope. Since the volunteering teams were involved in post-season play, a sufficient time had elapsed such that group interaction could contribute to the development of perceptions of both the normative and collective efficacy beliefs.

Results and Discussion

Results are presented in two sections. The first section highlights the descriptive statistics related to the normative and collective efficacy measures. In the second section, the reliability and validity of the scales (i.e., internal consistencies and bivariate correlations) are discussed.

Descriptive Statistics

Table 1 illustrates the means and standard deviations of the normative and collective efficacy measures. The mean of the normative measure is moderately high ($\underline{M} = 61.38$) suggesting that the use of aggressive behaviours is acceptable over fifty percent of the time. This finding supports the descriptive literature on physically aggressive behaviour and its acceptability in sport (cf. Bredemeier, 1985; Dorsch, 1992, 1993; Silva, 1983; Vaz, 1977) . While the perceptions of collective efficacy were high (range from 74.86 to 90.73), this was not unexpected given the elite nature of the teams sampled. These teams had a high level of skill and successful performance records, thereby, demonstrating the mastery experience related to their elevated perceptions of their collective competence. What should be noted is that the strength of the teams' beliefs in their collective confidence to execute aggressive skills was the lowest of all the collective efficacy scales. Once again, this finding is not unexpected as these skills are rarely practices and used to a lesser extent, therefore, the strength of these efficacy beliefs is not as well developed. Relative to offensive/defensive team skills, mastery experiences while using aggression as a tactical aspect of the game are not rehearsed in regularly scheduled practices and do not occur with the same frequency either in competition or in practice (cf., Bandura, 1997).

Table 1

Descriptive Statistics of Normative and Collective Efficacy (CE) Measures

Measure	M	SD
NORMS	61.38	20.29
CEAGG	74.86	14.26
CEOFF	82.07	6.98
CEDEF	81.65	6.59
CECOMM	83.89	7.36
CEMOTIV	83.82	7.45
CEKEY	86.52	11.41
CEOBST	83.86	11.36
CEGEN	90.73	7.69

Note: N = 46

The acronyms for the various measures are as follows:

NORMS - Normative perceptions of physically injurious behaviour

CEAGG	- CE aggression	CEMOTIV	- CE motivation
CEOFF	- CE offense	CEKEY	- CE loss of key player
CEDEF	- CE defense	CEOBST	- CE team obstacles
CECOMM	- CE communication	CEGEN	- CE general issues

Reliability and Validity

Internal consistencies. Because instruments in the study were being developed, there was a need to assess their reliability and validity. Of initial concern in instrument development is how well the items in the scale "stick together", or covary, to measure the construct being examined. The covariance among all items in each scale (i.e., internal scale consistency or reliability) was simultaneously examined through the calculation of Cronbach's coefficient alpha (Cronbach, 1951). An item's relation to a particular scale can also be observed and its contribution to the scale examined with this statistic.

Table 2 shows the internal consistencies of the normative and collective efficacy scales. The internal consistencies of the NORMS and CEAGG measures are .85 and .75, respectively. The rest of the collective efficacy measures also have acceptably high values (alphas of .74 to .91) to proceed with future investigation.

Table 2

Internal Consistencies of Normative and Collective Efficacy (CE) Measures

Measure	Number of Items	Cronbach's Alpha
NORMS	8	.85
CEAGG	4	.75
CEOFF	16	.88
CEDEF	8	.74
CECOMM	14	.88
CEMOTIV	13	.90
CEKEY	3	.79
CEOBST	11	.91
CEGEN	8	.91

Note: N = 46

The acronyms for the various measures are as follows:

NORMS - Normative perceptions of physically injurious behaviour
CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation
CEKEY - CE loss of key player
CEOBST - CE team obstacles
CEGEN - CE general issues

Concurrent validity. Based on the alpha values alone, the scales may be considered internally consistent but what is being measured (i.e., scale validity) is still unknown (Widmeyer, Brawley, & Carron, 1985). Thus, in order to determine if the CEAGG scale is a construct independent from the other collective efficacy measures, bivariate correlations were computed among the collective efficacy scales. Examination of these correlations, as presented in Table 3,

shows that most collective efficacy measures are significantly related. Significant positive correlations, similar to the findings of Paskevich (1995) in volleyball, were expected among these scales given the salience of the questions to the ice hockey athletes and the meaningfulness of the items identified during the instrument development process. However, with regard to the relationships between other collective efficacy measures and the CEAGG scale, the only significant relationship was between CEAGG and CEDEF ($r = .48$, $p < .0001$). This finding provides some preliminary evidence to suggest that CEAGG is indeed an independent construct related somewhat to athletes' perceptions of their team's defensive skills. This relationship is understandable, considering most aggressive behaviour at the elite level of competition is performed in a defensive mode and is rarely used offensively. For example, aggressive behaviours are often used to deter the opposing team when it has a viable scoring opportunity.

Table 3

Relationships Among Collective Efficacy (CE) and Normative Measures

Measure	1	2	3	4	5	6	7	8	9
1. CEAGG	-	.34	.48**	.21	.22	-.04	.08	.25	.23
2. CEOFF		--	.78**	.57**	.55***	.24	.25	.42***	-.21
3. CEDEF			--	.69**	.67***	.41**	.42***	.58***	-.16
4. CECOMM				--	.82***	.57***	.55***	.55***	-.11
5. CEMOTIV					--	.68***	.62***	.55***	-.09
6. CEKEY						--	.41**	.40**	-.22
7. CEOBST							--	.45***	-.17
8. CEGEN								--	.09
9. NORMS									--

Note: N = 46

The acronyms for the various measures are as follows:

CEAGG	- CE aggression	CEMOTIV	- CE motivation
CEOFF	- CE offense	CEKEY	- CE loss of key player
CEDEF	- CE defense	CEOBST	- CE team obstacles
CECOMM	- CE communication	CEGEN	- CE general issues
NORMS	- Normative perceptions of physically injurious behaviour		

* $p < .05$; ** $p < .01$; *** $p < .001$

With respect to the NORMS scale, negative correlations (range -.09 to -.21) are found with all the collective efficacy measures except for CEAGG ($r = .23$) and CEGEN ($r = .09$). These non-significant relationships could indicate that the NORMS scale is an independent construct. However, given the psychometric properties of the scale, further examination with a larger sample is warranted to see if any relationships do exist. The negative correlations can be accounted for by considering the distribution of the scores for each scale (appendix C). For example, the range of the distribution for the NORMS scale is from 2.5 to 100 whereas the

range for the majority of the collective efficacy scales is largely skewed to the right (i.e., ranging from 45 to 100), with the median values ranging from 82.5 (CEDEF) to 86.7 (CEKEY). Therefore, the distribution of the NORMS scale tends to be broad and decreasing while the collective efficacy scale distributions are skewed and increasing, thus resulting in negative correlations.

Summary and Conclusions

This preliminary study was conducted to develop and validate a measurement tool designed to assess ice hockey players' perceptions of the normative acceptability of physically injurious acts, and their collective efficacy in ice hockey. There are two important outcomes associated with the results of this study.

First, the measures developed were based on sound theoretical and empirical research. The conceptual definition of group norms, advanced by Carron (1988), provided the basis for the normative perceptions of physically injurious behaviours. The collective efficacy measures were based upon the conceptual definition of collective efficacy advanced by Zaccaro et al. (1995), and previous research in the sport of volleyball (Paskevich, 1995) and basketball (Dorsch et al., 1995a). In addition, as per the suggestions of Bar-Tal (1990), the constructs were (a) operationalized from a holistic measurement perspective which aggregated group members' beliefs regarding their group as a whole (i.e., "our team believes"), and (b) representative of a number of group processes, including coordinative and integrative functions. To further add to the validity of these measures, scale items were content validated by both experts and participants of the game of ice hockey. Subsequent to the content validation, statistical analyses revealed the scales to be reliable. Therefore, the existing measures have both

conceptual and statistical support for use in further examination of the relationships of these concepts with group performance.

Second, the scales most relevant to the following two studies of this dissertation were the two aggression-based measures, i.e., the normative perceptions of the acceptability of physically injurious behaviours and the collective confidence of a team in its ability to inflict physical harm on their opponent. The findings from this study show support for group-based perceptions of both measures. Furthermore, support exists for the finding that collective efficacy for aggression is related to, yet independent from, other aspects of group functioning.

In summary, the findings from this study fulfill the major purpose of this preliminary study. Specifically, group-based measures to assess perceptions of team aggressive behaviour were developed, and found to be psychometrically reliable and valid. Thus, further exploration of the relationships of these group-based perceptions to actual aggressive behaviour can continue with conceptually-based and statistically supported measures. The upcoming studies focus on these relationships.

Although a first step has been taken in the examination of group-based perceptions of aggressive behaviour, in order to further validate the measurement tool and the construct, the issue raised by Bar-Tal (1990) concerning the demonstration of agreement among group members with regard to the construct, needs to be addressed. Because this study only had a sample size of three teams, a statistical analysis which would demonstrate the amount of sharing in group members' perceptions was impossible. The procedure used for this type of analysis calculates the degree to which the variance in the measures can be attributed to the group. Then, further analyses are conducted which adjusts for individual and group level variation

(Kenny & LaVoie, 1985). This procedure is felt to be a necessary analysis, as a number of researchers (e.g., Florin, Giamartino, Kenny, & Wandersman, 1990; Klein, Dansereau, & Hall, 1994; Ostroff, 1993; Roberts, Hulin, & Rousseau, 1978) have reported that when the level of analysis (i.e., individual or group) does not correspond to the measurement of the construct of interest, false or incorrect conclusions may be made. Furthermore, Paskevich (1995) found that collective efficacy beliefs in the sport of volleyball were "shared" among athletes, thereby determining that a group level analysis was more appropriate than the customary individual level analysis. Thus, a further purpose of Study Two is to examine the amount of "sharing" that exists in the group-based perceptions of aggressive behaviour.

STUDY TWO

Group Aggressive Behaviour as a Determinant of Group-Based Perceptions of Aggressive Behaviour

Like any other behaviour, the consequences of aggressive behaviour are varied. Research has examined physical (i.e., injury, e.g., Katorji & Cohoon, 1992), psychological (i.e., outcome values, e.g., Boldizar, Perry, & Perry, 1989), or performance consequences (i.e., allstar selection, e.g., Widmeyer & Birch, 1979) of this behaviour for individuals. While the consequences of aggressive behaviour to the individual are obvious, there are also consequences to the group to which the individual belongs (i.e., the team). For the most part, research examining the consequences of aggression for the team has focused on this behaviour's relationship to the team's performance outcome (see Widmeyer, 1984 for a review). To date, there have been few, if any, examinations of the psychological consequences of team aggression. It is important to note that the aggressive actions of individuals within a team produce a collective team response regarding these actions which can have widespread and enduring effects (Bandura, 1973). Such a response, according to social cognitive theory (Bandura, 1986), would be the development of group-based cognitions or perceptions regarding aggressive behaviour. These internal cognitive factors (i.e., perceptions), in conjunction with behaviour and environmental events, operate as interacting determinants that influence one another bidirectionally.

While social cognitive theory was developed mainly to understand individual behaviour, it is recognized that people do not live their lives in isolation, but work together to produce the results they desire. Therefore, when participants are judging actions within a group, they are

not "plumbing an abstract group mind in which the members are detached from one another" (Bandura, 1997, p. 478). Rather, a collective cognition develops where perceptions become shared among members of the group. And, since aggressive behaviour is widely perceived as a useful strategy in the sport world (Widmeyer, 1984), the team performance of such behaviours should lead to collective perceptions of (a) the acceptability of such behaviours (i.e., group norms), and (b) the team's ability to execute these behaviours (i.e., collective efficacy).

With respect to normative perceptions, while Shields and Bredemeier (1995) propose that sport teams develop collective norms about appropriate behaviour, no studies have examined the relationship between aggressive behaviour and the development of such group norms. Shields, Bredemeier, Gardner, and Bostrom (1995) did find a relationship between perceived leadership behaviour, team cohesion, and group norms regarding cheating and aggression, however, their study did not include a measure of actual aggressive behaviour.

Similarly, while no studies have linked the performance of aggressive behaviour to collective efficacy perceptions, a number of studies both in the field (e.g., Kane, Marks, Zaccaro, & Blair, 1993; Lirgg, Feltz, & Chase, 1994; Paskevich, 1995) and in the laboratory (e.g., Hodges & Carron, 1992) have examined performance outcome as a determinant of collective efficacy. In each of these studies, successful previous behaviour, as measured by performance outcome, has led to higher perceptions of collective efficacy than unsuccessful performance outcome.

Thus, the primary purpose of this study is to examine the relationship between aggressive behaviour and two group-based perceptions of aggression. Specifically, aggressive behaviour will be examined as a determinant of a group's perceptions of (a) the acceptability of

physically injurious behaviours (i.e., group norms), and (b) their ability to successfully execute strategic aggressive behaviours (i.e., collective efficacy for aggression). Before this relationship can be examined, however, the need to establish the reliability and validity of the measures is essential.

The first study in this dissertation revealed promising psychometric results for the measurement of normative and collective efficacy perceptions. However, one issue that could not be addressed in that study, due to the small sample size, was the extent of agreement among members of the group regarding these perceptions (cf. Bar-Tal, 1990). Because the measurement of these perceptions was conceptually developed focusing on the group as a whole (Bandura, 1997; Zaccaro et al., 1995), any differences in these beliefs should be greater between groups than within groups. Indeed, within real groups (i.e., not contrived in the laboratory), there is significant task interdependence, communication, and motivation, among members of the group that would lead to perceptions of the group being shared (Zaccaro et al., 1995). These integrative aspects of real groups lead to an interesting dilemma when it comes to analyzing any data that are obtained from these groups. In fact, when real groups are studied, it must be acknowledged that non-independence of observations is a central realism (Carron, 1988; Kenny & LaVoie, 1985), and as such the statistical assumption of independent observations is violated.

Statistical "nonindependence" is not a new problem to social psychology research, and at least two solutions have been put forth to remedy this situation. The first proposes adherence to the independence assumption and, either (a) eliminate group influences by artificially creating independence in a laboratory setting, or (b) ignore interdependence altogether by focusing only

on individual level processes, thereby ignoring the group phenomenon altogether (Florin et al., 1990). The latter solution involves ignoring individual variability and analyzing the group response, thus violating the requisite statistical assumption. Neither of these solutions totally addresses the situation when studying group concepts.

Kenny and LaVoie (1985) propose another solution for the treatment of statistical nonindependence. Their proposal suggests that both individual level and group level variation can be useful in the analysis and interpretation of both individual and group level phenomena. They discuss a statistical procedure which removes the group effect from individual scores and the individual effect from group scores[1]. The basic premise of this procedure is that data can be examined from either the individual level or the group level while controlling for the other. The basis for the decision as to which analysis to choose is the extent of agreement among group members' responses, as identified by intraclass correlations.

The intraclass correlation is interpreted as the percentage of variance in the measure that is contributed by the group (Kenny & LaVoie, 1985). Positive intraclass correlations suggest that team members are more similar than non-team members. Previous research by Paskevich and colleagues (Dorsch, Paskevich, Brawley, & Widmeyer, 1996; Paskevich, Brawley, Dorsch, & Widmeyer, 1995; Paskevich, 1995) has utilized this analysis strategy to examine the extent of agreement among team members' perceptions of collective efficacy in the interactive sports of volleyball and ice hockey. Findings from these studies reveal collective efficacy perceptions to contain a significant degree of sharing, thus warranting group level analysis. Therefore, a

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[1]The reader is referred to Kenny and LaVoie, 1985, for a more detailed account of this procedure.

further purpose of this study is to examine the extent to which team members share their normative and collective efficacy perceptions regarding aggressive behaviour.

In addition to the examination of group perceptions of normative beliefs and collective efficacy for aggressive skills, this study includes the measurement of team aggressive behaviour. In order to measure this concept in ice hockey, many previous studies (e.g., Andrews, 1974; Dorsch, 1992, 1993; McGuire, 1990; Widmeyer & Birch, 1979, 1984) have used the total number of penalties accumulated by a team and/or individual. The critical aspect of using this method for the measurement of aggressive behaviour is to ensure that the behaviours are indeed "aggressive" (i.e., include the intent to injure). As such, a distinction between aggressive and non-aggressive penalties was made based upon that delineated by Widmeyer and McGuire (1997). The bulk of these penalties were empirically determined by Widmeyer and Birch (1978) through a method which involved the use of participants as active agents in determining which penalizable hockey actions were perceived as being intentionally physically harmful (i.e., aggressive). Based upon the recommendations of this past research, team aggressive behaviour was defined as being the number of penalties assessed per team per game for the actions of fighting, spearing, butt ending, high sticking, slashing, cross checking, instigating, roughing, boarding, charging, kneeing, elbowing, kicking, head butting, and checking from behind.

In summary, the purpose of this study is twofold. The ultimate goal is to examine the relationships between team aggressive behaviour and both (a) normative perceptions of physically injurious behaviours, and (b) collective efficacy for aggression. However, in order to further validate the measures of these group perceptions, the degree to which these concepts are shared must first be examined.

The data for this study were obtained from a larger study which was designed to examine collective efficacy, cohesion, and performance outcome in ice hockey. Thus, due to the assessment of group cohesion, an empirically established group-based measure, the opportunity arose to further concurrently validate the newly developed measures. Subsequently, while the examination of the relationships among cohesion and the aggression-based constructs is an interesting and worthwhile avenue to pursue, the cohesion measures will only be used to concurrently validate the normative and collective efficacy measures in this study.

Further, it is felt that since the aggression scales are specific to tasks utilized in ice hockey, the most meaningful relationships would be found with the task-related collective efficacy scales. As such, only the collective efficacy scales specifically related to ice hockey tasks (i.e., offense, defense, communication, and motivation) are reported.

Method

Participants and Design

Participants in this study included 389 male ice hockey athletes (mean age = 17.96 ± 1.43 years) representing 23 junior level teams during the 1994-1995 regular competitive season. On average, these athletes had spent 12.26 years (SD = 2.6 years) playing organized hockey and 1.50 years (SD = .92 years) playing for their current team. Thus, normative and collective efficacy beliefs should be well established for athletes of this caliber.

Because the primary purpose of this study was the observation of natural groups in a field setting, random assignment and controlled selection of participants was not possible. A correlational design was employed to determine the relationships between the performance of

aggressive behaviour and group-based perceptions of aggressive behaviour. However, the prospective nature of the measurement of these variables did allow for exploration of causal relationships. The mean number of athletes representing their team was 16.9 (SD = 3.8), with a low of 11 to a high of 22 members. Each team was represented by at least 50% of its members, thus ensuring a group belief.

Measures

A brief description of the normative and collective efficacy measures follows. For greater detail, refer to the description of measures in Study One. It should be noted, however, this study also includes the measure of team aggressive behaviour which is described in detail below.

Normative perceptions of physically injurious behaviours. This measure involved the assessment of an athlete's perceptions of the team's acceptability of engaging in physically injurious behaviours in ice hockey. Participants were asked to rate how often, in general, their team believed physically injuring an opponent was acceptable in various situations on a 0 ("Never acceptable") to 100 ("Always acceptable") scale. An item representative of this scale is "In general, our team believes it is acceptable (all right, okay) to attempt to physically harm (INJURE) opposing players in order to stop a scoring chance". The mean of the eight items included in this scale was calculated to give an overall perception of the normative acceptability of physically injurious behaviours (NORMS).

Collective efficacy measures. Participants were asked to rate their team's confidence in their ability to perform various aspects of the game of ice hockey on a 0 percent ("No confidence") to a 100 percent ("Complete confidence") scale. Each scale is described briefly

below.

1. Collective efficacy for aggressive skills. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to execute aggressive behaviour successfully. Thus, a representative item of this scale is "Generally speaking, our team's confidence in our ability to physically injure the other team is ___". The mean of this 4-item scale represented collective efficacy aggression (CEAGG).

2. Task collective efficacy. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to jointly perform certain ice hockey skills under game and practice conditions. Division of this scale into subcategories of offense (n items = 16) and defense (n items = 8) was undertaken for further analysis. A representative item of these two scales is "Generally speaking, our team's confidence in our ability to generate scoring opportunities while short-handed is ___". The mean of the 16 offense-related questions and the mean of the 8 defense-related questions formed the collective efficacy offense (CEOFF) and collective efficacy defense (CEDEF) scores respectively.

3. Communication collective efficacy. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to effectively communicate with team members and coaching staff during games and practices. A representative item in this scale is "Generally speaking, our team's confidence that we can effectively communicate to each other during a power play is ___". The mean of this 14-item scale represented communication collective efficacy (CECOMM).

4. Motivation collective efficacy. This scale assessed an athlete's perceptions of their team's confidence in the team's ability to either increase, remain, or become motivated during

games and practices. A representative item is "Generally speaking, our team's confidence that we don't give up if we are losing a game is ___". The mean of this 13-item scale represented motivation collective efficacy (CEMOTIV).

Group cohesion. The Group Environment Questionnaire (GEQ: Carron, Widmeyer, & Brawley, 1985) was used to measure cohesion. In total, the instrument contains 18 items. All responses are rated on a 1 ("Strongly Disagree") to 9 ("Strongly Agree") scale. The reliability of the GEQ has been well established in published literature with estimates of internal consistency ranging from .65 to .93 (Brawley, Carron, Widmeyer, & Spink, 1994). The GEQ is also recognized as a valid measure of group cohesion in the group dynamics literature (cf., Cota, Evans, Dion, Kilik, & Longman, 1995; Dion & Evans, 1992; Gully, Whitney, & Devine, 1993), as well as in the sport and physical activity literature (cf. Brawley, 1990; Widmeyer, Carron, & Brawley, 1993).

The GEQ measures four dimensions of team cohesion. These four scales revolve around two important distinctions -- individual versus group concerns, and task versus social concerns. Thus, the four scales are: Individual Attractions to the Group - Task (ATG-T), Individual Attractions to the Group - Social (ATG-S), Group Integration - Task (GI-T), and Group Integration - Social (GI-S). The two Individual Attraction to the Group scales focus the athlete on his/her attractions to both the team's task and social aspects. The two Group Integration scales focus the athlete on the team's coherence around its task and social activities.

Team aggressive behaviour. Based on past research in ice hockey (e.g., Dorsch, 1993; McGuire, 1990; Widmeyer & Birch, 1978; Widmeyer & McGuire, 1997) team aggressive behaviour was operationalized as being the number of penalties assessed per team per game for

the actions of fighting, spearing, butt ending, high sticking, slashing, cross checking, instigating, roughing, boarding, charging, kneeing, elbowing, and checking from behind.

Procedure

The president of the Ontario Hockey Association (OHA) gave permission to contact the general managers of teams in the Association. Requests to participate in a study "involving social psychological variables and performance in ice hockey" were subsequently sent to the general managers of 37 teams prior to their participation in the 1994-1995 regular season. Because the 23 teams who responded favourably to this request were spread across southern Ontario, a protocol was developed that had a team representative administer the questionnaire. This process included forwarding a package (appendix D) to each team's general manager containing (a) the collective efficacy and normative perceptions questionnaire (appendix A), (b) instructions of how and when to administer questionnaires, (c) players' instructions for filling out the questionnaire, and (d) courier instructions to ensure the return of the questionnaires to the investigator. Questionnaires were administered to all athletes on all teams within a 14-day time-frame.

The team representative was instructed to administer the questionnaire at a time neither immediately before or after a competition in order to avoid competition specific biases in responses. Assessments were made approximately eight weeks into the season after an average of 18 games (range 13 to 26). Administration of the questionnaires at this point in the season allowed for the development of initial perceptions of both normative and collective efficacy beliefs with respect to the athletes' current season.

Participants were ensured of the confidentiality of their responses by immediately sealing the completed questionnaire in a personal envelope provided by the researcher for this purpose. The general manager, coach, and peers were never able to see the athletes' responses. All questions were completed in a 20- to 30-minute time frame and the sealed envelopes were returned by courier at the investigator's expense. In order to facilitate return, teams which were one week late in responding were contacted via a facsimile or telephone reminder.

Performance and aggressive behaviour. At the end of the regular season, the OHA office was again contacted and game sheets for all of the participating teams were obtained. Game sheets provide an accurate breakdown of all performance-related behaviours (i.e., goals for and against, and all penalizable offences, including aggressive behaviours), which occur during a game. As such, these records provide researchers with a rich data base of behaviour, accurately recorded by trained individuals. Team win/loss records plus team aggressive behaviours were calculated for the first eight weeks of the season from these game sheets using the index of aggressive behaviour described earlier.

Results and Discussion

The results are presented in four sections. First, the descriptive statistics of the normative and collective efficacy measures are highlighted. Second, reliability analyses (i.e., internal consistencies) are reported for all of the scales. The third section deals with the validity of the measures by examining (a) bivariate correlations, and (b) intraclass correlations. Finally, the fourth section deals with the relationships between aggressive behaviour and group-based aggression perceptions. This study deals with a prospective hypothesis, thus, past aggressive behaviour is regressed upon the group-based normative and collective efficacy perceptions.

Descriptive Statistics

As can be seen in Table 4, the means for all the scales are slightly lower than those reported in Study One (range 61.38 to 83.89). This decrease in the strength of the perceptions can be, in part, explained through the wider range of skills and winning percentage of games observed for the teams involved in this second study. For example, the winning percentage of the teams involved in this study ranged from a low of 0% to a high of 88.89% (M = 49.5%), while the teams involved in the first study were all in post-season play and, thus, had winning percentages of well over 50%. These findings are similar to the results reported by Paskevich (1995) and Spink (1990a) who found teams who recorded higher levels of collective efficacy also demonstrated higher skill levels as measured by winning percentage.

Table 4

Descriptive Statistics of Normative and Collective Efficacy (CE) Measures

Measure	M	SD
NORMS	44.54	25.14
CEAGG	71.98	17.96
CEOFF	74.08	12.27
CEDEF	69.72	13.72
CECOMM	76.25	12.36
CEMOTIV	73.49	14.22

Note: N = 389

The acronyms for the various measures are as follows:

NORMS - Normative perceptions of physically injurious behaviour
CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

Scale Reliability

The Cronbach's alpha values are reported in Table 5. The normative and collective efficacy for aggression scales remain reliable, with alpha values of .85 and .86, respectively. The internal consistencies of the other collective efficacy scales are also at acceptable levels, ranging between .90 and .95.

Table 5

Internal Consistency of Normative and Collective Efficacy (CE) Measures

Measure	Number of Items	Cronbach's Alpha
NORMS	4	.85
CEAGG	4	.86
CEOFF	16	.94
CEDEF	8	.90
CECOMM	14	.94
CEMOTIV	13	.95

Note: N = 389

The acronyms for the various measures are as follows:

NORMS - Normative perceptions of physically injurious behaviour
CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

Validity of the Measures

Concurrent validity. Concurrent validation refers to the extent to which the new measures are related to alternative measures of the construct (Nunnally, 1978; Widmeyer et al., 1985). However, this type of validation can pose a problem if the other instruments purported to measure the construct are of poor quality, or they do not exist. The measures used in this study faced the latter dilemma.

It was felt that as there are no other group-based measures of normative perceptions or collective efficacy dealing with aggression as a tactic, an issue of primary importance to resolve was whether these two scales were distinct from the other aspects of collective efficacy (e.g., collective efficacy for offensive skills). Thus, the relationships among all the task-related collective efficacy scales were examined. Because all the measures are conceptually related in that they deal with collective perceptions, some degree of a relationship should be found (Indik, 1968; Ostorff, 1993). However, for the CEAGG and NORMS measures to demonstrate that they differ from other collective beliefs, they should not be highly correlated to the other measures.

The bivariate correlations presented in Table 6 show that, as expected, the CEAGG scale is significantly correlated ($p < .001$) with all the other collective efficacy scales. However, these correlations (range .56 to .61), are lower than most of the relationships among the other collective efficacy scales (range .80 to .88). Thus, as with the findings of Study One, support exists for the notion that, while it is an independent construct, CEAGG is somewhat related to other collective efficacy measures. Furthermore, the other task-related collective efficacy measures are all significantly related (range .82 to .88). This finding was not unexpected given the salience of the questions to the athletes and the meaningfulness of the team task skills and social processes which were identified during the instrument development.

Table 6

Relationships Among Collective Efficacy (CE) and Normative Measures

Measure	1	2	3	4	5	6
1. CEAGG	--	.61***	.60***	.56***	.57***	.20***
2. CEOFF		--	.88***	.80***	.83***	.06
3. CEDEF			--	.80***	.82***	.05
4. CECOMM				--	.82***	.03
5. CEMOTIV					--	.09
6. NORMS						--

Note: N = 389

The acronyms for the various measures are as follows:

CEAGG - CE aggression
CECOMM - CE communication
CEOFF - CE offense
CEMOTIV - CE motivation
CEDEF - CE defense
NORMS - Normative perceptions of physically injurious behaviour

*p < .05; **p < .01; ***p < .001

The relationship between NORMS and CEAGG is also statistically significant (r = .20, p < .001). Thus, it appears that perceptions of team confidence in aggressive skills are related to the acceptability of physically injurious behaviours. The positive, albeit non-significant relationships between the NORMS and the remaining collective efficacy scales indicate that no relationships exist between these group-based measures.

Beyond the relationships observed above, another aspect of concurrent validation of the collective efficacy and normative measures that could be examined is the relationship to other measures of group phenomenon (e.g., group cohesion). Given the notion that cohesion, collective efficacy, and normative perceptions of aggression are all group measures, a significant relationship should exist (Indik, 1968; Ostroff, 1993). However, because the normative and

collective efficacy measures reported in this study focus on specific physical skills and abilities that the team performs, only the relationships between these measures and the task-related aspects of group cohesion (i.e., ATG-T and GI-T) are examined. As can be seen from the results of the analyses presented in Table 7, the collective efficacy measures are significantly related to the task cohesion scales (r = .33 to .55, p < .001). This finding is similar to previous results observed in other sports whose groups (teams) require collective interaction (e.g., Dorsch, Widmeyer, Paskevich, & Brawley, 1995c; Paskevich, 1995; Paskevich, Brawley, Dorsch, & Widmeyer, 1996; Spink, 1990a).

Table 7

Relationships Between Task-related Cohesion and Collective Efficacy (CE) and Normative Measures

Measure	ATG-T	GI-T
CEAGG	.33***	.32***
CEOFF	.44***	.47***
CEDEF	.45***	.50***
CECOMM	.42***	.51***
CEMOTIV	.49***	.55***
NORMS	-.09	-.12*

Note: N = 389

The acronyms for the various measures are as follows:

ATG-T - Individual attractions to the group - Task
GI-T - Group integration - Task
CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation
NORMS - Normative perceptions of physically injurious behaviour

* p < .05; ** p < .01; *** p < .001

In examining the relationships between task cohesion and the NORMS measure, there was no evidence of a relationship for ATG-T and while, the negative relationship between NORMS and GI-T was significant, it was small. Thus, these two measures of group phenomena are not strongly related.

Construct validity. The construct validation of an instrument cannot be determined in a single study, rather, it is an ongoing process of verification of the instrument and its underlying theory (Paunonen, 1984). Therefore, a first step in the construct validation process is to attempt to validate the measure as an indicant of the construct under study. Consequently, because the normative and collective efficacy measures reflect shared beliefs, there is a need to demonstrate that responses reflect this sharing. It has been argued that interdependence among individual responses is a central facet of real groups (Carron, 1988) and that collective efficacy is not only influenced by actual conditions within the group, but also by how other group members perceive and convey their interpretations of these conditions to each other (Zaccaro et al., 1995). As such, in small group research, the simultaneous study of the individual and the group from a statistical viewpoint can be regarded as an exercise in construct validity (Cronbach & Meehl, 1955).

To further reflect shared beliefs, the construction of the normative and collective efficacy measures focused on giving participants the opportunity to respond to questions about what the entire group believed (cf. Bandura, 1986). This focus on sharing was accomplished by wording normative and collective efficacy questions such that perceptions were being captured from a team perspective (e.g., "Our team believes ..." and "Our team's confidence...").

The sharing of perceptions can be demonstrated empirically. This procedure involves the examination of the amount of sharing or "nonindependence" of group member responses by demonstrating that the perceptions of individuals within a group are more similar than the perceptions of individuals between groups. Thus, to examine the sharing of beliefs statistically, the intraclass correlation is used (Florin et al., 1990; Hays, 1973; Kenny & LaVoie, 1985; Myers, DiCecco, & Lorch, 1981). The intraclass correlation measures the extent to which within-group variability is small relative to between-group variability (Shavelson, 1988). When significant and positive intraclass correlations are obtained, data can be considered for analysis at the group level using group means (Kenny & LaVoie, 1985). By contrast, if the intraclass correlations are not significant, then the individual level of analysis can be considered as more appropriate as no significant degree of sharing of individual perceptions is observed (Kenny & LaVoie, 1985). However, when interpreting the significance of the intraclass correlation, Myers (1972) suggests that a more liberal level of .25 be applied, rather than arbitrarily using the conventional alpha level of .05. This suggestion is made because the more conservative alpha could result in the use of the incorrect level of analysis.

Previous work by Paskevich (1995) utilized this analysis strategy and group measurement protocol. In this study, the intraclass correlations for collective efficacy perceptions of similar group functions in another interactive sport were found to range from .28 to .42 ($p < .05$). Given the magnitude of these results and the evidence for shared beliefs demonstrated in this previous research, the application of the conventions described above were that (a) alpha was set at $p < .05$, (b) significant, intraclass correlations above .30 would be considered for group-level analysis, (c) significant intraclass correlations less than .30 would be

considered for both individual- and group-level analyses, and (d) non-significant intraclass correlations would be considered for individual-level analyses. The intraclass correlations for the collective efficacy and normative measures are shown in Table 8.

Table 8

Percent Group Variance in Normative and Collective Efficacy (CE) Measures

Measure	Intraclass r	F ratio (df 23, 372)	p
NORMS	.15	3.91	.0001
CEAGG	.44	14.12	.0001
CEOFF	.51	18.68	.0001
CEDEF	.48	16.43	.0001
CECOMM	.35	10.00	.0001
CEMOTIV	.50	17.57	.0001

Note: N = 23 teams

The acronyms for the various measures are as follows:

NORMS - Normative perceptions of physically injurious behaviour
CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

The .44 intraclass correlation for the CEAGG scale suggests that further analyses should be done at the group level. The remaining task-related collective efficacy scales also contain a significant amount of group level variation (range from .35 to .51)[2]. These findings are similar to the results found by Paskevich (1995) in the sport of volleyball.

[2]Because the values of the intraclass correlations for the collective efficacy scales are indicative of group level variation, the relationships among the five collective efficacy scales were computed adjusting for individual level variation. The results of these correlations are similar to the patterns discussed with respect to the bivariate correlations. As such they will not be discussed in text. See Appendix E for the computed group adjusted correlations for the CEAGG and other collective efficacy measures.

Upon initial examination of the NORMS scale, a significant ($p < .0001$), albeit low, intraclass correlation of .080 was calculated. While this value is statistically significant, Kenny and LaVoie (1985) caution researchers to examine the magnitude of the intraclass correlation. Because a low intraclass correlation was found for the NORMS scale it can be inferred that variance is present at both the individual and group levels, however, much more individual than group variance is present.

Due to the presence of both individual and group level variance in the normative measure, the content of this scale was re-examined. From the internal consistency analysis, the inter-item correlations of the eight original scale items suggested that four questions could be deleted from the scale. Conceptually, the four deleted questions were related, as they all dealt with defending either the goaltender, the player themselves, or other teammates, or performing an act in retaliation for something an opponent had done. As such, these items all dealt with aggressive behaviours that were prompted for protective purposes. The four items remaining in the scale deal with more overt tactically aggressive actions, e.g., harming an opponent to stop a scoring chance. As such, these items are more relevant to the major purpose of this thesis. The reduced scale was subjected to reliability (alpha = .85) and intraclass correlation analyses.

The intraclass correlation of the reduced NORMS scale remains low at .15, still suggesting that more individual than shared variation is elicited in response to this measure. Therefore, further analyses involving this scale needs to be done at both the individual and group level of analysis as per Kenny and LaVoie's (1985) suggestion.

Causal Relationship of Aggressive Behaviour to Group-based Aggression Perceptions

The prospective design of this study allows for the opportunity to test the hypothesized relationship whereby behavioural determinants of group-based aggression perceptions predict future shared beliefs about these constructs. Specifically, team aggressive behaviour, observed earlier in the season, was used to predict later group-based perceptions of aggressive behaviour (i.e., collective efficacy and normative perceptions). The analyses are computed using the computer program LEVEL (Kenny & Stigler, 1983).

The initial step in this procedure is the determination of the level of analysis by examination of the intraclass correlations. From the previous section it was determined that collective efficacy perceptions can be considered from the group level, while normative perceptions should be considered from both the individual and the group levels. Next, the LEVEL's program removes group effects from individual scores and individual effects from group scores, thereby portraying a clearer picture of actual individual and group effects.

As can be seen from the results of the regression analyses in Table 9, the aggressive behaviour (AB) as a determinant of CEAGG fell in the predicted positive direction, albeit to a modest degree ($R^2 = .06$, $N = 23$ teams). Specifically, the higher incidence of aggressive behaviour predicted future perceptions of collective efficacy for aggressive skills. Therefore, it seems that the enactive learning experiences of performing aggressive behaviour lead a team to believe in their collective competence to perform these behaviours (cf, Bandura, 1986, 1997; Zaccaro et al., 1995). However, it should be noted that because group-level correlations adjusted for individual variation are indirectly computed by the LEVEL's program, standard significance tests for the R^2 statistic are not valid (Kenny & LaVoie, 1985). Therefore, in order

to insure the results are meaningful, Cohen's (1992) conventions for effect size were considered post hoc. Because this finding would be considered to be a small effect size by Cohen's (1992) standards ($f^2 = .06$), caution must be exercised when interpreting this result.

Table 9

Prospective Analysis of the Relationship Between Aggressive Behaviour and Collective Efficacy for Aggression and Normative Perceptions of Physically Injurious Behaviours

		Unadjusted Individual[a]			Adjusted Group[b]	
Criterion	Predictor	β	R^2	p	β	R^2
CEAGG	AB				.24	.06
NORMS	AB	-.11	.01	.04	-.28	.08

NOTE: N individuals = 389. N teams = 23.

[a]Unadjusted Individual - Individual analysis ignoring group variation
[b]Adjusted Group - Group analysis controlling for individual variation
The acronyms for the various measures are as follows:
CEAGG - CE aggression AB - Aggressive behaviour
NORMS - Normative perceptions of physically injurious behaviour

With respect to the NORMS scale, the findings suggest that the group level analysis adjusted for individual variation accounts for a greater percentage of the variance ($R^2 = .08$, N = 23 teams, $f^2 = .09$) than the individual level analysis ($R^2 = .01$, N = 389 individuals, p = .04)[3]. This finding is perhaps not surprising, given that the questions posed in the scale were directed to the group, i.e., "In general, our team believes it is acceptable to ...". However, what was unexpected was the negative direction of this relationship. Indeed, one would expect

[3]The individual level of analysis adjusted for group variation could not be computed by the LEVEL program as the measure of aggressive behaviour was a team measure, subsequently, no individual variation was present.

that as more and more aggressive behaviours are performed, the normative perception of the acceptability of these behaviours should increase as well. However, the results and subsequent examination of the group means indicate that as aggressive behaviours decrease, normative perceptions increase.

In an attempt to shed more light on this finding, the behavioural measure of aggression was revisited. As mentioned previously, there is research (e.g., Dorsch, 1992, 1993; Dorsch et al., 1994; Mummendey et al, 1982) to suggest that some "aggressive" acts are more acceptable than others. Consequently, in order to obtain more meaningful comparisons among the aggression-based measures, it was decided to reduce the measure of aggressive behaviour to include only those acts which are deemed acceptable less than 50% of the time by professional hockey players (Dorsch et al., 1994). Thus, the revised aggressive behaviour measure includes only the penalized acts of kicking, spearing, head-butting, butt-ending, kneeing, checking from behind, high sticking, charging, boarding, slashing, elbowing, and cross-checking. Deleted from this index were the penalties assessed for fighting, roughing, and instigating. The mean number of aggressive behaviours with the original index was 7.86 ± 1.52 aggressive penalties per team per game. However, using the refined measure this mean fell to 3.58 ± .72 aggressive penalties per team per game. The results of the analyses using the reduced (i.e., unacceptable) aggressive behaviour measure (AB2) are reported in Table 10.

Table 10

Prospective Analysis of the Relationship Between Unacceptable Aggressive Behaviour and Collective Efficacy for Aggression and Normative Perceptions of Physically Injurious Behaviours

		Unadjusted Individual[a]			Adjusted Group[b]	
Criterion	Predictor	β	R^2	p	β	R^2
CEAGG	AB2				.21	.05
NORMS	AB2	.04	.002	.45	.10	.01

NOTE: N individuals = 389. N teams = 23.

[a]Unadjusted Individual - Individual analysis ignoring group variation
[b]Adjusted Group - Group analysis controlling for individual variation
The acronyms for the various measures are as follows:
CEAGG - CE aggression AB2 - Unacceptable aggressive behaviour
NORMS - Normative perceptions of physically injurious behaviour

With respect to the analysis of unacceptable aggressive behaviour predicting CEAGG, there is not a great deal of change between the variance accounted for using all aggressive behaviours ($R^2 = .06$, N = 23 teams, $f^2 = .06$) and the variance accounted for using only the unacceptable aggressive acts ($R^2 = .05$, N = 23 teams). While the latter result is considered a small effect size statistically ($f^2 = .05$), conceptually the finding does fall in line with Bandura's (1986, 1997) reasoning that prior performance leads to perceptions of collective efficacy.

Where the statistical differences do appear, is in the examination of the unacceptable aggressive behaviour relationship with the NORMS measure. Previously with the entire aggressive behaviour index, the variance accounted for in the group level analysis was 8%. However, when the behavioural index is reduced to include only the unacceptable aggressive

behaviours, this relationship is eliminated ($R^2 = .01$, $\underline{N} = 23$ teams, $f^2 = .01$). This drastic reduction in the amount of variance accounted for begs the question, "What behaviours are predicting normative perceptions?".

Another analysis was therefore, conducted using the acceptable aggressive behaviours deleted from the overall aggressive behaviour index (i.e., fighting, instigating, and roughing). This group-level analysis adjusted for individual variation revealed that the acceptable aggressive behaviours accounted for approximately 17% of the variance in the normative perceptions ($\beta = -3.29$, $R^2 = .17$, $N = 23$ teams, $f^2 = .20$). This negative relationship may be due a number of factors. For example, one might speculate that the performance of aggressive behaviours may reach a critical level beyond which the acceptability of these behaviours decreases, or that because a team reputation has been built based upon their past aggressive behaviour, then, teams may no longer need to perform these behaviours. Nonetheless, while this finding is intriguing, the explanation lies beyond the scope of this study.

The "bottom-line" with respect to the NORMS measure, is that it seems that (a) the group level analysis accounts for more variance than the individual unadjusted level analysis, and (b) those aggressive behaviours identified as being acceptable less than 50% of the time are not strong predictors of future perceptions of the acceptability of aggressive behaviours.

Summary and Conclusions

This study represents a first attempt to explore the relationships among group-based perceptions of aggressive behaviour and actual aggressive behaviour. Specifically, the purpose of this study was twofold. The first purpose was to validate the normative and collective efficacy measures by examining the degree of "sharing" which existed among group members'

perceptions, and the second objective was to explore the performance of aggressive behaviour as a determinant of these group-based measures.

Scale Validation

The first purpose was examined by building upon the issues of measuring group-based perceptions formulated by previous researchers (e.g., Bandura, 1997; Bar-Tal, 1990; Carron, 1988; Florin et al., 1990; Kenny & LaVoie, 1985; Paskevich, 1995; Zaccaro et al, 1995). Following the suggestions of these researchers, the items in the inventories were operationalized revolving around the sharing of perceptions. The choice of this holistic group measurement subsequently leads to the statistical issue of nonindependence of responses as each team member's response is influenced by their membership in the group. Hence, the further validation of these scales revolved around examining the degree to which these perceptions are shared.

With a solid foundation coming from social cognitive theory (Bandura, 1986), the collective efficacy for aggressive skills and other collective efficacy measures, were subjected to psychometric examination. The results of this examination show the scale measuring perceptions of the team's confidence in their ability to successfully execute aggressive skills to (a) be psychometrically reliable, (b) be related to, yet somewhat independent of other task-related collective efficacy measures, (c) be related to another group phenomenon (i.e., group cohesion), and (d) contain a significant degree of group variation (i.e., shared beliefs). In summary, it can be concluded that, as assessed, the collective efficacy for aggression scale is a psychometrically sound measure of group-based perceptions of a team's confidence to successfully execute aggressive behaviours.

With respect to the measure of normative perceptions of physically injurious behaviours, the findings are not supportive. Indeed, the data do not indicate a group-based measure of normative perceptions. In other words, individuals are not responding to the normative questions in the same shared way as they are to the collective efficacy measures.

This result raises two issues. First, one can ask if the construct was measured at all. Although group norms were operationalized to indicate the sharing of beliefs, the conceptual basis is somewhat less developed for this construct than for collective efficacy. Whereas the development of the collective efficacy measures drew from a vast amount of theoretical and empirical literature, the norms measure did not have this base to rely upon. However, the same procedures were used in the development of each of the measures, albeit successfully in the case of collective efficacy. Thus, due to these findings, the validity of the normative measure needs to be questioned.

The fact that similar procedures were used to develop each of the measures, with evidence for group perceptions existing in one (i.e., collective efficacy), and no evidence of shared beliefs in the other (i.e., norms), leads one to question if there is, in reality, a shared normative perception. If we choose to accept the statistical evidence presented in this study, then we would conclude that the perceptions of the acceptability of physically injurious behaviours are not influenced by group membership.

On the other hand, if we choose to believe in the existence of shared normative perceptions, then we must assume that the measurement procedure buried any evidence of this sharing. If we take a step back and look at the performance of aggressive behaviour as a tactic in the sport of ice hockey, the nature of this task is such that a hockey team can be successful

without using this strategy. The question becomes whether the team chooses to accept the use of tactical aggression or not. As such, the acceptability of physically injurious behaviours may be a norm of a group rather than of the entire subculture of ice hockey such that only a few teams hold this perception. In either case, the matter needs to be pursued further in future studies.

Determinants-Based Relationship

According to social cognitive theory (Bandura, 1986) a relationship should exist between group aggression and group-based perceptions of this behaviour. Many studies have shown that prior performance is, indeed, one of the strongest antecedents to perceptions of collective efficacy (see Bandura, 1997 for a review). The prospective design of this study allowed for the examination of the causal relationship of aggressive behaviour to group perceptions of such behaviour. The results of these analyses, however, do not support the hypothesis that the performance of aggressive behaviour leads to perceptions of (a) collective efficacy to execute aggressive skills, or (b) normative acceptability of physically injurious behaviours.

While this finding does not conform to the proposed relationships set out by social cognitive theory, Bandura (1986) states that in some instances it may take time for a causal factor to exert its influence. In addition, it has been suggested that prior performance patterns must be fairly consistent in order for perceptions of collective confidence to be developed (Zaccaro et al., 1995). Indeed, a steady pattern of success or failure is more likely to lead to stable perceptions of competence than is a performance pattern of mixed success and failure. Such may be the case with the normative perceptions as well.

Once again, if we take a look at aggressive behaviour in ice hockey, the successful performance of such behaviours may be dependent upon many factors external to the team instigating these behaviours. For example, the enforcement of the rules by the officials may vary between or even within games, or the oppositions' ability with respect to their execution of aggressive tactics (i.e., tough or weak teams) all may lead to a mixed pattern of overt success or failure at performing these behaviours. Subsequently, the mixture of these successes and failures may result in conflicting perceptions of collective competence and normative acceptance of aggressive behaviour.

Notwithstanding the inability to find a causal relationship between aggressive behaviour and the group-based perceptions of aggression, the "bottom-line" of this study is that there is a collective perception revolving around the use of aggression as a skill which is distinct from other task-related skills in the sport of ice hockey. On the other hand, although the measurement of normative perceptions was conceived of and developed with the same procedures as the measurement of collective efficacy perceptions, there is little evidence to support a group-based measure for these normative beliefs.

While this study found little evidence for aggressive behaviour as a determinant of group-based perceptions of aggression, the prospective design of Study Three allows for a further test of this hypothesized relationship at a later point in the competitive season. Also, because social cognitive theory argues for a reciprocally deterministic relationship to exist between perceptions of collective efficacy and behaviour, the prospective nature of Study Three allows this reciprocality to be tested as well. Specifically, a further purpose of Study Three is to explore whether collective efficacy for aggression leads to collective aggression.

STUDY THREE

Group Aggressive Behaviour as a Consequence of Group-Based Perceptions of Aggressive Behaviour

"When you have King Kong on your bench, all your chimpanzees play like gorillas." Even though this adage may sound facetious, it does in fact contain a fair degree of truth, particularly when discussing collective aggressive behaviour in sports such as ice hockey. For example, Bandura (1997) suggests that when a key function for group success is performed by a highly efficacious individual (i.e., King Kong), members will have a higher opinion of their group's capability than of their own individual capabilities. As such, one or more individuals highly efficacious in their aggressive skills (i.e., "goons") in ice hockey, may heighten their team's collective efficacy to use aggression as a strategy. Further, the stronger the beliefs group members hold about their collective capabilities for various group behaviours, including strategic aggression, the more likely they are to perform these behaviours.

The contribution of perceived collective efficacy to group performance has been empirically tested in multiple contexts, including schools, organizations, and sport teams (e.g., Dorsch et al., 1995a; Feltz et al., 1988; Gibson et al., 1996; Hodges & Carron, 1992; Lirgg et al., 1994; Parker, 1994; Paskevich, 1995; Prussia & Kinicki, 1996; Silver & Bufanio, 1996; Spink, 1990a; Whitney, 1994). Although the methodology utilized by these researchers is diverse, all agree that collective efficacy perceptions are highly correlated with subsequent task performance.

While most of the above stated studies recognize collective efficacy as a group-level phenomenon, two also utilized the group as the statistical unit of analysis (Paskevich, 1995;

Prussia & Kinicki, 1996). For example, Paskevich (1995) in a study of 23 university volleyball teams, examined the relationship of collective efficacy perceptions and performance outcome, as measured by winning percentage. Using the group as the unit of analysis, he discovered that when team collective efficacy scores were controlled for individual variation, a greater percentage of the variation in performance was accounted for than when the team mean of individual scores was used. The findings of this study suggest that the relationship between collective efficacy perceptions and performance outcome could be underestimated if individual variation is not controlled for in the group measure.

Prussia and Kinicki (1996), also used the group as the unit of analysis in their laboratory exploration of brainstorming behaviours. The purpose of their study was to extend social cognitive theory to the group level by examining the relationships among collective efficacy, group goals, group affect, and group effectiveness. They, too, discovered that the variation in these group measures was largely due to between groups covariance, thus, the analyses were conducted at the group level. In addition, as a function of these analyses, they also discovered a significant relationship between collective efficacy perceptions and group effectiveness. Together, the results of these two studies suggest that (a) group-level analyses should be conducted when examining collective efficacy relationships, and (b) there should be a strong relationship between collective efficacy perceptions and subsequent group performance or performance outcome. These suggestions agree with the recommendations made by Kenny and LaVoie (1985) for the use of the group as the unit of analysis.

For the most part, the purpose of the studies reviewed was to examine if a group's performance or performance outcome would be related to varying levels of collective efficacy.

However, Steiner (1972) states that "among the many possible patterns of collective action that may be employed to meet a given need, some are likely to be much more productive than others and a few may be utterly dysfunctional" (p. 3). The performance of a negative behaviour, such as aggression, falls into the latter (i.e., dysfunctional) categorization. Thus, the primary purpose of the present study is to examine the relationship between a sport team's (i.e., ice hockey) collective confidence in their ability to use aggressive behaviour as a strategy and the subsequent performance of these aggressive behaviours from a group-level perspective.

However, as previously argued, the relationship between collective efficacy perceptions and aggressive behaviour should be reciprocal (cf, Bandura, 1986; Spink, 1990b; Zaccaro et al., 1995). While little evidence for the causal link between aggressive behaviour and collective efficacy perceptions for aggressive skills was found in the previous study, it was argued that, it may take time for the causal factor to exert its influence. Subsequently, a secondary purpose of this study is to explore, once again, the causal influence of aggressive behaviour on perceptions of collective efficacy for aggression at a later time point in the competitive season.

The data to examine the reciprocality of this relationship were obtained as part of a larger, prospective study designed to examine collective efficacy, cohesion, and performance outcome in ice hockey. Because, collective efficacy for aggression is a specific task-related measure of collective efficacy in ice hockey, it was felt that the strongest relationships would exist between this measure and the other specific, task-related collective efficacy measures. Subsequently, only the collective efficacy scales for offense, defense, communication, and motivation are reported in this study.

Method

Participants and Study Design

Participants in this study included 196 players representing 12 junior hockey teams during the 1994-95 regular competitive season. The mean number of athletes per team who completed the questionnaire was 16.33 (SD = 4.23), with a low of 11 respondents to a high of 21 respondents. Each team was represented by over 50% of its members, thus ensuring a representative group belief. Because this study was conducted in the field where observation of natural groups was part of the purpose, random assignment and controlled selection of participants was not possible.

The study design was prospective in nature to allow for the examination of the relationship between collective efficacy for aggressive behaviour and actual aggressive behaviour by the group. Thus, participants were assessed at two separate time periods, each after approximately eight weeks of competition (i.e., at 8 weeks and at 16 weeks). This measurement procedure allows for the study of temporal changes in the form and extent of the relationships being investigated (Brawley, 1990; Moreland & Levine, 1988; Paskevich, 1995). Researchers have successfully used this design and sampling procedure in the past to examine temporal change (e.g., Brawley, Carron, & Widmeyer, 1993; Paskevich, 1995).

Measures

A brief description of the measures used in this study follows. For greater detail about each of these measures, refer to the description in Study One.

Collective efficacy measures. Participants were asked to rate their team's confidence in their ability to perform various aspects of the game of ice hockey on a 0 percent ("No

confidence") to a 100 percent ("Complete confidence") scale. Each scale is described briefly below.

1. Collective efficacy for aggressive skills. This scale assessed an athlete's perceptions of the team's confidence in the team's ability to use aggressive behaviour as a tactic. Thus, a representative item of this scale is "Generally speaking, our team's confidence in our ability to physically injure the other team is ___". The mean of this four-item scale represented collective efficacy for aggression (CEAGG).

2. Task collective efficacy. This scale assessed an athlete's perceptions of the team's confidence in the team's ability to coordinate and perform certain ice hockey skills under game and practice conditions. Division of this scale into subcategories of offense (n items = 14) and defense (n items = 7) was undertaken for further analysis. Based upon the internal consistency analysis, two items were removed from the offense scale and one item was removed from the defense scale. Cronbach's alpha values for the revised scales were at acceptable levels (.96 and .88 respectively). A representative item of these two scales is "Generally speaking, our team's confidence in our ability to generate scoring opportunities while short-handed is ___". The mean of the sixteen offense-related questions and the mean of the eight defense-related questions formed the collective efficacy offense (CEOFF) and collective efficacy defense (CEDEF) measures, respectively.

3. Communication collective efficacy. This scale assessed an athlete's perceptions of the team's confidence in the team's ability to effectively communicate with team members and coaching staff during games and practices. A representative item in this scale is "Generally speaking, our team's confidence that we can effectively communicate to each other during a

power play is ___". Based upon the internal consistency analysis, four items were deleted leaving ten items in this scale (Cronbach's alpha = .96). Their mean represented communication collective efficacy (CECOMM).

4. Motivation collective efficacy. This scale assessed an athlete's perceptions of the team's confidence in its ability to either increase, remain, or become motivated during games and practices. A representative item is "Generally speaking, our team's confidence that we don't give up if we are losing a game is ___". Based on the internal consistency analysis, three items were deleted leaving a total of ten items in this scale (Cronbach's alpha = .94) and their mean represented motivation collective efficacy (CEMOTIV).

Team aggressive behaviour. Based on past research in ice hockey (e.g., Dorsch, 1993; McGuire, 1990; Widmeyer & Birch, 1978; Widmeyer & McGuire, 1997) team aggressive behaviours were operationalized as being the number of penalties assessed per team per game for the actions of fighting, spearing, butt ending, high sticking, slashing, cross checking, instigating, roughing, boarding, charging, kneeing, elbowing, and checking from behind. However, in a survey of professional ice hockey athletes, Dorsch et al. (1994) discovered that the penalties for fighting, instigating, and roughing, were perceived as being acceptable over fifty percent of the time. Because the actual "aggressiveness" (i.e., intent to harm) of these actions in questionable, these three penalties were removed from the index of aggressive behaviour.

The Time 1 unacceptable aggressive behaviour measure was calculated as the mean number of aggressive penalties per game during the weeks prior to the first assessment period. The Time 2 measure was calculated for the games played between the two questionnaire

assessments (i.e., for the eight weeks between assessment time 1 and assessment time 2).

Procedure

At the beginning of the season, permission for the conduct of the study was obtained from the Ontario Hockey Association. Requests to participate in a study involving social psychological variables and performance were sent to the general managers of 37 junior hockey teams across southern Ontario. Because of the large area over which these teams were spread, a protocol was developed which included forwarding a package (appendix D) to each team's general manager containing (a) the collective efficacy questionnaire (appendix A), (b) instructions of how and when to administer the questionnaire, (c) players' instructions for filling out the questionnaire, and (d) courier instructions to ensure the return of the questionnaires to the investigator. Questionnaires were administered to all athletes on all teams within a 14-day time-frame. It was stressed to the general manager that the questionnaire should not be administered at a time either immediately before or after a competition in order to avoid competition specific biases in responses.

Participants were ensured of the confidentiality of their responses by immediately sealing the completed questionnaire in a personal envelope provided by the researcher for this purpose. The general manager, coach, and peers were never able to see the athletes' responses. All questions were completed in a 20- to 30-minute time frame and the sealed envelopes were returned by courier at the investigator's expense. In order to enhance the rate of return, teams which were one week late in responding were contacted via a facsimile or telephone reminder.

The first assessment (N individuals = 389; N teams = 23) was completed approximately eight weeks into the competitive season. At this time, teams had played an average of 18 games

(SD = 4.33 games). After an eight week interval, the 23 teams that had participated in the first assessment period were sent a letter thanking them for their participation in the first part of this study and encouraging them to continue their participation (appendix F). Accompanying this letter was the assessment package containing the questionnaires and instructions for their administration. Administration procedures were the same as those for the first assessment period. The choice of these seasonal time points ensured that group processes had been in operation for a period of time. Therefore, some stability of group properties was assured (i.e., motivational base, role and status relationships, and efficacy perceptions). The time necessary to encourage regular member interaction and group stability was planned to allow for the development of group-based perceptions (cf, Zaccaro et al., 1995).

Twelve teams consisting of 196 athletes, completed the second questionnaire assessment. During the eight-week interval, the 12 teams played an average of 14.3 games (SD = 3.8 games). The prospective design allowed for the examination of concurrent, as well as prospective relationships among the variables. The concurrent analyses were computed on the entire Time 2 sample (N = 12 teams).

Dealing with missing data. As is the case with most prospective designs, the issue of how to deal with missing data at the second time period needs to be addressed. Therefore, in order to conduct the prospective analyses, the Time 1 and Time 2 data sets were matched using the key variable of Team. The participants who completed the questionnaire at Time 2 were the same as those involved at Time 1, however, if an individual member of a team failed to complete the second assessment, team means for each scale were entered to keep the number of responses per team equal. If, for example, at Time 1 twenty members of Team A completed the

questionnaire while only nineteen members completed the Time 2 assessment, then the Time 2 scale means would be entered for the twentieth individual at Time 2. It could be argued that if more than 25% of the individual data within a team were missing at Time 2, then the team response would not be adequately represented. Thus, in order to assure a common representation of a team's beliefs from Time 1 and Time 2, any team missing 25% or more individual responses was deleted from further analysis. Subsequently, three teams were deleted, leaving a total of 9 teams and 155 individuals for the prospective analyses. Team means were entered for ten individuals at Time 2 (5.1% of the final subject pool total) spread over six teams.

Results and Discussion

The results are presented in four sections. The first section presents the descriptive statistics of the collective efficacy measures. The second section highlights the reliability (i.e., internal consistencies) of the scales at Time 2. The third section discusses the validity (i.e., bivariate and intraclass correlations) at the Time 2 assessment period. Finally, in the fourth section, the relationships between the group-based collective efficacy for aggression perceptions and aggressive behaviour are examined.

Descriptive Statistics

The means and standard deviations for the collective efficacy measures at the first and second assessment times are illustrated in Table 11. The means at Time 2 are comparable to those at Time 1, although time 2 means are slightly higher. The mean winning percentage of the teams involved in the second assessment (M = 54.6%, SD = 25.80%) was similar to that obtained at Time 1 (M = 49.5%, SD = 26.00%).

Table 11

Descriptive Statistics of Time 1 and Time 2 Collective Efficacy (CE) Measures

	Time 1		Time 2	
Measure	M	SD	M	SD
CEAGG	71.98	17.96	77.02	16.24
CEOFF	74.08	12.27	76.27	13.55
CEDEF	69.72	13.72	72.60	13.64
CECOMM	76.25	12.36	78.50	14.16
CEMOTIV	73.49	14.22	77.00	14.89

Note: Time 1 N = 389. Time 2 N = 196.

The acronyms for the various collective efficacy (CE) measures are as follows:

CEAGG	- CE aggression	CECOMM	- CE communication
CEOFF	- CE offense	CEMOTIV	- CE motivation
CEDEF	- CE defense		

Scale Reliability

Based upon the internal consistency analyses of Time 1, the collective efficacy scales were revised for the Time 2 assessment. Subsequently, reliability analyses were conducted on these revised scales and the Cronbach's alpha values are reported in Table 12. Similar to the results reported in Study Two, the CEAGG scale remains reliable, with an alpha value of .87 (Study Two alpha = .86). The internal consistencies of the other collective efficacy measures are also at acceptable levels, ranging between .88 and .96 (Study Two range from .90 to .95).

Table 12

Internal Consistency of Time 2 Collective Efficacy (CE) Measures

Measure	Number of Items	Cronbach's Alpha
CEAGG	4	.87
CEOFF	14	.96
CEDEF	7	.88
CECOMM	10	.96
CEMOTIV	10	.94

Note: N = 196

The acronyms for the various collective efficacy (CE) measures are as follows:

CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

Validity of the Measures

Concurrent validity. The results of the bivariate correlations among the collective efficacy measures are consistent with those reported in Study Two, and as a result, are not reported in the text (see appendix G). For example, in the present study, the bivariate correlations range from .62 to .88. These relationships are comparable to the range of the correlations presented in Study Two (r's = .56 to .88). Taken together, the findings from these two studies support the assertion that, with few exceptions, CEAGG perceptions are related to, yet independent from, other perceptions of task-related collective efficacy.

Construct validity. The intraclass correlations (ICC) for all the measures taken at Time 2 (N = 12 teams) are shown in Table 13. The CEAGG scale (ICC = .39) and the rest of the collective efficacy scales show significant, positive values (range .44 to .51), thus suggesting a

strong degree of group-level variation[4] (i.e., shared collective efficacy beliefs).

Table 13

Percent Group Variance in Time 2 Collective Efficacy (CE) Measures

Measure	Intraclass r	F ratio (df 23, 372)	p
CEAGG	.39	11.26	.0001
CEOFF	.51	18.04	.0001
CEDEF	.49	16.27	.0001
CECOMM	.45	14.11	.0001
CEMOTIV	.47	15.40	.0001

Note: N = 12 teams

The acronyms for the various collective efficacy (CE) measures are as follows:

CEAGG	- CE aggression	CECOMM	- CE communication
CEOFF	- CE offense	CEMOTIV	- CE motivation
CEDEF	- CE defense		

In order to determine if the collective efficacy beliefs continued to be shared for the nine teams (i.e., Time 1/Time 2 sample), the intraclass correlations were again computed for the Time 1 measures (appendix H). The intraclass correlation of the CEAGG scale remains indicative of group-level variation (ICC = .31). The intraclass correlations for the remainder of the collective efficacy scales also remained at significant levels (ICCs = .28 to .50), meeting the criterion level reflective of the sharing of beliefs among team members.

The strong, positive intraclass correlations of the CEAGG scale at both Time 1 and

[4]Because the values of the intraclass correlations for the collective efficacy scales are indicative of group level variation, the relationships among the five collective efficacy scales were computed adjusting for individual level variation. The results of these correlations are similar to the patterns discussed with respect to the bivariate correlations presented in this study, and results from Study Two. As such they will not be discussed in text. See Appendix G for the computed group adjusted correlations for the CEAGG and other collective efficacy measures.

Time 2, suggest that there is a belief, shared among members of the team, about the team's ability to perform these behaviours. Thus, analyses should proceed using the group as the unit examined. Since perceptions of CEAGG are shared at Time 1 (ICC = .44) and at Time 2 (ICC = .39), it is probable that Time 1 perceptions of CEAGG should predict the same perceptions at Time 2. Using the group as the unit of analysis, the results of the regression adjusting for group variation provide evidence for this prediction ($\beta = .56$, $R^2 = .31$, $\underline{N} = 9$ teams). It should be noted that because group-level correlations adjusted for individual variation are indirectly computed by the LEVEL's program, standard significance tests for the R^2 statistic are not valid (Kenny & LaVoie, 1985). Therefore, in order to insure the results are meaningful, Cohen's (1992) conventions for effect size were considered post hoc. According to these conventions when R^2 is the index, a large effect size is found ($f^2 = .45$). Thus, this finding supports the idea that the CEAGG construct represents beliefs which are shared by fellow team members and that these shared beliefs are related over time.

Causal Relationship of Collective Efficacy for Aggression to Aggressive Behaviour

The prospective nature of this study's design afforded the opportunity to examine the causal relationship between the group-based collective efficacy for aggression perceptions (CEAGG) and actual future unacceptable aggressive behaviour. The results of the multiple regression using the group as the unit of analysis show CEAGG accounts for 41% ($\beta = .64$, $R^2 = .41$, $\underline{N} = 9$ teams, $f^2 = .69$) of the variance in unacceptable aggressive behaviour. This positive relationship confirmed that shared beliefs about performance of the team's aggressive behaviour predicts future performance of these team behaviours. This finding is in agreement with the tenets of social cognitive theory (Bandura, 1986) and the suggestions of other group

theorists (e.g., Zaccaro et al., 1995) that perceptions of collective competence influence future performance. The large effect size insures that this result can be considered meaningful statistically, as well as conceptually.

Measurement error. The results discussed above show that collective perceptions of competence for aggressive skills predicted future aggressive behaviour. However, an alternative hypothesis could be proposed by arguing that this relationship exists solely due to the way these constructs were measured (i.e., Collective efficacy: What are your team's views of their skills and abilities; Aggressive Behaviour: The number of aggressive penalties per team). More specifically, it could be argued that a large portion of the group effect obtained in the regression analysis may have occurred for methodological reasons (i.e., measurement effect) rather than being reflective of a true group phenomenon.

In order to determine if measurement error was a plausible rival hypothesis for the findings described above, a procedure outlined by Kenny and LaVoie (1985) was conducted which examined the amount of measurement error. In this procedure, the slopes obtained from the regression analyses at the individual level (unadjusted for group variation) and the group level (adjusted for individual variation) are divided by the reliability of the CEAGG measure at each level respectively. This procedure is referred to as "disattenuation for measurement error". If measurement error was responsible for the findings, disattenuation of the resulting slopes would show a marked decrease in the magnitude of the effect when the results from these analyses are compared. As can be seen from the results of this procedure presented in Table 14, a strong group effect is clearly evident after controlling for measurement error as the group adjusted slope remains over three times larger than the individual slope. Thus, the strong

relationship found between CEAGG and unacceptable aggressive behaviour is mainly due to the presence of a group phenomenon.

Table 14

Measurement Error Analysis: Collective Efficacy for Aggression (Time 1) Predicting Unacceptable Aggressive Behaviour (Time 2)

Level of Analysis	Slope	Reliability	Slope Corrected for Disattenuation
Individual Unadjusted	.0143	.850	.0168
Group Adjusted	.0493	.887	.0556

Note: N = 9 teams

Other collective efficacy perceptions. Similarly, it could be argued that if the collective perceptions of other team skills, e.g., offense or communication, were to predict aggressive behaviour, then perhaps the results of this study are due mainly to the measurement of the concepts from a group perspective, rather than to the conceptualization of the CEAGG scale. Subsequently, the remaining Time 1 collective efficacy scales were regressed upon Time 2 aggressive behaviour (appendix I). The results of these analyses show that individually, the other collective efficacy scales account for a low of 10% (CEDEF) to a high of 19% (CEMOTIV) of the variance in unacceptable aggressive behaviour. Also, the relationship of each of the other four task-related collective efficacy scales to aggressive behaviour is negative. All these results are smaller and in the opposite direction of the CEAGG - unacceptable aggressive behaviour relationship (variance accounted = 41%). This finding provides further evidence refuting the idea that the results are due to the methodological protocol. Therefore, it

can be concluded that the relationship of collective perceptions for the successful execution of aggressive skills is unique in its relationship to the performance of unacceptable team aggression.

Causal Relationship of Aggressive Behaviour to Collective Efficacy for Aggression

It has just been shown that perceptions of CEAGG do predict the future performance of unacceptable aggressive behaviour ($R^2 = 41\%$). According to social cognitive theory (cf. Bandura, 1986), the reciprocal relationship (i.e., unacceptable aggressive behaviour predicting CEAGG) may also occur. In Study Two the prior performance of unacceptable aggressive behaviours by the team was not strongly related to perceptions of CEAGG. However, the lack of such a relationship may have been due to an inadequate length of time for a causal influence to emerge. Due to the prospective nature of the present analysis, the hypothesis that prior performance of unacceptable team aggression leads to perceptions of CEAGG was explored at a later point in the competitive season.

In order to test the hypothesis that unacceptable team aggression leads to CEAGG, Time 2 unacceptable aggressive behaviour was regressed upon Time 2 CEAGG perceptions. Because this analysis was conducted on the variables measured at Time 2, the entire sample pool (i.e., $\underline{N} = 12$ teams) was used. Similar to the results of Study Two, a weak relationship was detected between unacceptable aggressive behaviour and CEAGG ($\beta = .18$, $R^2 = .03$, $\underline{N} = 12$ teams, $f^2 = .03$). Thus, while CEAGG perceptions do predict future unacceptable aggressive behaviour, the reciprocal analyses suggest that prior performance of unacceptable aggressive behaviour by the team has limited relationship to future perceptions of the team's ability to execute tactical aggressive behaviours. Thus, at least for this data, there is not strong

evidence for a reciprocal relationship between these two constructs.

This result raises a question about alternate determinants of CEAGG perceptions. Past research examining aggression in ice hockey (e.g., Colburn 1985, 1986) suggests that the aggressive behaviours previously defined as acceptable (i.e., fighting, instigating, and roughing) are viewed by ice hockey athletes as a means of control rather than as a means of intentional physical harm-doing. It may be that these acceptable aggressive behaviours are used in a strategic manner. Hence, the prior performance of acceptable aggressive behaviour may possibly lead to perceptions of CEAGG. Therefore, this causal relationship was examined using only the acceptable aggressive behaviours as the predictor variable. The result was that acceptable aggressive behaviours were found to be highly predictive of CEAGG perceptions ($\beta = .63$, $R^2 = .39$, $N = 12$ teams, $f^2 = .65$). Therefore, it can be concluded that prior team performance of acceptable aggressive behaviour (i.e., fighting, roughing, and instigating) predicts a team's perceptions of their collective efficacy to execute aggressive behaviour strategically. This finding suggests that it is the team's view of its use of fighting behaviours that help to determine the team's perception of its ability to execute strategic aggression, rather than other more potentially injurious actions.

Summary and Conclusions

The primary purpose of this study was to examine the relationship between perceptions of collective efficacy for strategic aggression and the performance of team aggressive behaviour. The findings support the relationship proposed by social cognitive theory, in that a team's perceptions of collective efficacy for their aggressive skills were predictive of future unacceptable aggressive behaviour. Hence, the more confidence a team has in their collective

ability to use aggression as a strategy, the more likely they are to perform unacceptable aggressive behaviours. While this finding supports the theoretical relationship, the tenets of social cognitive theory state that a reciprocal relationship should exist between the group's behaviour and the social cognitions of the group (i.e., their collective efficacy). This claim would suggest that since a team's collective perceptions of their ability to execute strategic aggressive behaviours is predictive of future unacceptable aggressive behaviours, then, as these relationships are reciprocally determined, the opposite relationship should exist as well.

It was discovered that a key factor in the examination of the reciprocal relationship between team aggressive behaviour and collective efficacy perceptions for aggressive skills was the players' views regarding what is or is not aggressive behaviour. Thus, when the relationship examining the determinants of collective efficacy for aggression perceptions was explored, it was revealed that the player-defined acceptable aggressive behaviours predicted future collective efficacy for aggression perceptions. Therefore, it seems that the team's performance of fighting and related behaviours (i.e., instigating and roughing) determines the team's shared beliefs of collective efficacy for strategic aggressive skills.

Taken together, the findings reported in the above paragraphs are supportive of the notion of reciprocal determinism as discussed within social cognitive theory (cf. Bandura, 1986). Indeed, reciprocality is supported in the sense that aggressive behaviour is linked bidirectionally with collective efficacy perceptions for aggressive skills. Very simply then, perceptions of collective efficacy for strategic aggression skills are determined by team mastery experiences of player-defined acceptable aggressive behaviour. Once these shared beliefs about strategic aggression are developed, the present data suggest these beliefs are able to predict

future unacceptable aggressive acts.

Two other important conclusions regarding collective efficacy for aggression can also be advanced at this time. First, both the intraclass correlational analyses and the measurement error analysis point to collective efficacy for aggression as truly a group-based perception. The former analyses show that a significant degree of sharing exists in the measure. This finding confirms that teammates' are more similar in their perceptions of their team's ability to successfully execute aggressive skills than are non teammates. Further, the measurement error analysis rules out possible methodological explanations for any findings, showing that the relationships between these shared perceptions reflect a true group phenomenon. Hence, collective efficacy for aggression can be considered a group perception related to the group's ability to successfully execute strategic aggression.

Second, it can be concluded that the collective efficacy for aggressive skills measure is independent from other task-related collective efficacy perceptions in ice hockey. This conclusion is based on the statistical evidence provided from the correlational analyses conducted at the individual and group levels, and the regression analyses using the four other task-related collective efficacy scales. The bivariate correlations examining the relationships among the five collective efficacy measures demonstrate that collective efficacy for aggressive skills is related to the other task-related collective efficacy scales. However, the magnitude of these relationships suggest that only 38 to 49% of the variance is shared among the task-related collective efficacy constructs. Subsequently, the remaining 62 to 51% of the variance is due to other factors. Thus, some degree of independence exists for the collective efficacy for aggression scale. Further, when each of the task-related collective efficacy scales were

examined with respect to predicting future unacceptable aggressive behaviours, the only strong determinant of such behaviour was the collective efficacy for aggression scale. Taken together, these two findings suggest that collective efficacy for aggressive skills is indeed, an independent and unique factor when examining collective efficacy and aggressive behaviour in ice hockey.

In summary, based upon the findings of this study, it can be said that a team's collective perceptions of its ability to execute aggressive behaviours are (a) predictive of future unacceptable aggressive behaviours, (b) determined by previous acceptable aggressive behaviours, (c) unique from, but related to, other perceptions of task-related group functioning, and (d) group based. Thus, as a first attempt to examine aggressive behaviour using the group as the unit of analysis, the results of this study are extremely promising. Indeed, this study has identified the shared perception of tactical aggression as another aspect of collective efficacy in the sport of ice hockey.

General Discussion

Summary

The study of aggressive behaviour has been conducted for many years, with the majority of this research focusing on the aggressive behaviour of individuals. However, most social psychological researchers would readily admit that an individual's behaviour is highly influenced by their membership in groups. While many group-related variables and perceptions may impact upon aggressive behaviour, the studies reported in this dissertation focused on the examination of two group-based perceptions and their relationship to team aggressive behaviour. Specifically, it was hypothesized that team aggressive behaviour would be related to (a) how acceptable the team believed aggression to be (i.e., group norms), and (b) how confident the team was in its ability to successfully execute aggressive behaviour that strategically influenced team performance (i.e., collective efficacy for aggressive skills). The overall objective of the three studies reported was to examine the relationships among these group-based variables and group aggressive behaviour in a team sport (i.e., ice hockey).

In Study One a reliable and valid instrument to measure the group-based normative and collective efficacy perceptions was developed. Both a theoretical and empirical foundation provided the basis from which to begin instrument development. These guidelines, along with the active participation of ice hockey experts and athletes in the development of the instrument, resulted in a measure that (a) operationalized the constructs from a group perspective, by examining group members' beliefs about their group as a whole, (b) was multi-dimensional, in that it represented a number of independent coordinative and integrative ice hockey team functions, including the two aggression-based beliefs (i.e., norms and collective efficacy for

aggression skills), and (c) demonstrated strong psychometric properties.

The reliability and validity analyses undertaken in Study One were a necessary first step in order to be able to continue with the examination of the relationships among the group-based aggression measures and actual aggressive behaviour in Study Two. However, as the normative and collective efficacy perceptions were both operationalized as an aggregate of the group's beliefs as a whole, it was necessary to show that these beliefs were indeed reflective of a group-based measurement. Positive intraclass correlations for both the normative and collective efficacy for aggressive skills measures indicated that these perceptions did indeed contain a certain degree of sharing among group members' responses (cf. Kenny & LaVoie, 1985). However, the low intraclass correlation obtained for the normative perceptions revealed that both individual and group level variation were present in this measure. By contrast, the relatively large intraclass correlation obtained for the collective efficacy for aggression perceptions indicated the presence of mainly group-level variance revealing that beliefs were shared by team members. Thus, even though the same conceptual arguments were made in the development of both the normative and collective efficacy measures, individuals did not respond to these constructs in the same shared manner. Consequently, the true group nature of the normative measure was questioned. On the other hand, the statistical evidence provided strong support for group-based perceptions of collective efficacy.

Once the extent of sharing within the aggression-based perceptions was determined, the appropriate level for further statistical analysis was ascertained (i.e., whether to use the individual or the group as the unit of analysis). Given the statistical criteria employed through the intraclass correlational analyses (Kenny & LaVoie, 1985; Paskevich, 1995), the relationship

between aggressive behaviour and normative perceptions was examined at both the individual and the group level of analysis. The relationship between aggressive behaviour and collective efficacy perceptions was, however, examined at the group level only.

While the hypothesis that prior performance of aggressive behaviour predicts (i.e., is a determinant) both normative perceptions and collective efficacy for aggressive skills was based on strong theoretical and empirical justifications, these relationships did not emerge at this point in the competitive season. However, the prospective design of Study Three allowed for the re-examination of these relationships at a later point in the competitive season.

In Study Three, the causal relationships described in Study Two were (a) re-examined, and (b) examined in their reciprocal form (i.e., collective efficacy perceptions as a determinant of team aggressive behaviour). Because it could not be demonstrated that the normative measure was group-based, subsequent testing with this variable was not warranted. Results of these analyses show that perceptions of collective efficacy for strategic aggression are (a) predictive of future unacceptable team aggressive behaviours, (b) predicted by previous acceptable team aggressive behaviours, (c) related to, yet independent of, other task-related collective efficacy scales, and (d) group-based. Taken together, the results of this study are supportive of (a) the reciprocal deterministic relationship proposed by social cognitive theory, and (b) the findings of Study Two, which found collective efficacy perceptions for strategic aggression to be a group-based and somewhat independent aspect of collective efficacy in ice hockey.

Conclusions

The primary purpose of the three studies previously described was to examine aggressive behaviour from a group perspective. Based on the results, three major conclusions can be reached.

First, there is evidence to suggest that group-based perceptions of collective efficacy for strategic aggression exist as a related yet unique aspect of team functioning in ice hockey. Specifically, the magnitude of these collective efficacy perceptions was shown to be strong -- similar, in fact, to perceptions of team confidence for the more traditional offensive and defensive ice hockey skills. This finding suggests that teams do have a collective perception of their competence for executing strategic aggressive behaviours. Further, this perception was shown to be (a) related to other aspects of group functioning, (b) predictive of future unacceptable aggressive behaviours, and (c) predicted by previous acceptable aggressive behaviours. Thus, as a first attempt to examine aggressive behaviour using the group as the unit of analysis, these initial findings are encouraging.

Second, these studies are part of a growing literature (e.g., Paskevich, 1995; Prussia & Kinicki, 1996) designed to extend the tenets of social cognitive theory to the group level. While other studies in this body of literature examine relations to positive behaviours (i.e., performance outcome), the present studies are the first in sport to examine the performance of negative behaviours (i.e., aggression). Further some support was found for the reciprocality of the aggressive behaviour - collective efficacy relationship. Thus, a starting point has been established from which future examinations of these theoretically hypothesized relationships can emerge.

Finally, the need to examine the correspondence between the operational definition of the constructs and the level of statistical analysis was demonstrated. Both the normative and collective efficacy concepts were operationally defined using an aggregate of team members' beliefs. The statistical evidence empirically confirmed that the collective efficacy beliefs were shared, thereby reflective of the group-based nature of the construct. Subsequent statistical analyses were, therefore, conducted using the group as the unit of analysis. This procedure has implications for the development of group-related theories and data collection strategies revolving around group-based concepts.

Implications for Theory

As just stated, the level of statistical analysis (i.e., individual or group) has strong implications for the development and construct validation of group-related concepts. The theoretical/conceptual implications for the three major concepts examined in the present studies (i.e., collective efficacy, group norms, and aggressive behaviour) are discussed below.

Collective efficacy. As collective efficacy is an aspect of the larger social cognitive theory (cf. Bandura, 1986), implications of the results can be advanced for both the theory itself and also for the collective efficacy construct. With respect to social cognitive theory, as said in the previous section, these studies extended the theoretical tenets to the group level. Thus, while previous research has shown the existence of a reciprocal relationship between collective efficacy and positive group behaviours, the present studies show support for this theoretical relationship with respect to negative group behaviours.

In regards to the construct of collective efficacy, three further implications can be advanced. First, within the conceptual definition of collective efficacy advanced by Zaccaro et

al. (1995) the notion of shared beliefs is central. The findings from the present studies confirm via intraclass correlational analyses and measurement error analyses that a truly shared perception exists. Second, the concept of collective efficacy for aggression skills as a unique aspect of group functioning in ice hockey was demonstrated through bivariate correlations at both the individual and group levels of analysis. It was also demonstrated in Study Three that collective efficacy perceptions for aggressive skills were unique in their contribution to the performance of unacceptable aggressive behaviours when compared to the independent contributions of the other task-related collective efficacy scales. While further analyses are needed to confirm the true multidimensional nature of collective efficacy perceptions in ice hockey, the present research has begun this process. These preliminary findings regarding the multidimensionality of collective efficacy are similar to the results found by Paskevich (1995) and Dorsch et al. (1995a). The combination of similar findings in three different interactive sports (ice hockey, volleyball, and basketball) suggest some generality of the collective efficacy construct within interactive sports.

In conclusion, Bandura (1997) states that "the greatest progress can be made in explaining the development, decline, and restoration of collective efficacy, and how it affects group functioning, if multifaceted measures of perceived collective efficacy are tied to valid indices of group performance." (p. 478). The studies of this dissertation attempted to achieve this goal by examining a specific aspect of group functioning (i.e., collective efficacy for aggression skills) and tying it to the group performance of aggressive behaviour.

Group norms. Similar to the definition of collective efficacy, the conceptual definition of group norms emphasizes the sharing of beliefs (cf. Carron, 1988). Indeed, it can be argued

that both collective efficacy beliefs and group norms are more than just the simple summation of their individual psychological counterparts (i.e., self-efficacy and attitudes). The main implication for the theoretical advancement of group norms lies in the statistical protocol and technique (Kenny & LaVoie, 1985; Paskevich, 1995) utilized in this dissertation. Using this technique, the results obtained from Study Two do suggest the presence of group level variation in the normative measure. However, no conclusive statements can be made regarding the true group nature of this concept as individual variation was present as well. Thus, the statistical procedure is important when defining norms as reflective of the group as a whole and subsequent statistical analysis using the group as the unit of analysis. Recommendations for future measurement and research issues are discussed in the following section.

Aggressive behaviour. An underlying argument in the present research was that theories which attempt to explain individual aggression are insufficient to explain the causes, development, or functions of collective aggression (Groebel & Hinde, 1989). The three studies outlined are the first known attempt to explore the determinants and consequences of collective aggressive behaviour. Perhaps the most important finding is that of the existence of a group-based perception of collective efficacy for aggressive skills. The discovery of this unique and independent aspect of group functioning shows that teams actually do have a collective belief regarding the team's strategic aggressive behaviour. Further, it is interesting to note that when the behavioural aggression index was delineated into those aggressive behaviours players themselves defined as acceptable and unacceptable, the relationships with the collective beliefs were altered. Therefore, it seems necessary to involve participants as active agents in the research process (cf. Sherif & Sherif, 1969) when defining aggressive behaviours. In

conclusion, as a first attempt to examine aggressive behaviour from a group perspective, it can be said that group perceptions exist revolving around this behaviour and this area definitely should be explored further.

Future Directions

As an initial attempt to examine aggressive behaviour from a group perspective, the three studies of this dissertation reveal promising avenues for future research. Recommendations regarding both measurement and research issues will be discussed.

Measurement Issues

Collective efficacy for aggressive skills. Even though it was shown that the measurement of this aspect of ice hockey team functioning was valid and reliable, one must wonder if there are items not contained in this scale that may strengthen the relationship between aggressive behaviour and collective efficacy perceptions. Perhaps with the assistance of ice hockey experts, items which deal with specific aggressive strategies could be identified to enhance the predictive validity of this scale.

Normative perceptions. The individual variability in the normative perceptions of aggressive behaviour should not be a surprise, as it has been suggested by previous researchers that perceptions of aggression, like beauty, are in the eye of the beholder (e.g., Dorsch & Widmeyer, 1996). Thus, even within a social subculture like ice hockey which condones and even encourages aggressive behaviour, the acceptability of such behaviour is subject to immense variation. Whether or not the acceptability of this behaviour is retained as a group belief may depend upon a multitude of other factors. For example, the development of a group norm regarding aggressive behaviour may, in part, be influenced by the social context within the

subculture (i.e., level of competitive hockey -- professional vs minor leagues), the extent to which individuals identify with their specific team, or the extent to which the team chooses to use aggression as a tactic. Further, perhaps the relationship between group norms and aggression needs to be examined from another direction. For example, it could be that aggression norms influence behaviours other than the performance of aggression, e.g., communication, self- and/or team presentation, etc. Thus, before this construct is abandoned with respect to the study of aggressive behaviour, further exploration is warranted.

Another avenue for future research regarding group norms is to re-examine the operational definition of normative beliefs. The measurement tactic used in the present research revolved around the acceptability of aggressive behaviours. Conceptually, however, group norms were defined as standards for behaviour which become expected by group members (Carron, 1988). The question which follows from this discussion is "are expected behaviours necessarily expected?" Thus, the challenge for future research is to attempt to determine if expectations for group behaviour are similar to the acceptability of a group's behaviour.

Aggressive behaviour. Just as recommendations can be made to improve the measurement of the perceptions related to aggression, there are also recommendations for the improvement of the behavioural index. An initial attempt to refine the aggressive behaviour index was done, whereby, aggressive behaviours were delineated into those considered acceptable and unacceptable by ice hockey athletes. Even though this refinement succeeded in clarifying some of the theoretical relationships, it can further be questioned whether some aggressive behaviours are used strategically at all. Thus, there is a further need to ascertain which aggressive behaviours are used strategically. Furthermore, because perceptions of

aggressive behaviour are highly influenced by contextual factors, a need remains to identify those actions which are defined as aggressive by players within various levels of competitive hockey.

In addition, it could be questioned whether the index of team aggression actually captured a group behaviour. For example, two teams could receive 100 aggressive penalties per season. However, on one team, 20 players may receive 5 aggressive penalties each, whereas on the other team, 5 players could have received 20 penalties each. This hypothetical distribution may have an impact on group-based perceptions of aggressive behaviour. For example, the team which has a greater number of players performing aggressively may have a stronger collective perception of their ability to execute these strategies. Thus, it is recommended that individual variation in aggressive behaviour be examined with respect to group perceptions of aggression as well.

Research Issues

This dissertation attempted to examine aggressive behaviour from a group perspective. The results provided an encouraging start to this line of research, opening a plethora of avenues to pursue in future studies.

The most probable reason for the lack of support for a few of the hypothesized relationships is that not all teams choose to accept and use aggressive behaviour strategically because it is not a necessary tactic in order to achieve success in the sport of ice hockey. Thus, in future, if the question is to isolate aggressive behaviour as a tactic, then research should attempt to isolate those teams which accept and use this behaviour as a strategy for successful performance in ice hockey. Then, through a structured observational study, the hypothesized

relationships can be examined with these extreme cases.

A further issue to consider arises from a study by Widmeyer and Birch (1984). They demonstrated that aggressive behaviour is often used as a strategy early in a contest. Consequently, examination of temporal issues in the execution of aggressive behaviour needs to be addressed as well.

In any event, the further examination of aggressive behaviour from a group perspective needs to take heed of the recommendations of previous group researchers (e.g., Hodges & Carron, 1992; Paskevich, 1995) and study these behaviours with real groups through the use of prospective designs. As many group-based variables are dynamic and may change in their form and extent over time, the only way to truly understand the influence of group perceptions on the performance of aggressive behaviour is to examine these relationships via these methods.

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APPENDIX A

Sample Questionnaire

NOTE:

1. The acronym following each item on the sample questionnaire details the scale to which the item belongs.
   - The acronyms of the various measures are as follows:

OUTEXP	Outcome expectations

Collective Efficacy (CE) measures:

CEOFF	CE offense	CEMOTIV	CE motivation
CEDEF	CE defense	CEKEY	CE loss of key player
CEAGG	CE aggression	CEOBST	CE team obstacles
CECOMM	CE communication	CEGEN	CE general issues

Normative perceptions (NORMS) measures:

NORMINJ	NORMS of physically injurious behaviours	NORMINT	NORMS of psychologically intimidating behaviours

Group Cohesion measures:

ATGS	Individual attractions to group - social	GIS	Group integration - social
ATGT	Individual attractions to group - task	GIT	Group integration - task

2. The following items were deleted from the normative (NORMS) scale in Study Two and Study Three

In general , our team believes it is acceptable (all right, okay) to attempt to physically harm (INJURE) opposing players: in order to defend onself
in order to defend our goaltender
in order to defend other teammates
in retaliation for something they've done

3. The following items were deleted from their respective collective efficacy (CE) scales in Study Three.

CEOFF	1. our ability to pass the puck accurately to a moving target is 2. our ability to pass the puck accurately to a stationary target is
CEDEF	1. our ability to reduce our goals against is
CECOMM	1. we can effectively communicate during a 2 on 1 offensive rush is 2. we can effectively communicate during a 2 on 1 defending an attack is 3. Our team's confidence that we can effectively let our teammates know when a penalty is over is 4. Our team's confidence that we can effectively communicate to our goalie that a penalty is being called on the other team is
CEMOTIV	1. Our team's confidence that in our games we outwork other teams is 2. Our team's confidence that we continue to play hard even if poor calls are made against us by the referee is 3. Our team's confidence that in our practices we outskate other teams is
CEOBST	1. our team's confidence in our ability to deal with probing questions by spectators and media is 2. our team's confidence in our ability to deal with frequent differences of opinion among starers and non-starters is
CEGEN	1. Our team's confidence that when we're on the road we won't violate any of the team rules (i.e., breaking curfews) is 2. Our team's confidence that we can openly discuss any problems that occur within our team is

4. The final 18 items of the sample questionnaire comprise the Group Environment Questionnaire (GEQ; cf. Carron, Widmeyer, & Brawley, 1985).
   - The GEQ was included only in the Study Two and Study Three questionnaire package.
   - The scale questions marked with an "R" after the scale name are reverse-scored..

ATHLETE COLLECTIVE EFFICACY QUESTIONNAIRE - HOCKEY

KIM D. DORSCH
LAWRENCE R. BRAWLEY
W. NEIL WIDMEYER

UNIVERSITY OF WATERLOO (WATERLOO, CANADA)

This questionnaire is designed to assess your team's confidence in the team's ability to perform a number of skills necessary for successful performance. There are no right or wrong answers so please give your immediate reaction. Some of the questions may seem repetitive but please answer ALL questions. Your honest responses are very important to us.

Your responses will be kept in strictest confidence (neither your coach nor anyone other than the researchers will see your responses). You have been asked to indicate your name so that we can match your information on this questionnaire with that of two future questionnaires.

This study has the approval of:

- Sport Canada
- Ontario Hockey Association
- Canadian Hockey Association
- Office of Human Research, University of Waterloo

Team Name: _____ Date: _____

Name: _____ Age: _____

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BACKGROUND INFORMATION

When data collection is complete, each player will be assigned a numerical code and your name will be removed in order to respect your privacy.

A. Usual playing position (60% of the time):
forward / defense / goaltender

B. Number of years played on this team: ____ years

C. Usually, are you (circle one):

first line / second line / third line / fourth line / starting goaltender / back-up goaltender

D. Number of years you have played organized hockey:

_____ years

ATHLETE COLLECTIVE EFFICACY AND COHESION QUESTIONNAIRE

Please answer about **your team's confidence** in the team's skills with respect to the following questions. Please **rate the strength** of the **team's confidence** using the percentage scale below. Place the appropriate confidence value in the space to the right of each statement. **Use the 100 percent scale** to estimate your answer with respect to the **next two months of your season.**

0	10	20	30	40	50	60	70	80	90	100
No Confidence										Complete Confidence

Generally speaking:	Confidence	Scale
Our team's confidence that we will:		
win all of our regular season games is	_____	OUTEXP
win three-quarters of our regular season games is	_____	OUTEXP
win half of our regular seasons games is	_____	OUTEXP
win one-quarter of our regular season games is	_____	OUTEXP
lose all of our regular season games is	_____	OUTEXP
win our games that go into overtime is	_____	OUTEXP

Generally speaking, our team's confidence in:	Confidence	Scale
our ability to pass the puck accurately to a moving target is	_____	CEOFF
our ability to pass the puck accurately to a stationary target is	_____	CEOFF
our ability to pass the puck accurately on a backhand is	_____	CEOFF
our ability to pass the puck accurately on a forehand is	_____	CEOFF
our ability to skate faster than other teams is	_____	CEOFF
our ability to stickhandle around opponents is	_____	CEOFF
our ability to reduce our goals against is	_____	CEDEF
our ability to increase our goals for is	_____	CEOFF
our ability to increase scoring opportunities is	_____	CEOFF

Generally speaking, our team's confidence in:	Confidence	Scale
our forechecking ability is	_____	CEOFF
our backchecking ability is	_____	CEDEF
our ability to intimidate the other team is	_____	CEAGG
our ability to physically injure the other team is	_____	CEAGG
our ability to fight is	_____	CEAGG
our ability to be a hard-hitting team is	_____	CEAGG
our ability to protect our goaltender is	_____	CEAGG
our ability to control the puck in the corners is	_____	CEOFF
our ability to clear the puck out of the defensive zone is	_____	CEDEF
our ability to control offensive zone faceoffs is	_____	CEOFF
our ability to control defensive zone faceoffs is	_____	CEDEF
our ability to break-out of our defensive zone at even strength is	_____	CEDEF
our ability to break-out of our defensive zone on a power play is	_____	CEDEF
our ability to attack the offensive zone at even strength is	_____	CEOFF
our ability to generate scoring opportunities while short-handed is	_____	CEOFF
our ability to set up in the offensive zone on a power play is	_____	CEOFF
our ability to generate scoring opportunities on a power play is	_____	CEOFF
our ability to change lines on the fly is	_____	CEOFF
our ability to play the box in our defensive zone in a penalty killing situation is	_____	CEDEF
our ability to prevent other teams from entering our defensive zone during a penalty killing situation is	_____	CEDEF

Generally speaking, our team's confidence that **during the next two months** of our regular season **we** can effectively communicate to each other:

	Confidence	Scale
on the ice is	_____	CECOMM
on the bench is	_____	CECOMM
in the dressing room is	_____	CECOMM
during a defensive zone break-out is	_____	CECOMM
during a power play is	_____	CECOMM
during a penalty killing situation is	_____	CECOMM
during a 2 on 1 offensive rush is	_____	CECOMM
during a 3 on 2 offensive rush is	_____	CECOMM
during a 2 on 1, defending an attack is	_____	CECOMM
during a 3 on 2, defending an attack is	_____	CECOMM
during defensive zone coverage is	_____	CECOMM

Generally speaking,

Our team's confidence that we can effectively let our teammates know when a penalty is over is	_____	CECOMM
Our team's confidence that we can effectively communicate to our goalie that a penalty is being called on the other team is	_____	CECOMM
Our team's confidence that during practices we can effectively communicate to each other on the ice is	_____	CECOMM
Our team's confidence that in our games we outwork other teams is	_____	CEMOTIV
Our team's confidence that in our games we outskate other teams is	_____	CEMOTIV
Our team's confidence that during games everyone will give 100% (i.e., no matter what) is	_____	CEMOTIV

Generally speaking,	Confidence	Scale
Our team's confidence that we don't give up if we are losing a game is	_____	CEMOTIV
Our team's confidence that we continue to play hard when we are winning our games is	_____	CEMOTIV
Our team's confidence in our ability to dig the puck out of the corners during games is	_____	CEMOTIV
Our team's confidence in our ability to attack the other team's net is	_____	CEMOTIV
Our team's confidence that we continue to play hard even if poor calls are made against us by the referee is	_____	CEMOTIV
Our team's confidence that we can get to the puck first when we play a dump offense is	_____	CEMOTIV
Our team's confidence that we always finish any bodychecks is	_____	CEMOTIV
Our team's confidence that in our practices we outwork other teams is	_____	CEMOTIV
Our team's confidence that in our practices we outskate other teams is	_____	CEMOTIV
Our team's confidence that the team as a whole will give 100% during practices (i.e., not dog it during certain drills) is	_____	CEMOTIV

There are times during the season when a key player on our team will be out for a few games because of an injury, illness, or suspension. Regardless of our team's desire to win these games, **our team's confidence** that we can still perform at the same level of play without:

our best forward is	_____	CEKEY
our best defenseman is	_____	CEKEY
our best goalie is	_____	CEKEY

Generally speaking, **during the next two months** of our season, **our team's confidence** in **our** ability to deal with:

	Confidence	Scale
embarrassment about poor game play is	_____	CEOBST
the fatigue of road trips is	_____	CEOBST
an unsuccessful record of game play is	_____	CEOBST
probing questions by spectators and media is	_____	CEOBST
mediocre refereeing is	_____	CEOBST
the coaching staff is	_____	CEOBST
frequent differences of opinion among team members is	_____	CEOBST
frequent differences of opinion among the starters and non-starters is	_____	CEOBST
dissatisfaction with progress in practices is	_____	CEOBST
pressures of a highly successful record of game play (i.e., ranked highly) is	_____	CEOBST
presenting a responsible team image is	_____	CEOBST

Generally speaking,

Our team's confidence that our coaches can communicate an effective game plan to us is	_____	CEGEN
Our team's confidence that our coaches can effectively communicate to us on the bench during a game is	_____	CEGEN
Our team's confidence that our coaches can effectively communicate to us during practices is	_____	CEGEN
Our team's confidence that our coaches can effectively communicate to us between periods is	_____	CEGEN
Our team's confidence that all our players are aware of and satisfied with their role is	_____	CEGEN

Generally speaking,	Confidence	Scale
Our team's confidence that when we're on the road we won't violate any of the team rules (i.e., breaking curfew) is	_____	CEGEN
Our team's confidence that we have set realistic goals is	_____	CEGEN
Our team's confidence that we can openly discuss any problems that occur within our team is	_____	CEGEN

Please answer the following questions with respect to **your team's beliefs** regarding the **acceptability** of the following acts. Use the 100% scale below to estimate your response as to how often each act is considered acceptable.

0	10	20	30	40	50	60	70	80	90	100
Never Acceptable					Acceptable 50% of the time					Always Acceptable

The first set of questions deal with your team's beliefs of the acceptability of physically injuring opponents.

In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players	____% of the time	NORMINJ
In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players in order to stop a scoring chance	____% of the time	NORMINJ
In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players in order to defend oneself	____% of the time	NORMINJ
In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players in order to defend our goaltender	____% of the time	NORMINJ
In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players in order to defend other teammates	____% of the time	NORMINJ

In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players in retaliation for something they've done	____% of the time	NORMINJ
In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players if we are frustrated	____% of the time	NORMINJ
In general, our team believes it is acceptable (all right, okay) to attempt to **physically harm (INJURE)** opposing players if they are among our opponents' best players	____% of the time	NORMINJ

The next set of questions deal with **your team's beliefs of the acceptability of physically or verbally intimidating opponents**. Please use the following scale.

0	10	20	30	40	50	60	70	80	90	100
Never Acceptable					Acceptable 50% of the time					Always Acceptable

In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players	____% of the time	NORMINT
In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players in order to stop a scoring chance	____% of the time	NORMINT
In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players in order to defend oneself	____% of the time	NORMINT
In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players in order to defend our goaltender	____% of the time	NORMINT

In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players in order to defend other teammates	____% of the time	NORMINT
In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players in retaliation for something they've done	____% of the time	NORMINT
In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players if we are frustrated	____% of the time	NORMINT
In general, our team believes it is acceptable (all right, okay) to attempt to **verbally or physically intimidate (FRIGHTEN)** opposing players if they are among our opponents' best players	____% of the time	NORMINT

The following questions are designed to assess **your feelings** about **YOUR PERSONAL INVOLVEMENT** with this team. Please CIRCLE a number from 1 to 9 to indicate your level of agreement with each of the statements.

I do not enjoy being a part of the social activities of this team. (ATGS)(R)

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

I'm not happy with the amount of playing time I get. (ATGT)(R)

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

I am not going to miss the members of this team when the season ends. (ATGS)(R)

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

I'm unhappy with my team's level of desire to win. (ATGT)(R)

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

Some of my best friends are on this team. (ATGS)

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

This team does not give me enough opportunities to improve my personal performance. (ATGT)(R)

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

I enjoy other parties more than team parties. (ATGS)(R)

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

I do not like the style of play on this team. (ATGT)(R)

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

For me this team is one of the most important social groups to which I belong. (ATGS)

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

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

Our team is united in trying to reach its goals for performance. (GIT)

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

Members of our team would rather go out on their own than get together as a team. (GIS)(R)

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

We all take responsibility for any loss or poor performance by our team. (GIT)

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

Our team members rarely party together. (GIS)(R)

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

Our team members have conflicting aspirations for the team's performance. (GIT)(R)

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

Our team would like to spend time together in the off season. (GIS)

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

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

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

Members of our team do not stick together outside of practices and games. (GIS)(R)

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

Our team members do not communicate freely about each athlete's responsibilities during competition or practice. (GIT)(R)

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

APPENDIX B

Study One

Coaches' Questionnaire Administration Sheet

ADMINISTRATION INSTRUCTIONS

- Please make sure that the questionnaire "**IS NOT**" filled out on the same day as a scheduled competition -- it can easily been done in 25-30 minutes after a practice. We realize this is a bit lengthy -- however, your investment of time, now, will enable us to provide you with more detailed feedback at the end of the season.

- Make sure the athletes are separated in the sense that they **cannot copy** other members responses.

★ IT IS IMPORTANT THAT YOU STRESS YOUR SUPPORT FOR THIS PROJECT TO YOUR ATHLETE'S SO THEY TAKE IT SERIOUSLY.

THIS WILL ENABLE US TO PROVIDE YOU WITH FEEDBACK THAT IS ACCURATE AND RELIABLE.

APPENDIX C

Study One

Distribution Statistics of Normative and Collective Efficacy Measures

Table C-1

Distribution Statistics of Normative and Collective Efficacy (CE) Measures

Measure	M	SD	Median	Minimum	Maximum
NORMS	61.38	20.29	61.25	2.5	100
CEAGG	74.86	14.27	76.88	38.75	100
CEOFF	82.08	6.98	82.66	62.5	95.63
CEDEF	81.66	6.59	82.5	65	93.75
CECOMM	83.89	7.36	84.39	67.14	98.57
CEMOTIV	83.82	7.45	84.62	62.31	96.15
CEKEY	86.52	11.41	86.67	56.67	100
CEOBST	83.86	11.36	85.46	45.46	99.09
CEGEN	90.73	7.69	92.5	67.5	100

Note: N = 46

The acronyms for the various measures are as follows:

NORMS - Normative perceptions of physically injurious behaviour
CEAGG - CE
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - - CE motivation
CEKEY - CE loss of key player
CEOBST - - CE team obstacles
CEGEN - CE general issues

APPENDIX D

Instructional Package to the Coach and Coaching Personnel

ADMINISTRATION INSTRUCTIONS

- Please make sure that the questionnaire "**IS NOT**" filled out on the same day as a scheduled competition -- it can easily been done in 25-30 minutes after a practice. We realize this is a bit lengthy -- however, your investment of time, now, will enable us to provide you with more detailed feedback at the end of the season.

- Make sure the athletes are separated in the sense that they **cannot copy** other members responses.

★ IT IS IMPORTANT THAT YOU STRESS YOUR SUPPORT FOR THIS PROJECT TO YOUR ATHLETE'S SO THEY TAKE IT SERIOUSLY.

THIS WILL ENABLE US TO PROVIDE YOU WITH FEEDBACK THAT IS ACCURATE AND RELIABLE.

- Questionnaires need to **BE COMPLETED AND RETURNED** within the time frame of to .

COURIER INSTRUCTIONS

- Please use the envelope that has been provided for returning the questionnaires.

- Please ensure that all completed questionnaires are included.

- Use PUROLATOR COURIER (if possible) and courier back "COLLECT" or have it BILLED TO

  Account # 0000000
  Department of Kinesiology
  c/o Dr. Larry Brawley
  University of Waterloo
  Waterloo, Ontario
  N2L 3G1

- Please return questionnaires as soon as completed.

- ALL QUESTIONNAIRES FOR TIME ___ NEED TO BE SENT FOR RETURN BY _____.

*** IT IS IMPORTANT THAT QUESTIONNAIRES BE RETURNED WITHIN THIS TIME FRAME SO WE CAN MAKE COMPARATIVE ANALYSES WITH ALL TEAMS INVOLVED IN THE SURVEY.

THIS WILL ENABLE US TO PROVIDE YOU WITH FEEDBACK AS TO THE DEVELOPMENT OF GROUP CONFIDENCE OVER THE COURSE OF THE SEASON.

ATHLETES' INSTRUCTIONS FOR COMPLETING THE QUESTIONNAIRE

1. FOR ANY QUESTION ABOUT THE WHOLE TEAM, ANSWER ACCORDING TO WHAT YOU FEEL THE TEAM BELIEVES.

   FOR QUESTIONS ABOUT YOURSELF, ANSWER WITH YOUR PERSONAL FEELING.

2. IF ANY QUESTION IS UNCLEAR, PLEASE ANSWER THE QUESTION, BUT PLACE A BIG QUESTION MARK BESIDE IT.

3. QUESTIONNAIRES SHOULD BE COMPLETED INDIVIDUALLY AND HONESTLY. YOUR FIRST REACTION IS BEST.

4. TO ENSURE YOUR PRIVACY, UPON COMPLETION OF THE QUESTIONNAIRE, PLACE IT IN THE ENVELOPE AND SEAL IT. THEN RETURN THE ENVELOPE TO YOUR COACH.

THANK YOU FOR YOUR COOPERATION.

APPENDIX E

Study Two

Group Adjusted Correlations Among Collective Efficacy and Normative Measures

Table E-1

Group Adjusted Correlations Among Time 1 Collective Efficacy (CE) and Normative Measures

Measure	1	2	3	4	5	6
1. CEAGG	--	0.74	0.74	0.81	0.75	0.18
2. CEOFF		--	0.96	0.97	0.95	-0.04
3. CEDEF			--	0.98	0.99	-0.03
4. CECOMM				--	0.96	0.10
5. CEMOTIV					--	0.05
6. NORMS						--

Note: N = 23 teams

The acronyms for the various measues are as follows:

CEAGG	- CE aggression	CECOMM	- CE communication
CEOFF	- CE offense	CEMOTIV	- CE motivation
CEDEF	- CE defense		
NORMS	- Normative perceptions of physically injurious behaviour		

APPENDIX F

Study Three

Letter to Coach and Coaching Personnel

December 28, 1994

Dear Coach and Coaching Personnel,

Included in this package are:

- Administration Instructions
- Athlete Questionnaires **(which we have shortened)**
- Return envelope
- Return - courier instructions

We'd like to **thank you** and your team for participating in the first part of the team-confidence study. Quite frankly, we have been overwhelmed with the cooperation and great response rate of our participants. We have over a 60 percent return rate from teams and players have conscientiously filled out the questionnaire. This is exciting because it is, in our memory, one of the best participation rates ever experienced for group research.

As you know, we've been trying to adapt return courier procedures **(by providing you with an account number to bill us for couriering materials #0000000)** to make your life easier. However, we welcome suggestions that don't compromise the high return rate and are within our budget (i.e., using Purolator Courier if at all possible as we get ⅓ regular rate). Please feel free to offer advice that encourages everyone to keep up the participation in January for Time 2 and in mid-February for the third and final time.

As you are aware, assessing a team once is only a snapshot, so to capture the "video" of the season, we need to test at Times 2 and 3. Please stay with us and encourage your players for this reason. It's great to have so many interested people involved!

Once again, thank you for you cooperation. If you have any problems contact us immediately at (519)885-1211 x.3153 or x3955 or FAX (519)746-6776.

Sincerely,

Kim Dorsch	Dr. Larry Brawley	Dr. Neil Widmeyer
(519)885-1211	(519)885-1211	(519)885-1211
x3865	x3153	x3955

APPENDIX G

Study Three

Concurrent Validation Analyses of Collective Efficacy Measures

Table G-1

Relationships Among Time 2 Collective Efficacy (CE) Measures

Measure	1	2	3	4	5
1. CEAGG	--	.70***	.67***	.62***	.62***
2. CEOFF		--	.87***	.83***	.83***
3. CEDEF			--	.73***	.80***
4. CECOMM				--	.88***
5. CEMOTIV					--

Note: N = 196

The acronyms for the various collective efficacy (CE) measures are as follows:

CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

*p < .05; **p < .01; ***p < .001

Table G-2

Group Adjusted Correlations Among Time 2 Collective Efficacy (CE) Measures

Measure	1	2	3	4	5
1. CEAGG	--	0.71	0.76	0.76	0.71
2. CEOFF		--	0.99	1.00	0.98
3. CEDEF			--	1.00	1.00
4. CECOMM				--	0.98
5. CEMOTIV					--

Note: N = 12 teams

The acronyms for the various collective efficacy (CE) measures are as follows:

CEAGG	-	CE aggression	CECOMM	-	CE communication
CEOFF	-	CE offense	CEMOTIV	-	CE motivation
CEDEF	-	CE defense			

APPENDIX H

Study Three

Percent Group Variation in Collective Efficacy Measures
Time 1/Time 2

Table H-1

Percent Group Variance in Collective Efficacy (CE) Measures: Time 1/Time 2 analysis

Measure	Intraclass r	F ratio (df 23, 372)	p
CEAGG	0.31	8.83	.0001
CEOFF	0.49	17.27	.0001
CEDEF	0.5	17.96	.0001
CECOMM	0.28	7.49	.0001
CEMOTIV	0.42	13.48	.0001

Note: N = 9 teams

The acronyms for the various collective efficacy (CE) measures are as follows:

CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

APPENDIX I

Study Three

Adjusted Group Level Analysis of the Relationship Between Time 1 Collective Efficacy Measures and Time 2 Unacceptable Aggressive Behaviour

Table I-1

Adjusted Group Level Analysis of the Relationship between Time 1 Collective Efficacy (CE) Measures and Time 2 Unacceptable Aggressive Behaviour

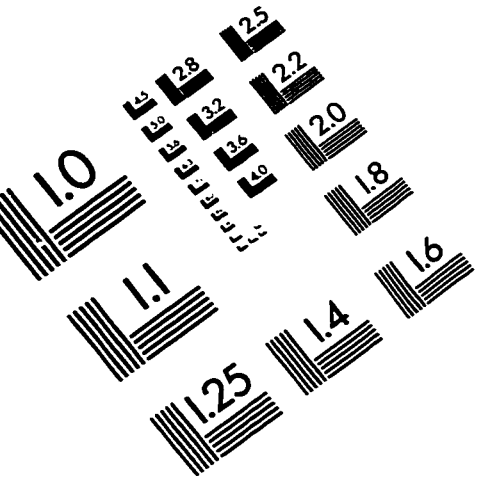
Criterion	Predictor	β	R^2
AB2	CEAGG	0.6415	0.4115
AB2	CEOFF	-0.3385	0.1146
AB2	CEDEF	-0.3174	0.1007
AB2	CECOMM	-0.4309	0.1857
AB2	CEMOTIV	-0.4381	0.1919

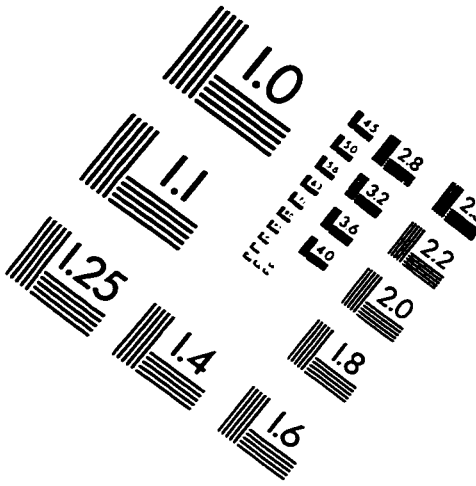
Note: N = 9 teams

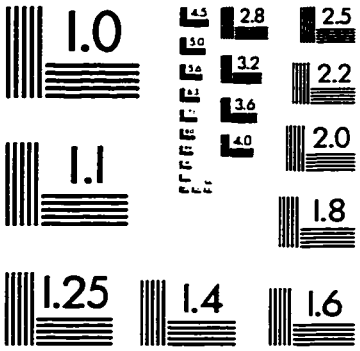
The acronyms for the various measures are as follows:

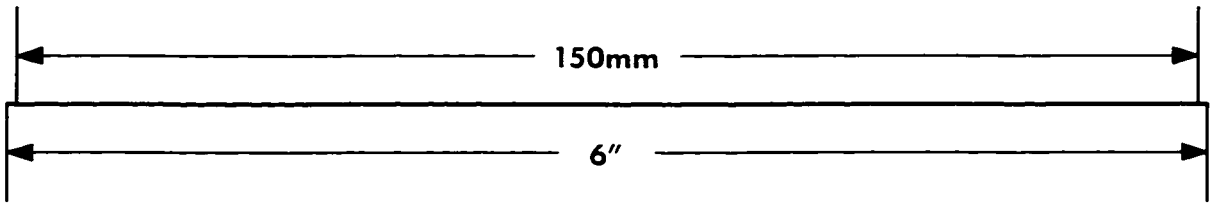
AB2 - Unacceptable aggressive behaviour
CEAGG - CE aggression
CEOFF - CE offense
CEDEF - CE defense
CECOMM - CE communication
CEMOTIV - CE motivation

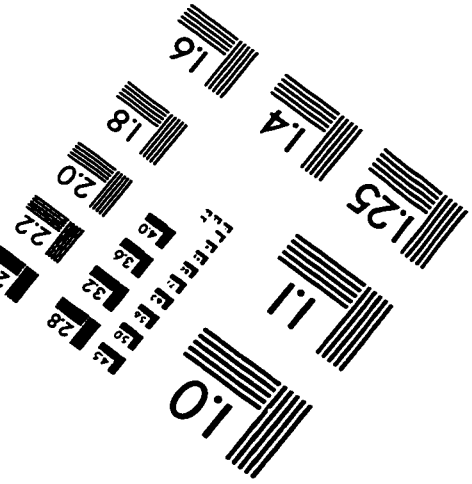
IMAGE EVALUATION
TEST TARGET (QA-3)

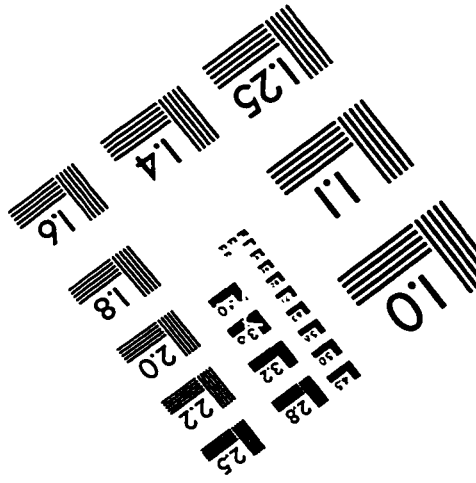












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1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989

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