Assessing the Cohesion of Teams: 
Validity of the Group Environment Questionnaire

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The process of validating a recently developed instrument to assess perceived team cohesion is discussed. The Group Environment Questionnaire (GEQ), an instrument designed to measure cohesion in sport teams, has good estimates for its internal consistency and for its content and factorial validity (Carron, Widmeyer, & Brawley, 1985; Widmeyer, Brawley, & Carron, 1985). However, other aspects of its validity required examination. The present article reports three studies concerning inspection of the GEQ’s concurrent (Study 1), predictive (Study 2), and construct (Study 3) validities. In Study 1 the GEQ exhibited the predicted correspondence with similar measures of cohesion and was not significantly correlated with measures of other constructs. In Study 2 the GEQ successfully discriminated team and individual sport athletes by predicting their membership to these groups on the basis of their task cohesion scores. As well, classification of athletes as new and long-standing members of individual sport teams was predicted on the basis of their social cohesion scores. Finally, in Study 3 evidence was obtained for the predicted difference in self-responsibility attributions between high and low task-cohesive athletes of team sports. Considering the results of the three studies with previous evidence of content and factorial validity, the conclusion was that the GEQ is valid. In sum, demonstrations of the GEQ’s content, factorial, concurrent, predictive, and construct validity reflect the ongoing process of its construct validation.

Group dynamics investigators have long recognized the importance of cohesion in the study of groups. The extensive literature on the cohesiveness of

Each investigator contributed significantly to the research for this article and considers its authorship as joint.

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groups in a variety of social contexts attests to the social scientists' fascination with this topic (e.g., Cartwright, 1968; Evans & Jarvis, 1980; Zander, 1979). However, the amount of literature concerning this phenomenon is not necessarily an indicant of whether it is clearly understood. Although there is some agreement among scientists as to how cohesion may be described, there has been little reliable effort to advance understanding by building upon any given conceptual model. Perhaps the closest beginning to a definition or model that influenced many group dynamics investigators was Festinger, Schachter, and Back's (1950) notion of cohesion as the total field of forces causing members to remain in their group. Even this widely cited definition has been criticized (e.g., Escovar & Sim, 1974; Gross & Martin, 1952).

The criticisms of studying cohesion in the absence of a conceptual model and the concomitant measurement problems have haunted the scientific literature for more than three decades. In particular, the problems of unidimensional measures underrepresenting the concept and the existence of a wide variety of uncomparable instruments with unknown psychometric properties make the systematic investigation of cohesion seem unlikely. These criticisms are not new (e.g., Carron, 1982; Escovar & Sim, 1974; Zander, 1979), yet there have been few attempts to solve the conceptual and the measurement problems.

Recently however, Carron, Widmeyer, and Brawley (1985) offered a starting point by proposing a conceptual model of group cohesion in sport. A conceptual model is a more elaborate representation of relationships among variables than is a hypothesis, but the variables are to an extent still in the process of definition. Presumably, the clarity of these definitions will increase over time as the conceptual model is tested, modified, and retested in its growth toward becoming a theory (Kerlinger, 1973).

Conceptual Model of Cohesion

The development of the conceptual model was primarily influenced by two cohesion-related issues that continually resurface in the group dynamics literature. The issues are (a) the need to distinguish between the individual and the group, and (b) the need to distinguish between task and social concerns of the group and its members (e.g., Carron et al., 1985; Mikalachki, 1969; Van Bergen & Koekbakker, 1959; Zander, 1971).

With these issues as a focus for the model, two broad conceptual categories were proposed. It was reasoned that group members possess views of what personally attracts them to the group and how the group functions as a total unit. Within the conceptual model, the former view was labeled Individual Attractions to the Group, and the latter, Group Integration. Both perceptions help to bind the group.

Second, it was proposed that both of the above perceptions could be manifested as task (i.e., group goals, objectives) and social aspects (i.e., social relationships). Thus, four related constructs that bind members to their group were distinguished. They are Individual Attractions to the Group–Task (ATG–T) and Social (ATG–S) and Group Integration–Task (GI–T) and Social (GI–S). For greater detail about the conceptual model, refer to Carron et al. (1985) or Widmeyer, Brawley, and Carron (1985).
Past research has often focused on observed group behavior as a means of characterizing the cohesion phenomenon. Observation of group behavior alone only indicates what investigators define as a cohesive group. In contrast, Carron et al. (1985) placed the group members' view of the group at the heart of their model. It can be argued that without members' beliefs about the group's potential to fulfill certain personal needs and about the existence of group integrity/unity, there is less motivation to maintain the group or resist disruptive forces. Put more succinctly, there is less group cohesion. Other factors, such as extra group forces, although not included in the model, were recognized as potentially influential. However, Carron et al.'s purpose was to construct an assessment tool with their conceptual foundation as a basis.

The Group Environment Questionnaire

Using the four constructs of their model, Carron et al. (1985) developed a measure to assess the perceived cohesion of sport teams. The instrument that evolved is called the Group Environment Questionnaire (GEQ). This 18-item, four-scale instrument (a) reflects good content validity, (b) is internally consistent, and (c) has preliminary factorial validity whereby items group into the four factors that reflect the constructs of the conceptual model (cf. Carron et al., 1985; Widmeyer et al., 1985).

While the GEQ was found to be reliable across two independent samples, the process of readying the instrument for widespread scientific use is incomplete. Demonstration of consistency and accuracy of item/scale assessment does not answer what relations exist between cohesion and other variables or why these relations exist. These questions cannot be answered effectively if a measurement instrument such as the GEQ does not possess validity.

The general purpose of the three studies reported in the present article was to examine various aspects of the GEQ's validity as part of the ongoing process of validation (cf. Nunnally, 1978; Paunonen, 1984). The types addressed were criterion-related—concurrent validity (Study 1) and predictive validity (Study 2)—as well as construct validity (Study 3). More extensive descriptions of these types of validity relative to the GEQ have been reported elsewhere (cf. Widmeyer et al., 1985).

Criterion-Related Validation

Study 1

Concurrent Validity

In the psychometric evaluation of a new instrument, it is traditional to estimate concurrent validity. Concurrent validity reflects the degree of correspondence between a new measure and some other criterion measure. Not only is it necessary to know whether the GEQ is related to other cohesion measures or related constructs, but also whether it is unrelated to entirely different constructs. Advancing predictions about relations between measures also requires consideration of (a) which alternative measures of cohesion qualify as criterion measures, and (b) what magnitude of correlation is sufficient to support or refute a hypothesis.


**Criterion Measures and Predictions**

For the present study, both of the above concerns were considered with respect to the GEQ. In response to the first concern, a dilemma was faced in choosing cohesion criterion measures. The availability of cohesion-related criterion measures without problems and/or with acceptable psychometric properties is rare. The dilemma is considering what is gained (e.g., well-known test) and lost (e.g., unknown reliability) when selecting measures. With respect to sport-related criteria, the aspects of the dilemma were weighed carefully. First, the GEQ was designed to assess sport groups. Therefore, most cohesion instruments designed for groups in the workplace, the military, or the community were not considered as criterion measures because they focus on behavior or affect in non-sport settings. Second, other sport-related measures of cohesion and of group variables do appear in the literature, and their relatedness to the GEQ should be revealed. Third, some sport-related measures are well known but their psychometric properties are unknown, whereas for others the converse is true.

Thus, several sport-related measures were chosen for comparison with the GEQ. The most commonly used five-item subset of the Sport Cohesiveness Questionnaire (SCQ: Martens, Landers, & Loy, 1971) and the sport-modified Bass Orientation Inventory (BOI: Bass, 1962; SBOI: Ball & Carron, 1976) have been used previously in assessing sport teams with respect to members’ perceptions. Thus, from a previous use perspective they were relevant criterion choices. Unfortunately, their psychometric properties are unknown.

By contrast, the recently developed but less known Team Climate Questionnaire (TCQ: Carron, 1986; Grand & Carron, 1982) has known psychometric properties; therefore it was chosen as a third criterion measure. Each of these instruments had more than a single factor that could correspond to GEQ constructs. As well, each had been used to examine a variety of sport teams, the type of use for which the GEQ was designed. Therefore the dilemma of criterion measures was partly resolved by choosing several instruments, each having at least one property sufficient for selection.

There is no definitive answer to the second concern of what statistical magnitude should be considered for acceptance or rejection of concurrent validity hypotheses. Nunnally (1978) does provide advice in this regard. He has suggested that in the case of similar measure correspondence (i.e., convergence), modest correlations should probably be expected between new and criterion measures. For different measure correspondence (i.e., divergence), either the absence of a relationship or a negative relationship might be examples of expected results. These guidelines were employed in the interpretation of results for hypotheses concerning both similar and different measure correspondence between the GEQ and various criterion measures.

**Similar Measure Correspondence.** The hypotheses tested in Study 1 were generated using the distinctions considered in the conceptual model of cohesion. Specifically, these were the individual–group distinction and the task–social distinction. The SCQ’s teamwork and closeness items assess individual members’ perceptions of the group as a unit (group perception items), while enjoyment, sense of belonging, and value of membership items assess the attraction of the same team for the individual member (individual attraction items). It was hypothesized that the Group Integration scales of the GEQ would correlate best with the
SCQ's measures of group perception. It was also hypothesized that the GEQ's Individual Attractions to the Group scales would correlate best with the individual attraction items of the SCQ.

The GEQ was also examined with respect to its correspondence to the role-involvement scales of the TCQ. Two purposes were served in this instance. First, the GEQ was examined relative to an instrument whose psychometric properties were known. Second, part of the task–social distinction in the purposes of groups could be examined. The TCQ's role-involvement measures concern understanding of, satisfaction with, and effective completion of a group member's task-performance roles. Thus it was predicted that the GEQ's two task scales of Group Integration–Task (GI–T) and Individual Attractions to the Group–Task (ATG–T) would correlate with the three TCQ measures of role involvement.

Different Measure Correspondence. While modest correlations could be predicted when relating the GEQ to similar criterion measures, the GEQ should not correlate with measures of different constructs. Zander (1971) emphasized that what individuals want for themselves and their group may be relatively independent. The task, affiliation, and self items of the SBOI (Ball & Carron, 1976) assess idiosyncratic personal motivations whereas the GEQ scales assess an individual's motives for and perceptions of group cohesion. Thus it was predicted that the correspondence between SBOI items and GEQ scales would be low and nonsignificant.

The final prediction also concerned correspondence between different measures. The GEQ social scales—GI–Social and ATG–Social—were not expected to be well related to the task-related, role-involvement scales of the TCQ. These are different constructs, so the relationship predicted was one that would be low and nonsignificant.

Method

Subjects

Subjects were 74 male and female athletes from 10 intact university team and individual sports. Various teams actively competing for two different Canadian universities in two different cities were assessed in season. Each team included a mixture of freshmen to senior students. Teams were assessed at different points during their season, thus avoiding a seasonal response bias. All teams were examined after at least 1 month of their season had elapsed and before regular season competitions had ended.

Instruments and Procedure

The athletes responded to a battery inventory which included the following:

1. The 4-scale, 18-item GEQ (scales of ATG–T, ATG–S, GI–T, GI–S);
2. The commonly used 5-item subset from the Sport Cohesiveness Questionnaire or SCQ (items of teamwork, closeness, value of membership, sense of belonging, enjoyment);
3. The 5-scale, 50-item Team Climate Questionnaire or TCQ (scales of task cohesion, social cohesion, role clarity, role acceptance, and perceived role performance); and
4. The 3-item sport modification of Bass’s Orientation Inventory or SBOI (items of task, affiliation, and social motivation).

The battery inventory had several forms. In order to protect against response set, the order of presentation of the inventories within the battery was randomized. Thus approximately equal numbers of athletes on each team completed the four different forms (i.e., differing inventory order) of the battery. To avoid situation-specific responses, administration was neither immediately before nor immediately after a competition. All inventories were completed either immediately before or after a regular weekly practice during the team’s season.

Results and Discussion

Similar Measure Correspondence

Similar measure correspondence concerned two series of predictions. In the first series the GEQ Group Integration (GI) scales were expected to relate to SCQ measures of group perception. As well, the GEQ’s task and social ATG scales were expected to correlate with the three individual attraction measures of the SCQ.

The results for the former prediction were that the GI-T scale of the GEQ was correlated with the group perception score of the SCQ (combined total of two items, teamwork and closeness) for both team and individual sport athletes ($r = .47$, $p < .001$, and $r = .41$, $p < .05$, respectively). This was also the case for the GI-S scale ($r = .47$, $p < .001$, and $r = .62$, $p < .001$, respectively). For the latter prediction, it also followed that since Group Integration and Individual Attractions are different constructs, the GI scales of the GEQ and individual attraction measures of the SCQ (combined total of three items: enjoyment, sense of belonging, value of membership) would not be well correlated. This was the finding obtained—correlations were low and not significant for both individual and team sports (i.e., range was $r = .25$ to $.40$, $p > .05$).

The second series of similar measure predictions concerned an expected correlation between the Individual Attractions to the Group-Task and Social scales (ATG) of the GEQ and the individual attraction score of the SCQ. Partial support for the prediction was obtained. For team sports the GEQ scales of ATG-Task and ATG-Social were significantly correlated with the SCQ’s individual attraction score ($r = .38$, $p < .001$, and $r = .43$, $p < .001$, respectively). However, for individual sports these correlations were not significant (ATG-Task: $r = .23$, and ATG-Social: $r = .24$, $p > .05$).

An explanation for these nonsignificant relations for individual sports may be considered in light of the significant relations between the same variables for team sports. In the latter groups, a more common set of individual needs may be fulfilled for team sport athletes. Thus, a greater relation between the GEQ and SCQ measures may exist when they assess the individual attractions to team sports. By contrast, athletes’ attractions to individual sports may be highly variable and idiosyncratic. The differences in responses for the individual sport athletes could be detected to a greater extent by the GEQ than the SCQ. The former scale’s additional assessment of friendship and social importance over and above the enjoyment and belonging items common to both measures may also be partly responsible for the low GEO–SCQ individual attractions correspondence for individual sports.
Another series of similar measure predictions involved an expected correlation between the GEQ measures of task-orientation (GI-T and ATG-T) and the TCQ's task-related, role involvement scales. These results are presented in Table 1. The GI-T scale of the GEQ correlated well with the TCQ measures for both team and individual sports. This was also the case for the correlations of the TCQ scales with ATG-T for team sports. Generally there was support for the predicted correspondence between similar measures.

The only exception to these similar measure results was for individual sport athletes. The reason for the lower overall correspondence for this sample was likely due to individual sport athletes having more unique noninterdependent roles and more unique personal attractions to their team than may be true of team sport athletes. The result may be that individual sport athletes see less relevance in items concerning role performance (TCQ). Individual sport athletes may have unique individual attractions that pull them to and hold them in their team (ATG-T). Responses such as these would cause a lack of correspondence between measures as occurred for this portion of the sample.

\textbf{Table 1}

\begin{center}
\textbf{Intercorrelations Between TCQ Role Involvement Measures and GEQ Task Scales}
\end{center}

<table>
<thead>
<tr>
<th>Sample</th>
<th>Role involvement</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Clarity</td>
<td>Acceptance</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>GI-T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual sport</td>
<td>.558***</td>
<td>.627***</td>
<td>.574***</td>
<td></td>
</tr>
<tr>
<td>Team sport</td>
<td>.384**</td>
<td>.494***</td>
<td>.433**</td>
<td></td>
</tr>
<tr>
<td>ATG-T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual sport</td>
<td>.012</td>
<td>.188</td>
<td>.118</td>
<td></td>
</tr>
<tr>
<td>Team sport</td>
<td>.396**</td>
<td>.581***</td>
<td>.329*</td>
<td></td>
</tr>
</tbody>
</table>

\textit{Note:} \( N \) is 74 male and female athletes from 10 intact team and individual sports.

\( *p < .05; **p < .01; ***p < .001. \)

\textbf{Different Measure Correspondence}

The similar measure correspondence was generally in the direction predicted and was an encouraging sign of validity. However, measures of different constructs should not relate well to the GEQ in order to establish the uniqueness of its assessed constructs. Different measure predictions were supported in examining the relations between the SBOI measures of personal motivations and the four GEQ scales. The majority of correlations—20 of 24—between the three SBOI measures and the GEQ scales were low and nonsignificant for both team and individual sport athletes (i.e., range was \( r = .03 \) to \( .28, p > .05 \)). The four exceptions were modest (i.e., range was \( r = .29 \) to \( .39, p < .05 \)) and uninterpretable. For team sports these exceptions were the relation between GI-T and
SBOI–Affiliation as well as GI–T and SBOI–Self. For individual sports they were between GI–S and SBOI–Affiliation as well as ATG–T and SBOI–Task. However, these findings did not reveal a consistent pattern of significant relations between the GEQ and SBOI measures. Thus it was concluded that what is measured by the GEQ is something unrelated to a measure of individual personal motivation (SBOI).

A second examination of different measure correspondence concerned the predicted absence of a relation between GEQ social scales (GI–S and ATG–S) and the task-related, role-involvement measures of the TCQ. The results offered support for this prediction. All eight correlations between the two GEQ scales and the three TCQ measures were low and nonsignificant for both team and individual sports (i.e., range was $r = .02$ to $.27$, $p > .05$).

In summary, examinations of the GEQ’s correspondence with similar and different criterion measures was undertaken. For the most part, GEQ scales were significantly correlated with other measures of the same constructs at a level expected of a unique but related measure (cf. Nunnally, 1978). The predicted absence of GEQ correspondence with measures of different constructs was also clearly supported by the majority of results. Taken as a whole, the results of Study 1 support the conclusion that the GEQ possesses the concurrent aspect of criterion-related validity.

Study 2

Predictive Validity

The predictive aspect of criterion-related validity is associated with assigning people to different groups and is important for decision making. Rather than demonstrating correspondence to another measure of the same construct (concurrent validity), predictive validity involves using the new measure to predict some kind of outcome. From a theoretical viewpoint, the construct is proposed to influence that outcome (cf. Cronbach, 1971; Kerlinger, 1973). However, the importance of predictive validity is not restricted to theory verification. It also has utility in solving practical problems. For example, predictive test results might assist investigators’ decisions in the assignment of athletes/teams to experimental or intervention conditions. One method of examining the GEQ’s predictive validity was to consider its ability to classify people into their natural groups. Implicit in this approach is the conceptual proposition that team members’ GEQ responses will reflect the cohesion associated with their type of sport group.

Task Cohesion

The amount and type of interaction within the group has been strongly linked to its assessed level of cohesion (e.g., Deutsch, 1949; Lott & Lott, 1961). Steiner (1972) has elaborated on group interaction types to clearly illustrate the differences between different groups. Mikalachki (1969) has stated that task cohesion will be encouraged when a group’s task requires organizing or cohering around task requirements. These notions stress member interdependence for task completion in contrast to groups whose members independently contribute to a group product. The greater the level of group interdependence, the greater the cohesiveness of the group.
Most organized sports have successful task completion as the basis for team member selection and the organization of training. As well, there is a division of sport groups to team and individual sports based upon the type of task interaction between their members. Therefore it was reasoned that interdependent team sport athletes would perceive greater levels of group unity (GI-T) in task cohesion than would their individual sport counterparts.

According to the Carron et al. (1985) conceptual model, task cohesion can be considered in two categories. A perception of the group as a whole can bind members to the team (Group Integration–Task) and/or a perception that the team fulfills individual needs may attract athletes (Individual Attractions to the Group–Task). As an example of the Group Integration perceptions, Zander (1971) has suggested that goals and motives of athletes whose tasks require interaction are more likely to be similar to goals of their team. By contrast, for Individual Attractions to the Group, personal task attractions and personal needs are more likely to draw individual sport athletes to their team, and are those things they will try to satisfy through team membership.

A test of the GEQ’s predictive validity would be meaningful if it could correctly measure the different levels and types of perceived task cohesion present among athletes in individual and in team sports. It was hypothesized, therefore, that GI–T would be higher for team sport than for individual sport athletes while ATG–T would be higher among athletes in individual sports than those in team sports.

**Social Cohesion**

Although a natural division based upon the task interaction of athletic groups led to predictions for the GEQ’s task-cohesion scales, the same was not true for social cohesion. In examining social cohesion, one finds no natural, sport organized, social interaction differentiation. However, an extreme-groups design was used to maximize the influence of variables known to affect the social cohesion a group develops. Thus, predictive validity hypotheses about the GEQ’s social scales could be advanced. The focal variable was length of membership (i.e., time spent in the group). The time that group members have spent with their group should differentially affect their social interaction and their related perceptions of social cohesion.

In the group dynamics literature, Sherif and Sherif (1969) have noted that situational factors such as task goals and interaction play a greater role in affecting group behavior in the early stages of the group’s life. However, as the group matures over time, social norms, values, and motives begin to play a larger role in affecting behavior. Thus for sport teams, it was reasoned that the natural task orientation of the sport would initially focus team members’ primary energies on task interaction. By contrast, at a later stage of group development when players had remained with their team, patterns of task interaction would become more stable relative to those of newly formed groups. By this time team members could begin to redistribute some of their energies toward social interactions with their teammates. At this later stage of development, long-standing team members might be more likely to perceive their team as a social as well as a task unit and perceive that their team was fulfilling some of the social needs of the individual team member.
If the GEQ social scales could discriminate between athletes who had been with their team on a long-standing basis and athletes new to their team, this would constitute predictive validity evidence. Differences in social cohesion should be greatest between the most long-standing and the newest team members. The former should be more socially cohesive than the latter because greater time together allows social norms and values to develop. It was unclear how social cohesion might also vary between team and individual sports. Thus no prediction was advanced in this regard.

Method

This study was conducted as a secondary data analysis of the GEQ responses of a large sample assessed in a previously published work (cf. Carron et al., 1985). The sample consisted of a variety of teams and sports, thus having representativeness qualities that are desirable for a predictive validity study.

Subjects and Design

Athletes from a variety of adult sports teams competing in municipal, university, and industrial leagues formed the sample. In all there were 247 athletes from 12 male and 14 female teams. Sixteen teams were from individual sports while 10 were from team sports. There was a wide variation in playing experience among members of each team. Teams varied in their members' tenure together and in the number of competitions in which they had participated.

In the extreme-groups design for the social cohesion predictions, 80 athletes were selected, 45 from the "long-standing team member" and 35 from the "new team member" categories. The extreme-groups design was used to maximize the possibility of categorization of athletes to the dependent variable (i.e., time on team: long-standing or new) by considering only those subjects who were extreme in the predictor or independent variables (i.e., social cohesion). The advantage of this design is that support for its a priori predictions provides strong evidence of an effect. The disadvantage is that there is a reduction in statistical power by using only the extreme portions of the sample.

Instruments, Operational Definitions, and Procedure

Again, the 18-item, four-scale GEQ (Carron et al., 1985) was used to assess the perceived cohesion of the athletes. Athletes' tenure on a team was operationalized by using the number of years players had competed for the team to categorize "Long-standing" and "New" members. First-year athletes were in the New category while team competitors of 3 or more years formed the Long-standing category. Athletes in the 2-year category were not part of the extreme-groups design.

To avoid situation-specific response bias, the GEQ was administered to athletes at times not immediately preceding or subsequent to competition. Administration occurred at weekday practices within the regular league season. Time of administration in the season for any one team occurred after teams had been together for at least 1 month and ended before teams began their playoff competition. Thus a representation of responses at different times throughout the regular season was obtained, and response bias associated with one selective seasonal time point was avoided. Subjects completed the GEQ individually and anonymously.
Results and Discussion

Task Cohesion

A stepwise discriminant function analysis was used to determine which combination of GEQ variables (scales) would best discriminate between team and individual sport athletes. Of the 247 respondents, 189 cases were used in this analysis. If any subject had a missing value for any one of the GEQ scales (i.e., discriminating variables), all the data for that subject were excluded. This listwise deletion process (cf. SPSS-X) was randomly distributed throughout respondents. No single team reflected a higher proportion of unused athlete responses than others. This process allows for analysis based upon equal numbers of responses for every variable and is more conservative than analyses based upon a different number of respondents for each predictor variable. The discriminant function that maximized the classification of team and individual sport athletes used all four GEQ scales. This function correctly classified 74% of the athletes (cf. Table 2) and was highly significant, $\chi^2 (4, N = 189) = 46.22, p < .00001$.

Table 2

<table>
<thead>
<tr>
<th>Predicted group membership</th>
<th>Team</th>
<th>Individual</th>
</tr>
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<tbody>
<tr>
<td>Team sport</td>
<td>75.6</td>
<td>24.4</td>
</tr>
<tr>
<td>Individual sport</td>
<td>27.1</td>
<td>72.9</td>
</tr>
</tbody>
</table>

Wilks’ lambda = .78; Canonical $R = .47$

$\chi^2 = 46.22, p < .001$

A post hoc univariate $F$ test was conducted for each variable contributing to the discriminant function. GI–T and ATG–T were the scales for which the largest differences existed between team and individual sport athletes. As predicted, GI–T was greater for team sport athletes, $F(1, 187) = 14.37, p < .002$ ($M_{team} = 32.64$ vs. $M_{individual} = 28.88$). As well, ATG–T was greater for individual sport athletes, $F(1, 187) = 7.22, p < .008$ ($M_{individual} = 30.97$ vs. $M_{team} = 28.85$). Although no social cohesion prediction was advanced relative to differences between individual sport and team sport groups, there was also a significant difference between groups for GI–S $F(1, 187) = 4.17, p < .04$. However, without a priori prediction, it was considered inappropriate to offer a conclusion other than that GI–S helped with the classification of athletes to these groups by adding to the discriminant function. The GEQ task scales (GI–T and ATG–T) successfully predicted athletes’ membership to teams that differed in their level of required task interaction. These results provided evidence for the predictive validity of the GEQ’s task scales.
Social Cohesion

The social cohesion predictions were examined only for athletes in the New and Long-standing competitor extreme groups. No specific predictions were advanced for the New and Long-standing athletes within the team and individual sports. However, separate stepwise discriminant function analyses were conducted on the tenure groups for both the task interaction categories. The GEQ task scale results were influenced by team type, a finding that might also be reflected in the social scale results.

The results for the GEQ social scales were interesting in that they did differ for team and individual sports. For team sports, the GEQ scales did not successfully discriminate between the extreme tenure groups. However, for individual sports, both social scales (ATG-S and GI-S) were used in the discriminant function to correctly classify 62% of the athletes to their tenure groups, $\chi^2 (2, N = 80) = 7.16, p < .03$ (see Table 3). A post hoc univariate $F$ test revealed that there was a significant difference between tenure groups for GI-S, $F(1, 78) = 4.48, p < .03$. Long-standing individual sport athletes expressed greater GI-S than New athletes from these teams ($M_{\text{Long-standing}} = 25.64$ vs. $M_{\text{New}} = 22.74$). Thus, some support was evident for social cohesion differences among athletes of different tenure.

Table 3
Percent of Individual Sport Athletes Correctly Classified to Tenure Type by Their Cohesion Scores

<table>
<thead>
<tr>
<th>Athlete's tenure</th>
<th>Predicted group membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New ($n = 42$)</td>
</tr>
<tr>
<td>New</td>
<td>59.5</td>
</tr>
<tr>
<td>Long-standing</td>
<td>36.7</td>
</tr>
</tbody>
</table>

Wilks' lambda = .91; Canonical $R = .30$
$\chi^2 = 7.16, p < .03$

However, the value of this result as evidence for the predictive validity of the GEQ social scales is tentative. It is unclear if a different result would have occurred for a different tenure operationalization. As well, some interaction between sport type (i.e., team vs. individual) and athletes' team tenure could also affect social cohesion. It would be speculative to explain why individual and team sports should differ in social cohesion in this instance. Thus, future attempts must be made to replicate this finding.

To summarize Study 2, when both task and social cohesion were considered, evidence for the predictive validity of the GEQ was found. The strongest support was indicated for the GEQ's task scales. As well, tentative support was found
for one of the GEQ's social scales (GI-S). Although these results provide initial support for predictive validity, attempts to replicate the study should be made with other samples. In future studies, reliable prediction of natural group divisions on the basis of cohesion scores would not only demonstrate validity, it would also confirm the notion that the amount of cohesion in a group can be estimated from the task and social interaction among members.

**Construct Validation**

**Study 3**

**GEQ Construct Validity**

It has been stated earlier that construct validation is an ongoing process that verifies the instrument and its underlying theory (Nunnally, 1978; Paunonen, 1984). If one key factor can denote construct validity, it is its close association with theory (cf. Bohrnstedt, 1970; Cronbach & Meehl, 1955; Kerlinger, 1973; Paunonen, 1984). This approach to determining validity contrasts with a strictly empirical approach whereby validity is reduced to a statistical estimate of behavioral prediction. The latter approach to validation often ends with instrument development. However, a theoretically based instrument encourages construct validation for as long as the test is used.

The accumulation of content and factorial validity (Carron et al., 1985) as well as two forms of criterion-related validity (i.e., Studies 1 and 2) were necessary to the continuing process of verifying the GEQ. The result of these various projects and studies has provided encouraging evidence of validity. However, to sufficiently verify the GEQ, other studies are required. The reasons for further research involve (a) the multidimensional nature of the cohesion phenomenon, and (b) the types of cohesion-other variable relationships associated with the conceptual model. Thus the validation process was continued by conducting a third study. The principle focus of the study was to assess the relationship between cohesion and success/failure responsibility attributions.

**Cohesion and Responsibility Attributions**

Although interpersonal liking of fellow group members has been an emotion from which to infer cohesion, there are also characteristic thoughts and behaviors associated with group unity. A cognitive variable that may be affected by cohesion is the responsibility attribution for achievement (cf. Rejeski & Brawley, 1983). For example, Forsyth and Schlenker (1977) found that group members on successful teams considered themselves more personally responsible for successful outcome than group members whose teams had experienced failure. This apparently self-serving effect was greatest in ad hoc groups whose members perceived a low level of cohesion. By contrast, Schlenker and Miller (1977) demonstrated that in highly cohesive ad hoc groups, group members assumed a responsibility for failure at least equal to the level presumed for the average group member. Likewise, in sport, Bird, Foster, and Maruyama (1980) found that cohesive basketball teams expressed similar self and team attributions while less cohesive teams were self-serving.

Zander (1982) has indicated that when a group is highly cohesive, many of the values, goals, and norms of the group are perceived similarly. Given the
similarity in perception of a close-knit group, it can be logically assumed they
would see their interdependence clearly in a number of situations including suc-
cess/failure (e.g., Deutsch, 1949; Yalom, 1975). Thus, each member should be
willing to accept equal responsibility for an outcome, but more or less than that
amount would run counter to what is normatively acceptable within the group.
For both achievement outcomes, group members should believe that their co-
horts ascribe as they do, sharing the responsibility (e.g., Braver, 1975; Yalom,
1975). In fact, shared failure may contribute to cohesion (Turner, Hogg, Turn-
er, & Smith, 1984).

In contrast, a less cohesive group should exhibit different perceptions of
group goals, norms, and values. There is less consensus among members on these
matters. Also, a belief about shared responsibility is not commonly agreed upon.
In these circumstances, when less between-member task interdependence is per-
ceived, group members should be more willing to take personal responsibility
for success and be more reluctant to share responsibility for failure in order to
enhance or protect self-esteem.

Given that (a) the evidence in the group dynamics and sport literatures
suggest why groups differing in cohesion also differ in their attributions, and (b)
a previous cohesion-attribution relationship has been established for sport and
other groups, it was felt that a reasonable test of the GEQ’s validity would be
to demonstrate this relation. This would not merely constitute a demonstration
of relations. If the relation validated the GEQ, an improvement would be ob-
tained over earlier cohesion-attribution studies that employed unidimensional
measures.

It was the purpose of Study 3 to examine athletes’ responsibility attribu-
tions in competitive team sports. How cohesion related to self-responsibility attribu-
tions for absolute success/failure was the primary question. As competitive sport
teams are largely motivated by their task, and the requested attributions concerned
the outcome of the task, predictions were focused on task cohesion and personal
task responsibility.

Method

Subjects and Design

Adult male athletes (N = 117) from 10 team sports formed the sample for
the study. Teams were from the sports of basketball, hockey, lacrosse, and volley-
ball in competitive municipal and university leagues. Half of the teams had won
and half had lost a regular season competition for which subjects’ responsibility
attributions were solicited. All teams had completed about half of their competi-
tions for the season.

An extreme-groups design was used to examine athletes from teams who
experienced either a winning or losing outcome. The design was used to max-
imize the possibility of differences in the dependent variable (i.e., attributions)
by considering only those subjects extreme in the independent variable charac-
teristic (i.e., task cohesion). The rationale was that athletes extreme in task co-
hesion would be most likely to exhibit the predicted self-responsibility attributions.

As the cohesion-responsibility attribution relationship had been found pre-
viously, a strong test of the relation should be possible. However, previous
research (e.g., Gossett & Widmeyer, 1981) has indicated that other sport cohesion instruments have provided response distributions that tended to be skewed mainly toward a positive (high) cohesion score. Thus, a question could be raised about any demonstrated effect of cohesion on some dependent variable because of small cohesion differences between comparison groups. This should be less probable using an extreme-groups design.

In the present design, the extreme groups not only needed to reflect the upper/lower 20% of the distribution but also to be above (high) and below (low) the middle score of a cohesion scale. For example, the middle score on the ATG–T, GEQ scale is 20 in a range of 4 (minimum) and 36 (maximum). The scale score distribution of a total sample would have to cover values on both sides of the middle score (i.e., 20) to be able to obtain high and low cohesion extreme groups (see Table 4).

**Instruments and Procedure**

Again, the four-scale, 18-item GEQ was used to assess cohesion. The task cohesion scales of ATG–T and GI–T were pertinent for this investigation. The attribution for self-responsibility was examined by the question, “What would be your estimate of your personal responsibility for the team’s outcome in your team’s last competition? Compare yourself to the average team member.” The associated range of scale responses to answer the question was 1 = the least responsible to 5 = about equal in responsibility to 9 = the most responsible. Comparison to the average team member was used for consistency with methods employed in previous research on attributions of groups varying in cohesion (e.g., Schlenker & Miller, 1977).

Teams were administered the GEQ and the attribution questionnaire within 2 to 3 days of their previous competition. To avoid competition-specific cohesion responses, the assessment of cohesion occurred at a regular weekly practice. Athletes completed the GEQ first, then reflected back to their last competition and responded by making self-responsibility attributions for the outcome.

**Results and Discussion**

**Task Cohesion Extremes**

Initially the GEQ scores were descriptively analyzed to examine the properties of the scale response distributions. The distributions were normal, covering the range of scale responses and meeting the criteria for the extreme-groups comparison. Table 4 displays the relevant GEQ scale means for the extreme groups relative to the total sample. The extreme-group scores (i.e., upper and lower 20% of the response distribution) were markedly different from the GI–T and ATG–T mean scores for the total sample. Thus, athletes categorized as reflecting extreme perceptions of cohesion perceived either quite high levels or low levels of task cohesion on their team. Considering an example, the high extreme, mean score for the ATG–T scale is 34.62. If that score is divided by the number of items in the scale (four items), the obtained average reveals that these athletes provided responses greater than 8 on a 9-point continuum. Similarly, athletes in the low ATG–T extreme responded with an average value between 3 and 4 on the con-
Table 4
GEQ Task Cohesion Means for Extremes and the Total Sample

<table>
<thead>
<tr>
<th>GEQ scales</th>
<th>Total sample</th>
<th>Extreme samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>GI-T (5-item scale)</td>
<td>31.21</td>
<td>38.46</td>
</tr>
<tr>
<td>(n=117)</td>
<td>(n=38)</td>
<td>(n=24)</td>
</tr>
<tr>
<td>ATG-T (4-item scale)</td>
<td>26.12</td>
<td>34.62</td>
</tr>
<tr>
<td>(n=117)</td>
<td>(n=29)</td>
<td>(n=28)</td>
</tr>
</tbody>
</table>

*Note: Extreme samples are divided into an approximate upper and lower 20% of the total sample.*

A further examination of the extreme groups for both scales (GI-T and ATG-T) confirmed that no single team was disproportionately represented in their athletes’ perceptions of task cohesion.

Self-Responsibility Attributions

Planned comparisons were used in the analysis of the attribution data. Table 5 contains the means for self-responsibility attributions of the extreme samples of team members who had won and lost. As predicted, athletes’ outcome responsibility attributions were not mediated by perceived task cohesion when they experienced success. This result is similar to that found for self-attributions in other studies in which subjects responded anonymously (e.g., Brawley, 1984; Schlenker & Miller, 1977).

It is the loss situation in which the egocentric response is most commonly observed. As can be seen in both tables, significant differences in self-responsibility occurred between the extreme groups, with athletes high in GI-T, \( t(23) = 2.45, p < .02 \), and ATG-T, \( t(23) = 2.39, p < .02 \), taking greater responsibility for the loss than athletes low on those scales. Those low in task cohesion reflected the self-serving attribution bias by assuming less responsibility for the loss than the average team member.

These results for self-responsibility are in agreement with those of other investigators (e.g., Bird, Foster, & Maruyama, 1980; Schlenker & Miller, 1977). For low task-cohesive athletes, the self-protective and self-maintaining functions of attributions may be serving the need to protect, maintain, or enhance self-esteem (Brawley, 1984; Rejeski & Brawley, 1983).

In contrast, high task-cohesive athletes were consistent in their attributions for both outcomes. These athletes assumed personal responsibility equal to that of their average team member regardless of outcome. It is suggested that team members perceiving high task cohesion on their team are most strongly influenced by team norms for equal acceptance of responsibility among players (cf. Schlenker, 1976; Schlenker & Miller, 1977). Under this influence, these players would be expected to accept as much responsibility as any other teammate, for both suc-
Table 5

Mean Self-Responsibility Attributions of Athletes Extreme in Task Cohesion

<table>
<thead>
<tr>
<th>Extreme cohesion</th>
<th>Absolute outcome</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Win</td>
<td>Loss</td>
<td></td>
</tr>
<tr>
<td>GI-T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>5.00</td>
<td>5.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>(n = 11)</td>
<td>(n = 11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>4.83</td>
<td>3.85&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>(n = 13)</td>
<td>(n = 14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATG-T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>5.33</td>
<td>5.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>(n = 12)</td>
<td>(n = 11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>4.43</td>
<td>3.14&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>(n = 12)</td>
<td>(n = 14)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Response scale was 1 (low responsibility) to 9 (high responsibility). Means with different subscripts differ significantly at \( p < .02 \).

cess and failure. The results of this study tend to support this suggestion. Although failure may be as damaging to personal self-esteem for players perceiving high task cohesion as it is for those perceiving low task cohesion, it may be easier for the former athletes to bear when they see their teammates sharing equally in the responsibility.

The results of this study offer evidence that cohesion moderates the self-serving bias in self-responsibility attributions for competitive sport outcomes. The agreement of these results with earlier work on the attributions of groups tends to validate the self-responsibility attribution-cohesion relationship. In demonstrating the predicted relationship using a new cohesion instrument, more evidence for the construct validity of the GEQ has been accumulated (cf. Nunnally, 1978; Paunonen, 1984).

General Discussion

The GEQ was designed to be a general measure of the multiple aspects of perceived cohesion in sport teams. When the results of the three studies reported here and previous content and factorial validity findings (cf. Carron et al., 1985) are taken as a whole, there is strong evidence of the GEQ’s validity.

Relating the results of the present studies to Carron et al.’s (1985) conceptual model, the distinction between the group and the individual is clearly demonstrated. Both the Group Integration and Individual Attractions to the Group measures were validated. Concurrent validation (Study 1) was evident for the
GEQ's correspondence with similar measure criteria (i.e., SCQ and TCQ). The predictive ability of the GEQ made it useful in discriminating between team and individual sports on the basis of the Group Integration and Individual Attractions measures (Study 2). Thus, evidence consistent with the utility of the group/individual distinction in the conceptual model was obtained.

Regarding the task/social distinction that is also part of the model, evidence from each of the studies indicates that the task focus is valid for sports teams. From a concurrent validation perspective, the GEQ task scales corresponded to other similar measures (Study 1: TCQ). GEQ task scales were also effective predictors of athletes to groups (Study 2). Finally, task cohesion scales stimulated sufficiently extreme responses to obtain the predicted outcome responsibility attributions of athletes high and low in perceived task cohesion (Study 3). Because this finding paralleled those of other cohesion-attribution studies, it was concluded that the GEQ assesses an important aspect of cohesion.

The ability to predict relations with other variables based upon various aspects of the conceptual model lends some verification to the model as well as to the GEQ. However, there are limitations to the findings. Although some evidence of social cohesion was revealed in Studies 1 and 2, these results were fewer in number and smaller in magnitude in comparison to task cohesion findings. Thus, future validation studies of the GEQ's social as well as task scales are required.

In conclusion, the process of validating the GEQ has just begun. More studies should be conducted to examine the relationship between perceived cohesion and other variables. As these are completed, gaps in the conceptual model of cohesion (cf. Carron et al., 1985; Widmeyer et al., 1985) may be filled. If this is the case, not only will the GEQ receive verification of its validity but so will the conceptual model. Nunnally (1978) clearly emphasized the ongoing nature of validation in stating that it is an unending process, and validity a matter of degree within the process. Evidence for the validity of the GEQ has been accumulated in studies that focused on content validity, concurrent and predictive criterion-related validities, factorial validity, and construct validity.

Two of the basic aims of science are to discover if relations occur among variables and then to answer why these relations do or do not exist. Without valid and reliable measures, neither aim can be accomplished. The evidence to date suggests the GEQ is reliable and valid. Its use in sport research may help answer questions such as why cohesion affects the behavior of athletic teams and their members.

References


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