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Questionnaire sur l'Ambiance du Groupe: A French-Language Instrument for Measuring Group Cohesion

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The present report provides a summary of five studies undertaken to develop a French-language instrument to assess cohesiveness in sport teams—the “Questionnaire sur l'Ambiance du Groupe” (QAG). For the initial version of the instrument, the Group Environment Questionnaire (Carron, Widmeyer, & Brawley, 1985) was translated into French using the protocol outlined by Vallerand (1989). However, psychometric analyses undertaken in Studies 1, 2, and 3 failed to yield acceptable evidence of construct validity. Items were then revised in an attempt to make them more suitable for the French culture. Subsequent analyses in Study 4 provided support for the construct validity and reliability (internal consistency and interscale equivalence) of the QAG. In Study 5, predictive validity was demonstrated. The QAG has been found to possess satisfactory psychometric properties as a measure of cohesion in sport teams.

Key Words: task cohesion, social cohesion, validation

Cohesion has been defined as “a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs” (Carron, Brawley, & Widmeyer, 1998, p. 213). It has been suggested that it is the most important small group variable (Golembiewski, 1962; Lott & Lott, 1961). The perceived importance of cohesion is illustrated by the wide variety of contexts in which it has been examined. These include, for example, the military (army units, airplane or tank crews) wherein a primary objective has been to understand the relationships between cohesion and confidence, morale, or a unit's efficacy going into battle (Elton, 1984; Foushee, 1984; Gal, 1988; Manning & Fullerton, 1988).

Similarly, studies in businesses and industries (e.g., with engineers, scientists, carpenters, bricklayers, miners) have focused primarily on the role that cohesiveness plays in productivity and employee morale (Pelz & Andrews, 1966; Van Zelst, 1952). Finally, considerable research has been undertaken in sport psychol-

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ogy to examine the relationship of cohesion to a wide cross-section of variables such as performance, team stability, and athlete satisfaction (Ball & Carron, 1976; Carron, Widmeyer, & Brawley, 1988; Widmeyer & Williams, 1991).

In a recent article, Dion (2000) traced the history of discussions on the conception and measurement of cohesion. He pointed out, "for the last 50 years, the cohesion construct has had its critics (e.g., Albert, 1953; Mudrack, 1989)" (p. 7). This observation, if anything, is understated. Mudrack (1989), one of the critics listed by Dion, concluded on the basis of his review that research on cohesiveness "has been dominated by confusion, inconsistency, and almost inexcusable sloppiness with regard to defining the construct" (p. 45). Certainly a variety of approaches have been taken in conceptualizing and assessing cohesiveness. These have included, for example, the consideration of cohesion as interpersonal attraction (Schachter, 1951), group resistance to breakup (Gross & Martin, 1952), the desire of members to remain in the group (Schachter, Ellertson, McBride, & Gregory, 1951), the presence of cliques (Lenk, 1969), similarity of opinions and status (Adams, 1953), feeling of membership (Indik, 1965), and the value that members place on group membership (Arnold & Straub, 1973).

More recently, theoreticians have begun to consider and operationalize cohesion as a multidimensional construct (see Dion, 2000, for a full discussion). In one approach taken by Carron, Widmeyer, and Brawley (1985; Brawley, Carron, & Widmeyer, 1987; Carron & Brawley, 2000; Carron et al., 1998; Widmeyer, Brawley, & Carron, 1985), cohesion has been viewed as a multidimensional, dynamic construct composed of the members' perceptions of the group as a totality and their perceptions of the personal attractiveness of the group. The first dimension is called *group integration*; the second is labeled *individual attractions to group*. Each of these dimensions is assumed to be focused on *task* and *social* aspects of the group. Thus, four constructs are identified: Group Integration-Task (GI-T), Group Integration-Social (GI-S), Individual Attractions to Group-Task (ATG-T), and Individual Attractions to Group-Social (ATG-S).

Generally there has been broad acceptance of this conceptualization. For example, Dion and Evans (1992) proposed that the Carron et al. "two-dimensional conceptualization of cohesion . . . appears promising as a conceptual and methodological approach with potentially broad applicability to different types of groups" (p. 247). Similarly, Cota, Evans, Dion, Kilik, and Longman (1995) proposed a heuristic of cohesion in which "the individual-group and task-social dimensions identified by Carron et al. (1985) are primary components" (p. 577).

To assess the four constructs of cohesion proposed in their model, Carron et al. (1985) also developed the Group Environment Questionnaire (GEQ). Since its development, a number of studies have examined the psychometric properties of the GEQ. In the overwhelming majority of studies, the GEQ was shown to possess content validity, concurrent validity, predictive validity, construct validity, and reliability (see Carron et al., 1998, for a full discussion). On the basis of that body of work, Hanrahan and Gallois (1993) described the GEQ as the most psychometrically sound measure of cohesion.

However, research on the factorial validity of the GEQ has produced mixed results. From a positive perspective, a confirmatory factor analysis on 321 male and female college baseball and softball players reported by Li and Harmer (1996) led to the conclusion that, consistent with the proposal of Carron et al., a "four first-order factor model . . . [provided] the best fit" (p. 60). Conversely, however,

after adapting the GEQ and testing 315 musicians from 84 bands, Dyce and Cornell (1996) concluded that "the results support social-task distinctions . . . but not the group integration-individual attractions to the group distinctions" (p. 264).

Similarly, Carless and DePaola (2000) adapted and tested the GEQ with 120 Australian public-sector retail employees in 59 work teams (dyads). Their confirmatory factor analysis failed to find support for either a two-factor solution represented by the task vs. social dimension, a two-factor solution represented by the group integration/individual-attractions-to-group dimension, or a four-factor solution. Finally, after testing 740 high school varsity athletes on 64 teams in various sports, Schutz, Eom, Smoll, and Smith (1994) concluded from their confirmatory factor analyses that "the findings of this study suggest that the [Carron et al.] underlying model could be in question" (p. 234).

The body of evidence summarized above has led Dion (2000) to conclude that "a firm conclusion concerning the GEQ's factorial validity and the adequacy of its underlying theoretical model (viz. the hierarchical model) await more research and consistent findings, as well as additional studies, to define the type of group and other boundary conditions for the GEQ as a cohesion measure for sports and other groups" (p. 15). It also raises an important issue of whether the GEQ has validity in other contexts (Carron et al., 1998). One way to assess the Dion suggestion would be to determine whether the Carron et al. (1985) conceptual model of cohesion is valid in other cultures. Presently no study carried out in other countries has reported on the validity of the GEQ and its conceptual model. This issue and the need for Francophone researchers to have an instrument to measure group cohesion provide the foundation for the present study.

Specifically, the general purpose of the present study was to examine the utility of the Group Environment Questionnaire as a measure of cohesion for French-language sport teams. A secondary purpose was to examine the validity of the Carron et al. (1985) conceptual model in another culture (i.e., in French sport teams). Five studies were undertaken. Initially the protocol advocated by Vallerand (Vallerand, 1989; Vallerand & Halliwell, 1983) for transcultural validation of psychometric instruments was adopted and the psychometric properties of the original (translated) GEQ were evaluated in Studies 1 to 3. A failure to obtain adequate factorial validity in these three studies led to item modification and the development of a cohesion instrument referred to as "Questionnaire sur l'Ambiance du Groupe" (QAG). Subsequently, Studies 4 and 5 were undertaken to examine the psychometric properties of the QAG.

Study 1

The purposes of Study 1 were to (a) translate the Group Environment Questionnaire (GEQ) into French and then (b) evaluate the clarity of the items within the target population.

Method

The preliminary French-language version of the GEQ was developed by the authors with the advice of a professor of English. Several criteria were used in the process of translation from English: (a) conformity with the original questionnaire's intention; (b) clarity of the items in French; and (c) understanding of the items by players from different team sports.

Vallerand and Halliwell (1983) have suggested that when a translated item contains an ambiguity, alternative forms of the item should be retained in the preliminary version. Consistent with this suggestion, several possible translations were retained. The result was a 26-item inventory (the original English version consists of 18 items).

In order to assess the clarity of the items for the target population, 30 athletes studying in a program for the sport sciences (15 women and 15 men, average age 20.2 ± 1.2 years) were asked to complete the questionnaire and to give their interpretation of the meaning of the items during an interview. To respond to the questionnaire, the participants were asked to circle a number from 1 ("strongly disagree") to 9 ("strongly agree") to indicate their level of agreement with each item. Negative items were reverse-scored such that higher scores represented stronger perceptions of cohesiveness.

Results and Discussion, Study 1

A number of criteria were adopted to retain or disregard items. In those cases wherein multiple items had been developed to represent an original GEQ item, the least clear or most restrictive item was eliminated. For example, "party" can be translated in French by "fête" or "soirée," but "fête" has a fairly restrictive meaning because it is understood as a particular type of "soirée." Therefore the latter was retained. Moreover, some of the English words in the original GEQ were found to contain a double meaning for French people (ATG-S3: "I am not going to miss the members of this team when the season ends"; GI-T14: "Our team members have conflicting aspirations for the team's performance"). For ATG-S3, a respondent could score high on this scale because he or she will go to another team after the end of the season or because he or she will stay with the team but will not meet other team members between the end of the season and the beginning of the next season. For GI-T14, a respondent could score high on this scale because he or she thinks members have individual goals that are incompatible with the team goals or members do not have the same collective goals.

In order to capture both meanings, two versions of the same item were retained. The analyses from Study 1 led us to reject 6 items and to retain two representations for two original GEQ items. The result was a French language version of the GEQ that contained 20 items. A summary of the original 18 items and the revised (French-language) version are presented in Table 1. The items identified as 3' and 14' are the second version of original GEQ items.

Study 2

The purpose of Study 2 was to evaluate the concurrent validity of the translated version of the Group Environment Questionnaire (GEQ). To this end, responses from the original English version of the GEQ were compared with the translated French version using bilingual respondents.

Method

As indicated previously, Table 1 describes the items of the original English language version of the GEQ and the comparable translated French language version. Since it was difficult to find a bilingual person involved in sport groups, the

Table 1 Item list for the Group Environment Questionnaire (GEQ)* and the Questionnaire sur l'Ambiance du Groupe (QAG)

GEQ	QAG
1. I do not enjoy being a part of the social activities of this team.	1. Je n'aime pas participer aux activités extra-sportives de cette équipe.
2. I'm not happy with the amount of playing time I get.	2. Je ne suis pas satisfait du temps de jeu que l'on me donne.
3. I am not going to miss the members of this team when the season ends. (item with double meaning for French people)	3. Je ne verrai plus les membres de cette équipe quand la saison sera terminée. 3'. Les membres de cette équipe ne me manqueront pas à la fin de la saison.
4. I'm unhappy with my team's level of desire to win.	4. Je trouve que l'envie de gagner de cette équipe est insuffisante.
5. Some of my best friends are on this team.	5. J'ai quelques uns de mes meilleurs amis dans cette équipe.
6. This team does not give me enough opportunities to improve my personal performance.	6. Cette équipe ne me donne pas assez d'occasions d'améliorer ma performance personnelle.
7. I enjoy other parties more than team parties.	7. Je préfère d'autres soirées aux soirées de cette équipe.
8. I do not like the style of play on this team.	8. Je n'aime pas le style de jeu de cette équipe.
9. For me this team is one of the most important social groups to which I belong.	9. Pour moi, cette équipe est un des groupes les plus importants auxquels j'appartiens.
10. Our team is united in trying to reach its goals for performance.	10. Les membres de notre équipe unissent leurs efforts pour atteindre les objectifs de performance.

(cont.)

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| <p>11. Members of our team would rather go out on their own than get together as a team.</p> <p>12. We all take responsibility for any loss or poor performance by our team.</p> <p>13. Our team members rarely party together.</p> <p>14. Our team members have conflicting aspirations for the team's performance
(item with double meaning for French people)</p> <p>15. Our team would like to spend time together in the off-season.</p> <p>16. If members of our team have problems in practice, everyone wants to help them so we can get back together again.</p> <p>17. Members of our team do not stick together outside of practices and games.</p> <p>18. Our team members do not communicate freely about each athlete's responsibilities during competition or practice.</p> | <p>11. Les membres de notre équipe préféreraient sortir chacun de leur côté plutôt qu'ensemble avec l'équipe.</p> <p>12. Nous assumons tous la responsabilité des défaites ou des mauvaises performances de notre équipe.</p> <p>13. Les membres de notre équipe font rarement des soirées ensemble.</p> <p>14. Les membres de notre équipe ont des objectifs incompatibles avec la performance de l'équipe.</p> <p>14'. Les membres de notre équipe ont des objectifs de performance divergents pour l'équipe.</p> <p>15. Les membres de notre équipe aimeraient passer du temps ensemble pendant l'inter-saison.</p> <p>16. Si des membres de notre équipe ont des difficultés à l'entraînement, chacun veut les aider, afin que le groupe retrouve son unité.</p> <p>17. Les membres de notre équipe ne restent pas ensemble en dehors des entraînements et des compétitions.</p> <p>18. Les membres de notre équipe ne s'expriment pas librement sur les responsabilités de chaque athlète en compétition ou à l'entraînement.</p> |
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* Used with permission of the authors.

two versions were completed independently by nine bilingual English teachers from Reims University (average age 31.9 ± 6.2 years). The participants were asked to complete both versions in succession—the QAG first, then the GEQ—with 15 minutes between the two tests. As indicated previously, the original English language version of the GEQ is an 18-item questionnaire containing 4 scales: Individual Attractions to Group–Task (ATG–T, 4 items); Individual Attractions to Group–Social (ATG–S, 5 items); Group Integration–Task (GI–T, 5 items); and Group Integration–Social (GI–S, 4 items). The translated French language version is a 20-item questionnaire containing 4, 6, 6, and 4 items in the scales ATG–T, ATG–S, GI–T, and GI–S, respectively. Consistent with the protocol in the original version, a 9-point Likert scale was used; it was anchored at the extremes by “strongly disagree” (1) and “strongly agree” (9). Negative items were reverse-scored such that higher scores represented stronger perceptions of cohesiveness.

The items were presented in a different order in the two versions. Also, the first questionnaire was immediately collected upon completion so that the subjects were not able to compare answers. A scale score was obtained by summing the relevant items.

Results and Discussion, Study 2

For the purposes of establishing concurrent validity and undertaking item trimming, two different protocols were used. The first involved an analysis of the degree of relationship between responses obtained in the original English language version and the translated French language version. The second involved an analysis of the mean responses in the French language version.

The correlational analysis was important for determining whether the translated version with either the original items or the revised items correlated better with the original English language version. Table 2 summarizes the correlation

Table 2 Correlations Between the Variables of the GEQ and the QAG

Items	QAG Variables					
	ATG–T (2,4,6,8)	ATG–S (1,3,5,7,9)	ATG–S' (1,3',5,7,9)	GI–T (10,12,14,16,18)	GI–T' (10,12,14',16,18)	GI–S (11,13,15,17)
GEQ Variables						
ATG–T	.90**	.21	.24	.66	.62	.43
ATG–S	.14	.94***	.95***	.18	.26	.91**
GI–T	.63	.11	.13	.93***	.92***	.51
GI–S	.20	.59	.65	.48	.50	.91**

Note: GEQ = Group Environment Questionnaire; QAG = Questionnaire sur l'Ambiance du Groupe; ATG–T = Individual Attractions to Group–Task; ATG–S = Individual Attractions to Group–Social; GI–T = Group Integration–Task; GI–S = Group Integration–Social.

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

Table 3 Comparing Means Between the GEQ and QAG Scales[†]

Items	QAG Scales					
	ATG-T (2,4,6,8)	ATG-S (1,3,5,7,9)	ATG-S' (1,3',5,7,9)	GI-T (10,12,14,16,18)	GI-T' (10,12,14',16,18)	GI-S (11,13,15,17)
Mean \pm SD	25.89 \pm 8.49	24.44 \pm 9.31	23.55 \pm 9.90	27.55 \pm 7.71	26.11 \pm 7.29	19.78 \pm 9.13

GEQ Scales						
ATG-T						
25.33 \pm 6.22	.42	—	—	—	—	—
ATG-S						
23.78 \pm 10.51	—	.56	-.21	—	—	—
GI-T						
28.33 \pm 7.35	—	—	—	-.80	-2.33*	—
GI-S						
19.78 \pm 7.82	—	—	—	—	—	.00

Note: GEQ = Group Environment Questionnaire; QAG = Questionnaire sur l'Ambiance du Groupe; ATG-T = Individual Attractions to Group-Task; ATG-S = Individual Attractions to Group-Social; GI-T = Group Integration-Task; GI-S = Group Integration-Social.

[†]t-test for dependent samples; * $p < .05$

coefficients between the scales for the original and translated versions of the GEQ. It is apparent that the correlations between comparable scales varied from $r = .90$ to $.95$. Thus, from a correlational perspective, it was irrelevant which of the translated versions was used.

The descriptive statistics for responses to the original (English) version of the GEQ and the translated (French) version are presented in Table 3. Insofar as the scale ATG-S is concerned, no significant differences were obtained when the overall means were compared for the version containing the original Item 3, $t(8) = .56$, *ns*, or the other one containing the revised Item 3', $t(8) = -.21$, *ns*. Therefore it was decided to retain Item 3' instead of Item 3 according to the lower scale mean observed for ATG-S'. Insofar as GI-T is concerned, a significant difference was observed for the scale containing the revised item, GI-T14': $t(8) = -2.33$, $p < .05$. Therefore it was decided to delete the revised Item 14'. Consequently, the translated version of the GEQ reverted to an 18-item questionnaire.

The results of Tables 2 and 3 were taken as evidence of support for the concurrent validity of the translated version of the GEQ (Spielberger & Sharma, 1976; Vallerand, 1989).

Study 3

The purpose of Study 3 was to evaluate the construct validity of the translated version of the Group Environment Questionnaire through the use of exploratory factor analysis and confirmatory factor analysis.

Participants

The sample consisted of 176 athletes (126 men and 50 women) from a variety of sports: basketball, handball, volleyball, soccer, rugby. Their average age was 20.2 ± 1.6 years. They had been members of their respective teams for 6 months to 16 years and averaged 8 years of playing experience in their sport (8.3 ± 4.6 years). The extreme range in tenure was due to the fact that one player, age 22, had been involved in his sport for 16 years and had also been a member of his club for 16 years. Note also that this sample was composed of club teams, not school or university teams.

Questionnaire

The questionnaire was the 18-item translated version of the Group Environment Questionnaire (Table 1) which contains 4, 5, 5, and 4 items, respectively, in the scales ATG-T, ATG-S, GI-T, and GI-S. Again, a 9-point Likert scale was used, anchored at the extremes by "strongly disagree" (1) and "strongly agree" (9). Negative items (see Items 1, 2, 3', 4, 6, 7, 8, 11, 13, 14, 17, and 18 in Table 1) were reverse-scored such that higher scores represented stronger perceptions of cohesiveness. The subject's responses on each scale were summed to yield a scale score.

Method

The translated version of the GEQ was administered prior to team training sessions in midseason in the middle of weeks during May 1999. All participants provided informed consent prior to completing the questionnaire.

Results and Discussion, Study 3

The factor structure of the 18 items was analyzed using a principal-component analysis and oblimin rotation as per the approach taken by Carron et al. (1985). Factors with eigenvalues greater than 1 that accounted for variance of at least 5% were retained (Guttman, 1954). Also, a minimum loading of 40% was adopted as the standard for concluding that an item was correlated on one factor.

Table 4 presents the results of the oblimin rotation. The analysis revealed four factors. The first factor primarily reflects social cohesion (i.e., most of the items that loaded on this factor reflect perceptions of social cohesion) while the second factor primarily reflects task cohesion. Most of the items that loaded on the third factor were contained in the ATG-S scale.

The confirmatory factor analysis tested a second-order model based on the Carron et al. model for group cohesion which postulates a hierarchical organization of latent variables. Using the results of the exploratory factor analysis as a basis, however, we tested the assumption that the cohesion items would load on social cohesion (ATG-S and GI-S) or task cohesion (ATG-T and GI-T). The confirmatory factor analysis was conducted with the LISREL 8 program (Jöreskog & Sörbom, 1993) using the maximum likelihood method and a variance/covariance matrix.

In order to evaluate the validity of the proposed model, we employed several fit indices: the chi square (χ^2 ; Jöreskog & Sörbom, 1993), the goodness-of-fit index (GFI; Jöreskog & Sörbom, 1993), the comparative-fit index (CFI; Bentler, 1990), the Tucker-Lewis index (TLI; McDonald & Marsh, 1990), and the single-

**Table 4 Results of Principal-Component Factorial Analysis, Study 3:
Factor Matrix After Oblimin Rotation**

Item #	Factor 1	Factor 2	Factor 3	Factor 4
ATG-S1	.49	.41	.53	-.15
ATG-S3	.61	.36	.70	-.01
ATG-S5	.18	.23	.83	-.08
ATG-S7	.68	.25	.49	-.14
ATG-S9	.39	.33	.61	.08
ATG-T2	.11	.13	.11	.87
ATG-T4	.10	.73	.29	.20
ATG-T6	.36	.58	.27	.36
ATG-T8	.39	.75	.28	.10
GI-S11	.86	.32	.18	-0.03
GI-S13	.84	.32	.19	.03
GI-S15	.68	.36	.32	-.01
GI-S17	.86	.44	.44	.03
GI-T10	.31	.82	.28	.11
GI-T12	.01	.53	.39	.03
GI-T14	.45	.64	.18	-0.18
GI-T16	.41	.65	.01	-.20
GI-T18	.32	.44	.21	-.23

Note: ATG-T = Individual Attractions to Group-Task; ATG-S = Individual Attractions to Group-Social; GI-T = Group Integration-Task; GI-S = Group Integration-Social.

sample cross-validation index (ECVI; Browne & Cudeck, 1989). The χ^2 indicates the level of correspondance between a proposed factor structure and the data. Therefore it should primarily be used as a fit index rather than as a null hypothesis test; its sensitivity to the number of variables and to the number of subjects has been acknowledged (Marsh, Balla, & McDonald, 1988). There are no null hypothesis tests for GFI, CFI, and TLI. But a commonly accepted empirical rule considers the model as adequate when its indices are greater than or equal to .90. The ECVI essentially allows for a comparison of specific models among themselves. The model with the lowest ECVI is generally selected (Browne & Cudeck, 1989).

The confirmatory factor analysis testing the second-order model demonstrated unsatisfactory fit indices. Specifically, the various indices were: $\chi^2(131) = 242.000$, $p = .0001$, GFI = .869, TLI = .887, CFI = .904, ECVI = 1.872.

The results of the two factor analyses revealed little conceptual value, and therefore were of little value from an operational definition perspective, for the measurement of cohesion in French sport teams using the GEQ. That is, the translated version of the GEQ did not show support for the underlying theoretical model,

and consequently, failed to demonstrate construct validity. The modification indices proposed by the LISREL 8 program suggested that the two second-order factors did not differ substantially. One question that arises is whether the size of the sample could have accounted for the findings. On the one hand, Tabachnick and Fidell (1996) have proposed that a sample size of 200 is only "fair" and, as was pointed out above, only 176 participants were tested. On the other hand, another rule suggested by Lacouture (2000) fixes the minimal size at five times the number of variables. Also, Marsh et al. (1988) observed that in order to obtain good indices, the optimal size of a sample should be between 100 and 200 participants.

Another explanation might be the protocol used. Cohesion is multidimensional and dynamic, and so, according to Carron and Brawley (2000), an essential criterion for testing the conceptual model is "a wide cross-section of groups from a similar social context (e.g., sports) at different stages of development and with heterogeneous membership characteristics" (p. 100). The sample in our Study 3 satisfied some of the points advocated by Carron and Brawley. That is, participants were heterogeneous in their membership characteristics (i.e., teams were from different sports and levels of competition, and the male and female athletes were of differing ages, sport experience, and team tenure). However, all participants were tested early in their competitive season.

Despite some minimal concerns about the size of the sample and its heterogeneity, it was felt that the unsatisfactory fit indices necessitated further work on the wording of items in the translated version of the GEQ. Nonetheless, Studies 1 to 3 were considered useful because they provided us with a foundation upon which to develop another questionnaire to test cohesion in French language sport teams.

Study 4

The results of Study 3 indicated that additional work was required to develop a conceptually and psychometrically sound measure of cohesion for the French context. Thus, one purpose of Study 4 was to initiate the development of an instrument called *Questionnaire sur l'Ambiance du Groupe* (QAG). This initial purpose was achieved through item development. A second purpose was to establish the psychometric properties of the QAG. The first step examined the construct validity of the QAG using exploratory factor analysis and confirmatory factor analysis; the second step assessed the reliability of the QAG by examining its internal consistency and interscale equivalence.

Item Modification

It became apparent from the results of Study 2 that it was necessary to depart from a literal translation of the items in the GEQ without losing the meaning of the items (Banville, Desrosiers, & Genet-Volet, 1999). Thus we decided to translate the phrases "this team" and "our team" to "mon équipe" ("my team"). The purpose was not to change the frame of reference from the original model but to have items that reflected a more personal involvement on the part of the French respondents.

Prior studies on French translation and validation of English questionnaires (Durand, Cury, Sarrazin, & Famose, 1996; Fontayne, Sarrazin, & Famose, 2000) have raised the same issues. In the French culture, "we" and "our" are also used as a general politeness expression. Thus, when French people speak about a group in

which they are involved, they do not use "we" or "our" because it feels too general; they prefer "my group," "my team," "my class," "my lesson." Wordings with "my" are more meaningful for French respondents and do not lead them to place themselves outside their group to comment on or judge its properties. So we decided to reword items that were not entirely clear to the samples tested in Studies 1 to 3.

Table 5 summarizes the end-product of the revisions, the items in the QAG. New items—those not in the original French translation of the GEQ—were added in three of the scales: Items 21, 23, 24, and 25 in the ATG-T scale; Items 22 and 26 in the ATG-S scale; and Item 31 in the GI-T scale. Thus the original QAG consisted of 31 items, with 10, 9, 7, and 5 items, respectively, in the scales ATG-T, ATG-S, GI-T, and GI-S.

Again, responses were obtained on a 9-point Likert scale anchored at the extremes by "strongly disagree" (1) and "strongly agree" (9). Negative items were reverse-scored such that higher scores represented stronger perceptions of cohesiveness.

Participants

The sample consisted of 286 athletes (184 men and 102 women, average age 19.6 ± 1.5 years) from a variety of team sports: basketball, handball, volleyball, water polo, soccer, ice hockey, and rugby. All were students in the Faculty of Sport Sciences at the University of Reims. They had been members of their team from 1 month to 17 years and had been involved in their sport from 1 month to 18 years (average = 7.8 ± 4.1 years). The extreme range in tenure was due to the fact that one player, 28 years of age, had been involved in his sport for 18 years and been a member of his club for 17 years. Note also that this sample was composed of club teams, not school or university teams.

Procedure

Participants completed the 31-item version of the QAG during two training sessions in midseason in February 2000. All participants provided informed consent prior to completing the questionnaire.

Results and Discussion, Study 4

Factorial Validity. Several exploratory factor analyses were undertaken to eliminate the items that did not correlate with the conceptualized factors: Group Integration-Task, Group Integration-Social, Individual Attractions to Group-Task, and Individual Attractions to Group-Social. These analyses led us to keep 18 items, which are indicated with an asterisk in Table 5. The factor structure for these 18 items was examined by means of a principal-component analysis and oblimin rotation. The criteria used for factor extraction and item correlation with the factors was identical to that used in Study 3.

As the results in Table 6 show, the principal-component analysis produced four principal factors which explained 60.1% of the total variance. The first factor included all 18 items. The intercorrelations were between .44 and .72. Factor 1 is equivalent to a general factor of cohesion. On the second factor, positive loaded items are referred to as social cohesion whereas negative loaded items are referred

Table 5 Item List for Second Version of QAG in Order of Presentation to Participants

<u>ATG-S1*</u>	Je n'aime pas participer aux activités extra-sportives de mon équipe. [I do not enjoy being a part of the social activities of my team.]
<u>ATG-T2</u>	Je ne suis pas satisfait par le temps de jeu que me donne mon équipe. [I'm not happy with the amount of playing time that my team gives to me.]
<u>ATG-S3*</u>	Les membres de mon équipe ne me manqueront pas à la fin de la saison. [I will not miss the members of my team at the end of the season.]
<u>ATG-T4</u>	Je trouve que l'envie de gagner de mon équipe est insuffisante. [I think that my team's level of desire to win is insufficient.]
<u>ATG-S5</u>	J'ai quelques uns de mes meilleurs amis dans mon équipe. [I have got some of my best friends on my team.]
<u>ATG-T6</u>	Mon équipe ne me donne pas assez d'occasions d'améliorer ma performance personnelle. [My team does not give me enough opportunities to improve my personal performance.]
<u>ATG-S7</u>	Je préfère d'autres soirées aux soirées de mon équipe. [I enjoy other parties more than team parties.]
<u>ATG-T8*</u>	Je n'aime pas le style de jeu de mon équipe. [I do not like the style of play on my team.]
<u>ATG-S9*</u>	Mon équipe est le groupe social le plus important auquel j'appartiens. [My team is the most important social group to which I belong.]
<u>ATG-T21*</u>	Je ne suis pas satisfait des objectifs sportifs de mon équipe. [I'm not happy about the sport goals of my team.]
<u>ATG-S22</u>	J'aime l'ambiance qui règne au sein de mon équipe. [I enjoy the general mood which reigns in my team.]
<u>ATG-T23</u>	En tant que joueur, je n'aime pas ce que je fais dans mon équipe. [As a player, I do not like what I do in my team.]
<u>ATG-S5*</u>	Quelques-uns de mes meilleurs amis sont dans mon équipe. [Some of my best friends are on my team.]
<u>ATG-T24*</u>	Je ne suis pas satisfait des priorités de jeu de mon équipe. [I'm not happy about the game priorities of my team.]
<u>ATG-S7*</u>	Je préfère participer à d'autres soirées qu'aux soirées organisées par mon équipe. [I enjoy rather taking part in other parties than in parties organized by my team.]
<u>ATG-T25</u>	Je trouve que mon équipe ne me laisse pas suffisamment participer au jeu. [I think that my team does not let me play enough.]
<u>ATG-S26</u>	Je trouve qu'il règne une bonne ambiance entre les membres de mon équipe. [I think that a good mood reigns between the members of my team.]
<u>ATG-T4*</u>	Je ne suis pas satisfait de "l'envie de gagner" de mon équipe. [I'm unhappy with my team's level of desire to win.]
<u>ATG-T6*</u>	Dans mon équipe, je n'ai pas assez l'occasion d'améliorer mon niveau de performance personnel. [In my team, I have not enough opportunities to improve my personal level of performance.]

- GI-T10* Les membres de mon équipe unissent leurs efforts pour atteindre les objectifs de performance.
[Members of my team are united in trying to reach the goals for performance.]
- GI-S11* Les membres de mon équipe préfèrent sortir chacun de leur côté plutôt qu'ensemble avec l'équipe.
[Members of my team would rather go out on their own than get together as a team.]
- GI-T12* Les membres de mon équipe se sentent tous responsables des défaites ou des mauvaises performances de l'équipe.
[Members of my team all feel responsible for any loss or poor performance by the team.]
- GI-S13* Les membres de mon équipe font rarement des soirées ensemble.
[Members of my team rarely party together.]
- GI-T14 Les membres de mon équipe ont des objectifs incompatibles avec la performance de l'équipe.
[Members of my team have conflicting aspirations for the team's performance.]
- GI-S15 Les membres de mon équipe aimeraient passer du temps ensemble pendant l'inter-saison.
[Members of my team would like to spend time together in the off-season.]
- GI-T16 Si des membres de mon équipe ont des difficultés à l'entraînement, chacun veut les aider, afin que le groupe retrouve son unité.
[If members of my team have problems in practice, everyone wants to help them so we can get back together again.]
- GI-S17* Les membres de mon équipe ne restent pas ensemble en dehors des entraînements et des compétitions.
[Members of my team do not stick together outside of practices and games.]
- GI-T18* Les membres de mon équipe ne s'expriment pas librement sur les rôles et les responsabilités de chaque athlète en compétition.
[Members of my team do not communicate freely about each athlete's roles and responsibilities during competition.]
- GI-T31* En compétition, les membres de mon équipe se donnent à fond pour l'équipe.
[During competition, the members of my team give all they have got for the team.]
- GI-S15'* Les membres de mon équipe aiment passer du temps ensemble pendant les vacances.
[Members of my team like to spend time together during holidays.]
- GI-T16'* Si des membres de mon équipe sont en difficulté à l'entraînement ou en compétition, chacun veut les aider pour que l'équipe soit performante.
[If members of my team have problems in practice or competition, everyone wants to help them so the team is high-performance.]

Note: The numbers are equivalent to the item numbers of the English version. The prime sign indicates a second item formulation. Numbers 21, 22, 23, 24, 25, and 26 are equivalent to the suggestion of new items for the attraction dimension; Number 31 is the new item for the integration. Negative items are underlined. Asterisks indicate which items were retained.

Table 6 Results of Principal-Component Factorial Analysis, Study 4: Principal Factors and Factor Matrix

	Factor 1	Factor 2	Factor 3	Factor 4
(Eigenvalue)	(5.76)	(2.41)	(1.42)	(1.23)
(% of variance)	(32.0)	(13.4)	(7.9)	(6.8)
<hr/>				
<i>Item #</i>				
ATG-S1	.45	.25	.12	.26
ATG-S3	.56	.18	.32	.37
ATG-S5'	.44	.31	.26	.44
ATG-S7'	.54	.40	.19	.12
ATG-S9	.50	.23	.08	.33
ATG-T4'	.58	-.53	.18	-.19
ATG-T8	.62	-.34	.31	-.05
ATG-T21	.57	-.39	.34	-.22
ATG-T24	.63	-.44	.39	-.14
GI-S11	.56	.41	-.02	-.48
GI-S13	.57	.46	-.08	-.44
GI-S15'	.55	.53	-.18	-.05
GI-S17	.61	.49	-.06	-.24
GI-T10	.72	-.37	-.19	-.01
GI-T12	.52	-.24	-.50	-.01
GI-T18	.49	-.10	-.30	.16
GI-T31	.60	-.35	-.33	.18
GI-T16'	.60	-.17	-.50	.21

Note: ATG-T = Individual Attractions to Group-Task; ATG-S = Individual Attractions to Group-Social; GI-T = Group Integration-Task; GI-S = Group Integration-Social.

to as task cohesion. So this factor seems to express the distinction between social and task cohesion. On the third factor, positive loaded items are referred to as the attraction dimension whereas negative loaded items are referred to as the group integration dimension. The fourth factor is not interpretable.

After oblimin rotation, the factor matrix also revealed four factors (Table 7). The first factor represented the ATG-T scale (correlations among Items 4', 8, 21, and 24 are between .70 and .85). The second factor represented the GI-S scale (correlations among Items 11, 13, 15', and 17 are between .60 and .87). The third factor represented the GI-T scale (correlations among Items 10, 12, 18, 31, and 16' are between -.56 and -.83). The last factor represented the ATG-S scale (correlations among Items 1, 3, 5', 7', and 9 are between .53 and .78).

**Table 7 Results of Principal-Component Factorial Analysis, Study 4:
Factor Matrix After Oblimin Rotation**

Item #	Factor 1	Factor 2	Factor 3	Factor 4
ATG-S1	.00	.08	-.06	.53
ATG-S3	.18	-.05	.03	.73
ATG-S5'	-.01	-.05	.04	.78
ATG-S7'	.05	.31	.07	.53
ATG-S9	-.02	.03	-.15	.58
ATG-T4'	.76	.00	-.18	-.09
ATG-T8	.70	.00	-.05	.17
ATG-T21	.80	.08	.03	.00
ATG-T24	.85	.01	.02	.09
GI-S11	.13	.86	.06	-.08
GI-S13	.05	.87	.00	-.06
GI-S15'	-.22	.60	-.19	.26
GI-S17	-.01	.74	-.05	.15
GI-T10	.39	.05	-.58	-.01
GI-T12	.02	.11	-.75	-.18
GI-T18	-.01	.02	-.56	.11
GI-T31	.15	-.11	-.73	.06
GI-T16'	-.08	.00	-.83	.07

Note: ATG-T = Individual Attractions to Group-Task; ATG-S = Individual Attractions to Group-Social; GI-T = Group Integration-Task; GI-S = Group Integration-Social.

The confirmatory factor analysis tested three models. Using the conceptual model of group cohesion proposed by Carron et al. (1985) as a basis, a first-order model was formulated (FM1). It assumed that the 18 items loaded on the four dimensions of group cohesion: ATG-S, ATG-T, GI-S, and GI-T. Additionally, however, the Carron et al. model for group cohesion postulated a hierarchical organization of latent variables. Therefore, two second-order models were also tested. Consistent with the propositions of Carron et al., one of those models (SM1) was based on the assumption that the four factors (ATG-S, ATG-T, GI-S, and GI-T) load on two second-order factors: the individual-attractions-to-group dimension (ATG-S and ATG-T) and the group integration dimension (GI-S and GI-T). The principal-component analysis reported above showed us that the items in the QAG were organized primarily in relation to the dimensions of social vs. task cohesion. Therefore, the other second-order model (SM2) tested the assumption that the cohesion items load on social cohesion (ATG-S and GI-S) or task cohesion (ATG-T and GI-T).

The confirmatory factor analyses were conducted with the LISREL 8 program (Jöreskog & Sörbom, 1993) using the maximum likelihood method and a variance/covariance matrix. In order to evaluate the validity of the proposed models, we used the same fit indices as in Study 3: chi square, goodness-of-fit index, comparative-fit index, Tucker-Lewis index, and single-sample cross-validation index.

The confirmatory factor analysis testing FM1, the first-order model, demonstrated good fit indices: $\chi^2(129) = 241.18$, $p = .000$, GFI = .912, TLI = .928, CFI = .939, and ECVI = 1.14. Correlations among the four variables ranged from .682 to .284, i.e., .443 between ATG-S and ATG-T; .682 between ATG-S and GI-S; .459 between ATG-S and GI-T; .674 between ATG-T and GI-T; .284 between ATG-T and GI-S; and .415 between GI-S and GI-T.

The confirmatory factor analysis testing SM1 and SM2, the two second-order models, also demonstrated good fit indices. Specifically, the various indices for SM1 were: $\chi^2(130) = 285.211$, $p = .0001$, GFI = .902, TLI = .902, CFI = .916, and ECVI = 1.288. For SM2 the various fit indices were: $\chi^2(130) = 245.101$, $p = .0001$, GFI = .911, TLI = .927, CFI = .938, and ECVI = 1.148.

Figures 1 and 2 show the structures of the two second-order factor models (SM1, SM2), their parameter estimates based on the LISREL completely standardized solution for the first- and second-order factor loadings, and residual variances. All factor loadings are statistically significant ($p < .001$ or $< .01$). The first-order factor loadings ranged from .475 to .836 for SM1 and from .466 to .836 for SM2; the second-order factor loadings ranged from .585 to .706 for SM1 and from .742 to .918 for SM2.

The factor analyses provided support for the construct validity of the QAG in that the results were consistent with the underlying theoretical model. The 18 items showed good correlations with a general latent factor of cohesion. Further, data are organized in relation to the distinctions between social and task cohesions and between the dimensions of individual-attractions-to-group and group integration. After oblimin rotation, the items split on the four expected factors. The data structure seems identical to the theoretical model proposed by Carron et al. (1985). However, the second-order model SM2 was superior in fit to the second-order model SM1. This finding lends support to a suggestion that in French sport teams the Carron et al. model may be best conceptualized in terms of a task-social cohesion distinction that is further subdivided into perceptions oriented toward group integration and individual attractions to group.

Internal Consistency and Interscale Equivalence. Reliability of each of the four scales of the QAG was analyzed through the use of Cronbach alpha coefficient (1951). As Widmeyer et al. (1985) have pointed out, internal consistency is more appropriate for determining the reliability of a dynamic construct such as cohesion than is test-retest reliability.

The Cronbach alpha coefficients were .71, .83, .83, and .79 for the scales ATG-S, ATG-T, GI-S, and GI-T, respectively. During their initial psychometric analyses of the GEQ, Carron et al. (1985) reported similar or lower values, namely, .64, .75, .76, and .70 for the scales ATG-S, ATG-T, GI-S, and GI-T, respectively.

Table 8 provides a summary of the item-total scale correlation analyses. It is apparent that in every instance each item correlated substantially higher with its own scale than with any other scale. The results of Table 8 also attest to the good reliability of the QAG.

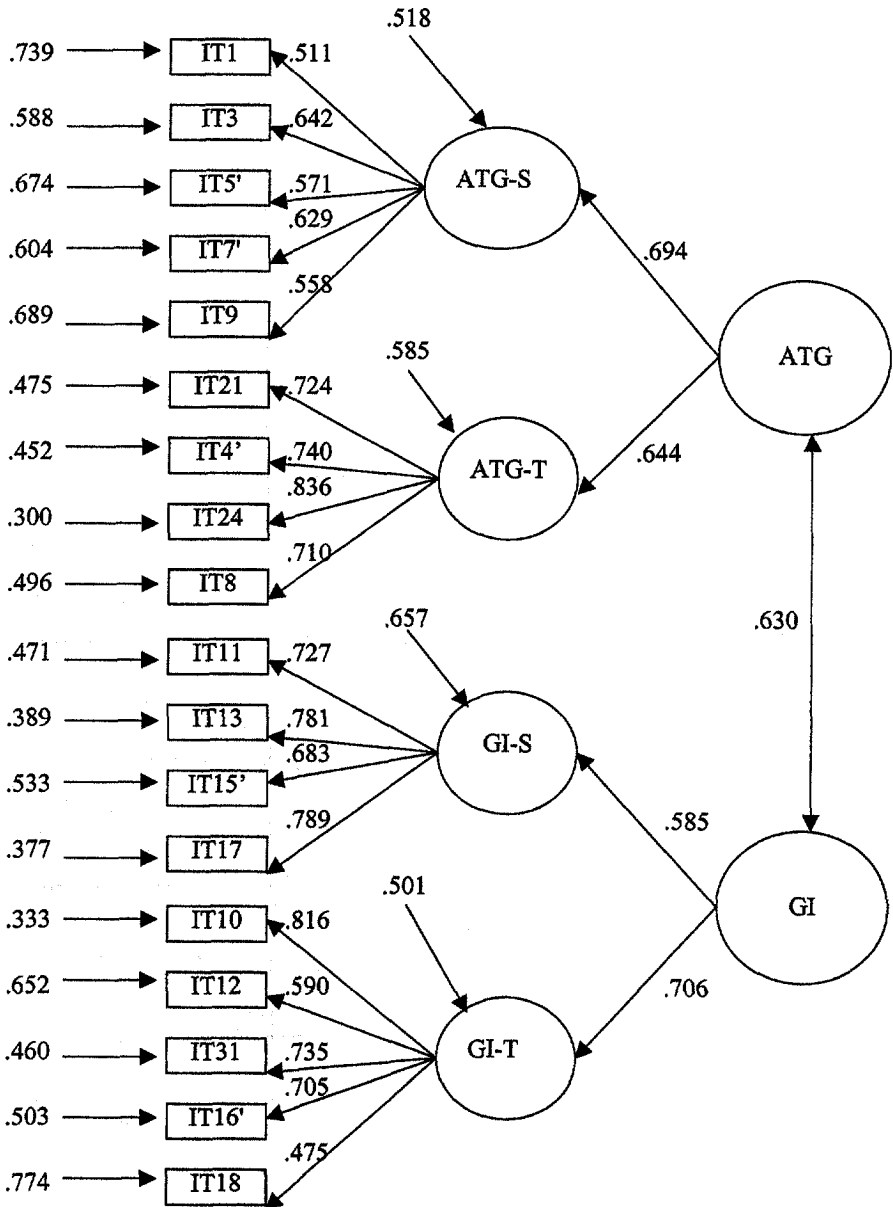


Figure 1 — Group cohesion: first- and second-order hierarchical organization of the first model, SM1. Estimates are based on the completely standardized solution. All path coefficients are significant, $p < .001$.

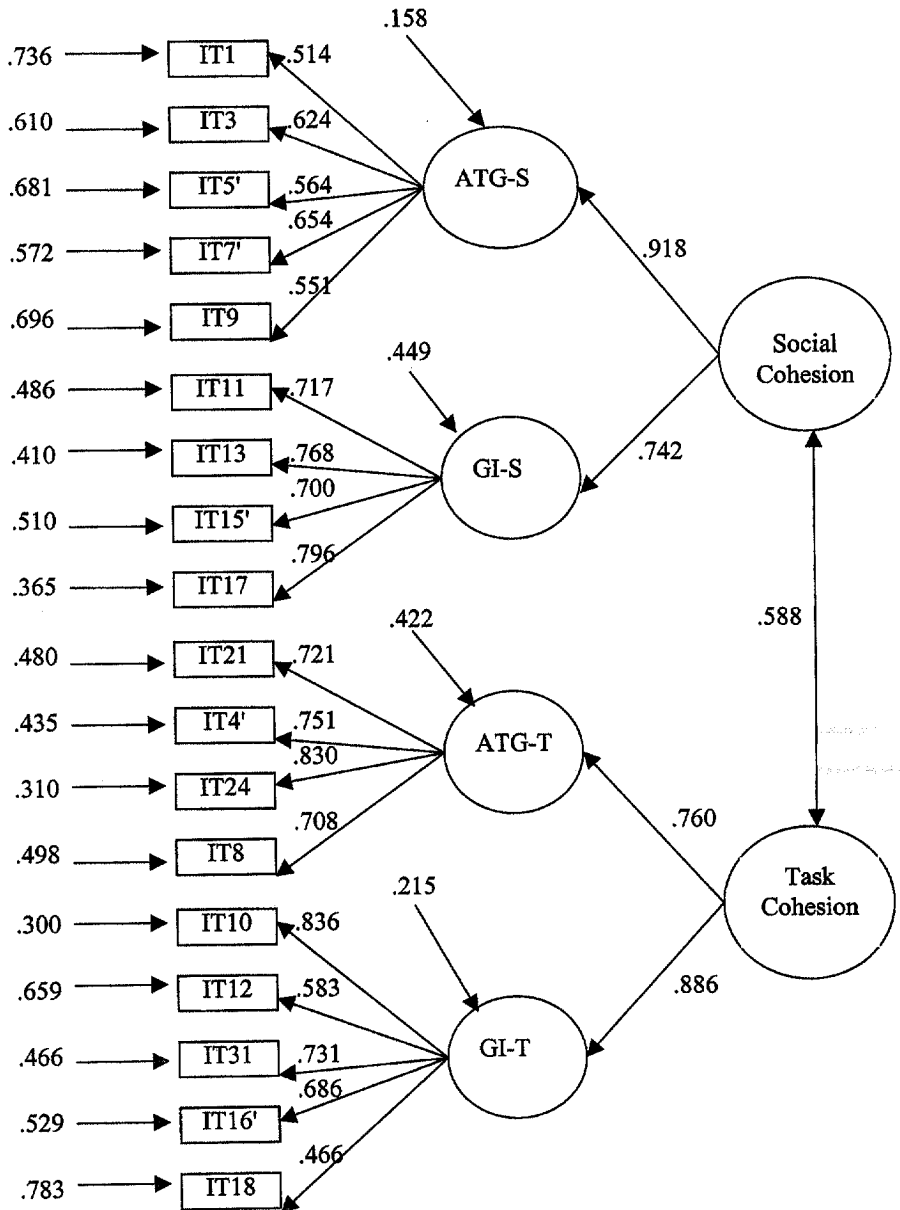


Figure 2 — Group cohesion: first- and second-order hierarchical organization of the second model, SM2. Estimates are based on the completely standardized solution. All path coefficients are significant, $p < .01$.

Table 8 Results of Interscale Equivalence of QAG

	ATG-S	ATG-T	GI-S	GI-T
ATG-S1	.60	.21	.32	.24
ATG-S3	.70	.33	.34	.28
ATG-S5'	.73	.18	.32	.19
ATG-S7'	.71	.23	.47	.23
ATG-S9	.67	.23	.35	.30
ATG-T4'	.19	.83	.16	.49
ATG-T8	.34	.77	.23	.43
ATG-T21	.26	.81	.21	.37
ATG-T24	.31	.86	.19	.43
GI-S11	.37	.24	.80	.27
GI-S13	.38	.22	.84	.28
GI-S15'	.49	.11	.78	.30
GI-S17	.48	.21	.84	.30
GI-T10	.31	.60	.32	.79
GI-T12	.17	.33	.25	.75
GI-T18	.28	.29	.24	.64
GI-T31	.27	.43	.21	.77
GI-T16'	.30	.32	.29	.77

Note: ATG-T = Individual Attractions to Group-Task; ATG-S = Individual Attractions to Group-Social; GI-T = Group Integration-Task; GI-S = Group Integration-Social.

Study 5

The purpose of Study 5 was to examine the predictive validity of the QAG. To this end, a number of the same predictions advanced by Brawley et al. (1987) in their validation of the Group Environment Questionnaire were tested. In their study, Brawley et al. demonstrated predictive validity by showing that participants' perceptions of cohesiveness could be differentiated on the basis of group type (i.e., individual vs. team sports) and team tenure (longstanding vs. new members).

Participants

The sample consisted of 237 athletes who participated in either individual sports ($n = 117$) or team sports ($n = 120$). The athletes were 21.3 years of age ($SD = 2.2$) and had been a member of their team from 1 month to 16 years ($M = 51.2 \pm 45.6$ months). Again, the range in team tenure was the result of one player, age 23, who had been involved in his sport for 16 years in the same club. As in the case above, this sample was composed of club teams and not school or university teams.

For purposes of analyses, athletes were classified as new team members if they had been on a team 12 months or less ($n = 40$), and longstanding members if they had been a team member from 6 to 16 years ($n = 52$). Consistent with the protocol adopted by Brawley et al. (1987), an extreme-groups analysis was chosen to maximize the possibility of categorization of athletes on the new vs. longstanding variable.

Procedure

The participants completed the QAG prior to team training sessions in midseason in the middle of the week during March 2000. All provided informed consent prior to completing the questionnaire. The factor scores were computed by summing the relevant item values: Items 1, 3, 5', 7', and 9 for ATG-S; Items 4', 8, 21, and 24 for ATG-T; Items 11, 13, 15', and 17 for GI-S; and Items 10, 12, 16', 18, and 31 for GI-T. Items 5', 9, 10, 12, 31, 15', and 16' are scored from "strongly disagree" = 1 to "strongly agree" = 9. The other items are scored from "strongly disagree" = 9 to "strongly agree" = 1. Thus, higher scores represented stronger perceptions of cohesiveness.

Results and Discussion, Study 5

Discriminant function analyses correctly classified 67.93% of the individual and team sport athletes, $\chi^2 = 46.78$, $p < .001$; and 66.30% of the new and longstanding members, $\chi^2 = 22.13$, $p < .001$. A one-way MANOVA was computed, with group-type (i.e., individual vs. team sport) representing the independent variable and the four measures of cohesion (ATG-T, ATG-S, GI-T, and GI-S) representing the dependent variables. Significant differences were obtained, Wilks' lambda = .82, R/Rao (4, 232) = 12.89, $p < .001$, on the factors ATG-T, $F(1, 235) = 13.94$, $p < .001$, and GI-T, $F(1, 235) = 8.73$, $p < .01$. Post hoc tests (Tukey's HSD) showed that ATG-T was greater for individual sport athletes than for team sport athletes (27.27 ± 6.78 vs. 23.97 ± 6.86), whereas GI-T was greater for team sport athletes (33.11 ± 5.49 vs. 30.57 ± 7.58).

A second identical MANOVA analysis was undertaken except that the independent variable in this instance was team tenure. Again significant differences were observed, Wilks' lambda = .78, R/Rao (4, 87) = 6.22, $p < .001$, for ATG-S, $F(1, 90) = 4.01$, $p < .05$; and for GI-T, $F(1, 90) = 7.18$, $p < .01$. Post hoc analyses showed that longstanding members perceived greater individual-attractions-to-group-social than did new members (30.35 ± 8.92 vs. 26.55 ± 9.12), whereas new members perceived greater group integration-task than did longstanding members (33.87 ± 6.23 vs. 29.71 ± 8.16). When the social cohesion factors ATG-S and GI-S and the task cohesion factors ATG-T and GI-T were combined, a significant effect of time on team on social cohesion was obtained, $F(1, 90) = 4.24$, $p < .05$. The longstanding members perceived greater levels of social cohesion in their team, 53.44 ± 14.85 vs. 46.82 ± 15.82 . The social and task orientations resulted in the correct classification of 59.78% of the athletes according to the time they spent with their team, $\chi^2 = 8.69$, $p < .02$.

Generally, the results were identical to those observed by Brawley et al. (1987) and provide support for the predictive validity of the QAG. Cohesion scores on the QAG led to a correct classification of athletes according to sport type and according to the time they spent on their team. Moreover, consistent with Brawley et al. (1987), individual sport athletes in our sample showed greater ATG-T while team sport athletes showed greater GI-T.

However, contrary to Brawley et al., we observed greater GI-T in new team members than in longstanding members. Brawley et al. (1987) did suggest that all members of a team are more focused on the task than on social interactions in the early stages of their group's life. This process would follow from the natural task orientation of sport. It is possible that in French sport teams, newer team members place more emphasis on task aspects in order to more readily assimilate whereas longstanding team members place more emphasis on social aspects. Then, in the later stages of the group's life, members would gradually attach importance to social norms or common values.

General Discussion

The main objective of the present study was to develop and validate a measure of group cohesion for use with sport teams with athletes who have French as a first or only language. Five studies were undertaken using protocols advocated for the transcultural validation of psychometric instruments (Vallerand, 1989). The final product, the Questionnaire sur l'Ambiance du Groupe (QAG), comprises four scales: Individual Attractions to Group-Task (ATG-T, 4 items); Individual Attractions to Group-Social (ATG-S, 5 items); Group Integration-Task (GI-T, 5 items); and Group Integration-Social (GI-S, 4 items).

Of interest to us was the fact that the various stages (our 5 studies) undertaken in the development of the QAG inadvertently were consistent with suggestions advanced by Carron et al. (1998) for the development of cohesion measures in other cultures:

researchers interested in the measurement of cohesiveness in other cultures or contexts should (a) directly use any of the original GEQ items that appear to represent cohesiveness in the group(s) under focus, (b) revise the wording of any item that appears to be useful but that contains language, terminology, or a situational reference not characteristic of the group(s) under focus, (c) delete those items that, through pilot testing, appear to be inappropriate, and (d) add new items that are more culturally meaningful or better represent the situation for any of the four scales of the conceptual model. The context-specific measure of cohesiveness can then be examined for its psychometric properties. (p. 223)

That is, original GEQ items were directly used. But first results showed it was necessary to revise the wording for specific items. Finally, inappropriate items were deleted and new items that were more culturally meaningful were added.

The end product was the QAG—a questionnaire that is both similar to and different from the GEQ. Nonetheless, results from Studies 4 and 5 did provide support for the theoretical model of cohesion proposed by Carron et al. (1985) in another culture, i.e., the French culture. They also confirmed Carron et al.'s (1998) belief that "the conceptual model . . . is sound; therefore, it could be used as the basis for any measures of cohesion developed in other countries or for other contexts" (pp. 222-223). The factor analyses confirmed the existence of two major dimensions: social cohesion/task cohesion and individual attractions to group/group integration. Moreover, the confirmatory factor analyses showed that the four factors load on two second-order factors: the individual attractions to group/group integration dimension and the social cohesion/task cohesion dimension.

A second-order model that assumed a task-social dimension composed of individual attractions to group and group integration perceptions fit the data better than did a second-order model that assumed individual attractions to group and group integration dimensions composed of task and social aspects. It seems that in French sport teams the Carron et al. model may be best conceived in terms of a task-social cohesion distinction that is further subdivided into perceptions oriented toward group integration and individual attractions to group. Nonetheless, the fit indices were satisfactory for both models.

Our results are similar to those of Li and Harmer (1996), who also confirmed two models, SM1 and SM2. However, in their study, better fit indices were obtained for the model in which attraction and integration were the two second-order factors. In any event, the results obtained by Li and Harmer as well as those from the present study, independent of whether SM1 or SM2 are adopted, support an argument that group cohesion is a multidimensional construct. There is not a principal dimension and a secondary dimension linked with the principal one; there are two interrelated dimensions with similar loadings. According to Widmeyer et al. (1985), the four constructs "are related through the interaction of various task and social orientations as viewed through the eyes of individuals for themselves and for their group" (p. 18).

The failure of studies by Dyce and Cornell (1996), Carless and De Paola (2000), and Schutz et al. (1994) to provide support for the theoretical model suggested by Carron et al. (1985) requires further research. Carron and Brawley (2000) proposed that the studies that failed to provide support for their conceptual model involved samples that were not sufficiently heterogeneous (and therefore all dimensions of cohesiveness might not have been salient to the participants). Certainly in our study, the sample of athletes and teams was heterogeneous in terms of gender, tenure, and sport type.

Validation is an ongoing process. Thus, further research is needed with the QAG. One critical step would be to assess the concurrent validity of the QAG. Another step would be the development of normative data so that subsequent researchers and/or coaches and practitioners could have some standard against which to compare their findings.

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