

2009

# Development of a Cohesion Questionnaire for Youth: The Youth Sport Environment Questionnaire

Mark Eys

Todd M. Loughead  
*University of Windsor*

Steven R. Bray

Follow this and additional works at: <https://scholar.uwindsor.ca/humankineticspub>



Part of the [Kinesiology Commons](#)

---

## Recommended Citation

Eys, Mark; Loughead, Todd M.; and Bray, Steven R.. (2009). Development of a Cohesion Questionnaire for Youth: The Youth Sport Environment Questionnaire. *Journal of Sport and Exercise Psychology*, 31 (3), 390-408.  
<https://scholar.uwindsor.ca/humankineticspub/9>

This Article is brought to you for free and open access by the Faculty of Human Kinetics at Scholarship at UWindsor. It has been accepted for inclusion in Human Kinetics Publications by an authorized administrator of Scholarship at UWindsor. For more information, please contact [scholarship@uwindsor.ca](mailto:scholarship@uwindsor.ca).

# Development of a Cohesion Questionnaire for Youth: The Youth Sport Environment Questionnaire

Mark Eys,<sup>1</sup> Todd Loughead,<sup>2</sup> Steven R. Bray,<sup>3</sup>  
and Albert V. Carron<sup>4</sup>

<sup>1</sup>Laurentian University; <sup>2</sup>University of Windsor;

<sup>3</sup>McMaster University; <sup>4</sup>University of Western Ontario

The purpose of the current study was to initiate the development of a psychometrically sound measure of cohesion for youth sport groups. A series of projects were undertaken in a four-phase research program. The initial phase was designed to garner an understanding of how youth sport group members perceived the concept of cohesion through focus groups ( $n = 56$ ), open-ended questionnaires ( $n = 280$ ), and a literature review. In Phase 2, information from the initial projects was used in the development of 142 potential items and content validity was assessed. In Phase 3, 227 participants completed a revised 87-item questionnaire. Principal components analyses further reduced the number of items to 17 and suggested a two-factor structure (i.e., task and social cohesion dimensions). Finally, support for the factorial validity of the resultant questionnaire was provided through confirmatory factor analyses with an independent sample ( $n = 352$ ) in Phase 4. The final version of the questionnaire contains 16 items that assess task and social cohesion in addition to 2 negatively worded spurious items. Specific issues related to assessing youth perceptions of cohesion are discussed and future research directions are suggested.

**Keywords:** group dynamics, youth sport, team, measurement

Cohesion represents “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). More than 30 years of research appears to support the suggestion by Lott and Lott (1965) that cohesion is one of the most critical variables within small groups. As one example of its importance within sport, Carron, Colman, Wheeler, and Stevens (2002) conducted a meta-analysis of 46 studies

---

Eys is now with the Kinesiology/Physical Education and Psychology Departments, Wilfrid Laurier University, Waterloo, ON, Canada. Loughead is with the School of Human Kinetics, University of Windsor, Windsor, ON, Canada. Bray is with the Department of Kinesiology, McMaster University, Hamilton, ON, Canada. Carron is with the Department of Kinesiology, University of Western Ontario, London, ON, Canada.

examining the cohesion–team performance relationship and found a moderate-to-large positive effect ( $ES = .65$ ; interpretations based on Cohen, 1992).

The definition highlighted in the previous paragraph provided the basis for a multidimensional conceptualization of cohesion for the sport domain developed by Carron, Widmeyer, and Brawley (1985). This conceptualization proposed that cohesion should be examined in relation to both the task- and social-oriented concerns of the group and that cognitions about the “cohesiveness of the group are related to the group as a totality and to the manner in which the group satisfies personal needs and objectives” (Carron, Brawley, & Widmeyer, 2002, p. 9). Consequently, their conceptual model for cohesion comprises four separate but related dimensions: (a) group integration—task (i.e., the individual group member’s perceptions of the degree of unity the group possesses surrounding task aspects; GI-T), (b) group integration—social (i.e., the individual group member’s perceptions of the degree of unity the group possesses regarding social aspects; GI-S), (c) individual attractions to the group—task (i.e., the individual group member’s perceptions of his/her personal involvement in task aspects of the group; ATG-T), and (d) individual attractions to the group—social (i.e., the individual group member’s perceptions of his/her involvement in social aspects of the group; ATG-S).

Stemming from this conceptualization, Carron and colleagues (1985) developed an operationalization of cohesion called the Group Environment Questionnaire (GEQ), which contains 18 items that assess the four dimensions of cohesion outlined in the previous paragraph. Overall, the utility of the GEQ has been supported through a number of studies (see Carron et al., 1998). Further, Dion (2000), in a comprehensive review of the literature, endorsed the GEQ as a useful and contemporary measurement approach to cohesion. However, on a few occasions, researchers have questioned the validity of the GEQ based on independent analyses of the factor structure of the instrument (e.g., Schutz, Eom, Smoll, & Smith, 1994; Sullivan, Short, & Cramer, 2002). For example, Schutz and colleagues distributed the GEQ to high school athletes participating on interactive and co-acting sport teams and found that the proposed four-factor structure of the questionnaire was not supported.

The lack of validity of the GEQ demonstrated with a high school sample (i.e., Schutz et al., 1994) illustrates a concern raised by the developers of the questionnaire themselves: “In short, is there a generalizability of the GEQ items across cultures and/or to other groups outside the population for which it was developed?” (Carron, Brawley, & Widmeyer, 2002, p. 39). The population targeted by Carron et al. (1985) consisted of male and female athletes between the ages of 18 and 30 years competing in competitive or recreational sport teams. Presently, researchers who desire to use the GEQ beyond the intended target population must either make a case for the appropriateness of the existing version for their specific use and/or alter items and analyses to suit as necessary. In fact, these practices have been engaged in with some degree of regularity for other activity types (e.g., exercise classes; Carron & Spink, 1993) and cultures (e.g., French sample; Heuzé & Fontayne, 2002) with varying levels of success. The age of participants (i.e., 18–30) for which the GEQ was intended has also restricted its use or forced researchers to consider alternatives to item wording as suggested by Carron, Brawley, and Widmeyer (2002). For example, Estabrooks and Carron (2000) developed a cohesion inventory specifically for use with older adults (>60

years of age) in an exercise setting entitled the Physical Activity Group Environment Questionnaire.

Overall, the utilization of a questionnaire (or a slightly modified version) with a population for which it was not wholly intended occurs under two major assumptions. First, it is assumed that the original *conceptualization* of the construct is relevant to the population under examination. In the case of relational constructs such as cohesion, this may not be a reasonable assumption. For example, Rubin, Bukowski, and Parker (2006) provided an excellent overview of the role that development plays in children's perceptions of their peer interactions, relationships, and groups. They noted that "children's peer experiences become increasingly diverse, complex, and integrated with development" (p. 586). Consequently, and of relevance to the current study, it is not reasonable to assume that the specific nature of the perceptions of group unity held by a younger sample reflect the underlying four-dimensional conceptual model of cohesion proposed by Carron and colleagues (1985). In fact, the issue of developmental differences has been discussed in other areas within sport psychology. In research examining the Sport Anxiety Scale, Smith, Smoll, and Barnett (1995) found that the original three-factor structure underlying this scale was not applicable with younger children and that it was necessary to reduce the original three factors (i.e., worry, somatic anxiety, and concentration disruption) into one total score. Smith et al. suggested that the age of the children involved in their study may have played a role in their ability to discriminate between physical and cognitive symptoms of anxiety.

The second major assumption is that the *operationalization* of the construct under examination and specific test items in the original questionnaire are appropriate for other types of groups. With regard to the above research with the Sport Anxiety Scale, Cumming, Smith, Smoll, Standage, and Grossbard (2008) noted the importance of age-appropriate measures, because ones developed with adults may not work effectively with younger populations.

Returning to the Group Environment Questionnaire, two issues of item wording should be discussed in relation to its use with younger populations. The first is the degree to which participants are able to understand the words and sentences contained within the inventory. Given that the original measure was designed for use with young adults (i.e., 18–30 years old), it is possible that the complexity of the language contained within the Group Environment Questionnaire would be beyond the comprehension of younger populations. Researchers in the fields of education (e.g., Harrison, 1980) and, to a lesser extent, sport psychology (e.g., Cumming et al., 2008) have assessed a measure's readability. Readability is described by Cumming et al. as the "school grade level at which items are successfully read by most children" (p. 688). Applying the Flesch–Kincaid assessment of readability<sup>1</sup> (see Kincaid, Fishburne, Rogers, & Chissom, 1975) to the test items contained within the original GEQ results in a range of readability scores from 0.0 to 16.2 with an average of 6.0. This level of readability would seem to be appropriate for the intended population of the original GEQ but some items may be problematic for youth participants (i.e., items above a school grade level of nine).

A second item wording issue pertinent to the GEQ is the use of mixed stems (i.e., positive and negative items). Eys, Carron, Bray, and Brawley (2007) provided an overview of issues related to employing a mix of positive and negative

items in a questionnaire and in the GEQ specifically. Eys et al. (2007) noted that certain individual characteristics (e.g., age) may influence (a) a participant's ability to interpret mixed and/or negatively worded items and (b) the internal consistency values of the dimensions within the GEQ. In its current form, the GEQ contains 12 negatively and 6 positively worded items.

In sum, the literature discussed above raises the issue of whether the original GEQ is effective as a measure of cohesion with youth<sup>2</sup> sport teams. In addition to the operationalization concerns (or perhaps as a consequence), on a practical level there appears to be a dearth of published literature pertaining to cohesion in youth groups. With a relatively small number of exceptions (e.g., Bruner & Spink, 2007; Granito & Rainey, 1988; Gruber & Gray, 1982; Schutz et al., 1994; Senécal, Loughead, & Bloom, 2008), this lack of scholarly focus on youth perceptions of cohesion is greatly outweighed by the prevalence and importance of participation in group sport activities at both recreational and competitive levels by this population (cf. Wankel & Mummery, 1996). In fact, Cameron, Craig, and Paolin (2005) found that 81% of sport participants aged 15–17 reported involvement in team sports such as hockey, soccer, basketball, football, volleyball, and rugby.

It is possible that this lack of cohesion research has stemmed from the lack of a valid, reliable, and relevant measure of the construct for youth sport groups. Consequently, group dynamics researchers (Carron, Eys, & Burke, 2007) have called for the development of an instrument appropriate for this age group. Specifically, Carron et al. (2007) stated “If cohesion is the most important group variable—as many authors have suggested—some measure of the degree to which it is present in youth sport is necessary” (p. 100). Therefore, the purpose of the current study was to initiate the development of a psychometrically sound measure to assess perceptions of cohesion in members of youth (13–17 years of age) sport groups.

To this end, a series of projects were undertaken over four phases of a research program. The initial phase—through three interrelated projects—was designed to garner an understanding of how youth sport group members perceived the concept of cohesion. In Phase 2, the participants' expressions of their perceptions of cohesion were used in the development of possible items for the new questionnaire. In addition, the content validity of these items was examined by group dynamics experts and youth athletes. Phase 3 was concerned with further item analyses (e.g., principal components analyses) leading toward a refined measure of cohesion for youth sport groups. Finally, the purpose of Phase 4 was to provide additional support for the factorial validity of the resultant questionnaire through confirmatory factor analyses with an independent sample. The protocol and results for these four phases are outlined in detail in subsequent sections.

## Methods and Results

### Phase 1: Operational Definitions of Cohesion for Youth Sport Participants

As noted above, the purpose of this phase was to determine the meaning of cohesion as perceived by youth sport participants and to derive appropriate expressions

of cohesion for the development of test items. Three interrelated projects were conducted to this end, namely the use of focus groups, open-ended questionnaires, and a search of the cohesion literature. For the first two projects, institutional ethics approval was obtained and participants as well as a parent or guardian provided informed consent.

**Project 1—Focus Groups.** Fifty-six team sport athletes (26 females and 30 males;  $M_{\text{age}} = 15.63 \pm 1.01$  years) from two high schools took part in the project. All were participants at a variety of competitive levels (i.e., recreational to competitive) in a number of sports including rugby, hockey, basketball, volleyball, soccer, doubles tennis and badminton, field hockey, and football. Each participant was placed in one of seven focus groups. Each focus group was moderated by a trained research assistant and followed a semistructured interview guide<sup>3</sup> that contained (a) introductory questions, (b) transition questions, (c) key questions, and (d) an ending question. This format was based on suggestions by Krueger and Casey (2000) and Patton (1990). Of most importance, the key questions asked participants to reflect on (a) the definition of cohesion, (b) indicators of cohesive sport groups, (c) indicators of noncohesive sport groups, and (d) how sport groups develop cohesion. Each focus group was audiotaped, transcribed, and further analyzed following procedures outlined by Côté, Salmela, Baria, and Russell (1993). While the above is a brief summary of the procedures used in this qualitative project, a detailed description of the methods and results has been communicated in a separate publication (Eys, Loughead, Bray, & Carron, in press).

**Project 2—Open-Ended Questionnaires.** The second project in Phase 1 used another qualitative approach. In this case, open-ended questionnaires were completed by 138 current team sport athletes and 142 former team sport athletes. The participants ranged in age from 13 to 17 years old ( $M_{\text{age}} = 15.77 \pm .99$  years), including 164 males and 113 females (three individuals did not indicate gender), with experience in the team sports of basketball, soccer, volleyball, hockey, rugby, baseball, curling, lacrosse, and football. The athletes responded to questions inquiring why individuals (a) join sport groups, (b) stay with sport groups, and (c) withdraw from sport groups. Consistent with the methodology used by Carron et al. (1985), approximately one-third of the athletes were asked questions specific to the self (e.g., Why did *you* join your sport team?), one-third were asked the same questions but in reference to their teammates (e.g., Why did *your teammates* join your sport team?), and the remaining third were asked questions from a general reference point (e.g., Why do *others your age* join sport teams?). Slight wording changes were required to query existing and former athletes separately. Overall, this approach was used to gain an understanding of group attraction processes in a manner consistent with previous protocols (i.e., Carron et al., 1985). The coding and analysis of responses were conducted in a similar fashion to Project 1 utilizing the suggestions summarized by Côté et al. (1993).

**Project 3—Cohesion Literature Search.** The final project in Phase 1 consisted of a literature search of studies that have examined youth participation in sport. The purpose of the search was twofold. First, information regarding the reasons why youth join, maintain membership, and leave sport teams was sought to supplement the information gathered in Project 2 of this phase. Second, a search for

previous items that have been used to assess youth perceptions of their sport teams was conducted. However, it should be noted that (a) the results from this specific project did not yield additional information beyond that found in Project 2 and (b) previous research typically used the original GEQ to assess youth perceptions of cohesion (e.g., Schutz et al., 1994; Senécal et al., 2008). Consequently, these items were considered for inclusion in subsequent stages.

## Phase 1 Outcomes

The resultant information from the three projects in Phase 1 formed the basis of the subsequent phase related to item generation. Specifically, Project 1 (focus groups) yielded 273 meaning units (i.e., phrases or words derived through the above qualitative methods that represent a single idea; Tesch, 1990) for further consideration, while Project 2 (open-ended questionnaires) yielded 994 meaning units from current team sport athletes and 873 meaning units from former team sport athletes.

## Phase 2: Item Generation and Content Validity

The main objective of this phase of the study was to use the information gathered in the first phase to create a pool of potential items for use in the questionnaire. The four investigators used this information to create an initial set of 142 items that took into consideration a number of issues. First, based on previous research conducted by Eys et al. (2007), each item was phrased in a positive manner (the implications of this approach are highlighted in the discussion section). Second, given that the procedures undertaken in Phase 1 did not result in the creation of additional potential dimensions of cohesion, each item was considered in reference to the four dimensions of cohesion originally proposed by Carron et al. (1985). Finally, based again on the type of responses from the participants in Phase 1, consideration was given to providing a relatively equal number of items representing behavioral, affective, and cognitive representations of cohesion.

The four investigators then assessed the content validity for each of the 142 items based on several criteria, including relevance to a youth population, duplication/similarity of items, and clarity of item wording. Each investigator independently judged whether each item should be retained and provided comments or edits to items as deemed necessary. Seventy-five percent agreement among the four investigators was required to retain any one item. The result of this item trimming process was a second version of the questionnaire containing 120 items. Six of these remaining items were slightly modified/edited for clarity based on suggestions by one or more of the researchers.

The third step in this phase was to further assess the content validity of the reduced 120-item version of the questionnaire through its examination by three external experts in group dynamics/sport psychology as well as five high school athletes representing multiple team sports and ranging in age from 13 to 17 years old. The experts (a) received a copy and explanation of the conceptual model of cohesion, (b) examined the items and their placement within the dimensions of the conceptual model, and (c) made suggestions as to the inclusion, modification, or deletion of any item.

The high school athletes received a copy of the questionnaire and were asked to (a) identify items that they felt might be difficult to answer or that they did not understand and (b) provide any suggestions for necessary item modifications. The lead investigator examined the input and responses of the experts and made changes to the items accordingly. The end result of these processes was a third version of the questionnaire that consisted of 87 items. Twelve of the remaining 87 items were slightly modified/edited for clarity through this content analysis process.

### Phase 3: Distribution and Principal Component Analyses

The purpose of Phase 3 was to examine the distribution patterns and the underlying components of the remaining 87 items with the additional aim of trimming the number of items to a level sufficient to examine the concept of cohesion in youth sport groups. Specifically, one strategy was to examine the degree to which each item was normally distributed via the assessment of skewness/kurtosis values and associated histograms.

A second strategy was to use principal components analysis. Stevens (2002) suggested that this type of analysis is appropriate when it is desired that the variables (i.e., items) are free to associate with all components and that one of the goals of the analysis is to determine the number of underlying components. This was clearly the case in the present situation.

Further, Stevens (2002) noted that this type of analysis is a psychometrically sound procedure. The considerations and criteria communicated by Stevens were used in the current study to guide decisions made about the suitability of items. For instance, decisions pertaining to how many components to retain were based on an examination of (a) the eigenvalues in comparison with the critical value suggested by Kaiser ( $>1.00$ ; 1960) and (b) the graphical representation of these values through the scree test (Cattell, 1966). This combination is favored because using Kaiser's criterion alone can "lead to retaining factors which may have no practical significance" (Stevens, 2002, p. 389). In addition, it is quite common for the initial principal components analysis to yield components that are not easily interpreted. Consequently, an orthogonal rotation (varimax; Kaiser, 1960) was applied to facilitate the interpretation of the components.

Finally, the issues of sample size and which coefficient criterion was used for component interpretation should be discussed in tandem. Although there is no gold standard for what criterion value is appropriate, Stevens (2002) noted that the common and blind use of coefficients greater than .30 should be discarded in favor of considering values based on sample size. Stevens provided a table of critical values (p. 394) for correlation coefficients ( $\alpha = .01$ ; two-tailed) based on sample size and suggested that, in practice, these values should be doubled. Consequently, given the sample size described in the subsequent section for the current study (i.e., 227 participants), the doubled criterion value for assessing component coefficients was equal to .364.

**Participants.** During this phase of questionnaire development, 281 youth participants completed the third version of the cohesion inventory (i.e., the 87-item version). After the removal of cases due to initial data screening involving the identification of missing values or suspected misuse of the questionnaire, data



from 227 participants were considered acceptable for further analyses. These eligible participants consisted of 117 males and 107 females (3 participants did not indicate their gender) ranging in age from 13 to 17 years ( $M_{\text{age}} = 14.37 \pm 1.41$ ). They represented 24 different teams from 10 team sports—basketball, soccer, volleyball, football, rowing, hockey, baseball, softball, field hockey, and rugby—and were members of their respective teams for an average of  $2.34 \pm 1.59$  years.

**Measure.** At this point in the development process, the items were placed in questionnaire format similar to the original Group Environment Questionnaire. Consequently, this third version of the inventory contained demographic questions designed to assess information communicated in the previous Participants section. In addition, a Likert-type scale was attached below each of the remaining 87 items in the inventory for participants to indicate their level of agreement on a 9-point scale ranging from 1 (strongly disagree) to 9 (strongly agree).

**Procedure.** Upon approval to approach potential participants by their coaches, research assistants described the purpose of the study and provided each individual with a letter of information and a consent form (to be signed by both the participant and a parent/guardian). Upon return of the signed consent form, participants received the 87-item questionnaire before or after a practice session or an arranged team meeting for completion (i.e., not before or after a competition). They were guaranteed anonymity/confidentiality of their responses and, if interested, were invited to contact the investigators for a copy of the general results of the research program as a whole.

**Results.** As noted previously, the first goal of this phase was to examine the distribution patterns of the 87 items to determine the level of skewness and kurtosis present. Essentially, each item was assessed for the degree to which it was normally distributed. Assessments were made via the examination of (a) histograms and (b) skewness and kurtosis values in combination with the obtained standard error values. Tabachnick and Fidell (2001) noted that “with large samples, the significance level of skewness is not as important as its actual size (worse the farther from zero) and the visual appearance of the distribution” (p. 74). The result of these analyses was that 30 items were removed owing to non-normal distribution patterns. The minimum skewness and kurtosis values (and associated standard error values;  $z$  scores) of the eliminated items were 1.29 ( $SE = .162$ ;  $z = 7.96$ ) and 2.00 ( $SE = .322$ ;  $z = 6.21$ ), respectively.

The remaining 57 items were subsequently examined using a series of principal component analyses. The criterion for selection or de-selection ( $> .364$ ) of items was discussed previously but it should be noted that items were considered strong candidates if their component coefficients were high on one factor and low on other factors. The results of the final principal components analysis of 17 items are presented in Table 1 and demonstrate that two principal components were produced explaining 62.35% of the total variance. The first component contains eight items that are related to social aspects of cohesion, whereas the second component contains nine items related to task aspects of cohesion. Note that these task and social components were the first two major components in each of the series of principal components analyses conducted in the current study. However, for the sake of brevity, only the final model is presented herein. Finally, the internal con-

**Table 1 Results of the Final Principal Components Analysis After Orthogonal Rotation With Original Items**

Item #	Component 1 (Social)	Component 2 (Task)	$h^2$	Item (Dimension)
3	.15	<b>.76</b>	.59	We all share the same commitment to our team's goals (task)
5	-.01	<b>.71</b>	.51	As a team, we are all on the same page (task)
7	<b>.82</b>	.19	.70	I invite my teammates to do things with me (social)
8	<b>.79</b>	.00	.63	Some of my best friends are on this team (social)
10	<b>.83</b>	.16	.71	We hang out with one another whenever possible (social)
12	.26	<b>.81</b>	.73	I like the way we work together as a team (task)
15	.24	<b>.80</b>	.69	We like the way we work together as a team (task)
17	.28	<b>.79</b>	.70	As a team, we are united (task)
25	.16	<b>.67</b>	.47	This team gives me enough opportunities to improve my own performance (task)
26	.25	<b>.39</b>	.21	For me, the team's success is more important than my own success (task)
31	<b>.87</b>	.18	.79	I contact my teammates often (phone, text message, internet) (social)
34	<b>.84</b>	.26	.76	We contact each other often (phone, text message, internet) (social)
59	.09	<b>.68</b>	.47	I am happy with my team's level of desire to win (task)
60	.17	<b>.70</b>	.52	My approach to playing is the same as my teammates (task)
65	<b>.83</b>	.25	.75	I spend time with my teammates (social)
79	<b>.75</b>	.29	.65	I am going to keep in contact with my teammates after the season ends (social)
87	<b>.83</b>	.21	.74	We stick together outside of practice (social)
% Var	45.25	17.10		
Eigenvalues*	7.69	2.91		

Note. Coefficients greater than .364 are bolded and retained for that component. Values of percentage of variance (% Var) for each component are prerotation. \*The eigenvalue of the third but unretained component was .91.  $h^2$  = communality coefficient.

sistency values (Cronbach's  $\alpha$ ; Cronbach, 1951) were high for both task ( $\alpha = .89$ ) and social ( $\alpha = .94$ ) dimensions and a moderate correlation ( $r = .45$ ) was found between the two components.

#### Phase 4: Confirmatory Factor Analyses

The purpose of Phase 4 was to conduct a confirmatory factor analysis (CFA) on the 17-item version of the questionnaire. This CFA assessed the fit between the final two-factor model suggested from the principal component analyses conducted in Phase 3 and data collected from a subsequent independent sample. A maximum likelihood method of estimation was used through AMOS 17.0 (Arbuckle, 2008). Further statistical information is presented in the results section of this phase.

**Participants, Measure, and Procedure.** Three hundred and fifty-two youth sport participants completed the 17-item version of the cohesion questionnaire. For the purposes of CFA, this sample size can be considered "good" based on suggestions by Tabachnick and Fidell (2001). The participants were 149 males and 203 females ranging in age from 13 to 17 years ( $M_{\text{age}} = 15.10 \pm 1.07$ ). They represented numerous team sports including basketball, volleyball, football, hockey, lacrosse, baseball, softball, soccer, and synchronized swimming. Participants responded to the 17-item version of the inventory structured in the same manner as the previous phase in that they indicated their level of agreement to items on a 9-point scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). Recruitment of participants took place through secondary schools (i.e., high schools) and athletes interested in participating in the study completed the questionnaire during a designated time of the school day and approved by the school principals and school board. Consequently, although intact teams were not directly sought for the purposes of this phase, it was possible that certain participants were members of the same team.

**Results.** Descriptive statistics and standardized factor loadings of all items are presented in Table 2. A number of indices were used to assess the fit between the proposed model and the obtained data. The initial chi-square test was statistically significant,  $\chi^2(118) = 480.69, p < .001$ . However, it should be noted that obtaining a significant chi-square result is highly likely with large sample sizes. Consequently, additional assessments of model fit included the comparative fit index (CFI) and the standardized root mean square residual (SRMR). An acceptable fit between the model and obtained data are indicated by values of CFI  $> .90$  and SRMR  $< .08$  (Hu & Bentler, 1999; Kenny, 2008). The initial factor analysis demonstrated a near acceptable fit of the data to the model, CFI = .895, SRMR = .073. However, an examination of the standardized factor loadings suggested that one item had a very low value (i.e., .16; task cohesion item "For me, the team's success is more important than my own success"). Revisiting the final principal components analysis from Phase 3 (see item 26 in Table 1) also suggested that this item was potentially weak. Therefore, in the interest of retaining strong content valid items and having an equal number of items for each dimension, a second confirmatory factor analysis was conducted without this item. The assessments of fit between the proposed 16-item, two-factor model and the obtained data indi-

**Table 2 Descriptive Statistics  
and Standardized Factor Loadings for  
Confirmatory Factor Analysis From Phase 4  
(N = 352)**

Factor	Item #	Loading	Mean	SD
Task	3	.63	6.66	1.97
	5	.70	6.43	1.93
	12	.75	6.67	1.93
	15	.83	6.63	1.84
	17	.80	6.45	1.91
	25	.58	7.15	1.73
	26*	.16	5.96	2.18
	59	.69	6.79	2.02
Social	60	.67	6.06	1.99
	7	.68	6.24	2.03
	8	.68	6.80	2.36
	10	.81	5.23	2.27
	31	.87	5.88	2.41
	34	.83	5.65	2.40
	65	.84	6.07	2.14
	79	.72	6.69	2.06
87	.79	5.70	2.11	

*Note.* \*Item 26 was removed from the final version of the questionnaire.

cated an acceptable fit,  $\chi^2(103) = 436.29$ ,  $p < .001$ , CFI = .903, SRMR = .068, and the two dimensions were found to be moderately correlated,  $\phi = .49$ .

## Overview of Results

The *Youth Sport Environment Questionnaire (YSEQ)* resulting from the projects contained within the four phases of the current study is presented in the Appendix. The final version of the questionnaire asks participants to indicate their agreement to 18 statements on a 9-point Likert-type scale. The primary 16 items discussed in the previous section are further proposed to be subdivided into the two major dimensions of task and social cohesion (8 items each). In addition, two spurious negative items have been added to the questionnaire to aid in the detection of invalidating response sets. Further information on the inclusion of these negative items can be found in the discussion section.

## Discussion

The purpose of the current study was to initiate the development of a psychometrically sound measure to assess perceptions of cohesion in members of youth (13–17 years of age) sport groups. As noted, this measure can be found in the Appendix and contains 18 items (i.e., eight task cohesion items, eight social cohesion items, and two spurious negative items). This departure of the current two dimension factor structure (i.e., task and social cohesion) from the original four factor structure determined by Carron and colleagues (1985) with an adult population warrants further discussion. The results of the current study on cohesion are similar to those in previous research with other conceptual models in that it would appear that among younger individuals, distinctions between some conceptual dimensions may not be as clear as they are among adults. As noted earlier, in the case of sport anxiety, Smith et al. (1995) found that younger participants did not view physical and cognitive symptoms of anxiety as separate entities. In the present case, the item content generated by team sport athletes and past literature reflected both group-oriented and individual-oriented perceptions of cohesion; however, responses obtained on the items indicated they did not make a distinction between these two levels. On the other hand, task and social distinctions were clearly demarcated both conceptually and statistically.

This finding may be partially explained by the level of complexity with which youth view their interactions and relationships with others and larger groups compared with older individuals (Rubin et al., 2006). However, it also should be noted that there has been some debate about the overall utility of examining perceptions of “individual attractions to the group” in cohesion research. While it is beyond the scope of the present paper to provide a comprehensive overview of this issue (for examples of this discussion, see Carless, 2000; Carron & Brawley, 2000; Dion, 2000), our results are also unlikely to clarify whether the current lack of emergence of an individual attractions–group integration separation is due to developmental or conceptual issues. At this point, it is sufficient to note that (a) the current study was initially based on a strong theoretical foundation provided by Carron and colleagues (1985) that is supported by over 20 years of research, (b) both task and social dimensions contain items originally classified at individual attractions and group integration levels, (c) it appears youths do not perceive separation between the constructs of group integration and attractions to the group, and (d) a number of conceptual issues remain in the examination of cohesion (Dion, 2000).

As a final point of discussion related to the factor structure of the youth questionnaire, the distinction between task and social concerns supports a number of previous group dynamics researchers who have suggested that these are two primary orientations for the vast majority of groups (e.g., Carron et al., 1985; Festinger, Schachter, & Back, 1950; Fiedler, 1967; Hersey & Blanchard, 1969; Mikalacki, 1969). In fact, Dion (2000) concluded the following.

The conceptual distinction between task cohesion and social cohesion that has emerged independently from several models and lines of research is an important milestone in cohesion research . . . and one whose importance seems

to have a good deal of support, if not consensus, from cohesion researchers today. (p. 21)

It would appear that there is strong support for the approach and findings of the current study.

In addition to the 16 task and social items developed through the four phases of the research program, it should be noted (see the Appendix) that two spurious negative items have been included to address concerns raised about the issues of response acquiescence and item wording (negative vs. positive items). The use of mixed items has a long history in the development of questionnaires. On one hand, this strategy can detect response sets in which the participant is agreeing with all statements regardless of content (i.e., detecting agreement tendency or response acquiescence) (Block, 1965; Nunnally, 1978). On the other hand, mixed items can cause confusion for some participants and result in the misinterpretation of items based on simple sentence alterations (e.g., “do” to “do not”) (Spector, 1992). As noted previously, one potential downfall of this approach is decreased internal reliability (Eys et al., 2007). Consistent with the suggestions by Eys et al. to find a middle ground between concerns of response acquiescence and item interpretation, two general negative items (“I do not get along with the members of my team”; “Our team does not work well together”) designed to detect invalidating response sets (i.e., agreement tendencies) are embedded but are not included in the assessment of task or social cohesion. Thus, it is expected that the internal consistency of the scales should be more robust.

A second issue related to item wording (i.e., readability) was discussed in the introduction and is worth revisiting briefly. Readability scores calculated for the individual GEQ items in the original version ranged from Grades 0 to 16.2, and the 18 items as a whole scored a grade level of 6.0. The target population for the resultant questionnaire in the current study is youth ranging in age from 13 to 17. Consequently, it was desired that no items exceed a readability level of Grade 9.0. A calculation of the 18 items yielded a range of readability scores from Grades 0.0 to 9.0 with an average of Grade 3.7 across the total number of items. Finally, the initial *instructions* to the questionnaire were also revised with a similar goal of reducing the complexity of the language. This resulted in an improvement in readability levels for the instructions section from Grade 10.1 to Grade 6.2. Overall, this provides additional support for the appropriateness of the language for a youth population.

Given the lack of cohesion research with youth sport groups, it is hoped that the resultant questionnaire (i.e., the YSEQ) will spur future investigations into this important issue. With adult populations, the importance of group cohesion has consistently been demonstrated through its association with team sport performance (Carron, Bray, & Eys, 2002; Carron, Colman, Wheeler, & Stevens, 2002), adherence (Spink & Carron, 1994), and other critical psychosocial constructs (e.g., individual satisfaction; Williams & Hacker, 1982). Further, the need for an appropriate and psychometrically sound questionnaire for youth has been discussed in previous research (e.g., Carron et al., 2007). The approach in the current study was to use the contributions of a number of athletes from a wide variety of team sports in all phases of the research program. This has resulted in a questionnaire that has demonstrated (a) good initial psychometric properties on scores

obtained from a representative sample of the population of interest (e.g., factor structure and internal reliability of task and social dimensions), (b) content validity through the examination by experts in the area of group dynamics and with those who will be completing the inventory (i.e., youth), and (c) an appropriate readability level for the population in question. However, it should be noted that the assessment of validity of any measure is an on-going process and future research with the questionnaire should continue to examine the validity of the resultant items as well as the predictive utility of the questionnaire as a whole with other hypothesized correlates (e.g., role clarity; Eys & Carron, 2001).

## Notes

1. These scores were derived from the Flesch–Kincaid Grade Level Test that rates a piece of text on a school grade level (based on the United States school system) and can be calculated through standard word processing programs or through the formula

$$\text{Readability} = (.39 \times \text{ASL}) + (11.8 \times \text{ASW}) - 15.59$$

where ASL is the average sentence length (number of words / number of sentences) and ASW is the average number of syllables per word (number of syllables / number of words).

2. The authors recognize the complexity of delineating and classifying specific developmental stages. Terms such as *adolescent* and *youth* have been used in reference to a number of age classifications. In fact, *youth* has been used to describe individuals as young as 9 years of age (i.e., Cumming et al., 2008) to as old as 29 years of age (i.e., Singapore National Youth Council, 2006). Further, the World Health Organization (2008) uses the terms adolescence and youth interchangeably to describe individuals between the ages of 13 and 18 years. For the sake of clarity, the current study uses the term *youth* to refer to those between the ages of 13 and 17 years in a similar manner to Fraser-Thomas and Côté (2006).

3. A copy of the focus group guide can be obtained by contacting the lead author.

## Acknowledgments

The authors would like to thank the Social Sciences and Humanities Research Council of Canada (410-2005-0820) for its support of this project.

## References

- Arbuckle, J.L. (2008). *Amos (Version 17.0)*. Crawfordville, FL: Amos Development Corporation. [computer software].
- Block, J. (1965). *The challenge of response sets: Unconfounding meaning, acquiescence, and social desirability in the MMPI*. New York: Meredith Publishing Company.
- Bruner, M.W., & Spink, K.S. (2007). The effects of team building on the adherence patterns of youth exercise participants. *Journal of Sport & Exercise Psychology, 29*, S149.
- Cameron, C., Craig, C.L., & Paolin, S. (2005). *Local opportunities for physical activity and sport: Trends from 1999-2004*. Ottawa, ON: Canadian Fitness and Lifestyle Research Institute.
- Carless, S.A. (2000). Reply to Carron and Brawley. *Small Group Research, 31*, 107–118.
- Carron, A.V., & Brawley, L.R. (2000). Cohesion: Conceptual and measurement issues. *Small Group Research, 31*, 89–106.

- Carron, A.V., Brawley, L.R., & Widmeyer, W.N. (1998). The measurement of cohesiveness in sport groups. In J.L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp. 213–226). Morgantown, WV: Fitness Information Technology.
- Carron, A.V., Brawley, L.R., & Widmeyer, W.N. (2002). *The Group Environment Questionnaire test manual*. Morgantown, WV: Fitness Information Technology.
- Carron, A.V., Bray, S.R., & Eys, M.A. (2002). Team cohesion and team success in sport. *Journal of Sports Sciences, 20*, 119–126.
- Carron, A.V., Colman, M.M., Wheeler, J., & Stevens, D. (2002). Cohesion and performance in sport: A meta-analysis. *Journal of Sport & Exercise Psychology, 24*, 168–188.
- Carron, A.V., Eys, M.A., & Burke, S.M. (2007). Team cohesion. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp. 91–102). Champaign, IL: Human Kinetics.
- Carron, A.V., & Spink, K.S. (1993). Team building in an exercise setting. *The Sport Psychologist, 7*, 8–18.
- Carron, A.V., Widmeyer, W.N., & Brawley, L.R. (1985). The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. *Journal of Sport Psychology, 7*, 244–266.
- Cattell, R.B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245–276.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155–159.
- Côté, J., Salmela, J.H., Baria, A., & Russell, S.J. (1993). Organizing and interpreting unstructured qualitative data. *The Sport Psychologist, 7*, 127–137.
- Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334.
- Cumming, S.P., Smith, R.E., Smoll, F.L., Standage, M., & Grossbard, J.R. (2008). Development and validation of the Achievement Goal Scale for Youth Sports. *Psychology of Sport and Exercise, 9*, 686–703.
- Dion, K.L. (2000). Group cohesion: From “field of forces” to multidimensional construct. *Group Dynamics. Theory, Research, and Practice, 4*, 7–26.
- Estabrooks, P.A., & Carron, A.V. (2000). The Physical Activity Group Environment Questionnaire: An instrument for the assessment of cohesion in exercise classes. *Group Dynamics. Theory, Research, and Practice, 4*, 230–243.
- Eys, M.A., & Carron, A.V. (2001). Role ambiguity, task cohesion, and task self-efficacy. *Small Group Research, 32*, 356–373.
- Eys, M.A., Carron, A.V., Bray, S.R., & Brawley, L.R. (2007). Item wording and internal consistency of a measure of cohesion: The Group Environment Questionnaire. *Journal of Sport & Exercise Psychology, 29*, 395–402.
- Eys, M. A., Loughead, T. M., Bray, S. R., Carron, A. V. (in press). Perceptions of cohesion by youth sport participants. *The Sport Psychologist*.
- Festinger, L., Schachter, S., & Back, K. (1963). *Social pressures in informal groups*. Stanford, CA: University Press.
- Fiedler, F.E. (1967). *A theory of leadership effectiveness*. New York: McGraw-Hill.
- Fraser-Thomas, J., & Côté, J. (2006). Youth sports: Implementing findings and moving forward with research. *Athletic Insight, 8*, 12–27.
- Granito, V.J., & Rainey, D.W. (1988). Differences in cohesion between high school and college football teams and starters and nonstarters. *Perceptual and Motor Skills, 66*, 471–477.
- Gruber, J.J., & Gray, G.R. (1982). Responses to forces influencing cohesion as a function of player status and level of male varsity basketball competition. *Research Quarterly for Exercise and Sport, 53*, 27–36.
- Harrison, C. (1980). *Readability in the classroom*. Cambridge, UK: Cambridge University Press.
- Hersey, P., & Blanchard, K.H. (1969). Lifestyle theory of leadership. *Training and Development Journal, 23*, 26–34.



- Heuzé, J., & Fontayne, P. (2002). Questionnaire sur l'Ambiance du Groupe: A French-language instrument for measuring group cohesion. *Journal of Sport & Exercise Psychology, 24*, 42–67.
- Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.
- Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*, 141–151.
- Kenny, D.A. (2008, January 29). *Measuring model fit*. Retrieved December 19, 2008 from <http://davidakenny.net/cm/fit.htm>.
- Kincaid, J.P., Fishburne, R.P., Rogers, R.L., & Chissom, B.S. (1975). *Derivation of new readability formulas (Automated Readability Index, Fog Count and Flesch Reading Ease Formula) for navy enlisted personnel*. Millington, Tenn: Naval Air Station Memphis.
- Krueger, R.A., & Casey, M.A. (2000). *Focus group: A practical guide for applied research*. Thousand Oaks, CA: Sage.
- Lott, A.J., & Lott, B.E. (1965). Group cohesiveness as interpersonal attraction: A review of relationships with antecedent and consequent variables. *Psychological Bulletin, 64*, 259–309.
- Mikalachki, A. (1969). *Group cohesion reconsidered*. London, ON: School of Business Administration, University of Western Ontario.
- Nunnally, J.C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Patton, M.Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.
- Rubin, K.H., Bukowski, W., & Parker, J. (2006). Peer interactions, relationships, and groups. In N. Eisenberg (Ed.), *Handbook of child psychology: Social, emotional, and personality development* (6th ed., pp. 571–645). New York: Wiley.
- Schutz, R.W., Eom, H.J., Smoll, F.L., & Smith, R.E. (1994). Examination of the factorial validity of the Group Environment Questionnaire. *Research Quarterly for Exercise and Sport, 65*, 226–236.
- Senécal, J., Loughhead, T.M., & Bloom, G.A. (2008). A season-long team-building intervention: Examining the effect of team goal setting on cohesion. *Journal of Sport & Exercise Psychology, 30*, 186–199.
- Singapore National Youth Council. (2006). *Research framework: Definition of youth and youth development*. Retrieved November 14, 2008, from <http://www.nyc.gov.sg/research/youthdefinition.asp>
- Smith, R.E., Smoll, F.L., & Barnett, N.P. (1995). Reduction of children's sport performance anxiety through social support and stress-reduction training for coaches. *Journal of Applied Developmental Psychology, 16*, 125–142.
- Spector, P.E. (1992). *Summated rating scale construction: An introduction*. (Sage University Paper series on Quantitative Applications in the Social Sciences, series no. 07-082). Newbury Park, CA: Sage.
- Spink, K.S., & Carron, A.V. (1994). Group cohesion effects in exercise classes. *Small Group Research, 25*, 26–42.
- Stevens, J. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Sullivan, P.J., Short, S.E., & Cramer, K.M. (2002). Confirmatory factor analysis of the group environment questionnaire with coaching sports. *Perceptual and Motor Skills, 94*, 341–347.
- Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.
- Tesch, R. (1990). *Qualitative research analysis types and software tools*. New York: Falmer.

- Wankel, L.M., & Mummery, W.K. (1996). Canada. In P. De Knop, L. Engstrom, B. Skirstad, & M.R. Weiss (Eds.), *Worldwide trends in youth sport* (pp. 27–42). Champaign, IL: Human Kinetics.
- Williams, J.M., & Hacker, C.M. (1982). Causal relationships among cohesion, satisfaction, and performance in women's intercollegiate field hockey teams. *Journal of Sport Psychology*, 4, 324–337.
- World Health Organization. (2008). *Youth*. Retrieved November 14, 2008, from <http://www.who.int/topics/youth/en/>

*Manuscript received:* August 1, 2008

*Revision accepted:* February 23, 2009

## Appendix

### Youth Sport Environment Questionnaire

The following questions ask about your feelings toward **your team**. Please **CIRCLE** a number from 1 to 9 to show how much you agree with each statement.

1. We all share the same commitment to our team's goals.<sup>1</sup>

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

2. I invite my teammates to do things with me.<sup>2</sup>

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

3. As a team, we are all on the same page.<sup>1</sup>

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

4. Some of my best friends are on this team.<sup>2</sup>

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

5. I like the way we work together as a team.<sup>1</sup>

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

6. I do not get along with the members of my team.<sup>3</sup>

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

7. We hang out with one another whenever possible.<sup>2</sup>

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

8. As a team, we are united.<sup>1</sup>

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

9. I contact my teammates often (phone, text message, internet).<sup>2</sup>

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

10. This team gives me enough opportunities to improve my own performance.<sup>1</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
11. I spend time with my teammates.<sup>2</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
12. Our team does not work well together.<sup>3</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
13. I am going to keep in contact with my teammates after the season ends.<sup>2</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
14. I am happy with my team's level of desire to win.<sup>1</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
15. We stick together outside of practice.<sup>2</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
16. My approach to playing is the same as my teammates.<sup>1</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
17. We contact each other often (phone, text message, internet).<sup>2</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |
18. We like the way we work together as a team.<sup>1</sup>
- |                          |   |   |   |   |   |   |   |                       |
|--------------------------|---|---|---|---|---|---|---|-----------------------|
| 1                        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                     |
| <b>Strongly Disagree</b> |   |   |   |   |   |   |   | <b>Strongly Agree</b> |

---

<sup>1</sup>Task cohesion item

<sup>2</sup>Social cohesion item

<sup>3</sup>Spurious negative item