Perceived Cohesion in Small Groups: Adapting and Testing the Perceived Cohesion Scale in a Small-Group Setting

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The six-item Perceived Cohesion Scale (PCS) was created to measure perceived cohesion in groups. However, only large groups were used to assess the validity and reliability of the measure, leaving in question the use of the PCS with small groups. This study adapts the measure of cohesion to the small-group arena. Results provide support for the validity and reliability of the adapted measure for use within the small group.

The notion of teams and teamwork has received considerable attention by researchers in the past decade. With greater global competition and improving technology, firms are increasingly relying on teams, virtual or otherwise, to accomplish organizational objectives. As a result, developing sound measures for addressing the underpinnings of work-team phenomena is critical. Group cohesion is one such phenomenon.

Bollen and Hoyle (1990) define perceived cohesion as “an individual’s sense of belonging to a particular group and his or her feelings of morale associated with membership in the group” (p. 482). Highlighted in this definition are two dimensions of perceived
cohesion: a sense of belonging and feelings of morale. Bollen and Hoyle (1990) contend that without a fundamental sense of belonging, group members would not desire association with their cohorts. Without feelings of morale, motivation to achieve organizational goals and objectives would be minimized.

In addressing the need to develop a set of measures that taps into an individual’s perception of cohesion relative to the group, Bollen and Hoyle (1990) created their Perceived Cohesion Scale (PCS), a six-item measure reflecting these two underlying dimensions of cohesion. To capture the sense of belonging, they designed three items: (a) “I feel a sense of belonging to ________,” (b) “I feel that I am a member of the ________ community,” and (c) “I see myself as part of the ________ community.” To capture feelings of morale, three items were used: (a) “I am enthusiastic about ________,” (b) “I am happy to be at [live in] ________,” and (c) “________ is one of the best schools [cities] in the nation.” Responses are recorded on Likert-type scales ranging from 0 (strongly disagree) to 10 (strongly agree).

Using samples of 102 students from a relatively small college and 110 residents of a midsized city, Bollen and Hoyle (1990) examined the stability of their measure. Confirmatory factor analysis was used to test their two-factor model of cohesion. For both of Bollen and Hoyle’s samples, the statistically significant $\chi^2$ and the goodness-of-fit indices indicate strong model fit. Likewise, the maximum likelihood estimates of the item loadings were all highly significant. These results demonstrate strong psychometric properties for the scale.

Because they used a sociological perspective, Bollen and Hoyle (1990) chose relatively large reference groups (i.e., city, college) for the purposes of their study. The conclusions with regard to the validity and reliability of the PCS were thus limited to use with large groups. However, Bollen and Hoyle (1990) suggested that the PCS be adapted and further tested with small groups. The purpose of this study is to adapt the PCS to the small-group arena and to validate it for use in small groups.
METHOD—SUBJECTS AND TASK

SUBJECTS

To address the question of cohesion in small groups, we used data from experimental work groups where members performed a decision-making task using an electronic meeting system (EMS) and a provided decision-making method. Questionnaires containing the adapted PCS were administered to 330 undergraduate subjects (forming 70 groups) at a western Canadian university. Group size ranged from 4 to 5 participants. Subjects were randomly assigned to groups, except for the effort to balance gender. Groups were balanced such that no group included more than 60% of one gender, consistent with the recommendations of Kanter (1977). Complete subject demographics are found in Table 1.

EXPERIMENTAL TASK

Subjects participated in the experimental group task to meet a course requirement in an introductory course in management information systems. Participation in the experiment was voluntary. Full participation in all aspects of the experiment was required to receive 5% course credit. The opportunity to easily complete a course requirement encouraged the subjects to participate; however, there was no guarantee that they would perform at their best. Two methods were used to encourage thorough and full participation. First, two cash prizes were offered for the highest rated decision in each treatment. First prize was $150 per group ($30 per participant), and second prize was $100 per group ($20 per participant). Each group had approximately a 5% chance of winning one of the prizes, so the prizes were believed to be sufficient and sufficiently attainable to motivate the groups to high performance, consistent with Pinder’s (1984) recommendations with regard to the influence of rewards on performance. Second, the subjects were informed that they would have the opportunity to work with the latest problem-solving information technology; this would
enhance excitement about being in the sessions, and hence lead to high motivation and performance. Similar motivational efforts have been applied with success by Fellers (1989) and Gopal (1991), among others.2

The task performed by the groups was the School of Business Policy Task, developed by Wheeler and Mennecke (1992) and adapted for use in Canada with the assistance of a Canadian lawyer and Canadian university officials. The School of Business Policy Task is a hidden-profile (Stasser, 1992) task, in which each group member is made aware of only a portion of the task information, requiring the group to work together to reach a solution. Table 2 provides the details of the group process used in this study.

The study began with an introduction session. The introduction session was intended to serve the following purposes. First, it was intended to allow the subjects to get settled into the meeting location and get comfortable at their workstations. Second, it enabled the facilitator to introduce the experiment and describe the subjects’ roles in it. A statement about the intent of using the EMS was also made to the subjects during the introduction.

After hearing a brief introduction to the session and signing their consent forms, the subjects filled out prequestionnaires intended to capture demographics and preexisting perceptions about group meetings. The introduction was followed by training in the decision-making method and EMS technology.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number of Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>180</td>
</tr>
<tr>
<td>Female</td>
<td>150</td>
</tr>
<tr>
<td>Total subjects</td>
<td>330</td>
</tr>
</tbody>
</table>

TABLE 1: Demographics (n = 330)

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>21.50</td>
<td>3.50</td>
</tr>
<tr>
<td>Work experience (months)</td>
<td>19.51</td>
<td>30.17</td>
</tr>
<tr>
<td>Grade point average</td>
<td>2.83</td>
<td>0.47</td>
</tr>
</tbody>
</table>
The training session had one main purpose. It was intended that the subjects would be able to actually use the decision-making method and the technology during the performance of their experimental task. First, the groups were introduced to the decision-making method without the technology. The specific sequenced goals and activities of the decision-making methodology were taken from Wheeler, Mennecke, and Scudder (1993, p. 511) and were embodied in a decision-making handout.

Groups performed a practice task using the decision-making method. The intent of presenting the decision-making method without the technology was to teach the subjects how to use the decision-making method independently of the technology. The subjects also performed a practice task using the decision-making method.

Next, the subjects were instructed to open the portable computers in front of them. They were then provided with another handout describing the EMS tool that would be used for each step. In the training, the tools were demonstrated without concern for the order suggested in the decision-making method as the sole intent here was to teach the groups how to use the technology. To ensure adequate exposure to all EMS technology, each EMS tool was demonstrated for roughly an equal length of time.

Next, the subjects read their case role, after which they completed the pretask questions. Subjects spent approximately 10 to 15

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**TABLE 2: Detailed Experimental Procedures**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction, consent forms, presession questionnaire</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Training in the decision-making method</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Training with the electronic meeting system tools</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Reading the case role and completing the pretask questions</td>
<td>10 to 15 minutes</td>
</tr>
<tr>
<td>Break</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Introduce roles, start task</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Perform experimental task</td>
<td>70 minutes</td>
</tr>
<tr>
<td>Fill out solution memo</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Fill out postsession questionnaires</td>
<td>25 minutes</td>
</tr>
<tr>
<td>Wrap up</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Total</td>
<td>up to 190 minutes</td>
</tr>
</tbody>
</table>

The training session had one main purpose. It was intended that the subjects would be able to actually use the decision-making method and the technology during the performance of their experimental task. First, the groups were introduced to the decision-making method without the technology. The specific sequenced goals and activities of the decision-making methodology were taken from Wheeler, Mennecke, and Scudder (1993, p. 511) and were embodied in a decision-making handout.
minutes reading the case and writing down a preliminary solution to address the case.

Following a short break, the groups began work on their experimental task. After completion of the experimental task, the group filled out a solution memo, signed it, and returned it to the facilitator. Next, postsession questionnaires, which captured perceptions about the various aspects of the meeting and included the PCS, were completed.

ADAPTING THE PCS FOR SMALL GROUPS

Bollen and Hoyle (1990) suggested a number of changes to the PCS to make it appropriate for small-group use. The changes were recommended because they designed the questions for use with large groups. For example, “I feel like I am a member of the _______ community” would not be representative of a small group or team. Bollen and Hoyle suggested using terms such as family or team to replace the term community for small groups. For our purposes, we chose the word group in adapting the scale. Hence, for the example given above, we chose to use “I feel that I am a member of this group.” Similarly, Bollen and Hoyle, in examining feelings of morale, used the phrase, “I am happy to be at [live in] _______.” This was altered to read “I am happy to be part of this group,” as suggested by Bollen and Hoyle. The altered cohesion items are presented in Table 3. As noted, they are intended to capture two components of cohesion that are seen as fundamental to the existence of groups: belonging and morale. The items are reproduced below in the order that they were presented to the subjects (B = belonging, M = Morale—the numbers are for identification of the individual items in the analysis below).

ANALYSIS

The responses to the items were subjected to a confirmatory factor analysis using the AMOS version 3.61 structural equation modeling package (Arbuckle, 1997). We used maximum likelihood
estimation and analyzed the covariances of the six PCS items. The model and its standardized parameter estimates for our sample are produced in Figure 1. All standardized parameter estimates are statistically significant \((p < .05)\).

All items appear to load well on their respective constructs—the lowest item loading for either construct of .70 is above the minimal standard of .60 suggested by Bagozzi and Yi (1988). The correlation between the two constructs was quite high at \(r = .92\).

**TABLE 3: Perceived Cohesion Items**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I feel that I belong to this group. (B-1)</td>
</tr>
<tr>
<td>2</td>
<td>I am happy to be part of this group. (M-1)</td>
</tr>
<tr>
<td>3</td>
<td>I see myself as part of this group. (B-2)</td>
</tr>
<tr>
<td>4</td>
<td>This group is one of the best anywhere. (M-2)</td>
</tr>
<tr>
<td>5</td>
<td>I feel that I am a member of this group. (B-3)</td>
</tr>
<tr>
<td>6</td>
<td>I am content to be part of this group. (M-3)</td>
</tr>
</tbody>
</table>

NOTE: Responses were recorded on a 7-point, Likert-type scale with the following anchors: strongly disagree, quite, slightly, neither, slightly, quite, strongly agree.

**Figure 1: Two-Factor Model of the Perceived Cohesion Scale in Small Groups \((n = 330)\)**

NOTE: Standardized parameter estimates are all significant at \(p < .05\).
results are similar to the between-construct correlations of .96 and .92, obtained in the two samples studied by Bollen and Hoyle (1990, pp. 492-493). Finally, the Cronbach’s alphas for the belonging and morale constructs in our study were .95 and .87, respectively.

The overall fit of the model to the data is quite strong. Measures for model fit are provided in Table 4. Because there is no definitive standard for fit, a variety of indices, along with suggested guidelines, are provided. The covariance matrix for our sample is found in Table 5.

Because of the fairly high correlation between the two constructs, it could be asserted that an equally appropriate model would consist of considering the six PCS items as indicators of a single underlying cohesion construct. To address this concern, we first assessed a single-factor model. The factor loadings for this model are depicted in Figure 2, and the fit indices for the model are presented in Table 4. Although the fit indices are, in the main,
acceptable for the single-factor model, on some, it is clear that the two-factor solution performs better. Furthermore, the item loadings for the six PCS items on a single cohesion factor are not as consistently high as the loadings for the belonging and morale items, on their respective constructs, in the two-factor solution. In addition, the morale items load uniformly lower than the belonging items on the single-factor model.

### TABLE 5: Covariance Matrix for the Sample Data Set (n = 330)

<table>
<thead>
<tr>
<th></th>
<th>Morale 1</th>
<th>Morale 2</th>
<th>Morale 3</th>
<th>Belong 1</th>
<th>Belong 2</th>
<th>Belong 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morale 1</td>
<td>1.728</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morale 2</td>
<td>1.311</td>
<td>2.591</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morale 3</td>
<td>1.492</td>
<td>1.496</td>
<td>1.880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belong 1</td>
<td>1.366</td>
<td>1.190</td>
<td>1.242</td>
<td>1.726</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belong 2</td>
<td>1.452</td>
<td>1.249</td>
<td>1.345</td>
<td>1.539</td>
<td>1.750</td>
<td></td>
</tr>
<tr>
<td>Belong 3</td>
<td>1.433</td>
<td>1.403</td>
<td>1.479</td>
<td>1.493</td>
<td>1.594</td>
<td>1.861</td>
</tr>
</tbody>
</table>

NOTE: Standardized parameter estimates are all significant at \( p < .05 \).

![Figure 2: Single-Factor Model of the Perceived Cohesion Scale in Small Groups (n = 330)](image-url)
As a further indication of the relative goodness of the two-factor solution, we performed a $\chi^2$ difference test to assess whether the two constructs were distinct. This test involves comparing the $\chi^2$ statistics obtained from analysis of the two-factor model and the single-factor model (which suggests the two constructs are not distinct). The two-factor model is different because it specifies the relationship between morale and belonging to be perfectly correlated (i.e., 1.0). Thus, this model essentially suggests that all six items are measuring the same construct. As with the two-factor model, the single-factor model is tested against the same data set to obtain a second $\chi^2$ statistic. If the difference in $\chi^2$ values for these two models is nonsignificant, then the constructs are not distinct (i.e., all six of the items are measuring the same underlying construct). Conversely, a significant $\chi^2$ difference suggests the two constructs are distinct.

The original, two-factor model, with the freely estimated correlation, yielded a $\chi^2$ value of 69.807, with 8 degrees of freedom. The single-factor model (with 9 degrees of freedom) resulted in a $\chi^2$ value of 151.668. Thus, the difference (81.661) is greater than the critical $\chi^2$ value of 3.84 (1 df, $p = .05$), suggesting that the two constructs, belonging and morale, are indeed distinct and that the two-factor solution is likely more appropriate. We further address the relative appropriateness of a one- or two-factor solution in the discussion.

**DISCUSSION**

The goodness-of-fit indices found in this study support Bollen and Hoyle’s (1990) two-factor model of perceived cohesion as applied to small-group settings. Likewise, both factors of perceived cohesion demonstrated acceptable reliabilities. In addition, the item loadings were significant for each of the six items, suggesting the adapted items were effective indicators of the two factors of perceived cohesion. Furthermore, our test for comparing the correlation between factors provided statistical support for the notion of
two distinct dimensions of cohesion. The correlation between the constructs was above .90 (similar to the findings by Bollen and Hoyle). All findings in this study suggest the adapted PCS measure is a useful indicator of perceived cohesion in small groups.

Beyond the chi-square differences, which statistically demonstrate the differences between the two constructs, the high correlation between sense of belonging and feelings of morale may still raise concerns with regard to the existence of a single dimension rather than two. Addressing this, Bollen and Hoyle (1990) made a distinction between conceptual versus empirical dimensionality:

Conceptual dimensionality concerns whether we delineate conceptually separated dimensions, whereas empirical dimensionality refers to whether we can distinguish between these dimensions empirically. Our definition of perceived cohesion identified sense of belonging and feelings of morale as separate dimensions of perceived cohesion. Belonging emphasizes cognition, whereas morale captures affect. Our empirical results showed these conceptual dimensions to be highly correlated empirically. High or even perfect correlation is not sufficient condition to claim that a concept is unidimensional rather than bidimensional. If we were to follow this strategy of equating empirical with conceptual dimensionality, we would be led astray. For instance, the height and weight of individuals are highly correlated, but from this we do not conclude that height and weight are the “same thing.” In time series aggregate annual data it is common to find correlations of .90 or greater, yet this does not entail that income, GDP, or other variables are conceptually indistinguishable. (p. 497)

As Hoyle and Crawford (1994, p. 479) further note, the conceptual dimensions of belonging and morale are associated differentially with both personal and social outcomes. In particular, belonging, a social-cognitive aspect of cohesion, is more strongly associated with social outcomes, whereas the feeling of morale, an affective aspect of cohesion, is more strongly associated with personal outcomes. Hence, we concur with Bollen and Hoyle (1990) that the two-factor solution is more appropriate, both on statistical and conceptual grounds.
SUMMARY AND CONCLUSION

In summary, this research adapted and tested the PCS developed by Bollen and Hoyle (1990) in the small-group context. The scale demonstrated similar psychometric properties when adapted appropriately to the small group.

Although we are pleased with our findings, this study is not without some limitations. Namely, we examined groups that were created for the purpose of our experiment. Findings from the analysis of these groups in an artificial environment may not be generalizable to organizational settings. Our experimental group was focused on a single problem and existed for only a short time period. Many small groups, in practice, must function on a continuing, day-to-day basis and may be fraught with many intervening factors such as interpersonal conflict among group members, task complexity, or resource constraints that affect their operation. Future research should examine the validity and reliability of the adapted small-group PCS in a field setting.

Whereas our study involves students, it should be clear that this scale has already been validated at the community level with actual (i.e., nonstudent) subjects. Tests of measurement invariance showed that the factor loadings between college students and city residents can be considered equal (Bollen & Hoyle, 1990, p. 495). The results of this study extend the generalizability by examining how the scales fit under small-group settings with realistic, student-related work. As DeSanctis (1988) noted, concerns about the use of student subjects are lessened if the students are performing tasks within their experience (e.g., deliberating and discussing suggestions to improve their university), which was the case in our study.

As a final assessment of the issue of student versus “live” subjects, we also performed a test of measurement invariance of the factor loadings between our data and the two samples used by Bollen and Hoyle (1990, p. 494). This test indicates whether the slopes relating the measures to their latent variables can be considered equal. An affirmation indicates that the measures are structurally equivalent across the small-group-level and community-level
contexts. The results, as assessed by the $\chi^2$ difference test of invariant loadings, indicate that our scale is factorially equivalent to Bollen and Hoyle’s college sample ($\Delta\chi^2 = 6.1$, 4 $df$) and city sample ($\Delta\chi^2 = 9.2$, 4 $df$).\(^3\)

Future research should attempt to reexamine the nomological network of cohesion, given this new measure. Traditionally, management research has used the Seashore (1954) index of cohesion. Additional research is needed to understand how these two measures of cohesion relate and if their predicative properties are similar.

Given that this construct has two dimensions, researchers would also need to understand if each dimension has its own unique set of antecedents as well as outcomes. For example, how does each dimension of cohesion interact with key outcome variables such as group task performance or organizational commitment?

Also, as technologies expand to involve virtual teams and other group arrangements where technology reduces or replaces face-to-face communication, the issue of cohesion becomes more critical. For example, researchers may want to examine whether cohesion can develop among anonymous team members focusing on a specific task.

Bollen and Hoyle (1990) believed they had created a measure to capture perceived cohesion “in work groups, organizations, towns, or other groups” (p. 501). Whereas our research has been exploratory in nature, the results of this study suggest that the adapted PCS is a potentially useful tool for assessing perceived cohesion in small groups.

NOTES

1. The type of information technology support that we employed here has been labeled with several terms, including group decision support systems, group support systems, and electronic meeting systems (EMS). We have chosen to adopt EMS—after Dennis, George, Jessup, Nunamaker, and Vogel (1988)—for this article because it highlights the idea that these technologies relate to the support of groups in meetings. See Nunamaker, Dennis, Valacich, Vogel, and George (1991) for a complete description of these types of systems.
2. As a manipulation check for excitement, we used Zaichkowsky’s (1985) Personal Involvement Inventory scale as a surrogate. This scale captures personal involvement with a series of 20 bipolar adjective pairs on a 7-point, Likert-type scale (alpha = 0.95), for example unexciting/exciting, interested/uninterested, mundane/fascinating, interesting/boring. The average response on the 20 items for our subjects was 5.27 out of a possible 7.00, indicating a relatively high degree of personal involvement with the session.

3. To save space, we do not provide full details with regard to the procedure and results of the invariance tests. The logic and procedures can be found in Meredith (1993) and Bollen and Hoyle (1990). In addition to the chi-square differences we report, detailed goodness-of-fit indices, parameter estimates, and so on can be obtained from the covariance matrix that we provide in this article and from those provided by Bollen and Hoyle (1990).

REFERENCES


Wynne W. Chin is associate professor in the college of business administration at the University of Houston. He received his A.B. in biophysics from the University of California, Berkeley, his M.S. in biomedical engineering from Northwestern University, and his M.B.A. and Ph.D. in computers and information systems from the University of Michigan. Wynne’s research focuses on structural equation models related to information technology adoption and electronic meeting support systems. He is on the editorial board of Structural Equation Modeling Journal, Information Systems Research, and MIS Quarterly. He is also the developer of PLS-Graph, a graphical based software that performs Partial Least Squares analyses.

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