

# Perceived Cohesion: A Conceptual and Empirical Examination\*

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## *Abstract*

*Most existing measures of cohesion attempt to objectively measure cohesion while neglecting individual group members' perceptions of their cohesion to a particular group. We propose that group members' perceptions of cohesion are important for the behavior of the individual as well as the group as a whole. We offer a theoretical definition of perceived cohesion which says individuals' perceptions of their own cohesion to a group has two dimensions: sense of belonging and feelings of morale. We test this conceptualization and the adequacy of our Perceived Cohesion Scale in two random samples: students at a small college noted for its strong "school spirit" and residents of a mid-sized city. Our confirmatory factor analyses indicate a two-factor model, with a high degree of invariance across the two samples, and with the two dimensions correlated over .90 in both. However, as anticipated, perceived cohesion is significantly higher in the college than the city sample.*

Historically, the concept of cohesion has occupied a key position in macro-sociology as well as in social psychology. Durkheim's (1951, 1956) classic works on the relationship between social cohesion, suicide, and the division of labor stimulated a great deal of research in macro-sociology. In social psychology researchers have analyzed the relationship of cohesion to small group phenomena ranging from group task performance (Bakeman & Helmreich 1975), to group therapy (Lieberman, Yalom & Miles 1973), to interpersonal communication within groups (Festinger, Schachter & Back 1950), and intragroup pressure for uniformity (Festinger, Gerard, Hyomovitch, Kelley & Raven 1952). Indeed, the centrality of cohesion as a mediator of group formation, maintenance, and productivity has led some social scientists to deem it *the* most important small group variable (Golembiewski 1962; Lott & Lott 1965). Recently,

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research on closely related constructs such as solidarity (Hechter 1987) and structural cohesion has appeared. Concerns about the mediating role of cohesion in productivity, absenteeism, social support, and mental health have fueled renewed interest in the construct.

The present research is an attempt to contribute toward the conceptualization and measurement of one aspect of the cohesion construct — perceived cohesion. First, we propose a definition of perceived cohesion, which has two conceptual dimensions. We compare this definition with other explicit or implied definitions of cohesion. Second, we present a measure of perceived cohesion that closely corresponds to the two dimensions; we contrast the new indicators with others in common usage. Third, we present a confirmatory factor analysis of the indicators to test empirically whether our measurement model is consistent with sample data. As part of this analysis, we report the reliability and validity estimates of the indicators as well as the degree of association between the two dimensions of perceived cohesion proposed in our definition. Finally, we estimate our model using data from two different random samples — students at a small college campus and residents of a mid-sized city — to test whether the relationship of the latent dimensions to indicators is consistent across settings. Our definition and measures apply to individuals, but we will show that it is possible to use them for group comparisons.

#### LITERATURE REVIEW

The foundation for our research is a rich heritage of theoretical and empirical work on cohesion. Even a cursory review of this work reveals substantial disagreement about the precise nature of the construct. For purposes of highlighting points of disagreement, we categorize the various treatments of cohesion into two perspectives: (1) theory and research that focuses primarily on factors that contribute to a group's cohesion, and (2) theory and research that focuses on group cohesion as an independent construct that can be conceptualized and measured apart from a consideration of the factors that produce it. The latter perspective is represented by two different approaches that are most apparent when considering operationalization. The first portrays cohesion as an objective attribute of the group as a whole and relies primarily on composite measures of inter-member ratings to operationalize cohesion. The second considers cohesion as a function of each members' perceptions of his or her own standing in the group. We consider each of these in turn before proposing our own conceptualization and measure.

Despite the accumulation of an extensive literature on group or social cohesion (see Lott & Lott 1965 and Stein 1976 for reviews), there is still considerable ambiguity surrounding its definition and measurement. For instance, Mitchell's (1979:180) *A New Dictionary of Sociology* claims that "social cohesion (or cohesiveness) has no generally agreed upon meaning." In macro-sociology Gibbs and Martin (1964:7) write that "Durkheim does not present an explicit connotative definition of social integration [cohesion]." In social psychology similar conceptual ambiguity has had negative consequences on attempts to investigate cohesion. According to Zander (1979:433), "in the absence of a reliable method for measuring cohesiveness in a natural setting, or

a reliable procedure for creating it in the laboratory, one cannot be sure to what phenomenon investigators are attending."

Early treatments of cohesion (Back 1950; Festinger, Schachter & Back 1950; Schachter 1952) examined individual "forces" hypothesized to influence members to remain a part of the group. Because it is often unclear which forces are most important or how many forces should be measured to adequately ascertain cohesion (Gross & Martin 1952), Festinger (1950:194) proposed that cohesion be reconceptualized as "the resultant of all forces" that influence members to remain in the group. The difference in the original focus on individual forces and the later focus on the resultant of all forces is subtle, but important. Individual forces can vary from group to group and member to member; thus, it is difficult to devise a measure that permits generalization across groups. The resultant of all forces is more general and does not purport to determine the precise substance or number of forces contributing to it. Furthermore, it recognizes the need to consider, at some level, *all* salient pressures to remain a part of the group. An additional distinction concerns the type of indicators suggested by the two definitions. The original definition proposed by Festinger et al. (1950) focused on the *causes* of cohesion (forces acting upon group members); the revised definition proposed by Festinger (1950) focused on the *effects* of cohesion (the resultant of forces). The two definitions imply different approaches to operationalizing cohesion (cf. Bollen 1984).

Despite Festinger's (1950) attempt to recast the cohesion construct, several researchers continued to focus on specifying the particular forces at work in keeping groups together. Back (1950:21) referred to "the strength of attraction which the group has for its members." Lott (1961:279) formally operationalized this individual force as "the number and strength of mutual positive attitudes among the members of a group." Schachter (1952:556) defended the use of "the friendship component of the force field" as a proxy for cohesion. Although it seems probable that members' attraction to a group and/or members of a group will be translated into group cohesion (Lott & Lott 1965), it is doubtful that attraction to a group is the same as cohesion. Other antecedents, such as firm behavioral leadership (Shelley 1960), anticipated need satisfaction (Turner, Hogg, Turner & Smith 1984), and success in reaching group goals (Lott & Lott 1965), have been used to conceptualize cohesion.

If we analytically divorce cohesion from its antecedents, how might we conceptualize it as an independent construct? Researchers have taken at least two approaches to this manner of conceptualization. The first involves forming some composite of each group members' judgement of his or her closeness to each of the other group members. For example, early sociologists devised measures such as the average of each members' self-reported closeness to all other group members (e.g., Gross 1954) and composites of restraining forces against leaving the group (e.g., Hall 1955). Other researchers employed sociometric choice measures to construct an "index of morale" (Zeleny 1939), an "index of cohesiveness" (Martin, Darley & Gross 1952), or an "index of morale-cohesiveness" (Fessenden 1953). Dimock (1986:123) proposed that the index formed by dividing the actual number of mutual friendships in the group by the number of possible mutual friendships in the group is "one of the best

indicators of a group's cohesion." This class of measures takes a relatively *objective approach* to measuring cohesion.

A second approach to conceptualizing cohesion as an independent construct involves asking individual group members about their own perceptions of cohesion. This *subjective approach* follows the early admonition of Gross and Martin (1952:548) to operationalize cohesion by "allowing the subjects to use their own perceptions of why the group is important to them." Often these perceptions are expressed along several dimensions such as satisfaction (Hagstrom & Selvin 1965), task cohesion (Mikalachki 1969; Carron, Widmeyer & Brawley 1985), social cohesion (Mikalachki 1969; Carron et al. 1985), group integration, and instrumental value of the group (Stokes 1983).

A number of researchers representing the subjective approach to cohesion have proposed theoretical definitions that seem to share a common core meaning. Gross and Martin (1952) suggested that cohesion is the "sticking-togetherness" of the group, or its ability to resist potentially disruptive forces. Muldoon (1955:75) echoed this literal interpretation of the term as did Hartmann (1981:257), who described cohesion as the extent to which people "come to stick together in groups." More recently, Carron (1982:124) has defined cohesion as "the tendency for a group to stick together and remain united in the pursuit of its goals and objectives."

#### A THEORETICAL DEFINITION OF PERCEIVED COHESION

Recognizing that there exists no "true" definition of cohesion, we wish to propose a theoretical definition of cohesion that captures the extent to which individual group members feel "stuck to," or a part of, particular social groups. Without diminishing in importance other conceptualizations of cohesion, our purpose is to introduce *perceived cohesion* as an important aspect of the cohesion construct. We do not claim that this is the only important aspect, yet we do feel that it is a salient but neglected aspect that often is not distinguished from other aspects of cohesion.

Specifically, we are interested in specifying elements of a group member's perception of his or her group membership that might reflect a tendency to cohere, or "stick," to the group. We expect some relation between objective measures of cohesion and perceived cohesion. Yet, we speculate that perceived cohesion is more closely related to other subjective phenomena (e.g., loneliness, suicide propensity, adjustment to group) than is objective cohesion. We believe that perceived cohesion mediates much of objective cohesion's influences. Separating perceived from objective cohesion will allow tests of these hypotheses in future research.

More formally, our definition of perceived cohesion is as follows: *Perceived cohesion encompasses an individual's sense of belonging to a particular group and his or her feelings of morale associated with membership in the group.* Perceived cohesion is an attribute of individuals in a group that reflects an appraisal of their own relationship to the group. Appraisal of their relationship to the group results in judgements of their personal sense of how much they belong to the group and their personal feelings of morale associated with membership in the group. Sense of belonging comprises both cognitive and affective elements. At the

cognitive level, judgements of belonging include accumulated information about experiences with the group as a whole and with other group members. At the affective level, judgements of belonging include feelings that reflect the individuals' appraisal of their experiences with the group and group members. Feelings of morale stem from a global affective response associated with belonging to the group.

Individuals' sense of belonging to a group and feelings of morale associated with membership in that group are likely to be positively related for most members of most groups. This follows from current theory and research on the relationships between cognition and affect (e.g., Zajonc & Markus 1984). This literature suggests that affect associated with a particular object or event serves to initiate and direct evaluation via cognitive processing of that object or event. In turn, the evaluation that results from cognitive processing often results in an affective response to the outcome of the evaluation. As a result of this constant interplay, we would expect cognitive and affective elements of the perceived cohesion construct to be reciprocally related. Because sense of belonging comprises both cognitive and affective elements, it provides both information and motivation. Feelings of morale provide motivation to evaluate one's relationship to the group, to engage in social and task-related group activities, and to value one's membership in the group. We expect sense of belonging and feelings of morale to be moderately to highly intercorrelated by virtue of this reciprocal relationship.

It is possible to combine group members' perceptions to characterize the cohesion of the group as a whole (cf. Buckner 1988). We contend that, as individual group members come to feel a stronger bond to the group (higher perceived cohesion), the group as a whole will come to exhibit unity of purpose and experience (higher group cohesion). Thus, at the individual level perceived cohesion reflects the role of the group in the lives of group members; at the group level perceived cohesion reflects the role of individuals in the life of the group.

Our definition of perceived cohesion has several additional characteristics worthy of note. First, our explicit concern is with individuals' perceptions of their own experience with the group. Sociometric or social network definitions of cohesion that count the frequency and nature of interactions of group members are analytically distinct from perceived cohesion. Second, we do not define perceived cohesion in terms of its causes. For example, consider Festinger et al.'s (1950:164) definition of cohesion as "the total field of forces which act on members to remain in the group." Here cohesion consists of all those (unspecified) causes which keep members in a group without defining cohesion *per se*. In contrast, we explicitly define perceived cohesion and its two dimensions. Third, our definition includes no reference to individuals' attraction to the group (cf. Back 1950; Lott & Lott 1965). Group members that perceive themselves to be part of the group and have high morale may be more attracted to the group than those that do not, but this does not imply that attraction-to-group is the same as cohesion.

Our definition of perceived cohesion is similar to other theoretical definitions in several ways. Others have alluded to feeling a part of a group as a dimension of perceived cohesion. Gross (1954) proposed that group membership

fulfills a primary need in humans to feel a sense of belonging. Frank (1957:54) defined cohesion as "the members' sense of belonging to a group." Similarly, Lieberman et al. (1973:337) described cohesion as "a group property with individual manifestations of feelings of belongingness."

Group identification, such as political party identification or ethnic identification, is a concept similar to the sense of belonging dimension. Identification, however, has at least two different connotations. One concerns how much an individual identifies with a group of which he or she is a member. This connotation is very similar to our sense of belonging dimension of perceived cohesion. The other is more abstract and is the identification with a belief system or ideology. Agreement with "I am a Republican" may be more an indicator of agreement with a general Republican ideology than feeling a part of a local Republican club. This meaning departs from that of the sense of belonging dimension.

On occasion group morale has been treated as synonymous with a sense of cohesion (see Zander 1979), thus our definition is not novel in this regard. Hare (1976:170) noted that "the terms morale and cohesiveness have generally been used interchangeably." Interestingly, we find no theoretical definition that explicitly states that perceived cohesion comprises the two dimensions we propose — sense of belonging and feelings of morale.

Why should we use sense of belonging and feelings of morale as the two primary dimensions of perceived cohesion? We have several reasons for this choice. We view sense of belonging as fundamental to the existence of a group. If individuals do not perceive themselves to be members of a group, it is difficult to understand how group norms, values, and other group characteristics are likely to affect them. Indeed, the use of the term "group" implies some minimal sense of belonging on the part of group members, otherwise the collection of individuals is an aggregate. Other dimensions of cohesion such as individual liking or affection for other group members, group satisfaction, and anticipated need satisfaction presuppose that group members view themselves as belonging to the group. Furthermore, the sense of belonging dimension is close in meaning to Turner's (1987:28) notion of "self-categorization." Turner reports that self-categorizing into a group produces discriminatory behavior against out-group members, more positive attitudes and liking of in-group members compared to out-group members, ethnocentric biases, and an altruistic orientation toward in-group members. Thus, sense of belonging is fundamental to members' identification with a group and has numerous consequences for behavior.

Feelings of morale, the second dimension of perceived cohesion, is an important characteristic of group life that summarizes the positive or negative emotional response to belonging to a group. Because of the motivational consequences of affect, acknowledgement of this dimension of perceived cohesion is essential.

An important advantage of choosing belonging and morale as dimensions of perceived cohesion is that they are relevant for small and large groups. Most dimensions of cohesion proposed in previous research are oriented toward small, face-to-face groups. For instance, interpersonal attraction is the primary dimension of cohesion used in many social psychological studies. Interpersonal

TABLE 1: Perceived Cohesion Scale<sup>a</sup>*Sense of Belonging*

I feel a sense of belonging to \_\_\_\_\_.

I feel that I am a member of the \_\_\_\_\_ community.

I see myself as part of the \_\_\_\_\_ community.

*Feelings of Morale*

I am enthusiastic about \_\_\_\_\_.

I am happy to be at [live in] \_\_\_\_\_.

\_\_\_\_\_ is one of the best schools [cities] in the nation.

- <sup>a</sup> Responses are recorded on Likert scales ranging from 0 ("strongly disagree") to 5 ("neutral") to 10 ("strongly agree"). We substituted the name of the reference group for perceived cohesion in the blanks. Bracketed words in the final two items were used in the present study when referring to the city sample. The items are sorted for purposes of presentation; for actual use we suggest random ordering.

Items of the Perceived Cohesion Scale were generated by Bollen in the fall of 1984.

attraction presupposes that members of a group have at least some familiarity with each group member. In contrast, sociology applies cohesion to moderate-to-large groups where face-to-face interaction or even knowledge of everyone in the group of interest is not possible. In such groups the idea of equating interpersonal attraction with cohesion makes little sense. Yet, the dimensions of belonging and morale still apply. The samples we chose for this study illustrate this point. We investigate perceived cohesion in a sample of college students and a sample of residents of a mid-sized city. In both samples, respondents are not acquainted with all other members of their respective groups. Focusing upon belonging and morale as dimensions of cohesion liberates the empirical study of cohesion from the study of only small groups and is more in keeping with the study of cohesion regardless of group size.

#### PERCEIVED COHESION SCALE

The Perceived Cohesion Scale (PCS), presented in Table 1, parallels the preceding theoretical definition. Three of the six indicators pertain to sense of belonging and three to feelings of morale. The items apply to many groups where the group name can be substituted in the blank. In some cases a slight rewording may be necessary, as in the case of the second and third morale items. Also, the scale has few items so that it requires minimal questionnaire space or respondent's time, and so that it does not become excessively repetitious.

We recognize that the wording of these items might limit the use of the scale with certain groups and samples. For example, enthusiasm (first indicator of morale) may not characterize the affective manifestation of morale exhibited

in some groups (e.g., families). In addition, it is possible that the items have a middle class bias and, as a consequence, would not work well for working class respondents. We address this latter issue by examining the invariance of the scale's measurement properties across socioeconomic class. Finally, as with any questionnaire measure, there are respondents and target groups for which the items may need to be significantly altered or rewritten. (We suggest alternative wordings in the Appendix.) We are, however, optimistic about the flexibility and generality of the items.

One of the best known indices of cohesion is that of Seashore (1954). Comparing this scale to ours is a useful way to reveal the similarities and differences between the PCS and existing measures. Seashore's scale includes three items: (1) "Do you feel that you are really a part of your work group?"; (2) "If you had a chance to do the same kind of work for the same pay, in another work group, how would you feel about moving?"; and (3) "How does your work group compare with other work groups at Midwest on the following points: (a) the way men get along? (b) the way men stick together? (c) the way men help each other on the job?" Like our scale, Seashore's scale focuses on a specific target group rather than attempting to gauge some global sense of cohesion; however, items are geared toward the work group (for males) and thus lack the flexibility necessary to adapt the items to the study of other specific groups.

Seashore's (1954) first question closely corresponds to the sense of belonging dimension that we identify. The second question appears to tap work group loyalty or resistance to leaving. We would expect a strong sense of belonging or high morale to be positively associated with resistance to leaving the group, but not always. For example, a high school graduate might have very high perceived cohesion with regard to his or her family, but nonetheless would leave the family for college or for a job. Or, a worker may be happy and feel a part of his or her work group, but nevertheless might leave readily for a promotion. Thus, we view loyalty as associated with, but conceptually distinct from, the two dimensions of perceived cohesion we have identified.

Seashore's third question asks workers to assess their group as a whole as to the degree of cooperation and harmony in their intragroup relations. This item differs from the other two in that workers do not report their *own* feelings or perceptions but are to judge the group. It is likely that a worker's perception of their status in the group will color their assessment of the group's standing — a confound that exists regardless of the members' personal perceptions of cohesion. The PCS item that comes closest to this same problem is item 6, an item targeted at morale. It taps an aspect of perceived cohesion that differs from Seashore's third question; however, it does ask the individual to assess the group as a whole. We believe that it is strongly influenced by the individual's morale, an hypothesis that will be tested in our empirical analyses.

Overall, there is little correspondence between the substance of Seashore's (1954) items and the theoretical definition of perceived cohesion we outlined above. It seems that Seashore's scale taps several dimensions rather than just one; however, this conceptual dimensionality is not adequately reflected in the scale's items, because there are not multiple indicators for each dimension. Only Seashore's first question corresponds to either of the dimensions in our



theoretical definition of perceived cohesion. None of the items gauge morale, which we view as a critical dimension of perceived cohesion.

Comparison of our scale to other measures of cohesion revealed differences and similarities analogous to those detailed above. For instance, a 10-item instrument by Dailey (1978) asks respondents to compare their own group or team to other groups or teams with regard to "How the team sticks together," and "The extent of 'oneness' in my team." Unlike items forming our scale, these items do not ask for individuals' perceptions of their own relation to the group. Rather, they ask individuals to evaluate the "team" as a whole. Further, other items on the scale appear to measure constructs we have distinguished from perceived cohesion like loyalty ("The amount of team loyalty in our team."), satisfaction ("How team members are satisfied with their team membership."), and helping ("How members of the team help each other on the job."). An 18-item "solidarity" measure created by Wheelless, Wheelless, and Dickson-Markman (1982) purports to assess individuals' perceptions of cohesion in a group [Wheelless et al. consider solidarity to be "semantically isomorphic to the cohesion concept" (p. 375)]. Items like "I feel very close to this group," and "The group members feel very close to each other," tap our sense of belonging dimension, but there are no items that tap feelings of morale. In addition, many items tap attraction-to-group ("I like this group much more than other groups I have participated in."), a construct we have distinguished from perceived cohesion. Neither the Dailey (1978) instrument nor the Wheelless et al. (1982) instrument is based on a precise theoretical definition of cohesion. Further, neither measure proposes a dimensional structure (i.e., each scale produces a single score), though each measure includes items that appear to tap several separate aspects of cohesion.

Buckner (1988), using an approach similar to ours, proposed a definition of cohesion, then employed exploratory factor analysis to create an 18-item Neighborhood Cohesion Instrument (NCI). Buckner proposed three dimension of cohesion in neighborhoods: sense of community ("I feel like I belong to this neighborhood."), attraction-to-neighborhood ("Overall, I am very attracted to living in this neighborhood."), and degree of interaction within the neighborhood ("I visit with my neighbors in their homes."). He then created candidate items to measure these dimensions at the individual and at the neighborhood level. Although Buckner was unable to produce evidence supporting the correspondence of the NCI to the proposed multidimensional structure (coefficient alpha for the 18 items was .95), he demonstrated that NCI scores, though based on individual perceptions of neighborhood cohesion, could be used to test hypotheses at the neighborhood level of analysis.

In summary, there exists a number of instruments similar in nature to the PCS, but no single measure that embodies all of the qualities of the PCS. Some instruments measure one of our dimensions, but not the other. Some instruments include indicators of constructs that are similar to perceived cohesion, but not the same as perceived cohesion. Some instruments combine individuals' perceptions of the group as a whole with individuals' perceptions of their own experience in the group. Some instruments include indicators that appear to represent multiple dimensions, but multiple dimensions are not specified and, in many cases, there is only one or two indicators of particular dimensions. Our

conceptual examination of cohesion suggests that perceived cohesion is a neglected aspect of the cohesion construct. The goals of our empirical examination of the PCS are as follows: (1) to examine the dimensionality of the PCS and thus the correspondence of the PCS to our theoretical definition of perceived cohesion; (2) to demonstrate structural invariance of the PCS across populations; and (3) to demonstrate the use of the PCS to test hypotheses at the group level of analysis.

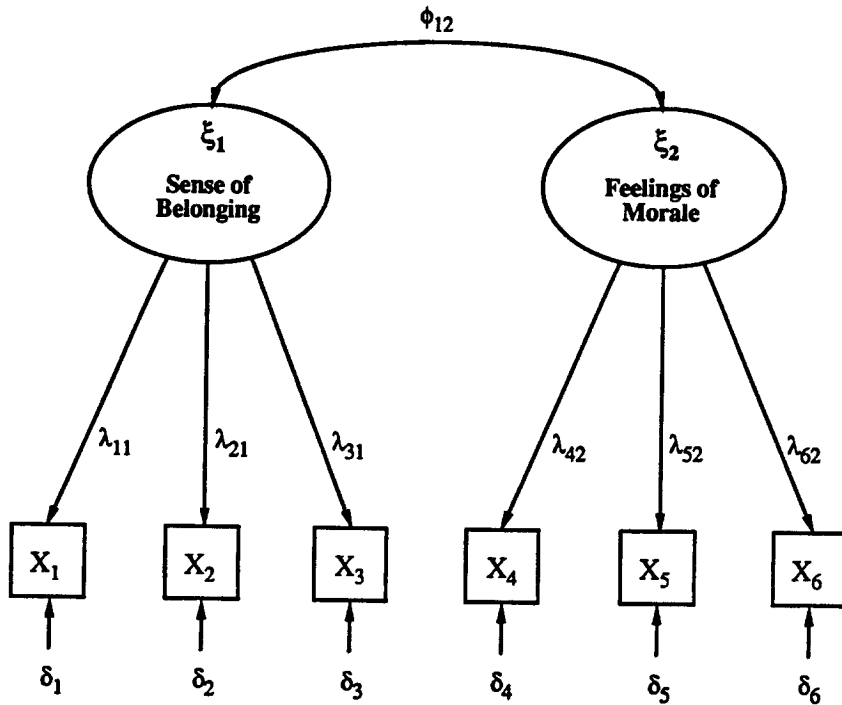
### **Samples and Data Collection**

We selected a high cohesion and a lower cohesion group for analysis. We assumed that students from a relatively small college with a reputation of strong "school spirit" would express greater cohesion than residents of a mid-sized city. Thus, the validity of our measure would be supported, in part, by a difference in the mean level of perceived cohesion reported by the two groups on the PCS. In addition, we were interested in examining the stability of the hypothesized structure of the scale across samples.

We chose a random sample of undergraduates at a private liberal arts college in the Northeast. The questionnaire presented in Table 1 was administered to 49 male and 60 female resident students at the college in the fall of 1984. Seven subjects, six males and one female, failed to respond to one or more items of the questionnaire and were therefore not included in the analyses. The final sample of 102 respondents was 58% female and 87% white. The age representativeness of the sample for the college population from which it was drawn is reflected in the distribution across college class. Thirty-six percent of the sample were freshmen, 24% sophomore, 17% junior, and 32% senior. The small percentage of juniors reflects the common practice at the college of juniors spending one or more semesters off-campus.

We drew a second random sample from the city directory of a mid-sized Northeastern city. Residents responded to the PCS as part of a larger public opinion poll administered in the spring of 1985. Of the 119 residents that responded to the survey, 110 (52% male) provided complete data on the PCS. Twenty-five percent of this sample responded to the scale in face-to-face interviews, twenty-three percent responded through telephone interviews, and the remainder completed the opinion poll (including the scale) at home and mailed in the completed forms. The final sample ranged in age from 18 years to older than 70 years; the median age category was 40 to 44 years. When asked to provide social class information, two-thirds of the sample classified themselves as "middle class"; the majority of the remaining one-third considered themselves to belong to the "working class." We believe that the college and city samples represent rather distinct populations and thus provide useful information as to the validity and flexibility of our definition and measure of perceived cohesion.

FIGURE 1: Factor Model for Two Dimensions of Perceived Cohesion



## Results

Figure 1 displays the hypothesized model that we believe applies to both samples. The notation follows the standard path diagram and LISREL notation (Wiley 1973; Jöreskog & Sörbom 1986). The  $\xi_1$  and  $\xi_2$  represent the latent variables sense of belonging and feelings of morale. The curved arrow between  $\xi_1$  and  $\xi_2$  stands for the covariance between them,  $\phi_{12}$ . These exogenous latent variables arise outside the model. We expect these two dimensions to have a high positive intercorrelation. Each of the latent variables influences responses to three of the indicators from the PCS. The residual variability in the indicators — that not accounted for by the influence of the latent variables — is reflected in the  $\delta$ s.

We used the maximum likelihood fitting function (Jöreskog & Sörbom 1986) to estimate the measurement model shown in Figure 1. The null hypothesis is that  $\Sigma = \Sigma(\theta)$ , where  $\Sigma$  is the population covariance matrix,  $\Sigma(\theta)$  is the population covariance matrix predicted by the model, and  $\theta$  contains the free

TABLE 2: Covariance Matrices and Item Means for Two Samples of Responses to the Perceived Cohesion Scale<sup>a</sup>

Item <sup>b</sup>	Covariances						Means	
	1	2	3	4	5	6	College (N=102)	City (N=110)
1	6.43	5.43	4.56	5.57	5.38	4.92	8.22	6.78
2	4.11	7.26	4.47	4.94	5.58	4.82	8.87	7.20
3	2.56	2.83	8.03	4.48	4.94	4.37	8.80	5.44
4	2.42	2.27	3.02	7.93	6.41	5.47	7.96	6.85
5	3.28	2.83	2.71	4.46	7.69	5.88	7.77	6.85
6	2.98	2.36	2.56	3.50	5.48	6.46	8.01	6.63
	2.82	2.38	2.59	3.32	3.11	4.42		

<sup>a</sup> Lower values on the diagonal and entries below the diagonal are the variances and covariances for the college sample; upper values and entries above the diagonal are the variances and covariances for the city sample.

<sup>b</sup> Item number corresponds to number in Table 1.

parameters of the model. A chi-square test is available to test  $H_0: \Sigma = \Sigma(\theta)$ . When the model is valid, the chi-square estimate should *not* be statistically significant. The chi-square test assumes that the distribution of the observed variables has no excessive kurtosis (Browne 1974). Since some of our observed variables do not fully satisfy this assumption, we also estimated our model with an asymptotic distribution free estimator (Browne 1984) to investigate the robustness of the maximum likelihood based tests.

Several other goodness of fit measures complement the chi-square statistic. Each measures the closeness of the sample covariance matrix ( $S$ ) to  $\Sigma$  which is  $\Sigma(\theta)$  evaluated at  $\theta$ , the sample parameter estimates. We use four incremental fit indices ( $\Delta_1$ ,  $\Delta_2$ ,  $\rho_1$ , and  $\rho_2$ ) developed by Bentler and Bonett (1980), Bollen (1989a), Bollen (1986), and Tucker and Lewis (1973), respectively, and Jöreskog and Sörbom's (1986) GFI and AGFI. Higher values of these measures indicate a better fit and all but  $\Delta_2$  and  $\rho_2$  have a maximum value of 1.0. Values of  $\Delta_2$  and  $\rho_2$  should be near 1.0 for a valid model, but they can exceed 1.0. For further details on these fit measures see Bollen (1989b:256-81). Because no consensus has emerged concerning which overall fit measure is superior, we report all of the above ones.

Table 2 presents the covariance matrices and item means for the two samples. If the covariances are converted to correlations, they range from about .56 to .80 in each sample. We first analyzed data from the two samples separately. We then tested our hypotheses of mean differences and invariance of factor structure across the two samples.

TABLE 3: Goodness of Fit Indices for Confirmatory Factor Analysis of Six Indicators of Perceived Cohesion — College Sample<sup>a</sup>

Model <sup>b</sup>	$\chi^2$	df	prob	$\Delta_1$	$\Delta_2$	$\rho_1$	$\rho_2$	GFI	AGFI	Rsd1	Rsd2
M <sub>0</sub>	487.75	15	<.001	—	—	—	—	—	—	—	—
M <sub>1</sub>	9.32	8	.316	.981	.997	.964	.995	.969	.919	.013	.018
M <sub>2</sub>	12.93	9	.166	.973	.992	.956	.986	.959	.905	.015	.021

<sup>a</sup> See text for descriptions of  $\Delta_1$ ,  $\Delta_2$ ,  $\rho_1$ ,  $\rho_2$ , GFI, and AGFI. Rsd1 = average absolute standardized residual; Rsd2 = average absolute standardized off-diagonal residual.  $N = 102$ .

<sup>b</sup> M<sub>0</sub> = uncorrelated variables (baseline model); M<sub>1</sub> = two latent variables, each with three effect indicators; M<sub>2</sub> = M<sub>1</sub> with  $\rho_{\xi_1\xi_2}$  set to one.

#### ANALYSIS OF COLLEGE DATA

A summary of fit indices for measurement models of college students' responses to the PCS appears in Table 3. There are no previous analyses of models for these variables, so we took our baseline model, M<sub>0</sub>, to be that all six variables have zero covariances with each other and their variances are unrestricted. This baseline model was used to calculate  $\Delta_1$ ,  $\Delta_2$ ,  $\rho_1$ , and  $\rho_2$ . The table reveals that the two factor model, M<sub>1</sub>, has an excellent fit. The chi-square of 9.32 is nonsignificant ( $p = .30$ ) and the various summary fit indices approach their optimal values (e.g.,  $\Delta_1 = .98$ ;  $\Delta_2 = 1.0$ ; GFI = .97). Before examining the last row of Table 3, we turn to the individual free parameters of the M<sub>1</sub> model.

Table 4 displays parameter estimates for M<sub>1</sub> in the college sample. The ratio of the parameter estimate to its standard error is asymptotically distributed as a  $z$  statistic and allows a test of the difference of the estimate from zero. The maximum likelihood estimates for the  $\lambda$ s are consistently large relative to their standard errors and are highly significant (a critical ratio of 1.96 is significant at  $p < .05$ ), and most  $\lambda$ s are of a similar magnitude. Furthermore, as evidenced by the large  $R^2$  for each indicator (minimum .57, maximum .86), a substantial portion of the variability in each indicator is accounted for by the latent variables. Finally, using the definition of a correlation coefficient,  $\xi_1$  and  $\xi_2$  are correlated .96 according to the sample estimates for  $\Phi$ . A reasonable question is whether sense of belonging ( $\xi_1$ ) and feelings of morale ( $\xi_2$ ) are perfectly correlated. The last row of Table 3 provides the overall fit measures for a model, M<sub>2</sub>, which constrains  $\rho_{\xi_1\xi_2}$  to equal 1.0. The chi-square estimate of 12.93 ( $p = .166$ ) and the other fit measures indicate a good fit.

How does it compare to M<sub>1</sub> where  $\rho_{\xi_1\xi_2}$  is not restricted? Since M<sub>2</sub> is nested in M<sub>1</sub>, we can form a new chi-square estimate by subtracting the M<sub>1</sub> chi-square estimate from the chi-square estimate for M<sub>2</sub>. This new chi-square estimate tests whether  $\rho_{\xi_1\xi_2} = 1.0$ . A nonsignificant chi-square means that the more restrictive M<sub>2</sub> model does not fit significantly worse than M<sub>1</sub>. The resultant chi-square difference with one degree of freedom is 3.61 with a  $p$ -value of .06. Thus, a case

TABLE 4: Maximum Likelihood Confirmatory Factor Analysis of Six Indicators of Perceived Cohesion — College Sample<sup>a</sup>

Parameter	ML Estimate	Standard Error	Critical Ratio	R <sup>2</sup>
$\lambda_{11}$	<u>1.000</u>	—	—	.711
$\lambda_{21}$	.877	.076	11.547	.792
$\lambda_{31}$	.865	.081	10.722	.724
$\lambda_{42}$	<u>1.000</u>	—	—	.858
$\lambda_{52}$	.906	.091	9.926	.574
$\lambda_{62}$	.875	.077	11.443	.665
$\phi_{11}$	2.916	.566	5.155	—
$\phi_{12}$	3.205 <sup>b</sup>	.528	6.072	—
$\phi_{22}$	3.830	.638	5.999	—

<sup>a</sup> For the full model  $\chi^2(8) = 9.316$ ,  $p = .316$ . Underlined coefficients denote parameters fixed in order to scale the latent variables. All parameter estimates are significant at  $p < .01$ .  $N = 102$ .

<sup>b</sup> Interfactor correlation = .959

could be made that these two dimensions are perfectly correlated. By this we do not mean that *conceptually* these two dimensions are the same. Our earlier theoretical definition distinguished these dimensions from one another. Rather these results show that these conceptually distinct concepts *empirically* are virtually perfectly correlated. We provide possible explanations for this high correlation later. Now we turn to the city data.

#### ANALYSIS OF CITY DATA

We employed a similar strategy for analysis of the city data. We estimated the fit of the model in Figure 1 to the covariances in the sample data. We also tested whether  $\rho_{\xi_1\xi_2}$  was equal to 1.0. Table 5 presents summary fit indices for these models. As with the college sample, the  $M_1$  model shows a good fit. The chi-square estimate of 13.98 is nonsignificant ( $p = .08$ ) and the accompanying fit indices all attest to the adequacy of the model (e.g.,  $\Delta_1 = .98$ ,  $\Delta_2 = .99$ ,  $\rho_1 = .96$ ,  $\rho_2 = .98$ ), though they are slightly lower than the college sample. Table 6 permits a closer examination of the adequacy of the hypothesized model.

As with the college sample, the maximum likelihood estimates of factor loadings are highly significant and of comparable magnitude. Except for the third indicator of sense of belonging, the majority of the variance in each of the indicators is accounted for by the latent variables. Even the  $R^2$  of .49 associated with the third indicator is substantial enough to cause little reservation in accepting the model fit. The interfactor correlation ( $\phi_{12}$ ) of .92 is slightly lower than that for the college sample.

The last row of Table 5 provides the overall fit statistics for a model ( $M_2$ ) that constrains  $\rho_{\xi_1\xi_2} = 1.0$ . In contrast to the college sample,  $M_2$ 's chi-square

TABLE 5: Goodness of Fit Indices for Confirmatory Factor Analysis of Six Indicators of Perceived Cohesion — City Sample<sup>a</sup>

Model <sup>b</sup>	$\chi^2$	df	prob	$\Delta_1$	$\Delta_2$	$\rho_1$	$\rho_2$	GFI	AGFI	Rsd1	Rsd2
M <sub>0</sub>	577.93	15	<.001	—	—	—	—	—	—	—	—
M <sub>1</sub>	13.98	8	.082	.976	.990	.955	.980	.963	.902	.011	.016
M <sub>2</sub>	28.43	9	<.001	.951	.966	.918	.942	.928	.833	.018	.025

<sup>a</sup> See text for descriptions of  $\Delta_1$ ,  $\Delta_2$ ,  $\rho_1$ ,  $\rho_2$ , GFI, and AGFI. Rsd1 = average absolute standardized residual; Rsd2 = average absolute standardized off-diagonal residual.  $N = 110$ .

<sup>b</sup> M<sub>0</sub> = uncorrelated variables (baseline model); M<sub>1</sub> = two latent variables, each with three effect indicators; M<sub>2</sub> = M<sub>1</sub> with  $\rho_{\xi_1\xi_2}$  set to one.

estimate (= 28.4, df = 9) is statistically significant ( $p < .001$ ). Also, the chi-square difference test comparing M<sub>2</sub> to M<sub>1</sub> leads to a chi-square estimate of 14.45 with a  $p$ -value less than .001. So the model with  $\rho_{\xi_1\xi_2}$  unrestricted has a significantly better fit, which means that the two dimensions are unlikely to be perfectly correlated in this population. Taking the evidence from the college and the city samples together suggests that sense of belonging and feelings of morale are highly correlated but not always perfectly correlated.

#### ASYMPTOTIC DISTRIBUTION FREE ESTIMATES

Before turning to the multi-group analysis of the college and city samples, we present asymptotic distribution free estimates (Browne 1984) of the fit of M<sub>1</sub> to the data for each sample. We mentioned earlier that the maximum likelihood estimator assumes observed variables with no excess kurtosis. To check the robustness of our maximum likelihood results, we re-estimated M<sub>1</sub> for the two samples by fully iterating the generalized least squares fitting function for arbitrary distribution theory (i.e., Browne's (1982, 1984) asymptotically distribution-free estimator) provided in Bentler's (1985) EQS. This estimator allows either high or low kurtosis and provides an asymptotic chi-square test, which we compared to our maximum likelihood results. The results of these analyses were consistent with the earlier ones. For the college sample the chi-square estimate of 14.50 with 8 degrees of freedom was nonsignificant ( $p = .07$ ). Likewise, the chi-square for the city sample was nonsignificant (chi-square = 12.53, df = 8,  $p = .13$ ). With this assurance that the good fit of M<sub>1</sub> for both samples is robust with regard to distributional assumptions, we turn to the comparison of the individual parameter matrices for the two samples.

#### COMPARISON OF THE COLLEGE AND CITY DATA

For the PCS to be generally applicable, we would hope that it has similar structural properties in different groups. Otherwise, it makes little sense to

TABLE 6: Maximum Likelihood Confirmatory Factor Analysis of Six Indicators of Perceived Cohesion — City Sample<sup>a</sup>

Parameter	ML Estimate	Standard Error	Critical Ratio	R <sup>2</sup>
$\lambda_{11}$	<u>1.000</u>	—	—	.848
$\lambda_{21}$	.988	.077	12.897	.732
$\lambda_{31}$	.849	.095	8.915	.489
$\lambda_{42}$	<u>1.000</u>	—	—	.766
$\lambda_{52}$	1.048	.072	14.491	.868
$\lambda_{62}$	.918	.069	13.230	.794
$\phi_{11}$	5.451	.885	6.157	—
$\phi_{12}$	5.313 <sup>b</sup>	.842	6.307	—
$\phi_{22}$	6.074	1.061	5.722	—

<sup>a</sup> For the full model  $\chi^2(8) = 13.982$ ,  $p = .082$ . Underlined coefficients denote parameters fixed in order to scale the latent variables. All parameter estimates are significant at  $p < .01$ .  $N = 110$ .

<sup>b</sup> Interfactor correlation = .923.

compare groups' or individuals' standing on the scale. Also, the relation of perceived cohesion to other variables can be confounded by scaling differences if the scale is not nearly equivalent across populations. In this section we determine the scale comparability across two different groups.

We hypothesized that the structure of perceived cohesion would be similar despite differing mean levels for the two groups. LISREL VI (Jöreskog & Sörbom 1986) permits the simultaneous estimation of a measurement model for independent groups. By including constant intercept terms in the measurement equations, we can test the equivalence of group means in addition to the other parameters usually associated with the measurement model (see Alwin & Jackson 1981; Jöreskog 1971). Comparability or invariance in models represents a continuum. At the lower end of the continuum are considerations of comparability of form. In the present context, the test of form ( $H_{form}$ ) is whether the model for the two samples has the same number of latent variables with the same indicators, and the same specification of fixed and free parameters (see Figure 1). Table 7 presents the chi-square estimate and summary fit indices generated by this test. The nonsignificant chi-square value (23.3,  $df = 16$ ,  $p = .11$ ) accompanied by large values for the fit indices (e.g.,  $\Delta_1 = .98$ ,  $\Delta_2 = .99$ ) leads us to the conclusion that the model form holds similarly for the two samples.

Having received support for this preliminary test of invariance, we tested equality of parameters in a hierarchical fashion. We first tested the hypothesis that the  $\lambda$ s or factor loadings were equal for the two groups ( $H_\lambda$ ). This hypothesis restricts the slopes relating the measures to the latent variables to be equal for the two samples. The chi-square estimate of 26.16 with 20 degrees of freedom is clearly nonsignificant ( $p = .161$ ). All the fit measures accompanying



TABLE 7: Independent Groups Comparisons of Responses to Six Indicators of Perceived Cohesion by a College Sample and a City Sample<sup>a</sup>

Hypothesis	$\chi^2$	df	prob	$\Delta_1$	$\Delta_2$	$\rho_1$	$\rho_2$	College GFI	City GFI
Baseline	1065.74	30	<.001	—	—	—	—	.288	.281
$H_{\text{form}}$	23.28	16	.107	.978	.993	.959	.987	.971	.963
$H_A$	26.16	20	.161	.975	.994	.963	.991	.967	.959
$H_{\Delta\psi}$	37.45	24	.040	.965	.987	.956	.984	.956	.958
$H_{\Delta\psi^*}$	34.11	23	.064	.968	.989	.958	.986	.960	.957
$H_{\Delta\kappa}$	46.18	22	.002	.957	.977	.941	.968	.953	.937
$H_{\Delta\psi\kappa}$	130.66	26	<.001	.877	.899	.859	.883	.923	.823
$H_{\Delta\Phi}$	39.49	23	.018	.963	.984	.952	.979	.946	.946
$H_{\Delta\Phi\Theta}$	137.64	29	<.001	.871	.895	.866	.891	.758	.887

<sup>a</sup> Sample sizes equal 102 and 110 for the college and city samples, respectively.

this test provide strong evidence that  $\Lambda_x$  is invariant in the two groups. In fact,  $\Delta_2$ ,  $\rho_1$ , and  $\rho_2$ , which control for degrees of freedom, increase slightly over those associated with the less restrictive test of equal form. The chi-square difference between  $H_{\text{form}}$  and  $H_A$  is clearly nonsignificant ( $\chi^2(4) = 2.88$ ,  $p > .10$ ), which is additional evidence that the factor loadings are equivalent across groups.

Our next test of invariance adds the restriction that the intercepts of the measurement equations that relate the observed variables to the latent ones, are equivalent across the college and city samples. We represent this hypothesis as  $H_{\Delta\psi}$  in Table 7. The chi-square estimate of 37.5 with 24 degrees of freedom has a  $p$ -value of .04. With an alpha of .05, we should reject the added restriction that the intercept terms are the same. Since  $H_{\Delta\psi}$  is nested in  $H_A$  we can form a chi-square difference test. The resulting chi-square is 11.3 with 4 degrees of freedom ( $p < .05$ ). Thus, the statistically significant chi-square for  $H_{\Delta\psi}$  and the chi-square test comparison for  $H_{\Delta\psi}$  and  $H_A$  suggest caution in accepting the added restriction. The greatest support for  $H_{\Delta\psi}$  comes from the goodness of fit measures, which remain quite high (e.g.,  $\Delta_1 = .96$ ,  $\Delta_2 = .99$ , GFI = .96).

Earlier we mentioned a potential problem with our third indicator of morale (see Table 1) due to the fact that it may not only tap individuals' morale but also their assessment of the whole group. It could be that the intercept for this item differs between the groups and that this contributes to the rejection of  $H_{\Delta\psi}$ . To explore this idea, we estimated  $H_{\Delta\psi^*}$ , which is the same as  $H_{\Delta\psi}$  except that we did not restrict the intercept term for the third morale indicator. As Table 7 shows  $H_{\Delta\psi^*}$  has a chi-square of 34.1 with 23 degrees of freedom ( $p = .06$ ). The chi-square difference test of  $H_{\Delta\psi^*}$  and  $H_{\Delta\psi}$  is 3.3 with a single degree of freedom and a probability of slightly greater than .05. Thus, the improvement in fit is minimal.

We next tested whether the means of sense of belonging and the means of

feelings of morale were invariant. We predicted that the college sample would have higher means on both latent variables than the city sample. The chi-square estimate for  $H_{\Lambda\kappa}$  (where  $\kappa$  stands for the latent variable means) is 46.18 with 22 degrees of freedom ( $p = .002$ ). In addition, the chi-square difference test of  $H_{\Lambda\kappa}$  and  $H_{\Lambda}$  is 20.02 with 2 degrees of freedom ( $p < .001$ ).<sup>1</sup> Also, a small drop in several of the goodness of fit measures occurs (e.g.,  $\Delta_1 = .96$ ,  $\Delta_2 = .98$ ). For  $H_{\Lambda}$  the mean of college morale ( $\xi_2$ ) is 8.22 whereas the mean of city morale is 6.81. Means for sense of belonging ( $\xi_1$ ) are 7.96 and 6.88, respectively. As predicted, these values are higher for the college sample. Since there was some support for  $H_{\Lambda\psi}$ , we also estimated  $H_{\Lambda\psi\kappa}$  (see Table 7). Adding the constraint of equal means to  $H_{\Lambda\psi}$  also leads to a significant decline in model fit (chi-square = 93.21 with 2 degrees of freedom,  $p < .001$ ). Thus, regardless of whether we start with  $H_{\Lambda}$  or  $H_{\Lambda\psi}$ , adding the restriction that the two populations have the same means for sense of belonging and for feelings of morale leads to a significant decline in fit.

Returning to  $H_{\Lambda}$ , the highest level of invariance for which we have unambiguous statistical support, we now add the restriction that the covariance matrix for  $\xi_1$  and  $\xi_2$  (i.e.,  $\Phi$ ) is invariant for the two groups. This implies that  $\rho_{\xi_1, \xi_2}$  is equal across groups. Table 7 shows that  $H_{\Lambda\Phi}$  has a chi-square estimate of 39.49 with 23 degrees of freedom ( $p = .02$ ). The chi-square difference of  $H_{\Lambda\Phi}$  and  $H_{\Lambda}$  is 13.33 with 3 degrees of freedom ( $p < .01$ ). The goodness of fit measures are still reasonably high (e.g.,  $\Delta_1 = .96$ ,  $\Delta_2 = .98$ ), but the significant chi-squares are a source of concern. If we go one step further and add the restriction that the error variances ( $\Theta_{\delta}$ ) are equal across groups, a statistically significant chi-square results (chi-square of 137.64 with 29 degrees of freedom,  $p < .001$ ). Also, the other overall fit measures decline, rendering this hypothesis questionable at best.

#### CLASS BIASED INDICATORS?

We mentioned in the introduction the possibility that our items might be biased toward the experience of middle class respondents. As an empirical check for this potential bias, we tested the hypothesis that the  $\lambda$ s or factor loadings were equal ( $H_{\lambda}$ ) for middle class ( $N = 77$ ) and working class ( $N = 33$ ) respondents in the city sample. This hypothesis restricts the slopes relating the measures to the latent variables to be equal for the two groups. The chi-square estimate of 28.73 with 20 degrees of freedom was clearly nonsignificant ( $p = .093$ ). All the fit measures accompanying this test provided strong evidence that  $\Lambda_x$  is invariant in the two groups. (Similar results hold for  $H_{\Lambda\Phi}$  with a chi-square estimate of 30 with 23 degrees of freedom,  $p = .148$ .)

#### Discussion

Our review of the early and recent literature concerned with the conceptualization and measurement of cohesion revealed serious concerns about clarity and precision among researchers in a variety of domains interested in group phenomena. Virtually every recent work directly concerned with cohesion voices concern over the lack of a widely accepted theoretical definition. Some

attempt to synthesize the plethora of existing definitions; others simply avoid an explicit definition. In the absence of a widely accepted theoretical definition, operationalization and measurement are inconsistent across studies. As a result, the rather large literature on group and social cohesion was recently dubbed, "a legacy of confusion" (Mudrack 1989).

We have proposed, defined, and provided a measure for one aspect of cohesion — perceived cohesion — that represents an initial step toward clarifying the role of cohesion in individual and group life. Our analyses revealed excellent measurement properties of the Perceived Cohesion Scale (PCS) including sufficient sensitivity of the indicators to detect hypothesized between-group differences. The PCS is brief, applicable to a broad range of groups, consistent with our own theoretical definition and a sizeable body of literature on cohesion, and structurally invariant across groups. It is likely that the PCS is capable of serving as a common measure of cohesion across many groups and research perspectives, thereby contributing to the integration of a fragmented and inconclusive literature.

Our method of scale development and validation differed from many in that we did not analyze items designed by others to determine how many dimensions underlie them. Rather, we defined a two-dimensional construct and devised items to tap each dimension. The CFA tested whether the indicators were successful in doing so. The results were strongly consistent with the initial model, suggesting that the indicators behaved as predicted.

Sense of belonging and feelings of morale were correlated over .90 in our two samples. But, does the observed high correlation between sense of belonging and feelings of morale mean that we have only a single dimension rather than two? To answer this question we must distinguish conceptual from empirical dimensionality (see Bollen & Grandjean 1981). 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 a 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.

The same point holds for sense of belonging and feelings of morale. Empirically these two dimensions were highly correlated in our two samples, but this does not mean that they are the same concept. In fact, we cannot be sure that this high correlation will always be found.<sup>2</sup> We expect that there are some groups in which belonging and morale are not so closely aligned. We can imagine involuntary groups in which some individuals have a strong sense of belonging in conjunction with low morale. Consider families in which each

family member feels tightly linked to the other in a pathological sense, but the members are miserable. Natural disasters, such as the recent San Francisco earthquake, could increase sense of belonging and simultaneously depress feelings of morale. In these and other cases it will be important to keep separate track of sense of belonging and feelings of morale because they could have different consequences. For example, the propensity for suicide might be more sensitive to feelings of morale than to sense of belonging and this distinction would be lost by combining dimensions.

Also, it is interesting to note that the correlation between sense of belonging and feelings of morale was lower in the city sample than in the college sample and that the means of the latent variables were in the same order. It could be that the degree of *correlation* of belonging and morale is positively related to the *levels* of belonging and morale in the groups, though this is highly speculative.

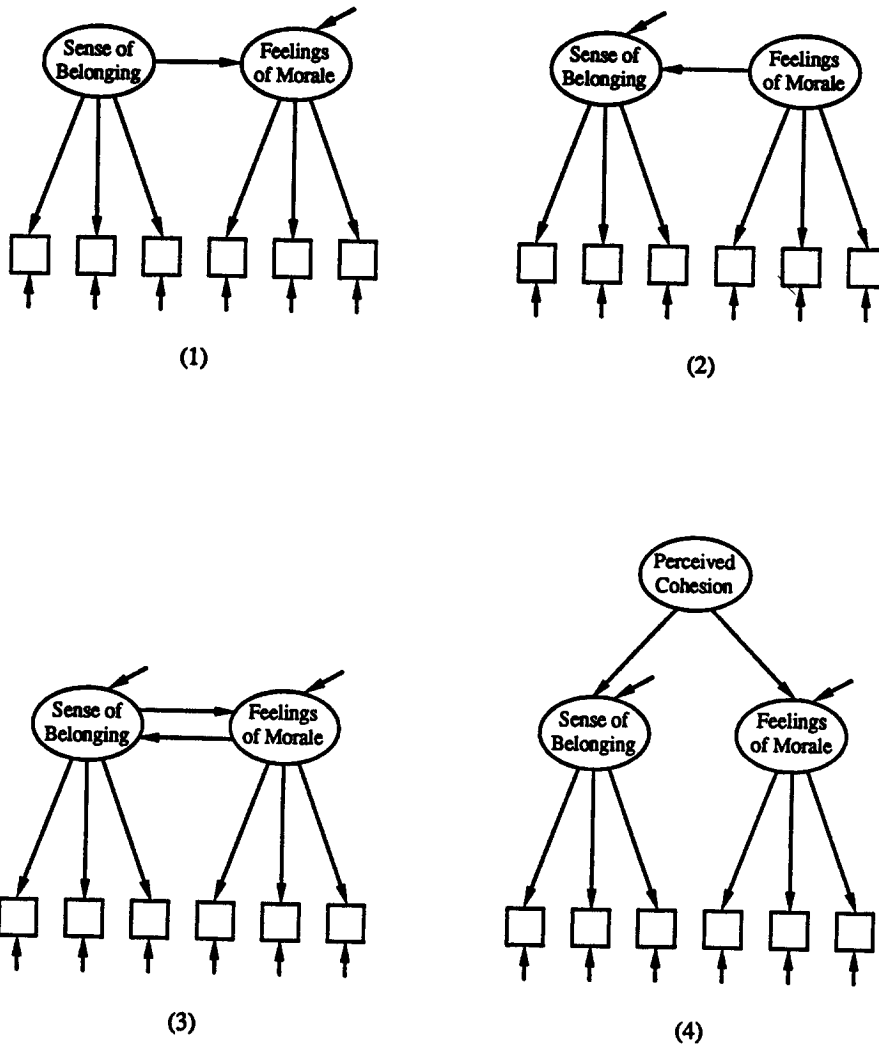
Why are belonging and morale correlated? There are several possible explanations, represented in Figure 2: (1) sense of belonging has a direct effect on feelings of morale; (2) feelings of morale has a direct effect on sense of belonging; (3) sense of belonging and feelings of morale are reciprocally related; and (4) a second-order factor influences both sense of belonging and feelings of morale. Although we cannot distinguish between these models empirically, our earlier theoretical discussion leaves (3) or (4) as the most plausible. Belonging and morale might be reciprocally related as a result of the feedback between affect and cognition and their role in these two dimensions. We considered this likelihood earlier when we defined perceived cohesion. Alternatively, perceived cohesion might be a second-order factor that drives both sense of belonging and feelings of morale. This explanation is congruent with our theoretical definition that proposes perceived cohesion as a more general construct with sense of belonging and feelings of morale as its two dimensions. It will not be easy to devise tests to distinguish between these two possibilities; we are unable to do so with the data in hand.

We were able to show a high degree of structural invariance for the PCS across samples. There was strong evidence that the slopes relating the indicators to the latent variables (i.e., factor loadings) are the same. We also obtained impressive evidence that the means of sense of belonging and feelings of morale were higher for the college sample than for the city sample. Furthermore, the two samples seem to have different covariances and variances for the latent variables and differ in their measurement error variances. Whether the intercept terms in the measurement equations are the same is more ambiguous.

The difference in group means on the two dimensions of perceived cohesion is important for two reasons. First, it is consistent with our intuitive hypothesis that students on a college campus feel more cohesion than residents of a city. Second, it demonstrates that the PCS can be used as a measure of overall group cohesion. Thus, it is possible to obtain a score from group members that can be used to examine the role of cohesion in members' contributions to the work of the group, or loyalty to the group, as well as examine differences in cohesion among families, groups, or organizations and how these differences relate to group productivity.

One of the virtues of operationalizing cohesion as perceived cohesion is the ability to examine the intersection of group life and individual adjustment.

FIGURE 2: Factor Models Depicting Alternative Relationships Between Two Dimensions of Perceived Cohesion



Consider, for example, the relationship between perceived cohesion and social support. Although it is conceivable that social support can exist when there are "weak ties" between an individual and a group (Adelman, Parks & Albrecht 1987), social support is usually associated with groups with which individuals are strongly connected. The type of connection assumed to underlie social

support is quite similar to that exemplified by high scores on sense of belonging and feelings of morale. In fact, Moos and Moos (1981) use the cohesion subscale of their Family Environment Scale to measure social support. Their item, "There is very little group spirit in our family," lies very close to our notion of feelings of morale. Likewise, the Interpersonal Support Evaluation List (Cohen, Mermelstein, Kamarck & Hoberman 1985) includes a subscale to measure "belonging" support. We maintain that belonging and morale are important in social support, but distinct from it, and could be accounted for by our conceptualization and measure of perceived cohesion.

Earlier we explained how perceived cohesion, when conceptualized as encompassing sense of belonging and feelings of morale, enables us to apply the concept of cohesion beyond the small groups common in social psychological studies. This means that we can examine perceived cohesion for members of communities, ethnic groups, states, nations, or other large groups. For instance, when we use ethnicity as a predictor of attitudes or behaviors, the implicit assumption is that all individuals in that ethnic group have the same degree of ethnic identification. By gauging individuals' sense of belonging and feelings of morale with regard to their ethnic group, we can discriminate degrees of "membership" and evaluate their impact. Or consider the concept of nationalism. We can view nationalism as perceived cohesion with regard to one's nation. Highly nationalistic individuals are ones with a strong sense of belonging and high feelings of morale with regard to their country.

Conceptualizations of cohesion as "interpersonal attraction" or "expected exchange relations" are less relevant and less practical to apply to the study of moderate-to-large groups. Indeed, these conceptualizations grew popular in small group social psychological research. As Durkheim and those that followed him showed, cohesion is also relevant to large groups. We believe that perceived cohesion, comprising sense of belonging and feelings of morale, provides the opportunity to expand the analysis of cohesion beyond the social psychology laboratory.

There are other constructs traditionally of interest to sociologists and social psychologists to which PCS scores might be related. It follows from Durkheim's work on suicide and integration that low scores on the PCS with regard to all of an individual's important groups will be accompanied by high scores on measures of hopelessness, helplessness, and anomie. Similarly, those low in perceived cohesion with regard to important groups will exhibit symptoms often associated with loneliness. Weiss (1973) asserts that the "loneliness of social isolation" can only be remedied by membership in an engaging social network — the type of social network that should lead to a strong sense of belonging and high morale in its members. Finally, there is some evidence that family cohesion is related to perceptions of social support in the family (Barrera, Sandler & Ramsey 1981). The generality of our scale makes it possible to examine the relationship of perceived cohesion in other groups and the amount of social support provided by those groups.

In summary, our preliminary analysis of the Perceived Cohesion Scale suggests that it has indicators with high reliability, validity, and some degree of invariance in different groups. Although we recognize that there needs to be much more extensive and varied use of these indicators before they can be used

without qualification, we believe that they have the potential to measure perceived cohesion in work groups, organizations, towns, or other groups. Researchers can examine whether the properties we have demonstrated here replicate in other types of groups. If so, we can begin to examine many of the important phenomena thought to cause, or depend upon, cohesion.

## Notes

1. Our progression of invariance tests followed several paths as opposed to a single hierarchical one. The first path progressed from the  $H_{\text{form}}$  to  $H_{\Lambda}$  to  $H_{\Lambda\psi}$  to  $H_{\Lambda\psi\kappa}$ . Since neither of the latter two were statistically significant, we moved back to  $H_{\Lambda}$  and added  $\kappa$  ( $H_{\Lambda\kappa}$ ). To insure a complete examination of the invariance of means, we then moved back to  $H_{\Lambda\psi}$  for which there was some statistical support, and added  $\kappa$  ( $H_{\Lambda\psi\kappa}$ ). Having obtained good evidence for the hypothesized difference in group means ( $\kappa$ ), we returned to  $H_{\Lambda}$  and added first  $\Phi(H_{\Lambda\Phi})$ , then  $\Theta(H_{\Lambda\Phi\Theta})$ . This pattern of comparison permitted us to examine all possible degrees of invariance in a systematic fashion, thus providing a full assessment of the invariance of  $M_1$  for the college and city samples.
2. We remind the reader that the hypothesis of a perfect correlation between belonging and morale was rejected in the city sample, so we cannot assume one dimension even if we take a purely empirical approach.
3. All four models produced an identical chi-square estimate ( $= 13.98$ ,  $df = 8$ ,  $p = .082$ ) when we constrained the reciprocal paths in (3) to be equal and the paths from the higher-order to the first-order factors in (4) to 1.0. Without these constraints neither (3) nor (4) was locally identified.

## APPENDIX

The particular wordings of items of the Perceived Cohesion Scale might not be appropriate for measuring perceived cohesion in all groups. The individual researcher is perhaps the most aware of the wording necessary to validly measure perceived cohesion in the particular group he or she is studying; however, we suggest alternatives to several of the item wordings shown in Table 1 as an example of how the scale can be adapted.

The first indicator of sense of belonging is likely to be applicable to any group. A possible limitation may be the abstractness of the phrase "sense of belonging." It is likely that a wording such as "I feel like I belong to \_\_\_\_\_" would render similar results. The wording of the second and third indicators of sense of belonging is probably not appropriate for some small groups. For instance, "I feel that I am a member of the \_\_\_\_\_ community" or "I see myself as part of the \_\_\_\_\_ community" is not typical of expressions of belongingness to smaller, often more intimate, groups. It may be possible to substitute "family" or "team" for "\_\_\_\_\_ community" and achieve something similar to the expressions used to communicate belongingness in small groups. Additionally, these two indicators may be problematic for involuntary groups; members may confuse "feeling" a member or part of a group with the objective state of "belonging" to a group. It may be that instructions directing respondents to express their *perceptions* rather than their *objective circumstances* would avoid this possible confusion.

We mentioned the potential problem with the use of "enthusiastic" in the first indicator of morale. Synonyms that may be more appropriate for some groups are "excited," "pleased," or "content." For the second indicator of morale, it may be necessary to substitute a phrase such as "be a part of" for "be at" or "live in" used for the two groups in our study; otherwise the item should apply broadly to most any group. The final indicator of morale may require similar adjustment. For example, when talking about cohesion with regard to a small group it might be more appropriate to use the wording: "\_\_\_\_\_ is one of the best [or 'finest'] anywhere." These wordings approximate more closely the terminology used to describe small groups without losing the meaning of the original indicator.

By suggesting these possible alterations to the Perceived Cohesion Scale, we are advocating a more flexible approach to measurement than is commonly practiced. The PCS performed consistently well with the wordings we used in the two samples we investigated; however, we suspect that the scale in its present form may not perform equally well for all samples and target groups. Instead we suggest this flexible measure that can be tailored to the research situation without sacrificing the basic meaning and structure of the scale. Of course, if items are reworded their comparability across groups should be retested.

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