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*Small Group Research* 1994; 25; 464

DOI: 10.1177/1046496494254003

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*Researchers who investigate group phenomena can choose either the group as a whole or individuals within groups as a basis for formulating research questions, developing data-gathering strategies, and conducting statistical analyses. This article considers the virtues and limitations of using individual-level data to investigate group phenomena and describes three categories of research questions about individuals in groups: (a) the contribution of group members to the composition of the group, (b) individuals' experience of belonging to the group, and (c) the impact of group membership on group members' personal life. The authors describe two examples from research on cohesion that addresses questions about individuals' experience of belonging to groups and the impact of group membership on their personal life. We conclude by noting the limitations of the approach we advocate and mapping directions for future research suggested by our emphasis on individual-level analysis of small-group phenomena.*

## USE OF INDIVIDUAL-LEVEL DATA TO INVESTIGATE GROUP PHENOMENA

### Issues and Strategies

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**A difficulty associated with research** on group phenomena concerns the decision about the most appropriate and illuminating unit of observation and analysis—the group, or individuals who compose the group. That decision may be influenced by a variety of concerns. One concern that has received considerable attention is the statistical treatment of data from studies of group phenomena. Group members are, by definition, interdependent (Insko &

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SMALL GROUP RESEARCH, Vol. 25 No. 4, November 1994 464-485  
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Schopler, 1987); therefore, any information provided by group members that is affected by their participation in the group potentially violates the independence assumption that underlies most statistical models (Hays, 1988). A second set of concerns centers around the formulation of research questions and the development of data collection strategies for addressing questions about group phenomena. These methodological issues are the primary concern of this article.

Our focus is on the use of individual-level data in group research. We assume that in any group, group members differ in how they think and feel about their group and in how they act in its behalf. A single score that represents the thoughts, feelings, or behavioral tendencies of the group results in a loss of information about the character of the group. We also assume that the experience of belonging to a group has implications for group members' personal lives. In other words, even if group members share a common experience of their group, that experience may translate into different personal outcomes for individual group members. Thus individual-level data that refer to group phenomena are relevant for investigations of research questions ranging from how groups function to how membership in a group affects the personal life of group members.

The primary aims of our treatment of individual-level research on group phenomena are to (a) extract from the research literature on group phenomena a class of variables for which individual-level data are necessary; (b) provide a brief, nontechnical overview of the research design and data-analytic issues involved with using individual-level data to study group phenomena; and (c) illustrate an investigation of a group phenomenon that relies on individual-level observation and analysis.

## **INFORMATION ABOUT INDIVIDUALS IN GROUPS**

Substantive questions emerge when the focus of an investigation shifts from the group as a whole to individuals who compose the group. For instance, an investigation might broach the question of

why particular individuals chose to join the group or what particular individuals contribute to the typical performance of the group. We see at least three classes of variables or processes that invite attention when the focus of group research moves from the group to the individual level of analysis: (a) contribution to group composition, (b) experience of belonging to the group, and (c) impact of group membership on personal life.

### CONTRIBUTION TO GROUP COMPOSITION

A fundamental set of questions concerns the contribution of individual group members to the structure and functioning of the group as a whole. At the core of an analysis of either the structure or functioning of a group must be an analysis of what individual group members bring to the group. Previous research on group structure has focused in part on the contribution of individual group members in two domains: power and consensus. Research on group functioning typically has focused on how individual group members facilitate or inhibit group performance. Thus we will consider individuals' contributions to group composition in terms of group structure and group functioning.

*Group structure.* In the domain of power, group researchers have considered how much and what kind of power individual group members hold. Groups, particularly large groups, usually are composed of some members who hold power over group members and some members who hold virtually no power within the group. The former are likely to establish and maintain physical and interpersonal distance between themselves and lower-power group members (Strickland, Barefoot, & Hockenstein, 1976), sometimes coerce or reward other group members (Bedell & Sistrunk, 1973), and elevate their view of themselves (Kipnis, 1974). Relatively powerless group members may adopt a passive position in the group as established by group members in power. On the other hand, the powerless group members may attempt to gain power through coalition formation or withdraw from the group (for a review, see Blau, 1977). In either case, the structure of groups, particularly

large groups, is better understood by accounting for individual group members' objective and self-perceived power.

A second contribution of individual group members to the structure of groups concerns the degree of consensus or variability of opinion within a group. Group phenomena ranging from group decision making to group performance to ingroup-outgroup interaction take into account the degree of consensus among group members (for a review, see Baron, Kerr, & Miller, 1992). Although both consensus and variability are group-level phenomena, they are based on individual reports of attitudes of relevance to the group. Thus assessment at the individual level is required, whether a research study focuses on between-group differences in consensus or the degree of consensus within a single group. The particular research questions at hand dictate whether the resultant data are analyzed at the group or individual level; however, as with the other phenomena we discuss in this section, the decision to analyze at the group level results in a loss of potentially revealing information about the group.

*Group functioning.* In terms of group functioning, the contribution of individual members can be viewed as either facilitating or inhibiting group performance. Perhaps the clearest example of facilitation is the situation in which a group is confronted with a disjunctive task (Steiner, 1972). In a disjunctive task, the quality of the group's performance is determined by the contribution of the brightest, most creative, or most skilled member of the group (although, in large groups, coordination problems may prevent discovery or disclosure of the solution, Littlepage, 1991). Individual-level information provides the basis for predictions about a group's performance on a disjunctive task.

Leadership style represents a class of individual-level characteristics that may affect group performance. Prominent researchers in this domain (Fiedler, 1967; Fiedler & Garcia, 1987) propose a contingency model of leadership in which leadership effectiveness is a function of leader characteristics and situational factors. Tests of the contingency model require assessment of the degree to which a leader or prospective leader focuses primarily on accomplishing

the task before the group or on the relations among members of the group. The group is likely to function well if the focus of the leader corresponds to the situational context within which the group operates. Thus individual-level variables that concern the style and capabilities of a leader contribute to the functioning of the group as a whole (see also Hollander, 1985).

Additive or conjunctive tasks are examples of another set of individual-level variables that focus on the effort expended by individual group members toward completion of a group task (Steiner, 1972). Performance on additive tasks corresponds to the sum of individual members' contributions, whereas performance on conjunctive tasks corresponds to the contribution of the poorest performing member of the group. In each case, the focus of group functioning is on the contribution of individual members of the group. Latané and colleagues (Latané & Nida, 1981; Latané, Williams, & Harkins, 1979; see also Littlepage, 1991) have highlighted the tendency for individual members to contribute less than maximum effort on additive tasks in which individual contributions are concealed. Particularly relevant to the present discussion is the fact that research in this domain requires assessment of performance or contribution to the group's performance at the individual level, although it is not uncommon to form composite variables that take data analyses to the group level. Adopting a group-level strategy precludes analyses of individual-level effects such as the sucker (Kerr, 1983) and free rider effects (Kerr & Bruun, 1983).

In the case of conjunctive tasks, the importance of assessing skill, expertise, or effort at the individual level is quite apparent. The performance of the group can be predicted with considerable accuracy from the performance of a single member of the group. Assessment at the individual level is desirable when studying group performance on conjunctive tasks as well as on disjunctive tasks.

In summary, a variety of phenomena associated with the structure and functioning of groups invite individual-level observation and analysis. Data must be gathered from individuals for most of the phenomena described in this section, although the data can be analyzed using either a group- or individual-level approach. Although neither approach is complete, a review of the research

literature reveals a tendency toward analyzing such data at the group rather than individual level. The crux of our argument is that, if statistical assumptions (discussed below) are properly satisfied, many research questions are suggested and some well-worn questions better understood by viewing the data from the individual level.

#### **EXPERIENCE OF BELONGING TO THE GROUP**

A second set of questions concerns individuals' experiences of belonging to the group. An exhaustive review of the research literature would likely uncover a plethora of phenomena that fall under this rubric; we have chosen three prominent ones to illustrate this class of questions: sense of belonging, collective self-esteem, and deindividuation.

From the point of view of the individual, no sensation likely characterizes the experience of being a member of a group as well as the subjective sense of belonging to the group (Bollen & Hoyle, 1990). Historically, sense of belonging has been assessed in two ways. The most straightforward approach involves inviting group members to express in a self-report format their sense of belonging to the group (e.g., Bollen & Hoyle, 1990; Hagstrom & Selvin, 1965). A second approach involves a more objective analysis of the network of relationships among group members (e.g., Dimock, 1986; Fessenden, 1953). Although a case could be made for either approach, the current perspective emphasizes the approach that is most likely to yield data that permit tests of individual-level predictions. Potential self-report biases notwithstanding, the subjective approach provides a rich source of data and has the advantage of producing meaningful individual-level data without requiring data from every member of a group (more on this issue below). Advances in sociometric analysis have produced the capacity to extract individual-level data from a sociometric context, thereby paving the way for individual-level analyses. In either case, operationalization of individual group members' sense of belonging provides a basis for evaluating individuals' experience of group membership.

A second, more recently elaborated variable relevant to an individual's experience of group membership is collective self-esteem (Luhtanen & Crocker, 1991). Collective self-esteem is a characteristic of individuals that refers to the esteem one holds for the groups to which one belongs. Derived from social identity theory (Tajfel, 1982), collective self-esteem as a trait is related to the extent to which group members react to threat by derogating outgroups and enhancing an ingroup (Crocker & Luhtanen, 1990). Thus collective self-esteem appears to have implications for how strongly group members identify with the groups to which they belong and the extent to which they will go in defending the reputations of those groups. Unlike sense of belonging, collective self-esteem always is assessed at the individual level through self-reports (Luhtanen & Crocker, 1992). To date, research on collective self-esteem has exemplified the approach to group research that we are advocating: Data are both gathered and analyzed at the individual level in the interest of illuminating the effect of group membership on individual group members' behavior and adjustment.

We briefly consider deindividuation as a final example of an individual-level variable that contributes toward understanding individual group members' experience of belonging to a group. Deindividuation refers to the individual state of ignoring one's individuality (Zimbardo, 1969). A reduction in self-awareness or a feeling of being "lost in the crowd" appears to be at the root of deindividuation (Diener, 1980). The results of deindividuation include reduced fear and guilt, attenuated concern for personal standards of judgment and morality, and reduced sense of responsibility for one's actions (for a review, see Prentice-Dunn & Rogers, 1989). Individuation is, by definition, an individual-level variable, although it clearly may have consequences for the behavior of groups (e.g., the diffusion of responsibility associated with social loafing may derive from a mild form of deindividuation; Latané & Nida, 1981). We should note, however, that deindividuation appears to be at its strongest in crowds, which may or may not fit the standard definition of a group. Nevertheless, for our purposes, deindividuation represents an interesting irony: It represents a point at which



individuals seem to lose their individuality, but from the point of view of the group researcher, it manifests as individual-level data.

In summary, a host of individual-level variables refers to individuals' experiences of their memberships in a group. In most cases, the nature of that experience has implications for group relations and group performance. Of the three we described—sense of belonging, collective self-esteem, and deindividuation, the latter two typically are assessed and analyzed at the individual level. Sense of belonging has been treated at both the group and individual levels, although it virtually always is assessed at the individual level. Therefore, we consider sense of belonging a case study in the issues associated with decision making about research design and analysis as illustrated in the empirical example we present later in the article.

#### **IMPACT OF GROUP MEMBERSHIP ON PERSONAL LIFE**

A final class of questions concerns the role of group life in the personal adjustment and functioning of individuals. Such questions concern variables that may not refer directly to an individual's membership in a group, but nevertheless, are affected by it. In particular, we are referring to theories of personality and selfhood that see group life as critical in the emergence and maintenance of individual differences.

One such variable is self-esteem. We are referring here to personal self-esteem, which is to be distinguished from collective self-esteem, described above. Although social identity theorists focus most directly on collective identity and esteem, they acknowledge that group life also may have implications for personal identity and esteem (Luhtanen & Crocker, 1991, 1992). Indeed, measures of identity that assess both personal and collective (i.e., social) aspects of identity reveal a clear association between the two (Hoge & McCarthy, 1984). At issue is whether group life contributes to or is affected by personal self-esteem beyond any effects or contribution of collective self-esteem. An examination of the literature reveals few studies on the issue, perhaps due to the fact that personal self-esteem is an individual-level variable and aspects of group life frequently are represented as group-level variables. In

the empirical example that follows, we investigate the relation between group life and self-esteem by assessing individuals' experiences of group life.

A second individual-difference variable that may be associated with group life is loneliness. Weiss (1973) has described the loneliness of social isolation as loneliness resulting from feelings of disengagement from meaningful social networks. Similar to the study of self-esteem and group life, the study of the relation between social isolation and loneliness couples a variable that typically is expressed at the group level with one that typically is assessed at the individual level. Bollen and Hoyle (1990) speculated that, if engagement in a meaningful group could be expressed as an individual-level variable, that variable likely would be correlated with expressions of loneliness. We investigate that hypothesis in the empirical example.

In summary, personality theories that address social life suggest research questions that necessitate operationalizing individuals' personal experiences of the groups to which they belong. Surprisingly few studies have examined the relation between personality and group life, perhaps because of differing levels of observation and analysis. We have described two instances in which research questions of interest to both personality and group theorists can be addressed if variables that refer to group life are assessed at the individual level. We briefly consider procedural and statistical issues associated with the shift from the group to individual level of analysis before turning to an empirical illustration.

### **ISSUES ASSOCIATED WITH PROCURING AND ANALYZING DATA FROM INDIVIDUALS IN GROUPS**

Our review of selected group phenomena revealed that data collection most often takes place at the individual level, even for variables that typically are analyzed at the group level. Moreover, we have suggested advantages to analyzing data on group phenomena at the individual level. Yet, we would be remiss to propose a shift toward individual-level analyses of group phenomena without

some discussion of the technical difficulties associated with that shift. In the next two sections, we present methodological and statistical issues that must be considered when analyzing individual-level data in small group research.

## METHODOLOGICAL ISSUES

The stage for statistical analyses is set by the procedural context within which data are gathered; this is particularly true in research on group phenomena. As a class, group research that uses a game paradigm provides a revealing example. Consider a program of research by Insko and colleagues (see Insko & Schopler, 1987, for a review). In the typical study, three-member groups are engaged in a series of interactions based on matrix games. Interdependence among group members and between groups can be varied by altering the context within which behavioral choices are made or altering the dynamics of the matrix game; the former is of relevance here. In a "minimal-groups" version of the interaction, group members who have been arbitrarily assigned to their group are precluded from interacting with other members of their group (Insko et al., 1987). Thus their behavioral choices are independent both procedurally and statistically. In a discussion version of the interaction, group members are permitted to have both visual and verbal contact with other members of their group, but are left free to make their own behavioral choice (e.g., Insko et al., 1987). That alteration in the procedure raises the possibility of within-group influence and dependency among observations. An additional alteration to the procedure involves requiring group members to reach a consensus about their behavioral choice, which is reflected in a single choice by the group (Insko et al., 1988). That procedure precludes individual-level analyses of choice behavior. A final procedural twist involves inviting discussion between groups prior to decision making. That procedure introduces not only dependency within groups, but dependency between groups as well. In that instance, the interaction often is treated as the unit of analysis (e.g., Insko et al., 1987), a case in which variability between and within groups is hidden within a single score.

Consideration of procedural variations within that program of research reveals that elements of experimental procedure in small group research may constrain the ways in which data can be analyzed. In the examples we described, procedure was varied intentionally; however, procedure occasionally is not an explicit variable in the study and is not considered in decisions about the appropriate unit of analysis. That insensitivity to procedural issues may stem in part from a belief that the only proper unit of analysis in group research is the group as a whole. Alternatively, it may stem from a lack of familiarity with statistical models that permit analysis of individual data when the data are not independent by virtue of the context within which they were generated.

#### STATISTICAL ISSUES

Small group researchers who focus on characteristics of individuals in groups rather than characteristics of groups as a whole must contend with a variety of thorny issues that begin with data collection and persist throughout data analysis and interpretation. The fundamental problem that may arise concerns the independence of observations (Kenny & Judd, 1986). Although that issue seems relatively straightforward, it is not always clear whether observations in group research are independent in the sense required for statistical tests. At issue is whether individuals who belong to a single group share a source of variability in their data that is not shared by individuals from other groups. In the examples we described in the previous section, the move from independence to dependency among subjects' data was apparent. It becomes less clear in research on some of the variables we described in earlier sections. For example, it may be the case that individuals' sense of belonging to a group is affected by the quality and quantity of interaction among group members, which varies across groups. Thus members of a particular group share a common source of influence not shared by members of other groups.

Is that dependency sufficiently strong to merit inclusion of a group membership variable in the design? In studies that include subjects from identifiable groups that are referenced in the assess-

ments, that source of variability likely is important and, if possible, should be included in the design. We suggest an initial evaluation of the degree to which the independence assumption is violated before conceding to less powerful designs that treat the group as the unit of analysis. Kenny and Judd (1986) elaborated an approach that estimates the average degree of correlation among observations within groups. An intraclass correlation is computed from information obtained from a one-way analysis of variance in which groups is the only factor. If the  $F$  ratio is nonsignificant but no less than approximately .75, there is no evidence of nonindependence due to groups.<sup>1</sup> If the  $F$  ratio is significant or falls below about .75, there is evidence of correlation among observations within groups. The intraclass correlation coefficient, which can vary between +1 and  $-1(m - 1)$ , where  $m$  is group size, is computed as

$$\frac{MS_b - MS_w}{MS_b + MS_w(m - 1)},$$

where  $MS_b$  and  $MS_w$  are the mean squares between and within groups and  $m$  is group size (Kenny & Judd, 1986). A negative coefficient signifies greater dissimilarity within groups than between groups, whereas a positive coefficient indicates greater similarity within groups than between groups. The data must be analyzed at the group level if the intraclass correlation departs significantly from zero.

An alternative approach to detecting nonindependence was detailed by Anderson and Ager (1978). Assume an experiment that includes two 2-level treatment factors, A and B. Five 3-person groups are randomly assigned to each treatment condition; thus  $n$  equals 60. The degree of nonindependence is evaluated within a hierarchical analysis of variance design that includes A and B as fixed effects and groups, G, and subjects, S, as random effects. That design produces two error terms: groups nested within treatments, G/AB, and subjects nested within groups nested within treatments, S/G/AB. The G/AB term has degrees of freedom equal to the number of groups ( $g = 20$ ) minus one for correction and the degrees of freedom associated with the treatment effects ( $ab - 1$ ); that value in the present example equals 16. The S/G/AB term has degrees of

freedom equal to the number of subjects minus one for correction,  $g$ , and the degrees of freedom associated with the treatment effects; that value in the present example equals 40. Use of the subject-level error term will produce a more powerful test of the treatment effects. To evaluate whether that error term is appropriate, it is necessary to evaluate whether there is significant variability in the data attributable to groups within treatments. That evaluation is accomplished by testing the  $G/AB$  term against zero using an anticonservative  $p$  value such as .25. If  $G/AB$  departs significantly from zero, then group membership is accounting for variability within treatment conditions and  $G/AB$  must be used as an error term for testing treatment effects. If, however,  $G/AB$  is not significantly greater than zero, then treatment effects can be tested using a pooled error term that combines  $G/AB$  and  $S/G/AB$ .

In addition to statistical approaches to the problem of nonindependence of observations in small group research, methodological strategies may be used to diminish the likelihood of dependency among observations. For instance, it may not be necessary to emphasize particular groups in the assessments, thereby freeing respondents to respond in terms of salient group memberships or a subjective sense of their group life as a whole. The research on collective self-esteem is an example of research that uses that strategy. Another option would be to sample subjects from a large group and ask them to provide data with reference to a single group to which all subjects belong. Then group membership is held constant and thereby has no influence on variability in the data. The empirical example described in the next section makes use of that paradigm in a study of the relation between group cohesion and personal and social adjustment.

### **EMPIRICAL EXAMPLE: PERCEIVED COHESION**

Psychologists and sociologists have expressed a keen interest in the concept of group cohesion. Durkheim's (1956) writings on solidarity and social cohesion marked the beginning of research on cohesion at the structural level in sociology. At a relatively micro

level, psychologists studied cohesion in the context of small groups and established a long history of research with a broad theoretical and empirical base (for a review, see Bollen & Hoyle, 1990).

Bollen and Hoyle (1990) identified two distinct approaches to the conceptualization of cohesion in group research. The first is a group-level approach, which involves computing a single composite score that characterizes the degree of closeness or cohesion among members of a group. For instance, Dimock (1986) proposed a cohesion index that is formed by dividing the actual number of mutual friendships among group members by the number of possible mutual friendships among group members. Another example is the system for the multiple level observation of groups (SYMLOG) developed by Bales and Cohen (1979) for measuring members' perceptions of group communication (e.g., Keyton & Springston, 1990). In the SYMLOG method, members use adjective rating forms to rate along three continua their perceptions of their own interactions and the interactions of other group members. These group member ratings are then averaged across the group and plotted in a three-dimensional "SYMLOG space." Group members with similar scores (i.e., those scores clustered together in SYMLOG space) indicate group cohesion, whereas dissimilar scores indicate lack of cohesion. Cohesion is measured with a formula that computes the average euclidean distance between members' scores plotted on each of the three dimensions. These two examples illustrate measures of cohesion that focus on the group as a whole.

From our point of view, there is a serious limitation to these approaches. By generating group-level data from individual-level observations, they gloss over potentially important variability within groups and at the same time sacrifice statistical power (i.e., the number of degrees of freedom for conducting the statistical test may be drastically reduced).<sup>2</sup> Building on a scattered literature on group cohesion in sociology and psychology (e.g., Gross & Martin, 1952; Hagstrom & Selvin, 1965; Stokes, 1983), Bollen and Hoyle (1990) proposed a conceptualization of cohesion that shifts the focus from the group to the individual level of analysis. Their conceptualization treats cohesion as a synthesis of individuals' sense of belonging to a group and their sense of morale associated



with membership in the group. Those two dimensions are relevant for both small and large group research. Moreover, they invite expression at the individual level of observation. To formalize that expression, the Perceived Cohesion Scale (PCS) was created and validated (Bollen & Hoyle, 1990). Although other self-report measures of cohesion exist, none focuses exclusively on individual group members' personal experience of belonging to the group. Although those measures observe the phenomenon of cohesion at the individual level, they assess a group-level characteristic. The PCS differs from those measures by operationalizing cohesion as an individual-level characteristic.

Items composing the PCS are shown in Table 1. Unlike most group-level measures of cohesion, the PCS does not require face-to-face interaction among group members. Indeed, individual group members need not know all of their counterparts in the group to provide meaningful data on the PCS. Therefore, the PCS provides a basis for evaluating perceptions of cohesion among members of large groups or organizations, which may also provide a basis of collective identity for individuals.<sup>3</sup> However, the PCS also can be used as a basis for evaluating perceptions of cohesion among members of small groups to determine the contribution of membership in small groups to the productivity and well-being of members. The PCS data available to us are from large groups, including many members who, for the most part, are unacquainted rather than from a small group in which members know each other and perhaps interact face to face. Nevertheless, these data can be useful to illustrate the advantages of using individual-level analyses to investigate phenomena of interest to small group researchers. After demonstrating how the PCS enhances our understanding of the experience of belonging to a large group, we discuss how the PCS (and other similar scales) might be useful in a small group research context.

To illustrate the advantages of construing cohesion as an individual-level variable, we present results from two studies. In the first study, 107 college students provided data on the PCS, several self-report measures of personal adjustment, and their social relationships at the university. The PCS was completed with reference



**TABLE 1: Items of the Perceived Cohesion Scale**

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<i>Sense of Belonging</i>	
1. I feel a sense of belonging to _____.	
3. I feel that I am a member of the _____ community.	
5. I see myself as part of the _____ community.	
<i>Feelings of Morale</i>	
2. I am enthusiastic about _____.	
4. I am happy to be at [belong to] _____.	
6. _____ is one of the best schools [groups] in the nation [around].	

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NOTE: Responses are indicated on Likert-type scales anchored by *strongly disagree* and *strongly agree*. The name of the reference group is substituted in the blanks and the phrases altered accordingly (alternative phrasing is indicated between brackets).

to the university, a large group that provides a strong basis of identity for students, but which includes many members that are unacquainted. Thus the study focused on the association between individuals' perceptions of cohesion to the student body and personal as well as social outcome variables. The results are presented in Table 2. The PCS was scored according to the two dimensions of cohesion identified by Bollen and Hoyle (1990): sense of belonging and feelings of morale. As revealed in the table, cohesion scores on the two dimensions were highly related. Particularly interesting is the fact that both belonging and morale are associated with both personal and social outcomes. Of note is the finding that sense of belonging, a social-cognitive aspect of cohesion, is more strongly associated with social outcomes, whereas feelings of morale, an affective aspect of cohesion, is more strongly associated with personal outcomes (although the correlations were not significantly different). The moderate negative correlation between sense of belonging and loneliness corresponds to Weiss's (1973) discussion of loneliness and social isolation. The negative correlations with both depression and social anxiety correspond to predictions from interpersonal theories of adjustment.<sup>4</sup> The moderate to large correlations with social outcomes are particularly noteworthy. Individuals high in perceived cohesion were more likely to have friends at the university and more likely to be involved in activities at the university. Thus the study confirms a variety of predictions regarding the likely role of group cohesion in the personal and social adjustment of group members.

**TABLE 2: Correlation of Belongingness and Morale With Personal and Social Outcome Variables<sup>a</sup>**

<i>Outcome Variable</i>	<i>Dimension of Perceived Cohesion</i>	
	<i>Belonging</i>	<i>Morale</i>
Personal		
Depression	-.35***	-.41***
Loneliness	-.45***	-.49***
Social anxiety	-.48***	-.51***
Social		
Percentage of friends in group	.43***	.30**
Degree of involvement in group activities	.65***	.44***
Cohesion		
Belonging	.94 <sup>b</sup>	
Morale	.69***	.71 <sup>b</sup>

a.  $N = 107$ .

b. Coefficient alpha for PCS subscale.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

In a second study, 469 students at a large public university completed the PCS along with two measures of self-esteem. The study focused primarily on the relation between perceived cohesion and personal self-esteem. Both global and domain-specific self-esteem were assessed. Domain-specific self-esteem refers to circumscribed reports of self-esteem, which in this case referenced social, physical, ability, and public self-esteem. Correlations between the two dimensions of cohesion and the various indexes of self-esteem are presented in Table 3. As in the first study, sense of belonging and feelings of morale were highly related and related similarly to outcome measures.<sup>5</sup> Although both dimensions of cohesion are positively correlated with all indexes of self-esteem, the correlations with social self-esteem are significantly higher than the correlations with the remaining indexes ( $z$ s range from 2.25 to 4.20,  $ps < .03$ ). It is important to note that social self-esteem (I feel secure in social situations) is to be distinguished from collective self-esteem (in general, others respect the social groups that I am a member of). Nevertheless, social self-esteem refers to a personal evaluation of one's skill and effectiveness in social situations, which clearly would have implications for one's experience of belonging to a group.

**TABLE 3: Correlation of Belongingness and Morale With Dimensions of Self-Esteem<sup>a</sup>**

<i>Outcome Variable</i>	<i>Dimension of Perceived Cohesion</i>	
	<i>Belonging</i>	<i>Morale</i>
Social	.31***	.29***
Physical	.15***	.15***
Ability	.19***	.17***
Public	.14**	.10*
Global	.23***	.23***
Cohesion		
Belonging	.94 <sup>b</sup>	
Morale	.81***	.82 <sup>b</sup>

a.  $N = 469$ .

b. Coefficient alpha for PCS subscale.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Although we have no data on the use of the PCS in research on small face-to-face groups, we suspect that research questions much like those addressed in the two empirical examples could be studied in the small group context. Other questions that focus on the properties that distinguish small groups from sociological groups could be addressed as well. For instance, individual-level data, such as that produced by the PCS, could be used to investigate the contribution of intergroup relations to group members' perceptions of their group, or the relation between perceived cohesion and individual contributions to group tasks. Indeed, consideration of group phenomena at the individual level of analysis permits both within- and between-subject comparisons of the experience of belonging to small groups as opposed to sociological groups.

The empirical examples that we described illustrate both advantages and limitations of operationalizing group phenomena as individual-level variables. An obvious advantage is the ability to use standard statistical approaches to investigate the relations between variables of primary interest to group researchers and variables associated with individual experience and adjustment. A further advantage, one we described above, is the ability to investigate group-level phenomena in large groups and groups composed of members who are unacquainted or even unaware of each other. With those advantages come limitations. The paradigm we have

described and illustrated is not suited for research on group-level outcomes, such as performance on tasks in which individual contributions cannot be ascertained. Furthermore, in the empirical example, we circumvented a statistical limitation by focusing on members of a single large group. Had we sampled individuals from various constituencies within the university, it may have been necessary to include that source of variability in the statistical design, which would compromise certain virtues of the individual-level approach. Nevertheless, our analyses reveal a lacuna in the group research literature that might be filled by shifting the focus of research on selected group phenomena from the group to the individual level of observation and analysis.

### SUMMARY AND CONCLUSIONS

Our survey of the group research literature revealed a bias toward the study of phenomena that typically are analyzed at the group level. Although certain group phenomena are, by definition, group-level phenomena, others may be viewed at either the group or individual level; still others can be investigated only at the individual level of observation and analysis. We surveyed three categories of phenomena that merit attention at the individual level of analysis: group structure and functioning, the experience of belonging to a group, and the relation between group life and personal and social adjustment. After a brief overview of procedural and statistical issues associated with the shift from the group to the individual level of analysis, we provided an empirical example in two studies of the association of cohesion, a fundamental group variable, with personal and social adjustment variables. Our analysis revealed moderate to strong relations that correspond to widely accepted theoretical models of individual differences and group life. We encourage small group researchers to consider an occasional move from the group to the individual level of analysis in their investigations of group phenomena. A rich store of new questions and strategies awaits.

## NOTES

1. Nonindependence may be due to greater similarity or greater dissimilarity within groups than between groups. The *F* ratio tests only the hypotheses of greater similarity within groups. The dissimilarity hypothesis is not testable within the context of the one-way ANOVA, although according to Kenny and Judd (1986), values of the *F* ratio that are substantially less than one correspond to significant within-group dissimilarity.

2. It is worth noting that, in a meta-analysis on the relation between cohesion and performance, Evans and Dion (1991) included only studies that were analyzed at the group level, which resulted in exclusion of as many as 11 of 27 studies.

3. There are, of course, other measures that share the qualities of the PCS (e.g., Ruekert & Walker, 1987). Our use of the PCS is based on access to two data sets that form the basis of the empirical example.

4. The reader should note that there is no overlap between items that compose the measures of personal outcomes and the PCS. Indeed, the PCS focuses clearly on the group, whereas the personal outcome measures focus clearly on the self.

5. Bollen and Hoyle (1990) discuss the conceptual and empirical basis for expecting such a strong relation between what is described as two separable dimensions. It is not possible to recapitulate that discussion here; however, we note that, conceptually, it concerns the strong but poorly understood association between cognition and affect.

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