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Structural and Affective Aspects
of Classroom Climate

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Students of social relations have long concerned themselves
with group norms on one hand and individual needs on the other.
Several rationales for the social structure of the classroom
group hypothesize a complementary or synergistic relation between
these factors. Presumably in classes in which the group work
is organized efficiently, the needs of individual students are
being met effectively. Subsequent paragraphs touch on some
multivariate research on the social psychology of small groups,
review some recent work on classroom climate, and present a
rationale for the present study.

Philosophical and literary traditions on problems of
individual-group relations trace at least as far back as Socrates'
choice between hemlock and exile. But quantitative, empirical
research on group climate and individual satisfaction started
as late as 1935 with the work of Lewin, Lippitt, and White.

Their study examined the effects of different leadership styles
on group climate. Clubs of eleven-year-old boys met for six-
week periods under adults who acted the part as democratic,
autocratic, or laissez-faire leaders. Observers made continuous
stenographic records of club conversations, kept running accounts
of social interactions, and noted psychologically interesting
anecdotes. It was found that group members under democratic
leadership were more friendly, group- and work-minded, and showed
more initiative and frustration tolerance than the other groups.

Work on the social psychology of small groups has mushroomed
since this early study, and one recently annotated bibliography
listed 2699 pieces of research (McGrath and Altman, 1966).
Unfortunately, almost all of the work has limited relevance for
the classroom because the samples of groups--bomber crews, teams
of workers on production lines, two-person dyads in artificial
laboratory settings--do not resemble school classes. Moreover,
many of the studies employed simple bivariate designs in which
the effect of an experimental variation is tested on one dependent
variable. Common sense tells the researcher that he must look
at many facets of group climate to understand what is going on
in the classroom.

The dearth of research bearing on classroom climate has some
outstanding exceptions, however, in the theoretical scheme of
Getzels and Thelen (1960), the empirical studies of Thelen and
and his colleagues (See Withall and Lewis, 1963, for a review

of classroom studies by Flanders, Glidewell, Thelen, Withall,
and others), and the multivariate measurement techniques of
Cattell (1953), Hemphill (1950), and their associates (See
Bereiter's summary, 1966). Let us consider the aspects of this
literature which are related to the present study.

While we shall examine only an abstracted portion of the
Getzels-Thelen scheme here, the interested reader is referred
to the original article (1960) for a more complete description
and examples as well as two recent pieces of empirical work
(Walberg, 1968, and Walberg and Anderson, 1968) based upon the
scheme. The main elements can be summarized analytically as
follows:

Institution	→	Role	→	Expectations	→	
Class	→	Climate	→	Intentions	→	Behavior
Individual	→	Personality	→	Dispositions	→	

The upper line can be termed the "structural" dimension; it
refers to the structure or organization of the classroom, for
example, democratic, stratified, or heterogeneous. For individual
students, it refers to their roles, obligations, or prerogatives.
While the upper line applies to the shared, group-sanctioned,
behavior, the lower line refers to idiosyncratic personal dispositions
to act in a given way to satisfy individual personality needs.
This line is termed the "affective" dimension, and in the present
research, it shall pertain to classroom levels of satisfaction,
intimacy, friction, and other such variables. The purpose of the

study is to investigate the relationships between the structural
and affective dimensions of group climate using the classroom
as the unit of analysis.

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had empirically established a number of principles of group
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Two multivariate studies from social psychology have metho-
dological relevance to the instrument used here to measure class-
room climate. Cattell, Saunders, and Stice (1953) factor analyzed
a great number of behavioral and attitudinal measures of small
groups using the group mean as the unit of analysis. Among the

14 factors are purposefulness, motivation, morale, and procedural orientation. Hemphill (1950) derived 13 group dimensions from a list of 1000 descriptive phrases using similar analytic techniques. Walberg (1960) modified 80 items from 12 of Hemphill's scales to make them descriptive of classroom climate. However, a factor analysis of the modified items revealed a finer structure of 18 factors. These factors were used as criteria for predicting mid-year class climate from measures obtained earlier on teachers (Walberg, 1968) and students (Walberg and Anderson, 1968). For this study the factors were classified into a set of 10 structural and 7 affective variables. (One scale, Social Heterogeneity, was unclassified and deleted from the analysis.)

Method

Subjects and Instrument

Some 2000 high school juniors and seniors in 72 classes throughout the country participated in the preliminary evaluation of Harvard Project Physics, a new course emphasizing philosophical, historical, and humanistic aspects of physics. The mean IQ of the group on the Henmon-Nelson Intelligence Test is 115 (s.d.=14). This level is about one standard deviation above the norm group and corresponds to the 84th percentile. It is about what one might expect from the rather select group of students who take high school physics. Approximately 61 percent of the subjects are male.

As explained above, the Classroom Climate Questionnaire
is a series of 80 items such as "The class knows exactly what it
has to get done." Students are asked to express degrees of
agreement or disagreement on a five-point scale. Subscores
are calculated by averaging the ratings of the items loading
uniquely above .30 on each of the 18 dimensions (See Table 1
for the names of the factors, and Walberg, 1968, for illustrative
items and reliabilities for each dimension). By employing an
extension of the Spearman-Brown formula (Remmers, Shock, and
Kelly, 1927), it was found in a previous study (Walberg, 1968) that
when used as a group measure all dimensions have reliabilities
above .85 and 9 of the 18 have reliabilities of .95 or better.

Procedure

A random fourth of the 2000 students in each of the 72
classes took the Classroom Climate Questionnaire under a system
of randomized data collection (Walberg and Welch, 1968). By
giving a set of tests to random sets of students in each class,
this method tends to minimize testing time and maximize the number
of tests that can be administered. It is especially, though not
solely, useful in studies such as this one in which the unit of
analysis is the class mean.

The 18 subscores for individuals were totaled separately
and divided by the number taking the Questionnaire. Thus, the 72
class means on the 18 dimensions served as the unit of analysis.

The correlations between the structural and affective measures were calculated; each of the affective measures were regressed on all of the structural measures; and similarly, each of the structural measures were regressed on all the affective measures (See Table 1). Finally, canonical correlations were calculated between all the structural and all the affective aspects.

Results

Table 1 shows a number of low to moderate correlations between the two aspects of classroom climate. In a 10 by 7 matrix, 3 to 4 correlations are expected to be significant at the .05 level by chance. Table 1 contains 23 correlations above this level, nearly 7 times the chance probability. Moreover, there are 15 significant beyond the .01 level in contrast to the chance expectation of less than 1 (actually .7) in 70.

(Insert Table 1 about here.)

All of the affective measures are predictable from the structural measures in the multiple regression analysis (p ≤ .05). The mean multiple R is .60 which accounts for 36 percent of the variance in the affective measures. Similarly, with the exception of Strict Control and Speech Constraint, all the structural

measures can be separately predicted from the affective measures
(p ≤ .05). The mean R is .54 which accounts for 29 percent
of the affective variance on the average.

The third method used here to analyze the relationship
between classroom structure and affect is canonical correlation.
This technique produces one or more sets of weights between two
groups of variables which, when multiplied by the variable
values, maximizes the overall correlation between the two
groups. The weights represent the contributions of the individual
variables to the canonical correlation and are interpretable
analogously to beta weights in multiple correlation (See Tatsuoka
and Tiedeman, 1963, for a theoretical treatment and Walberg,
1968, and Walberg and Anderson, 1968, for empirical examples
in classroom climate research.)

The first statistical test is the hypothesis of no signifi-
cant correlation between the two groups of variables, in this
case, structural and affective. The Chi-Square test of the
hypothesis was 190.92 with 72 degrees of freedom and very highly
significant (p < .001). Subsequent tests with successive "roots"
removed revealed no significant (p < .05) residual correlations
between the two groups after four canonical variates were
extracted. The four canonical correlations were .80, .75,
.63, and .57. The details of the variable contributions to
each canonical correlation are discussed below.

Discussion

The simple correlations in Table 1 seem to make good psychological sense. For example, the affective measure, Internal Friction, is correlated positively with Subservient, Disorganized, Stratification, and Speech Constraint and negatively with Democratic and Egalitarian. Similarly, the structural variable, Goal Direction, is correlated positively with Classroom Intimacy and Satisfaction and negatively with Alienation and Personal Intimacy. The positive relation of goal direction to classroom but not personal intimacy[2] can be explained by the general *esprit de corps* of a group working together on clear-cut goals as opposed to the cliquey subsets in disorganized groups. However, one or two of the correlations seem strange. It stands to reason why a disorganized group should exhibit more personal intimacy, alienation, internal friction, and less satisfaction (See Table 1). But it is more difficult to explain why disorganized classes have higher group status. In addition to Disorganized, the three other correlates of group Status are positive: Democratic, Strict Control, and Speech Constraint. The pattern suggests to this writer the possibility that some classes vacillate between autocratic and democratic modes perhaps as a result of the

2. Lower-case names of variables refer here to the underlying constructs; capitalized variables refer to empirical measures.

teachers' personality tensions (See Walberg, 1968). Membership
in such a class may be a sterling conversation topic for students
and a symbol of group status.

It is important to note that the discussion of the teachers is not/ meant
to be derogatory or demeaning. Our previous study (Walberg
and Welch, 1967) showed that aside from their courage in volun-
teering to try an experimental course they are superior intel-
lectually and emotionally to other samples of teachers.

The 23 significant zero-order correlations are too numerous
to comment on individually. The interested reader may wish
to examine Table 1 more closely than this brief discussion
permits. In any case, one can conclude that variables in the
affective domain are significantly related to variables in the
structural domain. Moreover, the multiple correlations show that
most of the variables in both domains are moderately predictable
from the variables in the opposite domain. A more succinct
analysis is the canonical correlation which resolves the complex
of associations between the two domains into their significant
components.

The first canonical correlation was .80 and weighted .30
or higher (or -.30 or lower) on two structural aspects of class-
room climate and four affective aspects. These weights
with decimal points omitted are as follows:

Structural Aspects	Weight	Affective Aspects	Weight
Disorganized	87	Internal Friction	56
Stratified	37	Alienation	47
		Personal Intimacy	47
		Satisfaction	-41

Thus, students who perceive their classes as disorganized and stratified also see themselves alienated, dissatisfied, in conflict with one another. The greater personal intimacy may be the clique pattern referred to in the discussion of the simple correlations. On a more positive note, classes which are low on this canonical variate are organized and unstratified on one hand and the students are more satisfied, less hostile and alienated, and, if our interpretation is correct, less cliquey.

The second canonical correlation was .75, involved more variables, and has a more complex interpretation. The weights for the structural and affective aspects (on the left and right, respectively) are:

Egalitarian	46	Interest Heterogeneity	54
Speech Constraint	43	Internal Friction	52
Democratic	-36	Satisfaction	42
Strict Control	-38	Classroom Intimacy	-46
Goal Diversity	-29		

Students in classes high on this canonical variate saw themselves as being treated equally (Egalitarian) but not having a voice in class activities (Democratic). At the same time, they felt

constrained in what they might say in class, felt less strictly controlled, and felt that the goals of the class are not diverse. On the affective side, they saw themselves as having more heterogeneous interests, internal friction, and satisfaction, and, finally, less classroom intimacy.

A recent observational study of high school science teachers (Gallagher, 1967) showed that they spend from 65 to 95 percent of the time talking. With this in mind a picture of this kind of class emerges: the teacher is lecturing; the students are treated alike; little individual expression is allowed; the goals of the class are unitary and teacher-defined. Affectively, unexpressed interests are heterogeneous, there is more internal friction, and less classroom intimacy. But how can one account for the less strict control and greater student satisfaction in these classes? The answer may lie in the psychology of the teacher. Lecturing may be dull, but it affords the safety of the external, on-stage control of the class. It is much easier for the teacher and students to play the roles of "lecturer" and turned-off "listener," much easier and satisfying than carrying out the difficult art of Socratic dialogue which leads to "stupid" or "difficult" questions.

The third canonical correlation was .63. The weights for it are:

Speech Constraint	65	Group Status	89
Democratic	50	Personal Intimacy	-38
Strict Control	30		

This pattern suggests a closely controlled classroom in which each student has a small but equal voice in policy. Emotionally, class members give up a degree of personal intimacy and identify more closely with the class as a high status group. This kind of class seems to exhibit a restrained _esprit de corps_ that may be very beneficial to learning.

The last correlation was .57 and weighted as follows:

Goal Directed	75	Classroom Intimacy	60
Egalitarian	-45	Internal Friction	58
		Personal Intimacy	-30
		Interest Heterogeneity	-41

This is the classroom in which the goals are clearly directed and the students are not treated equally. On the affective side, students feel intimate as a group but not personally; there is more internal friction between students and less heterogeneity of interests. Behind the variable pattern lies the image of the autocratic teacher who plays favorites. The unity of the class and the perceived homogeneity of interests may be defenses against this kind of teacher. However, there is at the same time friction between the class members and less personal intimacy. One wonders if this tension is between the favorites and the rest of the class united against them.

Conclusion

The statistical analyses support the hypothesis generated from the conceptual scheme: the structural aspects of the

classroom climate as perceived by students are strongly related
to their affective perceptions. In other terms, the role expec-
tations for students in the class are associated with their
personal dispositions as class members. However, the relation-
ships between the structural and affective dimensions are by no
means simple. The canonical correlations discussed boil the
the complexity into four basic patterns of association. Hope-
fully, a replication of the study planned for the coming academic
year will show the generalizability of these patterns.

This is a third in a series of studies employing the
measurement of classroom climate. The first (Walberg, 1968)
showed that the dimensions of climate are predictable from
teacher personality measured earlier. The second (Walberg
and Anderson, 1968) showed that the dimensions are also predictable
from the mental abilities and personalities of the students in
the class. This study shows that the structure of the class is
related to students' affective reactions. Another study of the
psychometric properties of the instrument has been completed
(Anderson, 1967). Armed with a revised form of the instrument
(Walberg and Anderson, 1967), we feel that two series of studies
are now in order. The first is the introduction of random
experimental variations into classrooms such as traditional and
new courses and democratic and autocratic teaching methods to
study their effects on climate. A second series will be done in
conjunction with the first, the correlation of systematic

observations of the teacher and the student with their percep-
tions of the classroom climate. The conceptual scheme employed
here should prove useful in guiding the research.

Table 1

Correlations Between Structural and Affective Measures of Classroom Climate

Structural Measures	Internal Friction	Classroom Intimacy	Interest Heterogeneity	Affective Measures — Group Status	Satisfaction	Alienation	Personal Intimacy	Multiple R
Goal Direction		24*			44***	-21	-34**	61***
Goal Diversity		38***					24*	51**
Democratic	-27*		-33**	36**	-23*			55***
Subservient	28**		20			-21		40
Strict Control				22	21		-26*	47*
Disorganized	29**		-21	34**	-53***	45***	35**	73***
Stratification	50***						21	54**
Egalitarian	-30**				21		-24*	52**
Formality					24*		-26*	42
Speech Constraint	30**	39***		22			-22	62***
Multiple R	71***	57**	53*	61***	64***	54**	58**	

Note — Simple and multiple correlations significant at the .05, .01, and .001 levels are marked with 1, 2, and 3 asterisks, respectively. Decimal points and correlations below the .1 level are omitted.

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