# The Use of Sociometry in Teaching at the University Level

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ABSTRACT. This article contains a brief review of the literature related to the use of sociometry within university education. It includes a report of a study in which the participants were students from a 4th-year undergraduate course involving the use of small groups as a primary learning method. The experimental groups were formed through the use of a sociometric procedure; the control groups were randomly assigned by the instructor. The results of correlational and multiple regression analyses indicated that, based on small-group evaluation measures, sociometry increased the students' learning satisfaction and their academic standing.

DURING THE PAST 15 YEARS, I (CAG) have been teaching a 4th-year undergraduate course entitled Dynamics of Group and Family Functioning. Faculty members in the department believe that a course of this type is beneficial for students nearing completion of their degree program. The focus of the course is on the integration of personal awareness and professional growth and competence. To achieve this goal, I emphasize the following key themes in personal/family functioning: system boundaries; power and control; affective issues; communication; negotiation issues including problem solving, decision making, and conflict resolution; contextual issues of space, time, and energy; task performance issues; self-concept and self-in-relationship; and beginnings and endings within systems. The students process these issues within the context of a small, interactive group. Graduate students in the department's marriage and family therapy graduate program serve as facilitators for these groups.

Because this class has 90 to 150 participants, I decided that the small groups would be determined through the process of sociometry. During the first 3 weeks of the course, the group is divided into three smaller units of approximately 35 to 50 members, depending on total class size. During these

3 weeks, I conduct all group activities, which facilitates interaction at both the verbal and activity level. At the end of the 3rd week, the students complete a sociometric form that is based upon the criterion of sharing together in a small, dynamic discussion group.

The graduate-student facilitators and I became curious about the impact of the sociometric selection process upon the students' satisfaction with the group and also with the grade that they attained in the course. Our curiosity led us to begin a research project in 1983 and to repeat our investigative efforts about the process every other year during the 10 years since then. In the article, we briefly review some of the theory and research on sociometry, especially as it applies to university-learning contexts. We also review the design of the current research project and discuss its outcomes and implications.

## Sociometric Theory

Sociometry was conceived by J. L. Moreno (1956) as one of the primary components of his psycho-cosmology; a complex, action-oriented theory of universal creativity. Moreno's first definition of sociometry, published in 1923, was in accordance with its Greek and Latin etymology, that is, *metrum*, meaning measurement and *socius*, meaning social, so that the word referred to social measurement (Moreno, 1956). Bain (1943) speculated that sociometry was a generic term used to describe all measurements of societal and interpersonal data. The word has also been defined as a "sociological investigation of the smallest social aggregate" (Moreno, 1953, p.17) and the mathematical results obtained by application of quantitative methods that inquire into the organization of groups and the positions of individuals within them (Moreno, 1953).

According to Moreno, the external reality of society consists of visible, overt, and observable groups, whereas the sociometric reality is composed of the interpenetration of numerous, less visible dynamics and factors, and both of these structural levels influence the overall social reality (Hale, 1981).

Interpersonal attraction or nonattraction is the basis of sociometric structure (Jennings, 1947), and sociometrists have addressed the question of what this attraction process is and how it occurs. The term *tele* was coined by Moreno to describe the flow of feelings that exists between individuals such that they are either drawn to or repelled by each other (Hale, 1981). Moreno further defined tele as "insight into, appreciation of, and feeling for the actual make-up of another person" (Moreno, 1946, p. 247).

The core of sociometric structure, then, is tele, or the personal attractions and repulsions among individuals. It promotes dyadic and group cohesion, which in turn influences all other aspects of group and societal life (Moreno, 1953).

## Sociometry in University Education

Since the middle of this century, theory on and research into the process of learning and education have included the assumption that there is an important relationship between the learning process and the social adjustment of learners. The following comments support this assumption: "Educators are generally agreed that social adjustment is essential to any large measure of success in academic achievement" (McClelland & Batliff, 1947, p. 147). Sociometric concepts and tools have been used, though not extensively, to examine and test the relationship between social factors and learning. Elementary-level students, junior-high and high-school students, and to a lesser extent, university students have served as subjects for sociometric research.

In this article, we focus on the limited research on sociometry conducted with college and university students. Most of the studies have been concerned with social factors unrelated to actual learning or academic achievement. For instance, the relationship between interpersonal judgment and sociometric status in a college group has been examined (French & Mensh, 1948), social rejection in a men's college residence was studied through the use of sociometry (Kidd, 1951), and noneducational determinants of sociometric structure in a university class have been measured (Hashmi, 1967).

In some cases, such as Trasher and Kerstetter's (1947) study of a sociometry and activity program at the university level, the learning factor is assumed, despite the lack of empirical evidence, to be correlated positively with positive sociometry.

A study by Lyles (1966) was designed to test the hypothesis that sociometrically determined group participation leads to increased learning and class performance. The participants were 188 undergraduate college students in eight co-ed classes, half of whom were divided into groups according to their sociometric choices while the other half were assigned to groups arbitrarily by the instructor according to the instructor's subjective evaluation of which students would work well together. The results of the study, which indicated that the so-called sociometrically structured groups achieved higher academic standing in the course than did the arbitrarily structured groups, might be more accurately attributed to the group members' mutual interest in a certain topic than to positive sociometric connections.

In a study more truly sociometrically designed that was conducted by Bonney, each student in a class of 38 was instructed to "write his/her first, second and 'other' choices of students with whom s/he would prefer to work on a class project, a committee, or any form of small group which might be formed as part of the class work" (Bonney, 1956, p. 532). Although this was sound sociometry, the major drawback of this criterion is that it lacks specificity. The more specific the criterion, the more clarity there is likely to be in

the meaning of the data (Hale, 1981). Very little current research has addressed the use of sociometry in college or university education. Our endeavor was an attempt to address this gap.

## Research Methodology

Our objective was to examine the relationship of sociometric factors to learning at two levels: the subjective level of satisfaction with one's personal and professional learning through the small-group process and the students' academic grade standing in the course. The participants were 4th-year students in a dynamics-of-group-and-family-functioning course that lasted 13 weeks. Over the years the course has been conducted, the class has, because of its large size, been divided into three large sections of approximately 35 to 50 members. Within these sections, the members of two of the sections were further divided on the basis of sociometry. Those in the third section were randomly assigned by the instructor to small groups. Each small group, whether divided by sociometry or random assignment, contained 8 to 10 participants.

We designed a limited sociometric instrument to enable the students in the sections using sociometry to make choices about the people who would participate in a small, dynamic discussion group. The instrument consisted of an eight-item form on which each student recorded first and second positive and negative choices for both peers and leaders for his or her small group. The students were also asked to indicate their first and second choices of greatest significance. That is, if an individual's first priority was to be with his or her most positively chosen peer, with a second priority to be without a negatively chosen leader, she or he was to circle the former item and underline the latter on the sociometric form. In the final session of every small group, both the experimental and the control groups in the study were asked to fill out a more comprehensive sociometric form. On this form, participants recorded a positive, negative, or neutral choice for every member, including the leader, of his or her small group and listed those choices, in the positive and negative categories, in order of importance. The criterion remained the same, sharing in a small, dynamic discussion group. A 31-item questionnaire, designed to assess students' subjective evaluation of certain aspects of their small groups and of their learning experience, was administered at the end of the group experience. This questionnaire consisted of three sections: (a) an assessment of the students' experience of cohesion in their small groups; (b) a rating of the effectiveness of the group as a learning environment for themselves and, in their perception, for other group members; and (c) responses to questions about how or if some sociometric factors were perceived as having an influence on students' learning experiences.

Final grades in the course were based on the students' responses to four dif-

ferent assignments. Twenty-five percent of each student's grade came at the end of the group from peers and the leader and was based on a 10-point rating scale, with each member contributing and with the average of the totals used as the final mark. Twenty percent was based on an essay that was to contain both theory and personal reflections related to a topic of the course. This was graded by the instructor. Another 20% was based on a process journal of session-by-session analysis of the group and the members, contributions to that group process. This was graded, based on a 10-item guideline, by the instructor. The final 35% was obtained through a final examination covering content of the entire course. This examination consisted of true/false and multiple-choice questions and was graded by machine.

It should be noted here that weighted scores were used in this study. Weighting in sociometry refers to the scoring of sociometric choices according to their strength. For example, if Students A and B both received five positive choices from fellow group members, both would have a score of 5 on the sociometric measure of "positives received." However, if Student A was chosen as a first positive choice by all five of those who chose him or her positively, whereas Subject B's positive choosers all ranked him or her 10th, the two scores for "weighted positives received" would differ a great deal. A scale in which first choices scored 10, second choices 9, and so on, as was used in this study, would result in a score of 50 for Student A and a score of 5 for Student B for "weighted positives received." As this example makes clear, it can be difficult to determine, before statistical tests are conducted, whether or not weighted and unweighted scores will be highly correlated. In sociometric literature, the use of weighted scores has been both advocated (Northway, 1940) and criticized (Gronlund, 1953). Because of the divided viewpoint, we looked at both weighted and unweighted scores in this study.

## Results

The first hypothesis—that positive sociometric structure is correlated positively with the mean learning satisfaction of the group—was supported. Correlation coefficients were calculated to express the direction and the extent of relationship between the groups' mean learning satisfaction and 14 different measures of sociometric structure. Of the 14 correlations, 4 were significant, and all 4 were positive correlations (Table 1). Those facets of sociometric structure that were significantly correlated with learning satisfaction were all measures of positiveness within groups. Apparently, the more positive the sociometric connections between members of learning groups, the greater the learning satisfaction experienced by the groups' members. This conclusion supports Newark's (1962) and Shoobs's (1947) findings that students enjoyed their studies more when learning with positively chosen peers.

**TABLE 1**
**Significant Correlations of Sociometric Structure With Groups' Mean Learning Satisfaction**

| Measure of sociometric structure | Pearson *r* |
|---|---|
| Positive mutuality | .56* |
| Weighted positive mutality | .59* |
| Total positiveness | .60* |
| Weighted total positiveness | .62* |

*Significant at the .01 level.

The second hypothesis was that a combination of predictor variables that constitute the measures of the sociometric status of an individual will account for a significant proportion of the variance in academic achievement. Total-course grade for the small group and the exam grade were examined separately as criterion variables in three multiple regression analyses. Because none of the studies examined in our literature review had employed multiple regression techniques in the analysis of sociometric data, we made no predictions about the order in which variables should be entered. The importance of using multiple regression analyses is related to the fact that individual sociometric factors in groups are not isolated from each other but exist within the complex whole of a social context. Unlike simple correlations, which deal with relationships between two factors only, multiple regression analyses indicate which factors are significant explainers of variance, given the presence of other factors.

No significant results were obtained that related to exam grade. Two sociometric status variables were significant in explaining 9.5% of the variance in the small-group grade. These two variables—weighted positives received and neutrals received—were significant at the .05 and .01 levels, respectively.

When total-course grade became the criterion variable, a full 14.9% of the variance was explained by two significant sociometric status predictors: weighted positive mutuals ($p < .0001$) and weighted positives given ($p < .01$). The fact that sociometric status measures accounted for a significant proportion of the variance in total-course grade provides clear support for the second hypothesis.

## Discussion

The finding that four measures of positive sociometric structure were significantly correlated with group mean perceived cohesion speaks to a well-

debated issue in group dynamics. Cartwright and Zander's (1968) claim that positive sociometry cannot be equated with high group cohesion and Powell's (1982) position that positive sociometry is a good indicator of high group cohesion are both supported here. In other words, the high correlation between positive sociometric structure and perceived group cohesion is impressive, but the two are not perfectly correlated.

Because of the long-standing confusion and controversy in the group-dynamics field over the phenomenon of group cohesion (Evans & Jarvis, 1980), it appears that no standardized instruments for measuring this factor have been developed. For this study, cohesion scores were calculated from the questionnaire items pertaining to the students' subjective experiences of the following aspects of their groups: general sense of comfort, ease of decision making, range and intensity of affect expression, boundaries, and degree of self-disclosure. Thus, group-cohesion composite scores on these factors and the measures of sociometric structure were significantly correlated with these scores. The higher the levels of positive sociometry in the groups, the easier it was to make collective decisions and the greater was the range and intensity of feelings expressed and the degree of self-disclosure.

The correlation of sociometric structure and the mean learning satisfaction of the groups showed that positiveness and positive mutuality were significantly and strongly related to learning satisfaction. When group cohesion and various aspects of individual sociometric status were examined in context with each other, that is, through multiple regression analysis, group cohesion was found to be the strongest predictor of variance in learning satisfaction. Another impressive result in showing the influence of positive sociometry on learning satisfaction was obtained by comparing the experimental and the control groups. Mean learning-satisfaction scores were significantly higher in the groups structured according to sociometric data than they were in the groups structured randomly (EG—38.0918; CG—33.8814, $p = .05$). The significance of this result is particularly impressive considering the limited amount of sociometric data that was used to structure the experimental groups. It was not practically or mathematically feasible to use sociometric data extensively in that structuring. The large size of the class made it unworkable for the students to make a positive, negative, or neutral choice for everyone, as a more complete sociometric exploration would have required.

With regard to learning satisfaction, we obtained some unique and significant results. In summary, positive sociometric choices were the factors most strongly related to higher learning satisfaction. Clearly, educators who wish to improve their student's satisfaction with the learning process have a powerful tool to do so if they know and implement simple sociometric methods. The skills involved in accommodating and facilitating productive sociometry in learning environments can be acquired through professional training in

sociometry and can be supplemented by Hale's (1981) manual of applied sociometry.

In terms of the students' academic standing in courses, we found, when experimental and control groups were compared in terms of mean academic achievement, a significant difference in favor of the experimental groups only for small-group grade. It seems that the effect of the sociometric structuring was limited to academic achievement, which was specific to the small groups, and did not carry over to the other course grades. When grades were determined by a well-balanced combination of subjective and objective measures and when the sociometric instruments were designed to capture accurately the issue under investigation, there was indeed a significant relationship between sociometry and academic achievement.

## Conclusions

The main practical implications of this study lie in the potential that exists for the sociometric method to improve learning environments and thereby increase learning satisfaction and achievement. From the simple maneuver of allowing students to choose their seats instead of assigning them places according to some other criterion, to the more involved process of conducting complete sociometric explorations, educators can use sociometry to enhance learning. With economic trends indicating that large university classes will be the future norm, sociometry can be well used to break the large classes into productive seminar groups. The particular sociometric factors that have emerged as most influential in this study are the measures of positive choices and positive mutuality. Grouping students according to these positive measures provides a relatively simple beginning point at which a fledgling sociometrist can make use of the method.

We with to put forth a major recommendation for the practical use of this study's results. Training in sociometric theory and methods should be made available by educational institutions to the teachers in their employ. In this way, sociometry's potential to enhance students' learning experiences could be expanded.

This study on sociometry and learning at the university level has constituted one step in the process of learning about group functioning and about learning itself. Results of our study contribute to the evidence that the sociometric connections between people, the sociometric structure of groups, and the sociometric status of individuals are significantly related to learning.

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