RELATIONSHIPS BETWEEN SELECTED SOCIOMETRIC VARIABLES AND ACADEMIC PERFORMANCE FOR COUNSELORS IN TRAINING

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The purpose of this research was to examine what relationships existed between selected sociometric variables and measures of academic performance for students in a counselor training program. The sociometric variables included counseling ability, counseling knowledge, and friendship. Academic performance measures included subject GPAs, group counseling participation and final grades, prepracticum grades, and practicum grades. Data was collected from sociometric questionnaires and academic records from the years 1991 to 2004, for 840 subjects who participated in a group counseling class at the University of North Texas.

Counseling knowledge had the highest correlations with all academic measures except group counseling final grades, in which counseling ability had the highest strength. The strongest correlations for all three sociometric variables occurred with group counseling final grades; correlations were $r = 0.42$ for counseling ability, $r = 0.40$ for counseling knowledge, and $r = 0.30$ for friendship. The sociometric variable of friendship had the lowest correlations in all academic measures, but was more significant than expected. The friendship sociometric variable may account for likeability as a factor in making sociometric choices.

Combined sociometric scores led to increased correlation strength and explained variances that reached the large level of $30\%$ with group counseling final grades. A statistically significant difference was found between A and B grade students in group counseling, on all three sociometric variables. Effect sizes were generally large.
Standard deviations for the A and B grade subjects were also large and could limit predictability of grades, based on sociometric scores alone. Results strongly suggested that all three sociometric variables would be a valuable source of information regarding counselor preparation. Results also validated that individual sociometric perceptions of others tended toward agreement. Significant correlations were found over a variety of academic measures and over a time-span of 14 years, suggesting a degree of consistency and stability in sociometric measures.
ACKNOWLEDGEMENTS

In many cultures it is an accepted understanding that it takes a community to raise a child. That concept applies well in graduate school too; it takes a community to raise a doctoral student. I’ve had support from so many people in so many ways, and without that community of caring people in my life, this degree would probably have remained a dream. First, I want to thank my Mom, Step-Dad, and Dad, for their unwavering support and love, and their belief in me as a person. My sisters, Mindi, Wendi, and Amy, have also always been there with their love, support, and confidence in me. If, as Yalom said, “past loving, is the source of strength”, then my capacity to care for and support others, particularly through counseling, is due mainly to the fact that throughout my life I have been so well loved. This affirmation also includes God’s love and support that stayed with me and got me through the day.

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Providing effective training for counseling students is a great concern due to prevailing economic influences that limit resources for educators and reimbursements for mental health consumers. Yalom (2002) expressed concern over the quality of psychotherapists being graduated from current training programs in psychiatry, counseling, psychology, and social work. The current climate of insurance-industry driven mental health care is such that investment in a long-term growth experience for a client has been discouraged. An emphasis on short-term, symptom oriented, less expensive service has led to abbreviated forms of psychotherapy and abbreviated forms of psychotherapist training. Yalom (2002) entreated trainees to pursue a deeper, richer commitment to their own growth and development as mental health professionals rather than be caught up in providing less expensive, less effective, and less meaningful therapies. Perhaps a fuller understanding of trainee growth needs would make for better counselors, a more effective profession, and clients whose needs are better served.

The design of many counselor training programs consists of didactic and experiential components intended to provide knowledge, clinical experience, and supervision (CACREP, 2001). Evaluation of a student’s level of counseling knowledge and counseling skill is crucial for providing growth enhancing feedback to students. Evaluation also serves a protective function, insuring only those persons with adequate skills are awarded the credentials necessary for serving the public. Group counseling and practicum courses provide opportunities for students to put counseling knowledge into practice and receive supervision on the use of their skills.
Practicum coursework allows primarily for the clinical application of counseling skills and the supervision, feedback, and support necessary to insure an acceptable level of service and to further the development of the student counselor (CACREP, 2001). Group counseling coursework is didactic and often includes experiential components that provide opportunities for personal growth, experience as a group leader, and supervision. Within the personal growth experience of being in a group, a technique known as sociometry has been used for eliciting evaluation of counselor trainees.

Sociometry was developed by Jacob Moreno (1953) and was described as both a theory and a method for understanding the interpersonal relationships that exist between persons living in social groups. Sociometry is concerned with the responses of actual people in groups rather than conceptual or generalized models of groups. The judgment, spontaneity, and initiative of the group members are valued rather than the opinions and ratings of external observers. Sociometric questions are often posed to group members in forms such as “who are the most and least knowledgeable persons in this group?”

A primary assumption of sociometry is that individuals cannot be understood outside the context of the social and personal relationships in which they live. Comprehension of the group structures in an individual’s life are necessary for understanding the behavior of children in their peer groups, persons in families, and adults in work or social organizations. Another prominent characteristic of sociometry is the view that groups of individuals are dynamic rather than static. Relational forces in groups are assumed to vary across time and across individuals. An individual will relate
differently with different persons in a group and will relate differently to the same person over a period of time (Bukowski & Cillessen, 1998).

Northway (1967) described a sociometric test as a way of determining the level of acceptance of individuals within a group, and discovering and understanding the relationship structures that exist among group members. The responses of group members can be combined in such a way to provide a composite sociometric score for each person, indicating how each person is perceived within the group. A more clarified description of a sociometric score is that it represents “the number of times an individual has been chosen by other individuals as a preferred associate for certain actions” (Northway, 1967). In this sense, sociometric scores are a way of discovering and identifying interpersonal relationships and are not a measure of the depth or intensity of those relationships.

In reviewing sociometric research, Berscheid (1985) identified a need for understanding the effects of attraction and affiliation on sociometric measurements. Sociometric techniques have often involved asking questions that are affiliative in nature: “who would you choose to be with when …” This measure of desire for affiliation would likely be influenced by factors such as perceived personal benefit, avoidance of personal loss, and liking, or attraction. The role of attraction in the choice to affiliate with an individual may be present for a variety of reasons and to varying degrees. For example, the anticipation of rejection and the amount of time spent in close physical proximity may affect feelings of attraction, contributing an effect on the strength of affiliation. It must be recognized that a sociometric measurement, such as who is chosen, will include effects from a number of factors, including how much a person is liked or disliked.
Sociometry has been used in studying the qualities of effective counselors and in evaluating the counseling effectiveness of counselor trainees. With regard to effective counselor qualities, several studies have indicated particular qualities effective counselors possess, including an ability to accept and promote change, a willingness to receive and give nurturance, and an accepting, outgoing, confident manner (Jones & Schoch, 1968; Walton, 1974; Johnson, Shertzer, Linden, & Stone, 1967). When sociometric status was correlated with effective counseling skills, results showed that the higher a student’s sociometric status was, the more likely a student was to be rated effective by supervisors and peers (Senner, 1979; Gade, 1967; Stefflre, King, & Leafgren, 1962). The study of sociometric status seems relevant to the training of counseling students.

Sociometric status has also been related to measures of academic success. Studies have generally shown that higher sociometric status has been associated with greater academic success (Gronlund & Holmlund, 1958; Rosenberg, McHenry, & Rosenberg, 1962; Senner, 1979; Overton, 2005). What appears to be missing from current research are contemporary studies and research that examine relationships of particular sociometric variables and how those variables might or might not be related to academic performance.

The summarizing means for identifying the effectiveness of a counseling student is ultimately expressed in the academic evaluation, or grade the student receives. Yet, before final grades are assigned, previous research suggests that sociometric measurements of the proper type may help identify students in need of additional training and support. If sociometry can be used to identify and improve the capabilities of struggling counseling students, counselor educators may be able to improve both the
quality of the counselors they graduate and the services these new professionals will provide to our communities.

Statement of the Problem

Research has been conducted on sociometric status and its relationship to counselor effectiveness and academic success. However, existing studies are dated and the scope of sociometry has generally been limited to the use of sociometric status. The study of selective sociometric variables and how they may relate to counseling student academic performance has not been examined. The problem that this research addressed was the lack of recent research on the relationships between specific sociometric variables and academic performance in clinical coursework.

Purpose of the Study

The purpose of this research was to examine what relationships, if any, existed between selected sociometric variables and measures of clinical and academic performance for students in a counselor-training program. The sociometric variables of counseling ability, counseling knowledge, and friendship were each analyzed for their relationship to student cumulative grade-point-averages (GPAs) and grades in masters level group counseling, prepracticum, and practicum courses. The results may facilitate the identification of counselor trainees who need additional support or guidance in their development as a counselor.

Review of the Literature

The training of effective counselors has immediate value in the counselor education process (CACREP, 2001). The use of sociometry in the training process to identify students with skill or knowledge deficiencies could have a positive impact on counseling-student development and the success of the clients they will serve. A review
of the literature relevant to the use of sociometry in counselor training will be presented in this section. This review will summarize relevant literature in three areas: sociometry and group counseling, sociometry and academic achievement, and sociometry and counselor effectiveness.

**Sociometry and Group Counseling**

Sociometric techniques have been used in groups to provide feedback for personal growth, to study the effects of acceptance and rejection, and as a screening method for counseling program applicants. Nagpal and Ritchie (2002) reviewed admission procedures for four counselor education programs and identified that departments used ten characteristics to evaluate applicants. These characteristics covered the three broad areas of professional attributes, personal attributes, and interpersonal skills, and specifically included goal and motivational appropriateness, professional and academic preparedness, personal maturity, flexibility, emotional stability, presence, social appropriateness, and verbal skill. Several of these characteristics were measured by subjective responses of the interviewer. Results suggested the selection process had limited predictive validity because interviewer evaluations were not well correlated with counselor effectiveness. The interview process seemed to be used more as a screening instrument rather than a selection instrument.

Nagpal and Ritchie (2002) suggested that the applicant interview contains a wealth of information that is not well understood in terms of criteria for selecting effective counselors, concluding that further work is needed to make interview data a useful tool in predicting the development of competent counselors.

Mappes (1982) attempted to determine if sociometric feedback could be an appropriate and safe source of information for supporting personal growth in counseling
students. Subjects were divided into two groups, one receiving a personal growth experience and one receiving an academic discussion group experience. Subjects were randomly assigned to receive sociometric feedback and then assessed for emotional upset and positive personal adjustment. Mappes (1982) reported a lack of statistically significant differences between the various groups being studied on most measures. For this study it appeared that giving structured sociometric feedback did not benefit or harm those who received it.

Passariello and Newnes (1988) described a case study of a sociometric intervention with a twenty-six member group. The group experience was conducted at a residential therapeutic setting for Roman Catholic priests, nuns, and other church staff. The sociometric intervention was to ask group members to share their response to the question “who would you like most to talk to about difficult therapy issues?” Group members tended to transform this question into “who do you like,” indicating member sensitivity to the possibility of rejection and guilt.

As a result of the sociometric intervention, the group norm for tolerable and acceptable discussion topics was broadened to include sexual abuse, male-female issues regarding power and helplessness, and family issues. Trust, honesty, and spontaneity were emphasized, while lack of authenticity was rejected. Some group members benefited from the experience while others seemed angry at not getting their needs met. The group restructured itself to allow for greater flexibility in exploring interpersonal interactions.

Senner (1979) explored the relationship between sociometric status and variables related to participation in counselor education training. With regard to sociometry and group counseling, results indicated that participation in a group
counseling class did not significantly impact the sociometric status score of the experimental or comparison group. Also, the sociometric status of low ranked and high ranked students were affected to similar degrees by the experience of the group counseling course.

Remer (1995) reviewed Moreno’s (1953) original sociometric approach, emphasizing how interpersonal feedback may be given so that distress can be reduced. Moreno’s original form of sociometry, which Remer described as “strong sociometry”, could produce negative consequences based on distress arising from the process of rejecting and the experience of being rejected.

Suggestions were offered that would increase familiarity with Moreno’s sociometric techniques and facilitate group warm-up. Methods were described for providing feedback with greater specificity and clarity, related to actual observations, and that would be offered in a supportive and respectful manner. A process for inviting feedback in a more accepting, less defensive way was also illustrated. Remer (1995) hypothesized that a greater understanding of strong sociometry and its potential for evoking distress would facilitate its effective use.

Remer, Lima, Richey, White, and Gentile (1995) conducted a sociometric exercise to study participant perceptions and experiences of strong sociometry. Participants were asked to choose and reject group members with whom they would want to perform a psychodrama exercise, and to discuss their reasons for choosing and rejecting.

In reviewing participant reactions to this process two observations were noted. Participants gained deeper understanding of themselves, others, and the process of choosing. Also, the experience produced discomfort, especially with regard to the
process of rejecting and being rejected. Remer et al. (1995) acknowledged the power of strong sociometry in developing self-understanding, interpersonal and intra-psychic insight and the desire for change. They were unable to determine how to reduce the discomfort of strong sociometry so that its benefits compensated for the accompanying discomfort associated with choosing and, especially, rejecting.

Carlson-Sabelli, Sabelli, Patel, and Holm (1992) reviewed the process of choosing and rejecting as originally conceptualized by Moreno (1953). The authors suggested the dichotomous nature of choosing and rejecting neglects the complexity of the attraction–repulsion experience, oversimplifying contradictory preferences into an exclusive choice.

The recognition of coexisting opposites and the measurement of preferences for and against were shown to provide a more useful description of relationship dynamics than a final event of choosing or rejecting. Carlson-Sabelli et al. (1992) suggested that considering preference dimensions rather than choice outcomes would improve understanding of sociometry, psychological testing, and psychodynamics.

Remer and Finger (1995) examined the effect of different sociometric components on personal and interpersonal growth. These components ranged from experiencing perceptions of group member’s social desirability, to choosing with whom they would like to do a group experience, to disclosing the reasons for their choices.

Weak sociometry was defined as perceiving other’s social appeal and strong sociometry was defined as choosing and rejecting others, and disclosing the reasons for choices. The effects of weak sociometry and strong sociometry on growth were specific objectives of this study. Strong sociometry appeared to have a greater positive influence on growth than weak sociometry. Within the process of choosing, the act of rejecting
others again seemed to be the most difficult component of the strong sociometric approach.

_Sociometry and Academic Achievement_

With regard to academic performance, sociometry has been researched for a relationship to achievement level, just as counselor effectiveness has been studied in relation to academic success. Felker (1973) examined the relationship between counselor effectiveness and intellectual ability. Two instruments were used to rate subjects. These instruments assessed the subject’s ability to develop an effective helping response and to evaluate the quality of helping responses. Intellectual ability was assessed based on grade point average and Miller Analogies Test scores.

Felker (1973) found statistically significant correlation between intellectual measurements and the subject’s ability to formulate helping responses. Intellectual measures and the ability to evaluate the quality of helping responses were positively correlated, though not at a significant level. These results suggested that measurement of academic and intellectual performance should be one component in the selection process of counseling student candidates.

In an early study of the use of sociometry in schools, Gronlund and Holmlund (1958) examined whether sociometric status could be used to predict adjustment of high school students. The sociometric status of approximately 100 sixth grade students was compared with their academic and social adjustment seven years later. Students were divided into two groups based on their sixth grade sociometric status: high status pupils and low status pupils. Each group was compared on items such as graduation rate, rank in graduating class, and percent holding leadership positions in school.
Results showed that 82% of high status students graduated, compared to 45% of low status students. High status students also had a relatively high placement in their graduating class and a disproportionate number of leadership positions. Gronlund and Holmlund (1958) suggested that sociometric status taken at regular intervals could be useful in monitoring the social and academic development of students.

Rosenberg et al. (1962) investigated the use of sociometric scores as predictors of academic performance. Repeating previous similar studies that examined the correlation of sociometric status and successful completion of various military training programs, 85 enlisted students in military courses were given a 14 item sociometric questionnaire.

Results indicated that several of the questionnaire items were effective in predicting academic success. Most effective were the items that rated whether an individual was perceived as being able to “perform the best on the job” and who would “have the most trouble fitting in”. Sociometric ratings appeared to perform weakly in predicting academic failure.

Chapman and Cope (2004) studied the effects of different reward-for-learning strategies on academic performance, self-esteem, and sociometric status of elementary school children. Their research showed that sociometry was one of several measurement variables by which an elementary education program could be evaluated. In terms of sociometric status, the reward system did not appear to affect how much group subjects liked one another.

Nichols and White (2001) studied the effects of peer clique groups on academic achievement. Adolescent algebra students were observed for involvement with or
absence of an associated peer network. Of the 230 student subjects, about 100 were not designated with a particular clique group.

Results indicated that students who were affiliated with a peer group had higher academic achievement than students who were not part of a peer group. Also, students within a particular group tended to perform at similar academic levels, suggesting that academic ability may have provided an initial attraction around which a group formed. Nichols and White (2001) suggested an understanding of how peer groups are formed and maintained could expand knowledge of adolescent development and adolescent relationships.

Sociometric measures have often been used to identify and understand peer rejected children. In reviewing research related to acceptance and rejection among children, Asher (1990) reported that children who are rejected by their peers have been shown to be at greater risk for developing problems later in life, having personality traits that lead to distress in peer relations. Similarly, Maassen, Goossens, and Bokhorst (1998) expressed that the social competence of children has been used as a predictor for adjustment and peer relationship problems, and that sociometric status represents a measure of social competence.

Reynolds and Walberg (1991) examined the factors associated with science achievement in adolescents. A productivity model was used with over 3000 students. An analysis indicated that direct and indirect factors had important influence on academic performance. Instructional qualities seemed to have direct effects because of influence on motivation, class environment, and peer environment. Prior achievement had an indirect influence on performance and was tied to motivation and home environment. While not explicitly identifying social connections as a source of positive
influence, Reynolds and Walberg (1991) identified peer and family environments as contributors to the academic success of the study population.

Senner (1979) examined the relationship between sociometric status and academic performance variables. Results showed that in a group counseling course with didactic and experiential components, students with higher sociometric status scores tended to have higher grades than students with lower sociometric scores. In a group admissions seminar with didactic-only instruction, students with high sociometric scores did not tend to receive higher grades than those with low sociometric scores. This suggests the possibility that in courses that include experiential components, allowing for greater development of relationships, sociometric status predicts academic performance. Sociometric status was not related to verbal, quantitative, or total scores on the Graduate Record Examination for the experimental group.

Overton (2005) also examined the relationships between sociometric status and academic performance using a multi-dimensional, or composite sociometric measure composed of several different sociometric values. Subjects were divided into two groups, based on their multi-dimensional sociometric scores: those with high scores and those with low scores. These two groups were compared on a number of academic measures to determine if a multi-dimensional sociometric score could be predictive of academic performance. Generally, results showed a positive correlation between course grades and a multi-dimensional sociometric score. Effect sizes were moderate for group counseling course grades and weak for prepracticum and practicum course grades.

Overton (2005) concluded that while results supported the usefulness of sociometric measures in predicting performance in a group counseling class, more
research was needed to understand the usefulness of sociometric measures in predicting overall academic performance and in identifying counseling students in need of further counseling skill development. Recommendations for future research included using counseling skill assessment strategies that better reflect the same qualities that sociometric measurements assess, administering the sociometric questionnaire at more intervals, and using a complete sociometric data set. A sociometric data set that includes the measurements of all subjects rather than only groups of high and low scorers could provide more detail about the relationships being studied.

**Sociometry and Counselor Effectiveness**

Sociometric techniques, while not always identified as such, have been used in the preparation and evaluation of counseling students and trainees. Sociometric status and peer ratings have been researched as an aid in the study of peer versus expert supervision, a method for identifying effective counselors, and as a tool for investigating the personal attributes of effective counselors.

Wicas and Mahan (1966) investigated characteristics associated with counselors who were highly rated. In a study using 25 subjects, three instruments were used to determine personality characteristics of participating counseling trainees. Trainees were evaluated and placed in groups based on being high-rated or low-rated in terms of counseling skill. Results indicated high-rated counselors tended to be aware of the expectations of others, patient and non-aggressive in relationships, appropriately interested in social progress, and anxious. The tendency for high rated counselors to be more anxious than low rated counselors may have reflected higher levels of dedication and sensitivity to the needs of others. This study seemed to be an example of the use of
evaluation to identify desirable personal qualities and areas for change, much like a sociometric technique.

In a study by Johnson et al. (1967) the personal qualities associated with effective counselors were investigated. Counselor trainees were rated by peers, supervisors, and counseling clients. Results indicated that effective female and male counselors were described by similar qualities. Effective female counselors were outgoing, confident, efficient, and assertive. Effective male counselors tended to be affable, likeable, accepting, capable, and satisfied.

Walton (1974) explored the question of what personal characteristics of counseling students were found to be desirable counselor qualities. Fifty-four students were administered a self-report questionnaire on personal performance and then later ranked sociometrically by peers on the basis of being a preferred choice as a counselor. The sociometric technique was to ask subjects to select and rank three persons whom they would choose as a counselor. Chosen counselors were then compared for similar counseling qualities.

Results showed the five most valued counselor qualities were, in order of most to least desired, an ability to persuade others, doing something new and different, willingness to receive help, encouragement, and sympathy, planning and organization, and a desire to help others. Persuasive ability being the most valued counselor quality seemed counterintuitive to Walton (1974), who offered several explanations for this finding and suggested replication with a larger sample might provide insight into the reasons for this unexpected result.

McDougall and Reitan (1961) reported on a method of using peer ratings in the evaluation and training of counseling students. Twenty-five trainees were asked to rate
one another by placing each classmate into one of four quarters based on four behavioral characteristics. Peer group evaluations were compared with self-ratings and supervisor ratings. Based on these comparisons, McDougall and Reitan (1961) suggested several benefits of peer ratings.

Peer ratings may offer awareness of counseling behavior that could go unacknowledged in conventional evaluation procedures. Because peer ratings are made through relationships, they may provide special insight into the interpersonal qualities of counseling relationships. Also, ratings by peers may avoid certain psychological barriers that could interfere with realistic self-evaluation. Finally, peer ratings could aid instructors in examining personal biases in the process of student evaluation.

Dilley (1964) examined whether supervisors and peers in an academic setting would evaluate counseling trainee effectiveness similar to supervisors in a field placement setting. Sixty members of an intensive counseling training program were placed in work settings at schools and evaluated by the school counselor. Academic instructors and school counselors ranked students according to perceived counseling ability. Results showed general agreement between working school counselors and academic evaluators. Counseling trainees rated effective in an academic setting tended to be rated effective in a work setting and trainees rated less effective in an academic setting tended to be rated less effective in a work setting.

Friesen and Dunning (1973) recognized the encouragement and support that peer groups often provide for counseling students. The concern of their research was to determine if peer evaluation could be useful to counseling trainees as a reliable source of feedback.
Comparisons were made between the ratings of supervisors and peers. Results showed that rank order correlation between these two rater groups was high. Peer raters tended to give scores that were higher than those of supervisors. Friesen and Dunning (1973) concluded that peer ratings were accurate and could be used as an aid in the educational experience of practicum students.

Benshoff (1993) identified peer supervision as a viable alternative or supplement when clinical supervision may be difficult to obtain. Feedback and consultation from peers was examined and compared to traditional supervision using experienced, university supervisors. Members of peer supervision groups reported a positive experience, citing the benefit of peer encouragement, support, and lack of evaluation.

In a second part of Benshoff’s (1993) study, a peer supervision group was compared with a traditional supervision group using an instrument to measure counseling effectiveness through self-ratings. Results showed that peer supervised counseling students did not rate themselves as significantly more effective at post-test than students who received traditional supervision. The similarity between the experimental and control groups may have been related to difficulty in detecting small changes in the effects being studied over only seven supervision sessions. The counseling effectiveness assessment instrument may have had limited validity due to the use of self-reports in discriminating subtle changes in counselor behavior.

Benshoff (1993) also suggested that other outcome changes in counselor self-confidence, anxiety, and the ability to use colleagues as resources should be considered as areas of growth due to a peer supervision process. Determining what outcome measures are most affected by peer supervision was an important issue.
identified in this study. This relates directly to the question of what sociometric measures are most meaningful in the training and development of effective counselors.

Stefflre et al. (1962) studied the problem of how to evaluate counselors for effectiveness. A peer evaluation process was used to identify effective and ineffective counselors and to determine common qualities of effective counselors. Forty subjects who were students in guidance institutes participated in role-playing, listening to one another’s tapes, and discussing guidance problems. Each subject was asked to rank all other subjects in terms of desirability as a counselor. The nine most chosen counselors were compared with the nine least chosen to determine qualities that would characterize desirable and effective counselors.

Stefflre et al. (1962) found a high degree of agreement among test subjects in identifying effective and non-effective counselors. Similarity of evaluations may have implied that subjects had insight into one another’s opinions. With regard to academic achievement, the nine chosen counselors had higher academic performance than the nine least chosen counselors. The authors suggested that subjects may have equated the concept of “good student” with the concept of “good counselor”, a possible halo effect of being academically advanced. Stefflre et al. (1962) concluded that peer ratings, a sociometric technique, could be an appropriate method for identifying effective and ineffective counselors.

The focus of a study by Gade (1967) was to explore the relationship between sociometric status, counselor effectiveness, and awareness of one’s own and other’s sociometric status. A group of 30 graduate students participating in a guidance and counseling program were ranked by their instructor according to criteria descriptive of
an effective counselor. Subjects ranked one another sociometrically with regard to
desirability as a friend and desirability as a working colleague.

Results showed a positive relationship between a student’s sociometric status
and instructor ratings of counselor effectiveness. Also, sociometric status and
awareness of other’s sociometric status appeared to increase over the seven-month
duration of the study.

Jones and Schoch (1968) examined the relationships between the personal
qualities of counselor education students and criteria of being a successful counseling
student. A sociometric instrument was used to rate the level of success of counseling
students in becoming effective counselors. Peers were asked to rank one another on
separate scales of who was most helpful, least helpful, the best counseling interviewer,
and the worst counseling interviewer.

Results indicated the need for more research in understanding criteria
appropriate for screening program applicants and how such criteria may relate to being
an effective counselor. A probing attitude was found undesirable and the equating of
academic success with counseling success was not supported. Jones and Schoch
(1968) suggested the need for research that would identify student characteristics that
correlate with effective counseling and possibly not with academic achievement.

Senner (1979) researched the relationship between sociometric status and
counselor effectiveness. A supervising professor and supervisory assistants made
evaluations of effectiveness, and sociometric status was obtained near the beginning
and at the end of a group counseling experience. Results showed a significant positive
correlation between sociometric status and counselor evaluation ratings.
In summary, sociometry has found application in areas related to counselor education, although the literature review suggests a paucity of recent research that is directly concerned with counselor training. The literature suggested sociometric techniques could be reliable predictors of counseling effectiveness and a powerful source of information for counselor development and training. Sociometric status variables could be useful indicators both of effective and less effective students of counseling.
CHAPTER 2
METHODS AND PROCEDURES

This research examined the possible relationships between sociometric variables and academic performance for students in a counselor training program. The sociometric variables of counseling ability, counseling knowledge, and friendship were analyzed for their relationship to student cumulative GPAs and grades in group counseling, prepracticum, and practicum courses. Hypotheses were tested using data collected from a large counseling-student population. Data consisted of sociometric scores obtained from a sociometric questionnaire and transcript records of student grades.

Research Question

This research attempted to answer the following question: What value do the sociometric variables of counseling ability, counseling knowledge, and friendship have in predicting academic performance in clinical coursework?

Research Hypotheses

For this research the following hypotheses were developed.

1. The sociometric variable of counseling ability will be positively correlated with subject cumulative GPAs.

2. The sociometric variable of counseling knowledge will be positively correlated with subject cumulative GPAs.

3. The sociometric variable of friendship will show no significant relationship to subject cumulative GPAs.

4. The sociometric variable of counseling ability will be positively correlated with group counseling class participation grades.
5. The sociometric variable of counseling knowledge will be positively correlated with group counseling class participation grades.

6. The sociometric variable of friendship will show no significant relationship to group counseling class participation grades.

7. The sociometric variable of counseling ability will be positively correlated with group counseling final grades.

8. The sociometric variable of counseling knowledge will be positively correlated with group counseling final grades.

9. The sociometric variable of friendship will show no significant relationship to group counseling final grades.

10. The sociometric variable of counseling ability will be positively correlated with prepracticum grades.

11. The sociometric variable of counseling knowledge will be positively correlated with prepracticum grades.

12. The sociometric variable of friendship will show no significant relationship to prepracticum grades.

13. The sociometric variable of counseling ability will be positively correlated with practicum grades.

14. The sociometric variable of counseling knowledge will be positively correlated with practicum grades.

15. The sociometric variable of friendship will show no significant relationship to practicum grades.
16. The sociometric variable of counseling ability will be statistically, significantly different between subjects with final grades of A and subjects with final grades of B, in a group counseling course.

17. The sociometric variable of counseling knowledge will be statistically, significantly different between subjects with final grades of A and subjects with final grades of B, in a group counseling course.

18. The sociometric variable of friendship will not be statistically, significantly different between subjects with final grades of A and subjects with final grades of B, in a group counseling course.

Hypotheses 1 through 15 concerned correlations between academic measures and sociometric variables, and are summarized in Table 1. All eighteen of these hypotheses were tested using data collected from the academic records of subjects and a sociometric questionnaire.
Table 1

Hypothesized Correlations between Academic and Sociometric Measures

<table>
<thead>
<tr>
<th>Academic Measures</th>
<th>Counseling Ability</th>
<th>Counseling Knowledge</th>
<th>Friendship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative GPA</td>
<td>Positive</td>
<td>Positive</td>
<td>None</td>
</tr>
<tr>
<td>Group Counseling</td>
<td>Positive</td>
<td>Positive</td>
<td>None</td>
</tr>
<tr>
<td>Participation grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Counseling</td>
<td>Positive</td>
<td>Positive</td>
<td>None</td>
</tr>
<tr>
<td>Final grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepracticum</td>
<td>Positive</td>
<td>Positive</td>
<td>None</td>
</tr>
<tr>
<td>Practicum</td>
<td>Positive</td>
<td>Positive</td>
<td>None</td>
</tr>
</tbody>
</table>

Definition of Terms

**Sociometry:** Sociometry is the study and measurement of interpersonal relationships in a group of people.

**Sociometric status:** Sociometric status for this study is derived by adding the total number of acceptance votes. It is the subject’s interpersonal position, or rank in the group as measured by a sociometric questionnaire.

**Sociometric variable:** A sociometric variable is the sociometric status of a subject with regard to a particular personal quality, such as knowledge or ability.

**Sociometric questionnaire:** A sociometric questionnaire is a way of assessing the strength of attraction and rejection between individuals in a group. Each member of the group is asked to respond privately to a question such as “whom would you prefer to be your counselor?” For this study, each group member selected one person from the
group in answer to the question posed. The number of times an individual was selected
was added to yield a sociometric status score for that individual.

Methods and Procedures

Subjects

The subjects for this research were master’s degree students who were enrolled
in the course, Group Counseling Theories and Procedures, COUN 5740, at the
University of North Texas during the fourteen-year period from 1991 through 2004. The
course consisted of didactic and experiential components of group counseling training.
In addition to completing the group counseling class, subjects completed additional
clinical courses, Prepracticum in Counseling, COUN 5660, and Practicum in
Counseling, COUN 5690.

The initial sample consisted of 840 students and was composed of 693 females
and 147 males. Students in the group counseling course were required to participate as
active, functioning members of a counseling group for one and one-half hours per week
for the duration of the course. There were a total of 116 groups. Doctoral students in the
counselor education program led the counseling groups. There were 123 group leaders,
including 7 co-leaders. The group leaders were composed of 73 female and 50 male
leaders.

The initial sample was reduced by removing 12 outliers. Outliers were selected,
based on visual examination of scatterplots for counseling ability, counseling
knowledge, and friendship sociometric scores, compared with group counseling final
grades. Sample size was further reduced to include only those subjects who had
graduated. The final pool of subjects was made up of 646 students, including 528
females and 118 males.
Due to the size of this sample it was reasonable to assume that the central limit theorem was satisfied (Hinkle, Wiersma, & Jurs, 2003). COUN 5740, COUN 5660, and COUN 5690 were required courses in the master’s degree program in counselor education at The University of North Texas. Subjects were informed verbally and through the course syllabus that their responses were voluntary and optional, that responses would be used in conducting research related to group counseling, and that subject confidentiality would be protected.

Data Collection

A sociometric questionnaire was administered during the subject’s counseling group experience, while taking the group counseling class. The questionnaire was administered just before the final group meeting. Identical instructions were given by the same course instructor for all questionnaire administrations through each year of data collection. Steps were taken to ensure the protection of confidentiality of subject responses for all administrations of the questionnaire. Values were calculated for each subject for the sociometric variables of counseling ability, counseling knowledge, and friendship.

To preserve subject confidentiality, the professor who taught the group counseling class provided grade information and sociometric scores to the researcher after all subject identifying information had been removed. The supervising professor retained a reference document that contained subject data linked with subject identity.

Instrument

A sociometric questionnaire developed by Senner (1979) was administered to the subjects in this research. The questionnaire was administered at the end of a group
counseling course. Subjects were asked the following three questions regarding the members of their counseling group.

1. If you needed counseling who would you select from this group as your counselor?
2. Which member of this group would you go to if you were seeking knowledge of and information about the counseling field?
3. In selecting a friend from this group, who would you choose?

Each of the above questions represented a sociometric variable being tested: counseling ability, counseling knowledge, and friendship. Subjects were instructed to identify a single person from their counseling group in answer to each question. The same person or a different person could be chosen in answer to each question.

Sociometric scores for each subject were calculated. A sociometric score for counseling ability was calculated, based on responses to question one. Sociometric scores for counseling knowledge and friendship were calculated based on responses to questions two and three, respectively. Each sociometric score was calculated by summing the number of times a subject was selected by group peers with regard to questions one, two, and three. For example, if three group members had identified a subject as the person they would choose as a counselor, that subject would have received a score of 3 for the sociometric variable of counseling ability. If only one group member had chosen the subject as a source of counseling knowledge, the subject would have received a score of 1 for the sociometric variable of counseling knowledge. Selection by four group members for friendship would have given the subject a score of 4 for the sociometric variable of friendship.
The three sociometric variable scores were further processed into percentages of the total possible sociometric variable scores in order to accommodate variations in group sizes. For example, if two of eight group members chose a subject for counseling ability, that subject would have a score of 2 for the sociometric variable of counseling ability. The subject would then receive a percentage score of 25% for the variable of counseling ability, based on receiving 2 of 8, or 25% of the possible selections. Percentage scores for the sociometric variables of counseling ability, counseling knowledge, and friendship were calculated for each subject and used to perform the statistical analysis.

Statistical Analyses

Sociometric data was analyzed using SPSS for Windows, version 13.0. Each subject had three sociometric variable scores, four course grades, and a cumulative GPA. Subjects were also classified according to gender, graduation status, and major area of study.

To test the hypotheses of the sociometric variables and their relationship to cumulative GPAs and course grades, Pearson product-moment correlation coefficients (r) were calculated. The Pearson r was determined for each sociometric variable with respect to subject cumulative GPAs and group counseling participation and final grades, considering these variables as continuous variables.

To test the hypotheses of the sociometric variables and their relationship to dichotomized course grades, biserial r correlation coefficients were calculated. Sociometric variables were treated as continuous variables and subject grades in prepracticum and practicum were treated as dichotomous variables.
Independent samples t-tests and the Mann-Whitney U test were used to test the hypotheses regarding statistically significant differences between subjects with grades of A and subjects with grades of B. Differences between the groups were examined for each sociometric variable.

Limitations of the Study

The subjects for this research were limited to master’s degree students who completed a course entitled Group Counseling Theories and Procedures, COUN 5740, in the counselor education program at the University of North Texas. Subjects were limited to those who enrolled in COUN 5740 during the fourteen-year period from 1991 through 2004, and who had graduated.

Reliability of the sociometric data was limited by the self-report nature of sociometric scores. Academic data from the prepracticum and practicum classes may have been skewed because each of these classes was taught by a number of different instructors with varying levels of experience, who may have used different grading strategies. Conversely, the group counseling class was taught by a single instructor, with extensive clinical and teaching experience, who used a consistent grading strategy over the time data was collected. The prepracticum and practicum dichotomous grade range of A or B may have limited the relationship strength that could be measured between these grades and the sociometric variables.
CHAPTER 3
RESULTS AND DISCUSSION

The relationships between the sociometric variables of counseling ability, counseling knowledge, and friendship, and academic grades were examined through correlation analysis and tests for significant differences in an effort to understand the utility of sociometric variables in predicting academic performance. Academic measures included GPAs and specific grades for clinical coursework. The results of various statistical procedures are reported and discussed, including identifying trends and their implications, and possible changes that could be made in future, similar research efforts. The results of each hypothesis are presented, followed by a discussion of the meaning of those results.

Results

This section describes the results of each hypothesis. In general, the hypotheses were proposed in order to gain understanding of how specific sociometric variables were related to academic measures. In examining the results and discussing their implications, it was important to have an understanding of the sociometric and academic data distributions and how these distributions satisfied the requirements of the statistical procedures. The first part of this section examines important criteria in the use of parametric statistical procedures to describe how these procedures were appropriate. After examining statistical applicability issues for the data sets in general, the hypotheses results are reported.

Normality and the use of Parametric Statistics

The use of parametric statistical methods is based in part on the assumption that the variables under study are reasonably normally distributed (Gall, Gall, & Borg, 2003).
Each of the distributions used in this study were examined with regard to normality and whether or not the Pearson r, biserial r, and t-test for independent samples would be appropriate parametric tools for making inferences about this data sample. Distributions of sociometric variables and academic measures for subjects who graduated are discussed in this section. Subjects who did not graduate from the counseling program were not included in this analysis.

**Pearson r.** Use of the Pearson r correlation coefficient is based on assumptions of interval or ratio data that are normally distributed (Hinkle et al., 2003). Assessing skewness and kurtosis values has been one way of determining how close a data distribution approximates the normal curve. Some authors have suggested that comparing skewness and kurtosis values to their respective standard errors can provide a formal test for divergence from normality. However, when the sample size is large, as was the case for this study, standard errors become very small and can indicate problems for even slight deviations from normality. Tabachnick and Fidell (1996) proposed that a visual inspection of histograms may be a better method of examining a sample’s relationship to the normal curve. Considering this approach, figure 1 depicts the histogram for the sociometric variable of counseling ability.
These scores had a skewness of 1.38 with a standard error of skewness of 0.1, and a kurtosis of 1.31 with a standard error of kurtosis of 0.19. Examining the distribution of these scores, a positive skew was evident, suggesting some degree of departure from normality. However, the sample size was quite large and Tabachnick and Fidell (1996) suggested that in large samples, even a variable with statistically significant skewness usually does not depart sufficiently from normality to negatively impact analysis. The effects of kurtosis are also reduced by samples larger than 200 (Tabachnick & Fidell, 1996). With these considerations, it seemed reasonable to treat Pearson r values from this data set as meaningful descriptions of relationship strength.

Similar patterns of skewness and kurtosis existed in the data sets of the counseling knowledge and friendship sociometric scores.

Figure 1. Histogram of % counseling ability sociometric scores.
The % knowledge sociometric scores had a skewness of 1.56 with a standard error of skewness of 0.1, and a kurtosis of 1.98 with a standard error of kurtosis of 0.19. The % friendship sociometric scores had a skewness of 1.02 with a standard error of skewness of 0.1, and a kurtosis of 1.0 with a standard error of kurtosis of 0.19. Figures 2 and 3 exhibit skewness and kurtosis characteristics similar to that depicted in figure 1, and have similar graphical shapes as well. These scores were also considered acceptable for use in determining Pearson r values, based on the large sample size of the distribution.

The positive skew that is evident in each sociometric variable distribution was due to the large proportion of zero-scores for each variable. A zero-score was the result of a subject receiving no sociometric votes for a particular sociometric variable. This was an expected phenomenon, given the nature of the sociometric method used to
collect this data. Subjects were given one vote to cast for each sociometric variable. When that vote was cast, all other persons in the subject’s group necessarily received zero votes from that subject. The fact that so many subjects received zero-scores appears to emphasize that there was a tendency for sociometric votes to coalesce around a few individuals, rather than being evenly spread among all group members.

![Histogram of % friendship sociometric scores.](figure.jpg)

*Figure 3. Histogram of % friendship sociometric scores.*

Each of the three sociometric variables of counseling ability, counseling knowledge, and friendship, were correlated with academic measures: subject GPAs, group counseling participation grades, and group counseling final grades. The relative normality of the distributions for subject GPAs, group participation grades, and group final grades were an important consideration because they, along with the sociometric variables, were used in calculating Pearson r values.
The distribution for subject GPAs had a skewness of -0.98 with a standard error of skewness of 0.1, and a kurtosis of 0.94 with a standard error of kurtosis of 0.19.

![Histogram of grade-point averages for graduates.](image)

*Figure 4. Histogram of grade-point averages for graduates.*

As shown in figure 4, this data exhibited a distribution with negative skew that caused a degree of departure from normality. Distributions for group counseling participation grades and final grades had a similar trend of negative skew. The distribution for group participation grades had a skewness of -0.90 with a standard error of skewness of 0.1, and a kurtosis of 0.34 with a standard error of kurtosis of 0.19. The distribution for group final grades had a skewness of -1.1 with a standard error of skewness of 0.1, and a kurtosis of 1.09 with a standard error of kurtosis of 0.19. These distributions are shown in figures 5 and 6.
Figure 5. Histogram of group counseling participation grades.

Figure 6. Histogram of group counseling final grades.
It is evident that all of the data sets for this study exhibited some degree of skewness and kurtosis. Again though, each data set was relatively large (N = 646) and this sample size was likely to reduce the effects of skewness and kurtosis, even when these effects appeared significant (Tabachnick & Fidell, 1996). The use of these measures to calculate Pearson r values appeared to be a reasonable method for drawing comparisons between relationship strengths and understanding the nature of how well each sociometric variable was related to different academic measures.

With regard to Pearson r results, an important consideration was whether or not scatterplots showed a linear relationship between correlates. Scatterplots provide a graphical expression of how two variables are related. If the relationship is roughly linear, the scatterplot will show data points clustering along a straight line, perhaps in the shape of a cigar. If data points do not generally follow a straight line or are clustered more tightly in one area than another, the relationship between the variables may be non-linear. The Pearson r is formulated to describe the linear relationship between two variables. When used to describe a non-linear relationship between two variables, the Pearson r will essentially underestimate the strength of the relationship (Hinkle et al., 2003). A scatterplot for group counseling final grades and % counseling ability sociometric scores is shown in figure 7.
The data in this plot was in the shape of an inverted, triangular wedge rather than a straight-line cluster, suggesting a non-linear distribution. It seemed reasonable to assert that a Pearson r calculated for correlations like this underestimated, or perhaps conservatively estimated, the strength of the relationship between the two variables.

Data was distributed on the upper side of a diagonal line traversing from the lower left corner to the upper right. This suggested that a minimum grade could be predicted based on a sociometric score. For example, a subject with a sociometric score of 50 could reasonably be expected to have a grade of at least a B+. The scatterplot also demonstrated the increase in sociometric score variability with increasing grade. The range of sociometric scores for a C+ grade was from 0 to 10, while the range of scores for an A grade was from 0 to 80.
All scatterplots generated for this study exhibited a similar shape. The Pearson r provided a reasonable, yet probably conservative measure for each relationship that was examined.

In summary, the data distributions used in this study departed to varying degrees from the characteristics of the normal curve. However, the acceptable degree of departure and the large sample size were regarded as sufficient reasons to use the Pearson r. The non-linear nature of the correlations and the resulting conservative values of the Pearson r provided an acceptable level of confidence in using the Pearson r to infer and discuss the relative strengths of relationships between sociometric variables and academic measures.

**Biserial r**. The biserial r correlation coefficient is appropriate for use in determining the strength of relationship between a continuous variable and a dichotomous variable with underlying continuity (Hinkle et al., 2003). This coefficient was used in studying the relationship between the sociometric variables of counseling ability, counseling knowledge, and friendship, and the grades for prepracticum and practicum. Of the academic measures included in this study, the distributions for prepracticum and practicum grades were distinct in that there were essentially only two values of data in each distribution: a grade of A or a grade of B. The number of C grades were N = 2, less than 0.4 percent of the distribution, and this data was not included in the analysis. The data values of A and B were treated as having an underlying continuity because the data represented grades that were continuous in nature.

When using the biserial r, the distribution of dichotomous data is an important consideration with regard to deviations from normality. In terms of the data frequencies,
percentages that are significantly different than 50% for each of the two data values, such as 1% and 99%, would make use of the biserial r undesirable (Hinkle et al., 2003). Histograms of prepracticum and practicum grades, shown in figures 8 and 9, illustrate the percent distribution of A and B grade values used in this study.

Figure 8. Histogram of prepracticum grades.

For prepracticum grades the percent distributions were 35% with a grade of B and 65% with a grade of A. For practicum grades the distributions were 26% with a grade of B and 74% with a grade of A. These percentages were considered acceptable for use with the biserial r in estimating the strength of the relationship between these grade distributions and the sociometric variables of counseling ability, counseling knowledge, and friendship.
Tests for significant differences. The t-test for independent samples is appropriate for identifying a statistically significant difference between two independent samples that satisfy conditions of normality and homogeneity of variance (Hinkle et al., 2003). For this research, two independent samples were created by dividing graduated subjects with group counseling final grades into one group who made A’s and another group who made B’s. These two groups were compared for significant differences in their sociometric scores for counseling ability, counseling knowledge, and friendship. With regard to normality, the distributions for these sociometric scores did show departures from the normal curve with values of skewness that sometimes exceeded 3.0 and values of kurtosis that sometimes exceeded 4.0. However, Stevens (1996) described that skewness and kurtosis have only slight effects on levels of significance or power when sample sizes are large (N > 50). Because the sample size for the t-tests
was quite large (N = 635), the amount of departure from normality was considered acceptable.

An additional consideration with these results was that the Levene’s test for equality of variances showed a significance value of p < .001 for each sample-pair tested. This level of significance indicated the assumption of equal variances was not met, meaning the variability of scores was not the same for the A subjects and B subjects. SPSS 13.0 provides statistical output for the case when this assumption is not met. This output is valid when group sizes are approximately equal (large/small = 1.5). The ratio for the A and B group sizes was 418/217 = 1.9. While this ratio was larger than 1.5, Stevens (1996) pointed out that when ratios exceed 1.5 and the large variance is associated with the large group, the significance test tends to be conservative. This was true for each sociometric variable in that the larger A-group consistently had a larger variance than the B-group. It seemed reasonable to accept the results of the t-tests comparing A and B grade subjects as valid tests for significant differences.

The Mann-Whitney U test for significant differences was performed as a nonparametric alternative that would not be sensitive to violations of homogeneity of variance or normality. Significance test results are reported for both t-tests and the Mann-Whitney U test.

Effect size interpretation. Cohen (1988) made an effective argument for interpreting the size of correlation coefficients and levels of significance when they are used with data from the socio-psychological sciences, dealing with aspects of personality. In examining personality features, theoretical relationships compared with measured relationships tend to be separated by inherent ambiguities, especially in the measurement process. Data of this type often includes effects from qualities that are not
part of the construct that is intended for measurement. For these reasons, Cohen (1988) suggested that data of this kind be interpreted with lower thresholds for small, medium, and large effect sizes. These interpretations seemed appropriate for the results of this study because the sociometric data, consisting of measurements of perceptions, was similar in nature to the socio-psychological data for which the effect sizes were suggested.

For the Pearson r, biserial r, and d statistic, Cohen (1988) tentatively suggested values for small, medium, and large effect sizes, based on the absence of more appropriate conventions. These values are summarized in table 2. Two sets of biserial r values were derived because the proportions of the dichotomous A-B groups were different for prepracticum and practicum correlations.

Table 2

<table>
<thead>
<tr>
<th>Effect Size</th>
<th>Pearson r</th>
<th>Biserial r</th>
<th>Biserial r</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>prepracticum</td>
<td>practicum</td>
<td></td>
</tr>
<tr>
<td>small</td>
<td>0.10</td>
<td>0.13</td>
<td>0.13</td>
<td>0.20</td>
</tr>
<tr>
<td>medium</td>
<td>0.30</td>
<td>0.31</td>
<td>0.33</td>
<td>0.50</td>
</tr>
<tr>
<td>large</td>
<td>0.50</td>
<td>0.47</td>
<td>0.50</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Cohen’s d statistic was a way of referencing the difference between means to the pooled variances of the two samples being compared. Cohen’s d was calculated using equation 1, where M is the mean and SD is the standard deviation (Cohen, 1988).
\[ d = \frac{M_{A-grade} - M_{B-grade}}{\sqrt{SD_{A-grade}^2 + SD_{B-grade}^2}} \]  

Cohen (1988) linked the values of the d statistic to correlation coefficient sizes, concluding that the small, medium, and large designations were similar in meaning for correlation values and mean differences.

**Hypothesis 1**

Hypothesis 1 was stated as follows: The sociometric variable of counseling ability will be positively correlated with subject cumulative GPAs. The descriptive statistics for counseling ability sociometric scores and subject GPAs are presented in table 3.

**Table 3**

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 1*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling  ability</td>
<td>646</td>
<td>0</td>
<td>80</td>
<td>13.62</td>
<td>17.84</td>
</tr>
<tr>
<td>GPA</td>
<td>646</td>
<td>2.98</td>
<td>4.00</td>
<td>3.75</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Histograms for counseling ability scores and subject GPAs were shown previously in figures 1 and 4. The frequency distribution for counseling ability scores showed a positive skew and the distribution for GPAs showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.22 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric
variable of counseling ability and subject GPAs (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 10 provides a scatterplot illustrating the relationship between % counseling ability scores and GPAs. The data points are somewhat spread out, yet there is a discernable pattern in the shape of an inverted wedge. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).

Hypothesis 1 was accepted, indicating that as a subject’s sociometric score of counseling ability increased, the subject’s GPA was also likely to increase.

![Figure 10](image)

*Figure 10. Scatterplot of % counseling ability sociometric scores versus GPAs.*

The coefficient of determination, or $r^2$, was 0.05, indicating that 5% of the variance in GPA values was associated with variability in counseling ability sociometric
scores. This implied a small relationship between this sociometric variable and subject GPAs (Cohen, 1988).

**Hypothesis 2**

Hypothesis 2 was stated as follows: The sociometric variable of counseling knowledge will be positively correlated with subject cumulative GPAs. The descriptive statistics for counseling knowledge sociometric scores and GPAs are presented in table 4. Histograms for counseling knowledge scores and GPAs were shown previously in figures 2 and 4. The frequency distribution for counseling knowledge scores showed a positive skew and the distribution for GPAs showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets.

Table 4

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 2*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling knowledge</td>
<td>646</td>
<td>0</td>
<td>86</td>
<td>13.21</td>
<td>18.31</td>
</tr>
<tr>
<td>GPA</td>
<td>646</td>
<td>2.98</td>
<td>4.00</td>
<td>3.75</td>
<td>0.19</td>
</tr>
</tbody>
</table>

SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.26 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric variable of counseling knowledge and subject GPAs (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 11 provides a scatterplot illustrating the relationship between % counseling knowledge scores and GPAs. The data points are somewhat dispersed, yet
there is a discernable pattern in the shape of an inverted wedge. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson $r$ to underestimate the correlation strength (Hinkle et al., 2003).

Hypothesis 2 was accepted, indicating that as a subject’s sociometric score of counseling knowledge increased, the subject’s GPA was also likely to increase.

The coefficient of determination ($r^2$) was 0.07, indicating that 7% of the variance in GPA values was associated with variability in counseling knowledge sociometric scores. This implied a small relationship between this sociometric variable and subject GPAs (Cohen, 1988).
Hypothesis 3

Hypothesis 3 was stated as follows: The sociometric variable of friendship will show no significant relationship to subject cumulative GPAs. The descriptive statistics for friendship sociometric scores and GPAs are presented in table 5.

Table 5

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 3*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% friendship</td>
<td>646</td>
<td>0</td>
<td>71</td>
<td>12.72</td>
<td>13.29</td>
</tr>
<tr>
<td>GPA</td>
<td>646</td>
<td>2.98</td>
<td>4.00</td>
<td>3.75</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Histograms for friendship scores and GPAs were shown previously in figures 3 and 4. The frequency distribution for friendship scores showed a positive skew and the distribution for GPAs showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets.

SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.13 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric variable of friendship and subject GPAs (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 12 provides a scatterplot depicting the relationship between % friendship scores and GPAs. The data points are dispersed, but there is a discernable pattern in the shape of an inverted wedge. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).
While the correlation between these variables was small, it did indicate the presence of a discernable relationship. Hypothesis 3 was rejected; an identifiable relationship did exist between the sociometric scores of friendship and GPA values.

![Scatterplot of % friendship sociometric scores versus GPAs.](image)

**Figure 12.** Scatterplot of % friendship sociometric scores versus GPAs.

The coefficient of determination ($r^2$) was 0.02, indicating that approximately 2% of the variance in GPA values was associated with variability in friendship sociometric scores. This implied a small relationship between this sociometric variable and subject GPAs (Cohen, 1988).

**Hypothesis 4**

Hypothesis 4 was stated as follows: The sociometric variable of counseling ability will be positively correlated with group counseling class participation grades. The descriptive statistics for counseling ability sociometric scores and class participation grades are presented in table 6.
Table 6

Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 4

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling</td>
<td>646</td>
<td>0</td>
<td>80</td>
<td>13.62</td>
<td>17.84</td>
</tr>
<tr>
<td>ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>group coun.</td>
<td>646</td>
<td>1</td>
<td>8</td>
<td>6.24</td>
<td>1.7</td>
</tr>
<tr>
<td>partic. grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Histograms for counseling ability scores and group counseling participation grades were shown previously in figures 1 and 5. The frequency distribution for counseling ability scores showed a positive skew and the distribution for the participation grades showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.33 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a medium positive correlation between the sociometric variable of counseling ability and group counseling participation grades (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 13 provides a scatterplot illustrating the relationship between % counseling ability scores and group participation grades. There is a discernable pattern in the shape of an inverted wedge. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).

Hypothesis 4 was accepted, indicating that as a subject’s sociometric score of counseling ability increased, the subject’s group counseling participation grade was also likely to increase.
Figure 13. Scatterplot of % counseling ability sociometric scores versus group counseling participation grades.

The coefficient of determination ($r^2$) was 0.11, indicating that 11% of the variance in group counseling participation grades was associated with variability in counseling ability sociometric scores. This implied a medium relationship between this sociometric variable and group class participation grades (Cohen, 1988).

**Hypothesis 5**

Hypothesis 5 was stated as follows: The sociometric variable of counseling knowledge will be positively correlated with group counseling class participation grades. The descriptive statistics for counseling knowledge sociometric scores and group class participation grades are presented in table 7.
Table 7

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 5*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling knowledge</td>
<td>646</td>
<td>0</td>
<td>86</td>
<td>13.21</td>
<td>18.31</td>
</tr>
<tr>
<td>group coun. partic. grade</td>
<td>646</td>
<td>1</td>
<td>8</td>
<td>6.24</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Histograms for counseling knowledge scores and group counseling participation grades were shown previously in figures 2 and 5. The frequency distribution for counseling knowledge scores showed a positive skew and the distribution for the participation grades showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.38 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a medium positive correlation between the sociometric variable of counseling knowledge and group counseling participation grades (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 14 provides a scatterplot illustrating the relationship between % counseling knowledge scores and group participation grades. There is a discernable pattern in the shape of an inverted wedge. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).
Hypothesis 5 was accepted, indicating that as a subject’s sociometric score of counseling knowledge increased, the subject’s group counseling participation grade was also likely to increase.

Figure 14. Scatterplot of % counseling knowledge sociometric scores versus group counseling participation grades.

The coefficient of determination ($r^2$) was 0.14, indicating that 14% of the variance in group counseling participation grades was associated with variability in counseling knowledge sociometric scores. This implied a medium relationship between this sociometric variable and group counseling participation grades (Cohen, 1988).

**Hypothesis 6**

Hypothesis 6 was stated as follows: The sociometric variable of friendship will show no significant relationship to group counseling class participation grades. The
descriptive statistics for friendship sociometric scores and group counseling participation grades are presented in table 8.

Table 8

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 6*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% friendship</td>
<td>646</td>
<td>0</td>
<td>71</td>
<td>12.72</td>
<td>13.29</td>
</tr>
<tr>
<td>group coun.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>partic. grade</td>
<td>646</td>
<td>1</td>
<td>8</td>
<td>6.24</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Histograms for friendship sociometric scores and group counseling participation grades were shown previously in figures 3 and 5. The frequency distribution for friendship scores showed a positive skew and the distribution for the participation grades showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.24 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric variable of friendship and group counseling participation grades (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 15 provides a scatterplot illustrating the relationship between % friendship scores and group participation grades. There is a discernable pattern in the shape of an inverted wedge. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).
The correlation strength between these variables indicated the presence of a discernable relationship. Hypothesis 6 was rejected; an identifiable relationship did exist between the sociometric scores of friendship and group counseling participation grades.

![Figure 15](scatterplot.png)

*Figure 15. Scatterplot of % friendship sociometric scores versus group counseling participation grades.*

The coefficient of determination ($r^2$) was 0.06, indicating that 6% of the variance in group counseling participation grades was associated with variability in friendship sociometric scores. This implied a small relationship between this sociometric variable and group counseling participation grades (Cohen, 1988).

**Hypothesis 7**

Hypothesis 7 was stated as follows: The sociometric variable of counseling ability will be positively correlated with group counseling final grades. The descriptive statistics
for counseling ability sociometric scores and group counseling final grades are
presented in table 9.

Table 9

Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 7

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling ability</td>
<td>646</td>
<td>0</td>
<td>80</td>
<td>13.62</td>
<td>17.84</td>
</tr>
<tr>
<td>group coun. final grade</td>
<td>646</td>
<td>2</td>
<td>8</td>
<td>6.61</td>
<td>1.27</td>
</tr>
</tbody>
</table>

Histograms for counseling ability scores and group counseling final grades were shown
previously in figures 1 and 6. The frequency distribution for counseling ability scores
showed a positive skew and the distribution for the group counseling final grades
showed a negative skew. The Pearson r was considered an acceptable measure of the
strength of the relationship between these two data sets. SPSS 13.0 calculations
showed the Pearson r correlation coefficient to be 0.42 using a one-tailed test of
significance. This value was significant at the 0.01 level and indicated a medium
positive correlation between the sociometric variable of counseling ability and group
counseling final grades (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 16 provides a scatterplot illustrating the relationship between %
counseling ability scores and group final grades. There is a discernable pattern in the
shape of an inverted wedge. Because this data did not cluster along a straight line,
there was the suggestion of non-linearity in the relationship that was likely to cause the
Pearson r to underestimate the correlation strength (Hinkle et al., 2003).
Hypothesis 7 was accepted, indicating that as a subject’s sociometric score of counseling ability increased, the subject’s group counseling final grade was also likely to increase.

*Figure 16.* Scatterplot of % counseling ability sociometric scores versus group counseling final grades.

The coefficient of determination ($r^2$) was 0.17, indicating that 17% of the variance in group counseling final grades was associated with variability in counseling ability sociometric scores. This implied a medium relationship between this sociometric variable and group counseling final grades (Cohen, 1988).

**Hypothesis 8**

Hypothesis 8 was stated as follows: The sociometric variable of counseling knowledge will be positively correlated with group counseling final grades. The
descriptive statistics for counseling knowledge sociometric scores and group counseling final grades are presented in table 10.

Table 10

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 8*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling knowledge</td>
<td>646</td>
<td>0</td>
<td>86</td>
<td>13.21</td>
<td>18.31</td>
</tr>
<tr>
<td>group coun. final grade</td>
<td>646</td>
<td>2</td>
<td>8</td>
<td>6.61</td>
<td>1.27</td>
</tr>
</tbody>
</table>

Histograms for counseling knowledge scores and group counseling final grades were shown previously in figures 2 and 6. The frequency distribution for counseling knowledge scores showed a positive skew and the distribution for the group counseling final grades showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.40 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a medium positive correlation between the sociometric variable of counseling knowledge and group counseling final grades (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 17 provides a scatterplot illustrating the relationship between % counseling knowledge scores and group final grades. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).
Hypothesis 8 was accepted, indicating that as a subject’s sociometric score of counseling knowledge increased, the subject’s group counseling final grade was also likely to increase.

![Scatterplot](figure17.png)

*Figure 17. Scatterplot of % counseling knowledge sociometric scores versus group counseling final grades.*

The coefficient of determination ($r^2$) was 0.16, indicating that 16% of the variance in group counseling final grades was associated with variability in counseling knowledge sociometric scores. This implied a medium relationship between this sociometric variable and group counseling final grades (Cohen, 1988).

**Hypothesis 9**

Hypothesis 9 was stated as follows: The sociometric variable of friendship will show no significant relationship to group counseling final grades. The descriptive
statistics for friendship sociometric scores and group counseling final grades are presented in table 11.

Table 11

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 9*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% friendship</td>
<td>646</td>
<td>0</td>
<td>71</td>
<td>12.72</td>
<td>13.29</td>
</tr>
<tr>
<td>group coun. final grade</td>
<td>646</td>
<td>2</td>
<td>8</td>
<td>6.61</td>
<td>1.27</td>
</tr>
</tbody>
</table>

Histograms for friendship sociometric scores and group counseling final grades were shown previously in figures 3 and 6. The frequency distribution for friendship scores showed a positive skew and the distribution for the group counseling final grades showed a negative skew. The Pearson r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the Pearson r correlation coefficient to be 0.30 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a medium positive correlation between the sociometric variable of friendship and group counseling final grades (Cohen, 1988). Table 21 lists a summary of correlation results.

Figure 18 provides a scatterplot illustrating the relationship between % friendship scores and group final grades. Because this data did not cluster along a straight line, there was the suggestion of non-linearity in the relationship that was likely to cause the Pearson r to underestimate the correlation strength (Hinkle et al., 2003).
The correlation strength between these variables clearly indicated the presence of a discernable relationship. Hypothesis 9 was rejected; an identifiable relationship did exist between sociometric scores of friendship and group counseling final grades.

\[ r^2 = 0.09 \]

This implied a medium relationship between this sociometric variable and group counseling final grades (Cohen, 1988).

**Hypothesis 10**

Hypothesis 10 was stated as follows: The sociometric variable of counseling ability will be positively correlated with prepracticum grades. The descriptive statistics
for counseling ability sociometric scores and prepracticum grades are presented in table
12.

Table 12

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 10*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling ability</td>
<td>550</td>
<td>0</td>
<td>80</td>
<td>14.33</td>
<td>18.28</td>
</tr>
<tr>
<td>prepracticum grades</td>
<td>550</td>
<td>5</td>
<td>8</td>
<td>6.96</td>
<td>1.43</td>
</tr>
</tbody>
</table>

A histogram illustrating the frequency distribution of counseling ability sociometric scores was shown in figure 1 and a histogram of prepracticum grades was shown in figure 8. The biserial r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the biserial r correlation coefficient to be 0.09 using a one-tailed test of significance. This value was significant at the 0.05 level, but indicated a negligible relationship between the sociometric variable of counseling ability and prepracticum grades (Cohen, 1988). Hypothesis 10 was rejected; a relationship was not identified between the sociometric measure of counseling ability and prepracticum grades. Correlation results are summarized in table 21.

*Hypothesis 11*

Hypothesis 11 was stated as follows: The sociometric variable of counseling knowledge will be positively correlated with prepracticum grades. The descriptive statistics for counseling knowledge sociometric scores and prepracticum grades are presented in table 13.
Table 13

Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 11

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling knowledge</td>
<td>550</td>
<td>0</td>
<td>83</td>
<td>13.68</td>
<td>18.5</td>
</tr>
<tr>
<td>prepracticum grades</td>
<td>550</td>
<td>5</td>
<td>8</td>
<td>6.96</td>
<td>1.43</td>
</tr>
</tbody>
</table>

A histogram illustrating the frequency distribution of counseling knowledge sociometric scores was shown in figure 2 and a histogram of prepracticum grades was shown in figure 8. The biserial r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the biserial r correlation coefficient to be 0.17 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric variable of counseling knowledge and prepracticum grades (Cohen, 1988). The explained variance ($r^2$) between these two variables was 2.9%. Hypothesis 11 was accepted, indicating that as a subject's sociometric score of counseling knowledge increased, the subject’s prepracticum grade was also likely to increase. Correlation results are summarized in table 21.

Hypothesis 12

Hypothesis 12 was stated as follows: The sociometric variable of friendship will show no significant relationship to prepracticum grades. The descriptive statistics for friendship sociometric scores and prepracticum grades are presented in table 14.
Table 14

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 12*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% friendship</td>
<td>550</td>
<td>0</td>
<td>71</td>
<td>13.48</td>
<td>13.27</td>
</tr>
<tr>
<td>prepracticum grades</td>
<td>550</td>
<td>5</td>
<td>8</td>
<td>6.96</td>
<td>1.43</td>
</tr>
</tbody>
</table>

A histogram illustrating the frequency distribution of friendship sociometric scores was shown in figure 3 and a histogram of prepracticum grades was shown in figure 8. The biserial r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the biserial r correlation coefficient to be 0.05 using a one-tailed test of significance. This value indicated a negligible relationship between the sociometric variable of friendship and prepracticum grades (Cohen, 1988). Hypothesis 12 was accepted; a relationship was not identified between friendship sociometric scores and prepracticum grades. Correlation results are summarized in table 21.

**Hypothesis 13**

Hypothesis 13 was stated as follows: The sociometric variable of counseling ability will be positively correlated with practicum grades. The descriptive statistics for counseling ability sociometric scores and practicum grades are presented in table 15.
A histogram illustrating the frequency distribution of counseling ability sociometric scores was shown in figure 1 and a histogram of practicum grades was shown in figure 9. The biserial r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the biserial r correlation coefficient to be 0.13 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric variable of counseling ability and practicum grades (Cohen, 1988). The explained variance ($r^2$) between these two variables was 2%. Hypothesis 13 was accepted, indicating that as a subject's sociometric score of counseling ability increased, the subject's practicum grade was also likely to increase. Correlation results are summarized in table 21.

**Hypothesis 14**

Hypothesis 14 was stated as follows: The sociometric variable of counseling knowledge will be positively correlated with practicum grades. The descriptive statistics for counseling knowledge sociometric scores and practicum grades are presented in table 16.
Table 16

Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 14

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling</td>
<td>546</td>
<td>0</td>
<td>83</td>
<td>13.69</td>
<td>18.52</td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>practicum grades</td>
<td>546</td>
<td>5</td>
<td>8</td>
<td>7.22</td>
<td>1.32</td>
</tr>
</tbody>
</table>

A histogram illustrating the frequency distribution of counseling knowledge sociometric scores was shown in figure 2 and a histogram of practicum grades was shown in figure 9. The biserial r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the biserial r correlation coefficient to be 0.16 using a one-tailed test of significance. This value was significant at the 0.01 level and indicated a small positive correlation between the sociometric variable of counseling knowledge and practicum grades (Cohen, 1988). The explained variance ($r^2$) between these two variables was 2.5%. Hypothesis 14 was accepted, indicating that as a subject’s sociometric score of counseling knowledge increased, the subject’s practicum grade was also likely to increase. Correlation results are summarized in table 21.

Hypothesis 15

Hypothesis 15 was stated as follows: The sociometric variable of friendship will show no significant relationship to practicum grades. The descriptive statistics for friendship sociometric scores and practicum grades are presented in table 17.
Table 17

*Descriptive Statistics for Sociometric and Academic Data used in Hypothesis 15*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% friendship</td>
<td>546</td>
<td>0</td>
<td>71</td>
<td>13.41</td>
<td>13.25</td>
</tr>
<tr>
<td>practicum grades</td>
<td>546</td>
<td>5</td>
<td>8</td>
<td>7.22</td>
<td>1.32</td>
</tr>
</tbody>
</table>

A histogram illustrating the frequency distribution of friendship sociometric scores was shown in figure 3 and a histogram of practicum grades was shown in figure 9. The biserial r was considered an acceptable measure of the strength of the relationship between these two data sets. SPSS 13.0 calculations showed the biserial r correlation coefficient to be 0.08 using a one-tailed test of significance. This value indicated a negligible relationship between the sociometric variable of friendship and practicum grades (Cohen, 1988). Hypothesis 15 was accepted; no relationship was identified between friendship sociometric scores and practicum grades. Correlation results are summarized in table 21.

**Hypothesis 16**

Hypothesis 16 was stated as follows: The sociometric variable of counseling ability will be statistically, significantly different between subjects with final grades of A and subjects with final grades of B, in a group counseling course. The counseling ability descriptive statistics for subjects with grades of A and B are shown in table 18.
Table 18

Descriptive Statistics of % Counseling Ability Scores for Grade A and B Subjects

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling ability scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for grade B</td>
<td>635</td>
<td>5.57</td>
<td>10.28</td>
</tr>
<tr>
<td>% counseling ability scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for grade A</td>
<td>635</td>
<td>18.13</td>
<td>19.46</td>
</tr>
</tbody>
</table>

The Levene’s test for equality of variances showed that the equality of variances assumption was not met (Levene’s F = 90.09, p < .001). With equal variances not assumed, the independent samples t-test showed that subjects who made a grade of A received significantly higher sociometric scores of counseling ability than subjects who made a grade of B (t = 10.64, df = 632.8, p < .001). There was a 95% likelihood that the true difference between the means of these two groups was between 10.2 and 14.9. Using equation 1, Cohen’s d was found to be 0.81. This value for d suggested a large effect (Cohen, 1988).

The nonparametric Mann-Whitney U test produced results similar to the t-test. With z = -8.79 and p < .001, these results also indicated a statistically significant difference between the comparison groups. Hypothesis 16 was accepted, based on concurrence of parametric and nonparametric tests that indicated a significant difference in counseling ability sociometric scores for subjects with A versus B grades in a group counseling course. Significance test results are summarized in table 21.

Hypothesis 17

Hypothesis 17 was stated as follows: The sociometric variable of counseling knowledge will be statistically, significantly different between subjects with final grades
of A and subjects with final grades of B, in a group counseling course. The counseling knowledge descriptive statistics for subjects with grades of A and B are shown in Table 19.

**Table 19**

*Descriptive Statistics of % Counseling Knowledge Scores for Grade A and B Subjects*

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% counseling knowledge scores for grade B</td>
<td>635</td>
<td>3.98</td>
<td>8.8</td>
</tr>
<tr>
<td>% counseling knowledge scores for grade A</td>
<td>635</td>
<td>18.25</td>
<td>20.13</td>
</tr>
</tbody>
</table>

The Levene’s test for equality of variances showed that the equality of variances assumption was not met (Levene’s F = 122.92, p < .001). With equal variances not assumed, the independent samples t-test showed that subjects who made a grade of A received significantly higher sociometric scores of counseling knowledge than subjects who made a grade of B (t = 12.39, df = 618.6, p < .001). There was a 95% likelihood that the true difference between these two groups was between 12 and 16.5. Using equation 1, Cohen’s d was found to be 0.92. This value for d suggested a large effect (Cohen, 1988).

The nonparametric Mann-Whitney U test produced results similar to the t-test. With z = -10.22 and p < .001, these results also indicated a statistically significant difference between the comparison groups. Hypothesis 17 was accepted, based on concurrence of parametric and nonparametric tests that indicated a significant difference in counseling knowledge sociometric scores for subjects with A versus B
grades in a group counseling course. Significance test results are summarized in table 21.

Hypothesis 18

Hypothesis 18 was stated as follows: The sociometric variable of friendship will not be statistically, significantly different between subjects with final grades of A and subjects with final grades of B, in a group counseling course. The friendship descriptive statistics for subjects with grades of A and B are shown in table 20.

Table 20

Descriptive Statistics of % Friendship Scores for Grade A and B Subjects

<table>
<thead>
<tr>
<th>Data</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% friendship scores for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grade B</td>
<td>635</td>
<td>8.23</td>
<td>10.39</td>
</tr>
<tr>
<td>% friendship scores for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grade A</td>
<td>635</td>
<td>15.27</td>
<td>14.03</td>
</tr>
</tbody>
</table>

The Levene’s test for equality of variances showed that the equality of variances assumption was not met (Levene’s F = 12.6, p < .001). With equal variances not assumed, the independent samples t-test showed that subjects who made a grade of A received significantly higher sociometric scores of friendship than subjects who made a grade of B (t = 7.15, df = 558.8, p < .001). There was a 95% likelihood that the true difference between these two groups was between 5.1 and 9.0. Using equation 1, Cohen’s d was found to be 0.57. This value for d suggested a medium effect (Cohen, 1988).

The nonparametric Mann-Whitney U test produced results similar to the t-test. With z = -6.46 and p < .001, these results also indicated a statistically significant
difference between the comparison groups. Hypothesis 18 was rejected, based on concurrence of parametric and nonparametric tests that indicated a significant difference in friendship sociometric scores did exist for subjects with A versus B grades in a group counseling course. Significance test results are summarized in table 21.

Discussion

Previous research on sociometric status has generally shown that higher sociometric status is related to greater academic success (Gronlund & Holmlund, 1958; Rosenberg et al., 1962; Senner, 1979; Overton, 2005). Overton (2005) defined sociometric status as a multi-dimensional sociometric measure, or composite of several sociometric variables. The essential question addressed in this study concerned whether or not relationships existed between particular sociometric variables and measures of academic performance. The individual sociometric variables of counseling ability, counseling knowledge, and friendship have not been researched with regard to their individual correlation to academic measures. Related questions regarding these variables were whether or not one was more highly correlated than another and if so, were these correlations consistent across different academic measures. This section will address these questions by identifying trends in the results and analyzing the combined effects of the results. A summary of hypothesis test results is shown in table 21.
Table 21

Summary of Hypothesis Test Results

<table>
<thead>
<tr>
<th>Hypothesis Description</th>
<th>Accepted or Rejected</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Counseling ability positively correlated with GPAs</td>
<td>Accepted</td>
<td>( r = 0.22, r^2 = 0.05 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>2. Counseling knowledge positively correlated with GPAs</td>
<td>Accepted</td>
<td>( r = 0.26, r^2 = 0.07 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>3. Friendship not correlated with GPAs</td>
<td>Rejected</td>
<td>( r = 0.13, r^2 = 0.02 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>4. Counseling ability positively correlated with group part. grade</td>
<td>Accepted</td>
<td>( r = 0.33, r^2 = 0.11 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium effect</td>
</tr>
<tr>
<td>5. Counseling knowledge positively correlated with group part. grade</td>
<td>Accepted</td>
<td>( r = 0.38, r^2 = 0.14 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium effect</td>
</tr>
<tr>
<td>6. Friendship not correlated with group part. Grade</td>
<td>Rejected</td>
<td>( r = 0.24, r^2 = 0.06 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>7. Counseling ability positively correlated with group final grade</td>
<td>Accepted</td>
<td>( r = 0.42, r^2 = 0.17 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium effect</td>
</tr>
<tr>
<td>8. Counseling knowledge positively correlated with group final grade</td>
<td>Accepted</td>
<td>( r = 0.40, r^2 = 0.16 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium effect</td>
</tr>
<tr>
<td>9. Friendship not correlated with group final grade</td>
<td>Rejected</td>
<td>( r = 0.30, r^2 = 0.09 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium effect</td>
</tr>
<tr>
<td>10. Counseling ability positively correlated with prepracticum grade</td>
<td>Rejected</td>
<td>( r = 0.09, r^2 &lt; 0.01 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>negligible effect</td>
</tr>
<tr>
<td>11. Counseling knowledge positively correlated with prepracticum grade</td>
<td>Accepted</td>
<td>( r = 0.17, r^2 = 0.03 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>12. Friendship not correlated with prepracticum grade</td>
<td>Accepted</td>
<td>( r = 0.05, r^2 &lt; 0.01 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>negligible effect</td>
</tr>
<tr>
<td>13. Counseling ability positively correlated with practicum grade</td>
<td>Accepted</td>
<td>( r = 0.13, r^2 = 0.02 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>14. Counseling knowledge positively correlated with practicum grade</td>
<td>Accepted</td>
<td>( r = 0.16, r^2 = 0.03 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>small effect</td>
</tr>
<tr>
<td>15. Friendship not correlated with practicum grade</td>
<td>Accepted</td>
<td>( r = 0.08, r^2 &lt; 0.01 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>negligible effect</td>
</tr>
<tr>
<td>16. Difference in Counseling ability between A and B subjects</td>
<td>Accepted</td>
<td>Significant difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( d = 0.81, \text{large effect} )</td>
</tr>
<tr>
<td>17. Difference in Counseling knowledge between A and B subjects</td>
<td>Accepted</td>
<td>Significant difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( d = 0.92, \text{large effect} )</td>
</tr>
<tr>
<td>18. No difference in Friendship between A and B subjects</td>
<td>Rejected</td>
<td>Significant difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( d = 0.57, \text{medium effect} )</td>
</tr>
</tbody>
</table>
Of the three sociometric variables being examined, counseling knowledge had the highest correlations in all academic measures except group counseling final grades. With group final grades, counseling knowledge ($r = 0.40$) and counseling ability ($r = 0.42$) had similar correlation values. On measures other than group counseling final grades, the correlation strength of counseling knowledge was approximately 15 to 18 percent higher than that of counseling ability and 30 to 60 percent higher than friendship. A possible explanation for this trend is that counseling knowledge may be the sociometric construct most closely related to grades. Academic measures are generally intended to reflect a subject’s level of knowledge through test evaluations and the sociometric variable of counseling knowledge is intended to reflect a subject’s knowledge through peer perceptions. These results suggest two conclusions about peer perceptions of counseling knowledge. Peer perceptions have validity as indicators of counseling knowledge, and peer perceptions of counseling knowledge are more strongly related to grades than the other sociometric variables under study.

Counseling knowledge and counseling ability correlations were similar and reached their highest values when correlated with group counseling final grades. This similarity between these sociometric variables may be the result of the nature of the group counseling final grade. Group final grades were composed of a knowledge component, analogous to the concept of counseling knowledge, and a clinical component, analogous to the concept of counseling ability. It seems reasonable that sociometric measures of the same nature as the grade components should reflect similar amounts of correlation. Of all the academic measures, group counseling final grades had the highest correlations for each sociometric variable, including friendship. If
the three sociometric variables in this study are to have practical application, a group counseling class appears to be the most practical point of application.

In contrast, correlations for prepracticum and practicum grades were generally small, with friendship correlations considered negligible. Correlation coefficients for all sociometric variables were less than 0.20 and explained variances were 3% or less. Several factors may have contributed to these low values. Prepracticum and practicum grades were limited to only two values: A and B. Consequently, a large range of sociometric scores were associated with each grade. For example, the standard deviation of the counseling knowledge sociometric scores for subjects who made a B in practicum was 14.75. The standard deviation for subjects who made a B in group counseling, a course with eight grade levels, was 7.0. Wider spreads of data probably limited the possibility of identifying a relationship.

Another factor that likely contributed to these low correlations was grader variability. Multiple instructors with potentially different grading strategies assigned grades for prepracticum and practicum. These instructors were often relatively inexperienced in both a clinical and academic sense. Conversely, only one instructor assigned grades for the group counseling course. This instructor used a consistent grading strategy and was highly experienced as a clinician and as an instructor. The comparative result was that the quality of grades from the group counseling course was probably superior to that of both the prepracticum and practicum courses.

A final contributing factor may have been that the sociometric data in this study was generated in a group context as part of a group counseling course. The sociometric data, generated from the relationships in a group, may have more closely paralleled the constructs that were taught and graded in the group course rather than the
prepracticum or practicum courses. Prepracticum and practicum classes emphasized individual counseling skills rather than group dynamics.

The trend of lower correlations for friendship than for counseling ability or counseling knowledge was recognizable in all of the academic measures. But the degree of correlation for the sociometric variable of friendship was higher than expected. The sociometric variable of friendship explained 6 % and 9 % of the variances in the group counseling participation and final grades, respectively. It appears that this sociometric construct has value in explaining grades in a group counseling course. Berscheid (1985) discussed the role of attraction on sociometric measurements, suggesting that the choices one makes about who to be with are intertwined with feelings of attraction. One may consider being with a person because of a desirable trait such as having counseling knowledge, but whether or not the person with counseling knowledge is actually chosen is influenced to some degree by the person’s likeability. In a reciprocal sense, competency, ability, and appropriate self-assurance may contribute to a person’s likeability. The friendship sociometric variable may capture a part of this complex effect that links likeability with other traits such as knowledge or ability. The best construction of a sociometric instrument may well be to include sociometric variables from a number of sociometric perspectives, including friendship, so that the effect of interpersonal attraction is more directly represented. Overton (2005) referred to this as a multi-dimensional sociometric score.

**Multi-dimensional Sociometric Scores**

Overton (2005) described a multi-dimensional sociometric score (MDSS) as a composite score, formed by summing different sociometric variables into a single number. Although the primary purpose of the current research was to study the effects
of individual sociometric variables, a review of MDSSs for this data set may enhance understanding of how to use individual sociometric variables.

MDSS values were calculated for each subject and were correlated with academic measures, yielding higher correlation values. The results of these correlations are shown in table 22.

Table 22

Correlations of Academic Measures and Multi-dimensional Sociometric Scores

<table>
<thead>
<tr>
<th>Academic measure</th>
<th>MDSS correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPAs</td>
<td>( r = 0.31 ) ( r^2 = 0.10 )</td>
</tr>
<tr>
<td>group counseling participation grades</td>
<td>( r = 0.46 ) ( r^2 = 0.21 )</td>
</tr>
<tr>
<td>group counseling final grades</td>
<td>( r = 0.55 ) ( r^2 = 0.30 )</td>
</tr>
</tbody>
</table>

MDSS correlations were larger than those associated with individual sociometric scores. For group counseling final grades, the explained variance reached a large level of 30% (Cohen, 1988).

It seems that an MDSS could be a better predictor of academic performance than an individual sociometric variable, such as counseling knowledge. But an understanding of the contribution effects of individual sociometric variables remains important; their study reveals which variables would be the most significant contributors to an overall sociometric score. These considerations also highlight a question for future research: Are there other sociometric variables, as yet unidentified, that would significantly contribute to the value of an MDSS? A comparison of standard deviations for MDSSs and individual sociometric variables illustrates further how additional sociometric variables could increase the strength of an MDSS.
Table 23

Comparison of Sociometric Variable Standard Deviations for Group Counseling Final Grades

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Counseling ability SD</th>
<th>Counseling knowledge SD</th>
<th>Friendship SD</th>
<th>MDSS SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>21.4</td>
<td>21.6</td>
<td>15.1</td>
<td>11.3</td>
</tr>
<tr>
<td>A-</td>
<td>15.7</td>
<td>17.7</td>
<td>12.9</td>
<td>9.9</td>
</tr>
<tr>
<td>B+</td>
<td>12.2</td>
<td>10.3</td>
<td>11.5</td>
<td>7.0</td>
</tr>
<tr>
<td>B</td>
<td>7.4</td>
<td>7.0</td>
<td>9.7</td>
<td>5.4</td>
</tr>
<tr>
<td>B-</td>
<td>7.3</td>
<td>6.5</td>
<td>7.3</td>
<td>4.1</td>
</tr>
<tr>
<td>C+</td>
<td>5.5</td>
<td>7.3</td>
<td>10.9</td>
<td>5.2</td>
</tr>
<tr>
<td>C unavailable</td>
<td>4.9</td>
<td>4.2</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 23 shows comparisons of standard deviations for each sociometric variable, broken down by group counseling final grade. This data illustrates that the amount of spread in the data was less for an MDSS than for any single sociometric variable. This increase in data convergence from summing individual sociometric variables suggests the possibility of further convergence from summing a fourth or fifth sociometric variable. It also underscores the need for understanding which sociometric variables provide the most meaningful contribution.

Sociometric Differences between A and B Subjects

Statistically significant differences were found between subjects who made a final grade of A and subjects who made a B in a group counseling course. A and B subjects were significantly different in all three sociometric scoring measures of counseling.
ability, counseling knowledge, and friendship. Effect sizes were large for counseling ability and counseling knowledge, and moderate for friendship.

The implications of these results are that A and B subjects appear to be quite different when examining their mean scores. For example, the mean counseling knowledge score for A subjects was 18.25, while the mean for B subjects was 3.98. This large mean difference demonstrates a measurable distinction between A and B subject groups. The utility of this large difference in means is tempered by the equally large standard deviations associated with each group. However, if data spreads could be reduced, counseling knowledge scores alone could prove useful in differentiating students of various grade and preparation levels. This suggests a need for examining how sociometric measures are obtained and whether or not the spread in data is due to the true nature of the sociometric construct or the method of measurement.

In figure 19 the scatterplot for counseling ability scores versus group counseling final grades illustrates the spread of sociometric scores associated with each grade. This figure shows a roughly linear increase in maximum sociometric scores as grades increase. Yet with each increment in grades, the minimum sociometric score remains the same: zero. The spread of the data is increasing at the same rate as the increase in sociometric score. Reviewing earlier figures 1, 2, and 3, an abundance of zero-scores is clear in each histogram. It may be that changes in how sociometric data is gathered, such that fewer zero-scores are generated, could result in more normal data distributions, lower data spreads, and higher correlations. One possible method for implementing this change could be to allow subjects to have more than one vote per sociometric question, allowing the voter to divide votes between multiple group members.
This would allow for more variability in sociometric scores. Another option could be to ask subjects to assign a sociometric score for each member of their group without limiting the number of available votes. Each group member could receive a sociometric rating of between 1 and 10, for instance, again increasing variability in scores and reducing the quantity of zero-scores.

The apparent large sociometric differences in A and B subjects could be a useful tool, especially if this trend extended to subjects with grades of C. A preliminary analysis showed that a very small sample of subjects (N = 11) with a grade of C had the following sociometric means: counseling ability mean = 1.0, counseling knowledge mean = 3.5, and friendship mean = 4.3. This data is promising in that, with the exception of counseling knowledge, these means are different from those of A and B.
subjects. If standard deviations could be reduced, the prediction of academic performance from sociometric scores could be a useful possibility in identifying students in need of assistance and support.

*Graduates versus Non-graduates*

A final area for review concerns the performance of graduating subjects as compared to subjects who did not graduate. Graduating subjects were used in the analysis of the test hypotheses because they formed a group that might more closely resemble the individuals who would ultimately deliver mental health services to a community. T-tests were performed to test for significant differences in sociometric scores between subjects who graduated and subjects who did not graduate. Table 24 shows comparative descriptive statistics for subjects with a final grade of A in group counseling.

**Table 24**

*Descriptive Statistics of Sociometric Measures for Grade A Subjects*

<table>
<thead>
<tr>
<th>Data</th>
<th>Graduate</th>
<th>N</th>
<th>Mean</th>
<th>Stand. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling Ability</td>
<td>Yes</td>
<td>418</td>
<td>18.1</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>56</td>
<td>15.8</td>
<td>16.0</td>
</tr>
<tr>
<td>Counseling Knowledge</td>
<td>Yes</td>
<td>418</td>
<td>18.3</td>
<td>20.1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>56</td>
<td>19.8</td>
<td>22.5</td>
</tr>
<tr>
<td>Friendship</td>
<td>Yes</td>
<td>418</td>
<td>15.3</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>56</td>
<td>13.9</td>
<td>14.9</td>
</tr>
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</table>

Among subjects with a final grade of A in group counseling, there was no statistically significant difference in sociometric scores on any of the three sociometric measures of counseling ability, counseling knowledge, or friendship. Results were
identical for subjects with a final grade of B: no significant differences. These results are somewhat surprising, because some mean scores were somewhat different. However, the amount of variability in the data, as expressed by standard deviation, was large relative to the mean values. This would make significance difficult to attain. As described earlier, steps to reduce the wide range of sociometric values associated with grades of A and B could increase the likelihood of identifying significant differences between groups and increase the utility of the sociometric measures.

Conclusions

The purpose of this research was to examine the relationships between selected sociometric variables and measures of academic performance. Ultimately, an understanding of these relationships could help to identify students in need of assistance in their development as counselors. The essential conclusion is that the individual sociometric measures of counseling ability, counseling knowledge, and friendship are all relevant sources of information about a student’s level of academic performance. Steps were taken in the statistical analysis to ensure that the parametric methods used were suitable and would lead to results that were trustworthy. The necessarily important steps of checking for normality and homogeneity of variance contributed to a conservative evaluation of the statistical results. Further, the data itself, with its built in variability, constrained the measurement of correlation values so that the magnitude of the relationship strengths were probably underestimated. The result is that while the actual numbers may not represent sociometry as the perfect and exclusive means for understanding student capabilities, sociometric data clearly presents a compelling view of student preparedness and should be a valued source of information in determining a student’s progress as a developing counselor. This view is further
reinforced by considering that the results of this study, in spanning a period of 14 years, have resisted erosion over time and over a large and varying sample.

Significant relationships were detected between sociometric variables and almost all grade measures, with the exception of prepracticum and practicum courses. The highest correlations occurred with the sociometric variable of counseling knowledge, although counseling ability was similar in strength. The variable of friendship was consistently the least correlated sociometric measure; however, the correlation strength of this variable was higher than expected and would make a significant contribution to an overall sociometric score. Together, these results demonstrate that all three of these sociometric variables can make significant contributions to a student’s composite sociometric status and to the understanding of the student’s level of academic performance. The effect strengths for the individual variables ranged from medium to small; however, when formed into a composite, multi-dimensional sociometric score, effect sizes for the group counseling course increased to the large level.

A significant benefit of the current data collection method was that the large number of zero-scores identified the tendency for sociometric votes to cluster around a few individuals in most groups. A zero-score meant that an individual was not chosen by any of one’s peers on a particular sociometric measure, and was in essence a sociometric isolate. Nothing in the data collection method of having only one sociometric vote for each sociometric variable, forced so many subjects to have sociometric scores of zero. There were enough votes available in each counseling group for all subjects in the study to have had non-zero sociometric scores on each variable; but this did not occur. Approximately 50% of the sociometric scores for each sociometric variable were zero-scores, indicating that votes tended to be cast for the same few individuals in each
group. This seems to confirm the idea that even though the subjects forming a group were distinct individuals, with differing values, needs, and goals, they tended toward agreement about whom in that group satisfied certain sociometric qualities: individual sociometric perceptions tended toward agreement. This is perhaps one of the most important observations of this study, lending validation to the entire process of sociometric selection. Sociometric data can be useful if it can be considered consistent across individuals, a quality that is supported by the results of this data and data collection method.

With regard to reducing zero-scores in order to possibly increase correlation strengths, there appear to be reasonable adjustments that could be made in data collection methods. From reviewing the data distributions, it appeared that reducing the number of zero-scores for the sociometric variables would contribute to more normal distributions, smaller standard deviations, and higher correlation values.

Significant differences were found between the sociometric scores of A and B students along each sociometric measure. Effect sizes were medium to large for these differences, suggesting the possibility that student academic levels could be differentiated, based on sociometric measures. These results were mediated by the fact that sociometric variable standard deviations were large in comparison to means. Again, if data collection methods could reduce the number of zero-scores and decrease the spread of the sociometric variable distributions, these results suggest that academic performance levels could be inferred from sociometric scores.

The sample used to examine the sociometric variables was made up of students who had graduated from their respective programs. Non-graduates were compared to graduates to determine if significant differences existed between these groups. No
significant differences were found for any of the sociometric measures, implying that the use of graduate data was acceptable.

The relevance of being able to identify which students are in need of assistance seems clear with regard to providing the best possible mental health care for our communities. This research has demonstrated that relationships exist between sociometric measures and student grades. The strength of these relationships clearly suggests that sociometric data can be a useful source of information about student abilities and is strong enough to warrant further effort in understanding their use. Evidence suggests that the sociometric measures of counseling ability, counseling knowledge, and friendship, can contribute to improved educational experiences for students of counseling and more effective mental health care providers for our communities.

The applicability of sociometric measures could also extend beyond students in a counseling curriculum to include virtually any group of interactive individuals. The consistency of sociometric perceptions and the relationship strength between sociometric measures and graded performance supports the use of peer perceptions in masters and doctoral admission interviews, supervision groups, and groups not specifically related to the counseling field. Project teams in the workplace might use sociometry in initial stages to help decide how to divide tasks among individuals, throughout a project to assess team functioning, and at the conclusion of a project to assess team performance and how future projects might be organized. Relationships are the fabric that connects individuals and Moreno’s (1953) sociometry has demonstrated value in identifying, comprehending, and perhaps facilitating personal growth through those relationships.
Recommendations

The results of this study have helped identify several areas in which expanded work could enhance the use of sociometric variables in counselor education and preparation. The following recommendations are suggested for future research.

1. The focus of this study was on the relationships between sociometric variables and academic measures. However, the results identified a purely sociometric phenomenon that could be explored further. Sociometric votes tended to coalesce rather than disperse among the counseling group participants, as evidenced by the high percentage of zero-scores. A future study could be designed to clarify how well sociometric perceptions converge and if certain sociometric variables show more convergence than others. This would be a study on how well correlated sociometric measures are with one another.

2. This study was conducted on a large sample collected over a period of 14 years, with subjects who were involved in multiple disciplines. The subject population included counseling, psychology, and rehabilitation students. Future studies could be performed to examine whether or not significant sociometric differences existed between students within these disciplines. Also, the 14-year span of subjects could be divided into smaller periods of two to three years. For instance, it may be that sociometric differences exist between subjects in the early 1990’s and subjects in the mid 2000’s. Historical events and cultural shifts may have influenced peer perceptions and sociometric measures.
3. The results of the correlations in this study showed that the three sociometric variables, counseling ability, counseling knowledge, and friendship, were significantly related to most academic measures. When added to form a multi-dimensional sociometric score, correlation strength increased. Future research could be conducted to determine if additional sociometric variables might also add to correlation strength. Studies could be conducted to assess the best group of sociometric questions to ask, perhaps adding one or more sociometric variables to be used in identifying student strengths and deficiencies. This study avoided the use of negative selection sociometric questions such as “who would you least want to choose as your counselor”. Negative questions like this could also be included in a study to select questions with the highest correlation strength.

4. An area of interest was identified regarding the number of zero-scores collected for each sociometric variable. These scores with a value of zero were prevalent for each variable. The effect was to skew the data distributions, possibly weakening correlation measures. A future study could adopt a different method for developing sociometric scores. Rather than having a single vote for each sociometric construct, subjects could be provided with 10 votes that could be weighted among the persons in the group according to the choice of the subject. For example, in a group of eight members a subject might give six votes to one member and two votes to two other members. The result would be fewer zero votes and more levels of differentiation between group members on any given sociometric variable score. Another method could be to ask subjects to rate each member on a
scale of 1 to 10, without regard to a limited number of votes. In a group of eight, two members might receive a score of eight, three members a score of four, two members a score of 1, and one member a score of zero. An expansion of variability in sociometric scores could lead to more normal frequency distributions, tighter clustering of scores, and higher correlation strengths.

5. An assumption for this study was that academic performance measures, such as course grades were an appropriate way of describing counseling student effectiveness. A more direct measure of counseling effectiveness could be used for studying the use of sociometric variables, based on ratings or instruments besides student grades. Engels and the University of North Texas Counseling faculty (2003) described the competencies required of counselors for meeting national accreditation and credentialing standards. Using the knowledge, skill, and performance guidelines from this resource as a method of evaluating counseling students could provide more appropriately descriptive measures with which sociometric variables could be related. Course grades may reflect differing degrees of emphasis on didactic and experiential components of a student’s performance.

6. This study was based on measuring sociometric variables at a single point in time. Future research could involve having more than one set of sociometric measurements, taken at different times during the group experience or at different times during the student’s progression through clinical courses. This repeated-measures statistical approach could allow for results with increased statistical power. In addition, sociometric measurements taken over time and
perhaps within different contexts, such as a group course and a practicum course, would allow for researching what point in a student’s education would be most beneficial for obtaining sociometric measurements.
REFERENCES


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