improved assertiveness. *Journal of Clinical Psychology, 48,* 246–250.

Kipper, D. A. (1992b). Group psychotherapy through role playing. *International Journal of Group Psychotherapy, 42,* 495–521.

Kolko, D. J., & Milan, M. A. (1986). Acceptability of paradoxical interventions: Some paradoxes of psychotherapy research. *Professional Psychology: Research and Practice, 17,* 524–527.

Moreno, J. L. (1985). *Psychodrama* (Vol.1, 8th edition). Ambler, PA: Beacon House.

Moreno, J. L., & Moreno, Z. T. (1975). *Psychodrama: Vol. 2. Foundations of psychotherapy.* Beacon, NY: Beacon House.

Munley, P. H. (1974). A review of counseling analogue research methods. *Journal of Counseling Psychology, 21,* 320–330.

Papp, P. (1983). *The process of change.* New York: Guilford Press.

Remer, R. (1990). Family therapy inside-out. *Journal of Group Psychotherapy, Psychodrama and Sociometry, 43,* 70–81.

Remer, R. (1998). Chaos theory and the Hollander psychodrama curve: Trusting the process. *The International Journal of Action Methods, 50,* 51–70.

Selvini Palazzoli, M., Cecchin, G., Prata, G., & Boscolo, L. (1978). *Paradox and counterparadox.* Northvale, NJ: Aronson.

Spiegel, S. B., & Hill, C. E. (1989). Guidelines for research on therapist interpretation: Toward greater methodological rigor and relevance to practice. *Journal of Counseling Psychology, 36,* 121–129.

Strong, S. R. (1971) Experimental laboratory research in counseling. *Journal of Counseling Psychology, 15,* 215–224.

Strong, S. R., Welsh, J. A., Corcoran, J. L., & Hoyt, W. T. (1992). Social psychology and counseling psychology: The history, products, and promise of an interface. *Journal of Counseling Psychology, 39,* 139–157.

Tom, C. C. (1994). *Using process methods to recognize organized emotional patterns in EKG.* Paper presented at the American Psychological Association Annual Meeting, Los Angeles, CA.

Weeks, G. R., & L'Abate, L. (1982). *Paradoxical psychotherapy: Theory and practice with individuals, couples, and families.* New York: Brunner/Mazel.

RORY REMER is a professor in the Department of Educational and Counseling Psychology at the University in Lexington. GORDON R. BETTS is a counseling psychologist on the Bluegrass Regional Mental Health and Mental Retardation Board in Danville, Kentucky. Remer, the corresponding author, can be reached at the College of Education, 245 Dickey Hall, University of Kentucky, Lexington, Kentucky 40506-0017.

Sociometry: Tools for Research and Practice

THOMAS W. TREADWELL
V. K. KUMAR
STEPHEN A. STEIN
KEVIN PROSNICK

ABSTRACT. This article reviews basic sociometric tools and their analysis, provid information on computer programs to analyze sociometric data, and briefly examin consideration in conducting sociometric investigations.

THE APRIL 3, 1933, SUNDAY ISSUE of the *New York Times* announced tl unveiling, by Jacob Moreno, of a "new science, named psychological geo raphy, which aims to chart the emotional currents, cross-currents, and unde currents of human relationships in a community . . . at the scientific exhil of the Medical Society of the State of New York" ("Emotions Mapped," 17). The *New York Times* further described that "[t]he maps represent studi of attraction and repulsion of individuals within a group toward one anoth and toward the group, as well as the attitude of the group as a whole towar its individual members, and of one group toward another group" (p. 17). Moreno reportedly claimed at the Medical Society meeting, "If we get to tl point of charting a whole city or a whole nation . . . we would have an inti cate maze of psychological reactions which would present a picture of a va solar system of intangible structures, powerfully influencing conduct. gravitation does bodies in space" (p. 17).

There is little doubt that Moreno's sociometry is one of the most signi cant contributions to social and behavioral sciences given its widespre;

applications in a variety of fields (e.g., developmental psychology, industrial psychology, individual and group psychotherapy, sport psychology, sociology, agricultural extension, education, government, health) to advance both research and practice (see, for example, Anshel, 1994; Breen, 1994; Buchanan, 1982; Gazda, 1982; Hinshaw & Melnick, 1995; Lee, 1991; Mouton, Blake, & Fruchter, 1960; Pareek & Singh, 1968). Scholars have viewed sociometry simultaneously as (a) a tool to gather data about relationships, (b) a tool to affect relational changes within therapeutic and work settings, and (c) a philosophy of life and living (see Mendelson, 1989).

Sociometry, in its most basic sense, can be best characterized as a collection of methods to investigate and evaluate networks of existing and preferred relationships. Specifically, sociometry is the study of interpersonal choices regarding criteria of interest to the investigator (Kumar & Treadwell, 1985). Sociometry is not a study of formal group structure (e.g., official hierarchies), rather it is a phenomenological study of people's interpersonal choices.

This article describes some of the basic sociometric tools for gathering information and analyzing data. Sociometric data may be obtained in writing or in action, as shown by a person placing his or her hand on the shoulder of a group member to display choices. The latter technique is referred to as "action sociometry" because interpersonal choices are displayed in action. The action technique is mostly used in applied settings when immediate feedback is needed.

Sociometry Tools

The basic approach in sociometric methodology is to ask participants to select individuals who, in their view, could accomplish certain tasks with (or for) them or who have specific behavioral characteristics (e.g., shyness, cooperativeness, sensation seeking, introversion, ability to lead). This method may also be used to inquire about significant others, events, pets, and objects in an individual's life (present, past, or anticipated) who make that individual's life either meaningful or miserable.

Bjerstedt (1956) differentiated between group-directed and individual-directed sociometry; Kumar and Treadwell (1985) used the terms *group-centered* and *individual-centered sociometry.* The former approach requires individuals to restrict their choices within an ongoing group; the latter allows choices from the larger community (deceased or living) to which they belong.

A third approach, "wishful sociometry," may also be used whereby individuals indicate their preference about wished-for relationships (individuals, groups, pets), objects (artwork, gifts), and activities (visit historical and cultural markers, experiment with novel ideas); (see Kumar & Treadwell, 1985; Carlson-Sabelli, Sabelli, Patel, & Holm, 1992; J. Moreno, 1953; Treadwell,

Leach, & Stein, 1993; Treadwell, Stein, & Leach, 1989). Self-selection m be allowed if needed; for example, a participant might wish to develop a b ter relationship with himself or herself (see Sywensky, Litsinger, & Treadw 1996). Wishful sociometry seems to be more commonly used in clinical pr tice than in research.

Method of Nomination Without Ranking

This method involves asking a respondent to nominate one or more in viduals (a) to perform a specific task, (b) who best reflect particular beh ioral characteristics, and (c) who he or she likes, dislikes, or feels indiffere toward (Ben-David, 1992; Bukowski, Hoza, & Newcomb, 1994). The non nation without ranking procedure does not require members to rank or their choices (e.g., first, second, third). Depending on the purposes of t investigation, self-nomination may or may not be appropriate. The respo dents may be allowed to choose nominees from their community at lar (individual-centered) or only the present group (group-centered).

Nomination data can be gathered in writing or by action within the context a group. By action, group members may be asked to place their left hand on t shoulder of one person and right hand on the shoulder of another person to d play their choices. Self-selection may be demonstrated by placing a hand one's own chest or forehead. Because some members are shy about bei touched and touching others, it is important that action sociometry be used on after obtaining consent. The action method may be cumbersome to use when t members are asked to display more than two choices simultaneously.

Method of Nomination With Ranking

This technique requires respondents to select more than one individu (usually between three and five) for a particular task, and also to rank ord their preference. Nomination with ranking can be easily used as an acti method by asking members to place their left hand on a member's shoulder indicate their first choice and place their right hand on another membe shoulder to indicate their second choice. Responses are best collected in wr ing if three or more choices are to be ranked. Written responses are best if t data are to be subjected to statistical analysis.

Kumar and Treadwell (1985) pointed out that "there is no simple answer [the] question" of how many choices are to be allowed in a sociometric stu (p. 10). They recommended that in small groups of 5 to 10 individuals, mer bers may be invited to rank order all their preferences. In larger groups, allo ing only three to five choices makes data handling and analysis easier, parti ularly if the data are to be used immediately in group work. J. Moreno (195

observed that either allowing unlimited choices or restricting the number of choices makes no difference in terms of who will receive the highest first choice. The unlimited choice method is useful if one wishes to assess an individual's degree of social expansiveness or social isolation.

Peer Rating Procedure

Asher, Singleton, Tinsley, and Hymel (as cited in Johnson, Ironsmith, & Poteat, 1994) had children rate how likely they would be to play with a particular peer, using a 3-point scale showing sad, happy, and neutral faces. Johnson et al. pointed out that such visual "ratings may be less objectionable to parents, teachers, and human-subjects review committees concerned about the effects of asking children to make negative verbal nominations of their peers" (p. 38).

Hayvren and Hymel (1984; see also Barclay, 1992) indicated that practitioners and researchers are "unwilling to administer negative sociometric measures . . . [that ask] . . . children to name peers whom they do not like or with whom they like to play . . . [because they] . . . would implicitly sanction the saying of negative things about others, and in fact, may cause children to view the disliked peers even more negatively" (p. 844). However, Bell-Dolan and Wessler's (1994) review of studies showed that the risk posed by participating in a sociometric study was no greater than "those encountered in everyday life. Children did not increase their negative interactions with unpopular peers, were not more socially withdrawn, and did not express feelings of unhappiness or loneliness following participation in studies that used sociometric measures" (p. 24). Nevertheless, Bell-Dolan and Wessler cautioned that because studies vary greatly with regard to various investigative procedures (e.g., consent procedures, confidentiality instructions, individual versus group administrations) "it is impossible to determine, across the board, whether sociometric procedures currently in use are ethically sound" (p. 24). Readers are referred to Bell-Dolan and Wessler's article for greater details on how risk may be minimized in sociometric investigations.

Social Atom

One of J. Moreno's (1947) most significant contributions in sociometry is the conceptualization and measurement of the social atom. The social atom signifies the smallest number of significant others (including pets, objects, groups, events) an individual needs to feel a sense of well-being, completeness, sociostasis, or social equilibrium (Hollander, 1974; Kumar & Treadwell, 1985; J. Moreno, 1947, 1953). The social atom construction can be either individual-centered or group-centered, and responses can be obtained either in written or action form.

Hollander (1974, cf. Kumar & Treadwell, 1985) differentiated among th types of social atoms: psychological, collective, and individual. Accordin Hollander, the psychological atom identifies those significant individt (e.g., family members, friends, teachers, psychologists, social workers) v contribute to a person's sense of wholeness or completeness. The collec atom includes significant groups to which a person belongs (e.g., church, t ple, YMCA, school, neighborhood club, gang). The individual atom inclu those individuals who help the respondent maintain membership in the v ous groups mentioned in the collective atom. J. Moreno (1947) describe particular type of individual-centered social atom for which the responde are asked to list their significant objects (money, clothes, books, cars) pets; for lack of an existing term, Kumar and Treadwell (1985) designated type of social atom as the *object atom*.

The traditional method of measuring an individual's social atom is provide a series of concentric circles (see J. Moreno, 1960). A do placed in the center of a circle to represent the respondent, and seve concentric circles are provided at increasing distances from the center The respondent is asked to place his or her choices, using distance fr the center dot as a measure of closeness. The method of concentric circ works well in ongoing groups. Even a glance at a group member's soc atom can reveal conflicts with significant others that may provide then for action in group therapy (see Kumar & Treadwell, 1986). Howe such graphic displays of social atoms are not easy to analyze for resea purposes. Furthermore, there are no known scoring systems for graphic ly represented social atoms. Consequently, their use has been limited clinical work.

Treadwell and associates (Treadwell et al., 1989; Treadwell et al., 19 developed the Social Network Inventory (SNI), which allows a compreh sive quantitative assessment of four social atoms: psychological, collecti individual, and ideal dream (wished-for). This instrument is designed to choices as well as ratings (closeness-distant) in four quadrants correspond to each of the social atoms. The psychological quadrant allows for the inc sion of pets and objects. The inventory is formatted in four columns allows for an unlimited number of choices.

For the psychological quadrant, respondents are asked to list the names significant others (including objects, pets, and deceased persons) in Colu 1; indicate their relationship to the person, pets, or objects in Column 2; their closeness on a bipolar 7-point scale (1 = *close*, 7 = *distant*) in Columi and rate how close they think the persons and pets are toward them on a point bipolar scale in Column 4 (a role reversal assessment). The instructi to complete the bipolar scale are appropriately modified for the collective the wished-for quadrants (for example, the instruction for the collective qu

rant is "How close are you to the group?" and for the wished-for quadrant, "How close do you wish to be to this person?").

In contrast to the traditional measurement of the social atom, the SNI provides not only qualitative but also quantitative self-report data. Furthermore, it provides for standardized administration, scoring, and mapping procedures. Treadwell et al. (1993) reported that the SNI is easily understood by the respondents.

Sociodynamic Sociometry

Carlson-Sabelli et al. (1992) and Carlson-Sabelli, Sabelli, and Hale (1994) have criticized the traditional sociometric measurement for (a) focusing on choices and ignoring why choices are made, (b) treating opposites (choice versus rejection and indifference) as mutually exclusive categories or as the opposite ends of a continuum (i.e., love and hate toward the same person can coexist resulting in push and pull processes operating simultaneously), and (c) using a linear scale whereby choices are rank ordered from least to most. Carlson-Sabelli et al. (1994) described a sociodynamic approach that uses the traditional nomination procedure (with or without ranking) along with the measurement of opposite processes of attraction and repulsion via the "plane phase of opposites"—or less technically "the diamond of opposites"—toward a person, activity, or opinion (p. 162). The diamond of opposites can be used to gather data in writing or in action. To use it in action, draw a large diamond in the center of a room and ask group members to place themselves within the marked areas of the diamond in a location that best reflects the intensity of their combined positive and negative feelings toward a significant other.

In Carlson-Sabelli et al.'s (1994) scheme, the bottom vertex of the diamond represents indifferent, neutral, or zero feelings, and the top vertex represents contradictory, ambiguous feeling characterized by intense but opposite (equally positive and negative) feeling. Thus, the area within the diamond of opposites is divided into four quadrants: (a) bottom (weak feelings of both attraction and repulsion), (b) top (strong contradictory feelings of both attraction and repulsion), (c) left (attraction), and (d) right (repulsion) (see Figure 1).

According to Carlson-Sabelli et al. (1994), the diamond can be used to prepare interpersonal profiles for a variety of criteria such as harmony-conflict, approach-avoidance, and attraction-repulsion represented as opposite axes of separate diamonds. Respondents are asked to rank order their significant others in terms of how much time the respondent (a) wishes to spend with their significant others (ideal rank order) and (b) actually spends with their significant others (actual rank order). Next, they locate their significant others by marking points in each of the diamonds (harmony-conflict, attraction-repul-

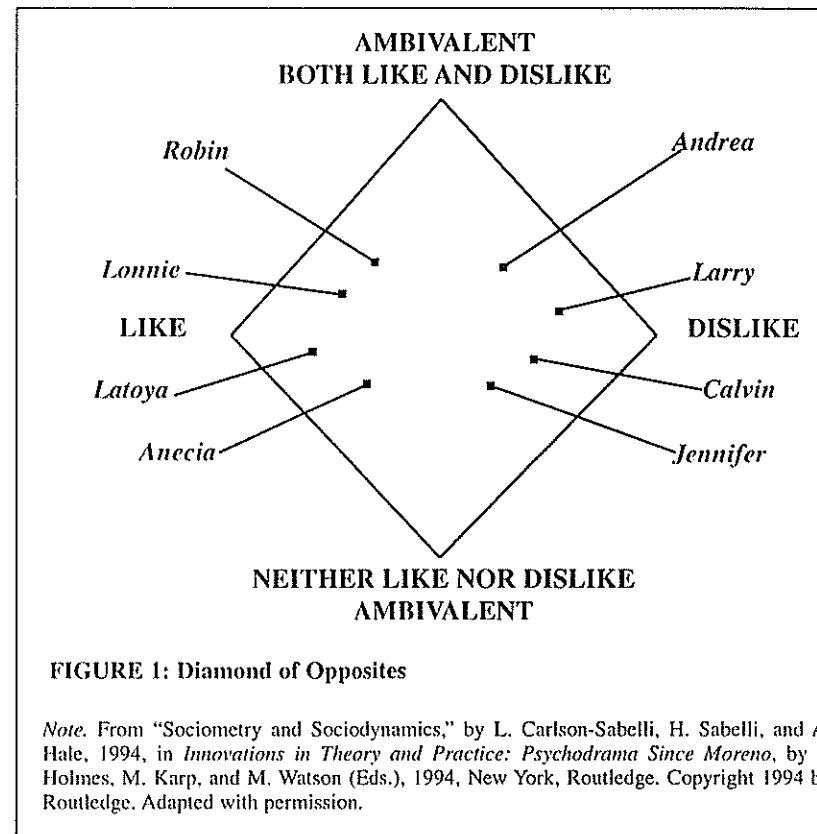FIGURE 1: Diamond of Opposites

Note. From "Sociometry and Sociodynamics," by L. Carlson-Sabelli, H. Sabelli, and A. Hale, 1994, in *Innovations in Theory and Practice: Psychodrama Since Moreno*, by P. Holmes, M. Karp, and M. Watson (Eds.), 1994, New York, Routledge. Copyright 1994 by Routledge. Adapted with permission.

sion, and approach-avoidance) first to indicate the actual rank order and second to indicate the ideal rank order. Connecting the dots within each diamond provides interpersonal profiles (for criteria of interest) for significant relationships, which can then be compared. Carlson-Sabelli et al. mentioned that their approach can be used in conjunction with the SNI (Treadwell et al., 1993) to determine social distances. (See Carlson-Sabelli et al., 1992, 199 for more information on the mathematics of the sociodynamic approach.)

Constructing Sociometry Questions

J. Moreno (1953) stressed the significance of using specific criteria in constructing sociometric questions. He defined a criterion as *"the common motiv which draws individuals together spontaneously, for a certain end* [italics i original]" (p. 97). He also differentiated between diagnostic and action criti

ria, although the former can be transformed to the latter. Questions using diagnostic criteria seek existing information, for example, "With whom do you go out to movies?" This question does not call for action, as in the case of the question, "Whom would you select to lead the group for the next hour?"

According to J. Moreno (1953), sociometric questions need to be differentiated from near-sociometric questions. Sociometric questions have the following four characteristics (Kumar & Treadwell, 1985, p. 3):

1. The questions attempt to determine interpersonal feelings (attraction, repulsion, indifference) in relation to an explicit criterion.

2. The criterion used is specific and action-oriented and not hypothetical, projective, or ambiguous.

3. When asked within the context of a group, the questions should serve an immediate group goal, such as for group warm-up or identifying roles (mother, father, brother, lover) for different individuals in the group or for subgroup structures, or a group theme for action (Treadwell, Stein, & Kumar, 1988).

4. The questions must specify whether or not choices can be made outside the group (J. Moreno, 1953; Z. Moreno, 1984, personal communication, cited in Kumar & Treadwell, 1985).

Near-sociometric questions use ambiguous, hypothetical, or projective criteria (e.g., "Who are you most comfortable with in the group?" or "Who in the group is most like yourself?" For additional examples, see Kumar & Treadwell, 1985).

Although the distinction between near-sociometric and sociometric questions is important, J. Moreno (1953) pointed out that the "sociometric procedure is not a rigid set of rules, but it has to be modified and adapted to any group situation as it arises" (pp. 101–102). Thus, both types of questions are helpful when leading groups. Near-sociometric questions may be particularly helpful in conducting warm-ups before moving to more specific task-oriented sociometric questions. The use of near-sociometric questions in research may lead to unreliable results because they are open to multiple interpretations by respondents in answering such questions.

In traditional sociometric investigations, certain key phrases are used to request nominations: "select a person," "choose a person," or "which person in the group . . ." Furthermore, the nomination requests may be worded to tap positive (select a person to work with) or negative (name the person that you do not wish to work with) feelings toward a person, activity, or belief. Kumar and Treadwell (1985) noted that phrasing questions to tap positive feelings may be preferred generally in action sociometry, because action makes the results obvious to the group members. A negative question requires deliberate rejection and may be threatening both to the choosers and to those chosen. In contrast, a positive question requires deliberate selection and, consequently, not being selected may not only reflect a lack of feeling rather than a well-

developed negative feeling. Feelings of deliberate rejection may cause unn essary conflict within a group. On the other hand, negative questions may helpful in locating problem situations to be resolved by the group (Bjerste 1956; Kumar & Treadwell, 1985). In the context of action sociometry, Kur and Treadwell also suggested avoiding broad ambiguous questions (e "Who do you like most in the group?"), personality trait questions (e.g., "W in this group is most androgynous?"), and ego-threatening questions (e "Who is the most resistant member in the group?").

Whether one uses positive or negative questions in action sociometry, i important to educate the group members before implementing socime regarding (a) different types of sociometric questions, (b) the four features sociometric questions, and (c) the proper interpretation of selection decisic (i.e., inform participants that not being selected does not imply rejection, a that selections are criterion-specific, not generalizable to other criteria).

In summary, while constructing sociometric questions, either for resear or for action purposes, it is important to ask the following questions (Kum & Treadwell, 1985):

1. Is the question relevant to the goals (or stated hypothesis) of [the] inv tigation? What I am trying to measure, and why?

2. Is the question a sociometric question? Is the question open to multi interpretations?

3. Does the question specify whether or not choices can be made to peo outside of the group?

4. Is the question realistic?

5. Is the question timely? Are the data immediately usable for action pi poses within the context of a group?

6. Is the question potentially threatening to any one in the group?

Administering the Sociometric Instrument

Sociometric questionnaires are relatively easy to construct and administ A simple sociometric instrument contains (a) statements (or questions) i questing one or more nominations for a particular purpose, and (b) blank lin to indicate one or more nominations. If the nominations are to be ranked, t blank lines may be prefixed by the phrases Choice 1, Choice 2, Choice 3, a so forth. (See Appendix for an example of a sociometric form.)

Some general guidelines, which readers might find helpful, for impleme ing a sociometric study are the following:

1. Regardless of whether the sociometric investigation is for research clinical work, it is important to prepare a clearly stated informed conse form. For research, the informed consent form should include (a) a clear stat

ment for why such data are being collected, (b) an assurance that data will be held in strict confidence, and (c) a request that participants not share their choices with others or to make them public (see Bell-Dolan & Wessler, 1994 for more information on consent-assent procedures, especially if participants are children and minors).

2. For group work, the informed consent form should (in addition to what was previously mentioned) require group members to treat sociometric data as privileged information not to be divulged to outsiders. If action sociometry is to be implemented, the consent form should state that certain exercises involve touching other group members. If group process is being videotaped, the informed consent form must also be signed by camera- and videotaping-technicians. Furthermore, if videotapes are sent home for evaluation by group members, the informed consent form should include an agreement that no one else, other than the group members, will view the tapes.

3. For research with small groups (15 to 20 individuals), data, if needed, can be collected anonymously by handing participants a sheet with names and identification (ID) numbers. If two people have the same name, nicknames may be assigned and made known to all participants along with the corresponding ID numbers. The participants are instructed to use only the ID numbers in reporting their nominations.

4. Completion of sociometric instruments at home is not recommended because members may compare answers or not complete the questionnaires in time.

5. In ongoing groups, it is important to recognize that sociometric data are highly personal, and being chosen or not chosen might be emotionally unsettling to some participants. Thus, the first one or more sessions should be spent educating group members about the nature of sociometry and how it will be used to facilitate group process to improve interactions among group members.

6. For general research guidelines, refer to the ethical guidelines published by the American Psychological Association (1992) and the Association for Specialists in Group Work (1990).

Analysis of Sociometric Data

Sociometric data provide a large amount of information about the nature of interactions within a group. Some of the basic sociometric indices commonly used by investigators to understand structural aspects of groups are reviewed here.

Analysis of Individual Status

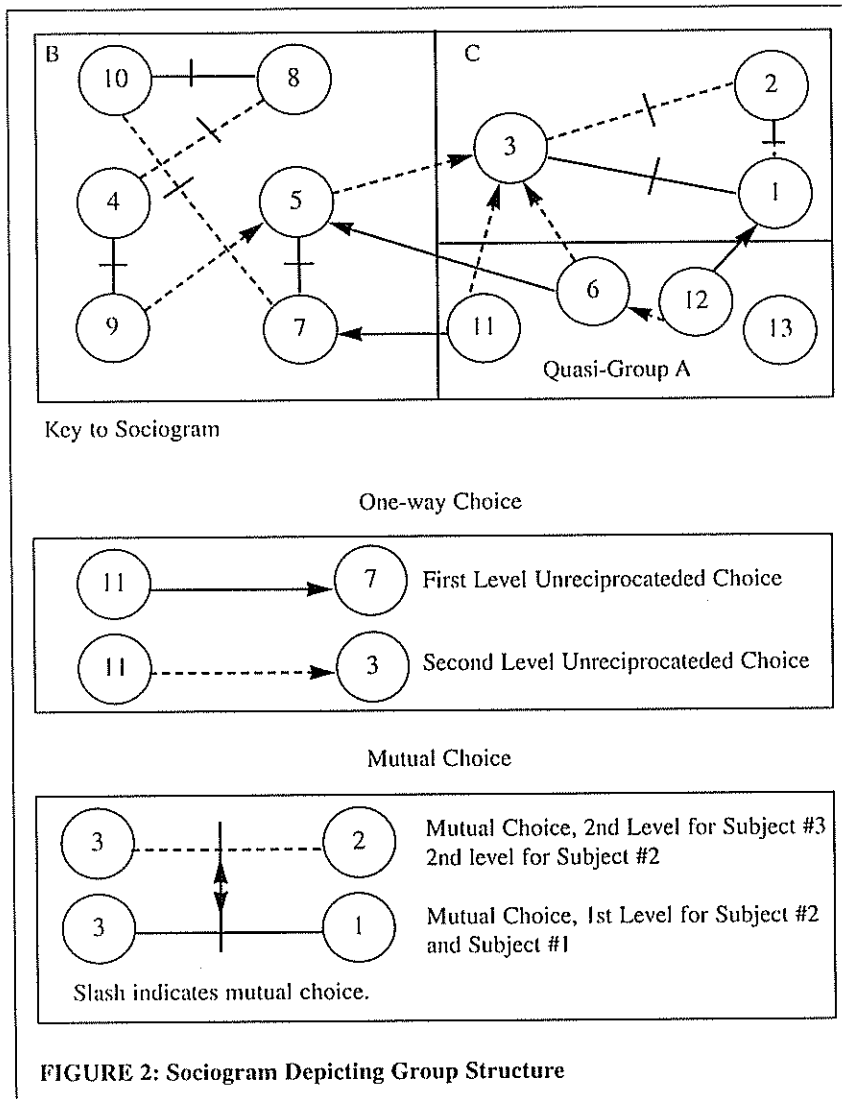*Positive stars and isolates.* The terms *positive stars* (described as stars of attraction in J. Moreno, 1953, p. 508) and *isolates* are used to identify the most and least popular individuals within a group when participants are as positive criterion questions (e.g., "With whom would you like to associate A positive star is an individual who receives the largest number of select on a specific criterion of interest when using the nomination procedure w out ranking. When choices are rank ordered, then a positive star would be most popular individual on the tabulation of the first choice. Of course, a ferent star may emerge on the second or the third choice.

An isolate is one who chooses, but receives no choices (see Figure 2, ! group A). A less commonly used term in the literature is a *true isolate*—individual who refuses to choose and who is not chosen (see Figure 2, ! group A; Jennings, 1950). There is no appropriate term for a person ' refuses to choose, but is chosen (e.g., a person is elected as a positive star, this individual refuses to choose). Future research may evaluate the sigt cance of such individuals in group processes.

Kumar and Treadwell (1985) suggested that isolates and stars are best c ceptualized as characteristics that occur in degree. Thus a person is mor less an isolate or a star—zero isolation would mean star status (chosen everyone), whereas 100% isolation would imply no one has selected the ii vidual (the two extreme ends of a continuum). Conceptualizing the star–lation characteristic as a continuum allows the investigator to classify n than one individual as popular or isolated within a group. This conceptual tion is consistent with Bronfrenner and Carver's (cited by Criswell, 19 methods of using cut-off points to select group members who are "conside to be overchosen, and the point below which an individual is underchose socially neglected" (p. 210).

Positive stars are pivotal individuals who can link group members to fr coalitions to provide leadership on a particular task. Kumar and Treadv (1985) suggested that the term *leader* be used for an individual who emer as a star on many different criteria; such an individual may be elected by group to be its representative or to serve as the main officer (e.g., preside For lack of a suitable term, a person not chosen on multiple criteria may designated as a *general isolate.*

Brusa, Stone, Beck, Dugo, and Peters (1994) have defined four types leaders in therapy groups: (a) task leader—one who "influences norm dev opment, goal clarification, style of communication, and many other dim sions of group life," (b) emotional leader—"the best-liked person and the m important support person to other members," (c) scapegoat leader—"often object of attack or nonverbal negative feelings from group members," and defiant leader—"who openly expresses an ambivalence about participatior group" (pp. 82–83). (See Brusa et al., 1994 for a sociometric test to ident these different types of leaders.)

Key to Sociogram

One-way Choice

First Level Unreciprocateded Choice

Second Level Unreciprocateded Choice

Mutual Choice

Mutual Choice, 2nd Level for Subject #3
2nd level for Subject #2

Mutual Choice, 1st Level for Subject #2
and Subject #1

Slash indicates mutual choice.

FIGURE 2: Sociogram Depicting Group Structure

Negative stars. The most frequently chosen individuals on a negative crite-
rion question (e.g., "With whom you would not like to associate?") are called
negative stars (J. Moreno, 1953, p. 508, described them as "stars of rejec-
tion"). However, there seems to be no appropriate term for the least chosen
individuals on a negative criterion question. Such individuals are not isolates
in the sense of being excluded from the group. If one defines isolation in terms
of exclusion from a group, then by definition a star of rejection must be an iso-

late who will be excluded from an activity. Edwards (1960) defined an iso
"as one who receives only 'neutral' or 'dislike' choices" (p. 220).

Negative stars are equally as influential as positive ones, because they r
affect the group's direction and cohesion. Negative stars should not neces:
ily be perceived as negative, because, like positive stars, they can exert tl
pressure to balance group functioning.

Other methods of classifying individual status. Peery (1979) develope
procedure for identifying from nomination data four types of individuals: p
ular, amiable, rejected, and isolated. His procedure requires the participant:
make nominations on both positive (like most) and negative (like least) crite
The total number of positive (p) and negative (n) votes are then used to cc
pute two indices: social impact is the sum of p and n votes (p + n) and so
preference is the difference between p and n votes (p − n). Using the m
scores on two variables as the point of intersection between the two variab
one can identify the four types suggested above: (a) popular–high social imp
(above the mean on both p and n); (b) amiable–positive social preference,
low social impact (above the mean on p but below the mean on n); (c) reje
ed–negative social preference but high social impact (above the mean on n
below the mean on p), and (d) isolated (below the mean on both p and n).

Coie, Dodge, and Coppotelli (1982) used Peery's method of comput
social impact and social preference scores to divide the individuals into
types: popular, rejected, neglected, controversial, average, and other. Th
method of classification involves first tabulating frequencies of positive
and negative (n) nominations and converting them into standard (Z) scores
social preference (SP) is then defined as the difference between standardi
p and n scores. A social impact (SI) score is defined as sum of the standar
and n scores. Each person is then classified into one of six categories using
following cut-off points:

1. Popular: $SP > 1.0$, $p > 0$, and $n < 0$
2. Rejected: $SP < -1.0$, $p < 0$, and $n > 0$
3. Neglected: $SI < -1.0$, $p < 0$, $n < 0$
4. Controversial: $SI > 1.0$, $p > 0$, $n > 0$
5. Average: SP between -0.5 and 0.5, SI between -0.5 and 0.5
6. Other: all remaining individuals

Coie et al.'s (1982) method has been used in several studies (Asher & Dod;
1986; Hinshaw & Melnick, 1995).

Analysis of Interactional Patterns

The previous section presented an analysis of status or relative position
an individual within a group. This section focuses on analyzing interactic

among members to discover mutuality or reciprocity of choices, nonreciprocity of choice, and subgroup formations (cleavages and cliques).

Mutuality of choice. A mutual (reciprocal) choice is one in which two people select each other on a given criterion. In an ongoing group, identification of mutual choices is often helpful in forming teams, making role assignments within the team (e.g., to serve as initiator, gatekeeper, provider of support). Mutual choices on positive and negative nominations may be called positive and negative mutuality reflecting mutual acceptance and rejection respectively.

In nomination procedures by which people rank order their choices, analysis, although cumbersome, may provide interesting insights. For example, one might find that person A gives his first choice to B, but on the second choice B selects A. This is an example of "different level reciprocity" (see Figure 2).

Kumar and Treadwell (1985) differentiated between different levels of mutuality; for example, first level mutuality (mutual first choices), second level mutuality (mutual second level choices), and so forth. Levels of mutuality reflect the intensity of attraction or repulsion, depending on whether positive or negative nominations are called for. However, the situation becomes complex when A gives first choice to B, but on the third choice B chooses A. In such cases there is mutual attraction between the two people, but the intensity of A's feeling toward B is greater than vice versa. Kumar and Treadwell have suggested a weighting scheme to investigate the degree of mutuality. If participants are allowed three choices, the mutual first, second, and third level choices are assigned the weights of 3, 2, and 1, respectively. A first level choice reciprocated at second level is assigned 2.5 points, and so on. The authors emphasized that this weighting scheme is arbitrary, and there may be other ways of assigning weights.

Nonreciprocity of choices. These choices reflect a one-way pattern of relationships within a group. Thus, in a four-member group, person A chooses B, B chooses C, C chooses D, and D chooses A. This may also be referred to as a chain, which is typically found in the initial stages of a group formation. The number of nonreciprocal choices is usually reduced as participants get to know one another.

Subgroup formations. Subgroups are groups within groups. A subgroup consists of a smaller set of individuals who are largely connected with each other on a particular criterion of interest. A simple example of a subgroup among six members would be three pairs of mutuals. One might also consider this as an instance of a cleavage. That is, the group is sharply divided on a major issue (or issues) with no selections made across groups (Sax, 1989). In

Figure 2, Subgroup B is characterized by three mutual first choices wh connected to each other by second level choices.

A clique is another example of a subgroup that is defined in terms group of people who only select each other (see Figure 2, Subgrouj Cliques may result from cleavages (Sax, 1989). Cliques can be criterion cific or exist as stable subgroups across a variety of criteria. Thus, it is in tant that investigators clearly specify their use of the term. Treadwell Leach (1987) used the term *quasi-subgroup* to describe a subgroup that sists of members connected to each other by one-way choices. Thus, q subgroups lack mutually interactive relationships (see Figure 2, Subgrouj

Processing Sociometric Data

Computers have made the formerly laborious task of plotting sociogi by hand and computing various indices much easier. There are at least computer programs:

1. The NARSOC (Naugher Sociometric), written by Naugher (1975)
2. CompSoc (a modified version of NARSOC), written by Treadwell Leach (1987; Treadwell et al., 1993)
3. Netmap, designed by John Galloway (cited by Blake & McCanse, I'
4. Snyder, Mowgli, Assor, and Stellrecht's program for Macintosh computer (cited by Hale, 1987)
5. Group, written by Muir (1994)

The Group and CompSoc programs (both compatible with IBM PC) ai the public domain and copies can be obtained by contacting the authors. A sion of CompSoc for Windows 95, GraphPlot, has been released by Martin ton and Thomas Treadwell. GraphPlot may be accessed on and downloz from the World Wide Web (http://www.voicenet.com/~msaxton/GraphPlot

Conclusion

Sociometry, a phenomenological methodology for investigating inter sonal relationships, has been used in various research and applied setti Although there are advances being made in sociometry (see Carlson-Sal et al., 1994), the basic methods of nomination with and without ranl remain popular with investigators. Computer technology has made it poss not only to expedite data analysis but also to use sophisticated statisi analysis. The computer programs should be particularly helpful in trair students on sociometric procedures. It is possible that the availability of c puter software will provide a fresh impetus to greater use of sociometric t in research and practice.

improved assertiveness. *Journal of Clinical Psychology, 48,* 246–250.

Kipper, D. A. (1992b). Group psychotherapy through role playing. *International Journal of Group Psychotherapy, 42,* 495–521.

Kolko, D. J., & Milan, M. A. (1986). Acceptability of paradoxical interventions: Some paradoxes of psychotherapy research. *Professional Psychology: Research and Practice, 17,* 524–527.

Moreno, J. L. (1985). *Psychodrama* (Vol.1, 8th edition). Ambler, PA: Beacon House.

Moreno, J. L., & Moreno, Z. T. (1975). *Psychodrama: Vol. 2. Foundations of psychotherapy.* Beacon, NY: Beacon House.

Munley, P. H. (1974). A review of counseling analogue research methods. *Journal of Counseling Psychology, 21,* 320–330.

Papp, P. (1983). *The process of change.* New York: Guilford Press.

Remer, R. (1990). Family therapy inside-out. *Journal of Group Psychotherapy, Psychodrama and Sociometry, 43,* 70–81.

Remer, R. (1998). Chaos theory and the Hollander psychodrama curve: Trusting the process. *The International Journal of Action Methods, 50,* 51–70.

Selvini Palazzoli, M., Cecchin, G., Prata, G., & Boscolo, L. (1978). *Paradox and counterparadox.* Northvale, NJ: Aronson.

Spiegel, S. B., & Hill, C. E. (1989). Guidelines for research on therapist interpretation: Toward greater methodological rigor and relevance to practice. *Journal of Counseling Psychology, 36,* 121–129.

Strong, S. R. (1971) Experimental laboratory research in counseling. *Journal of Counseling Psychology, 15,* 215–224.

Strong, S. R., Welsh, J. A., Corcoran, J. L., & Hoyt, W. T. (1992). Social psychology and counseling psychology: The history, products, and promise of an interface. *Journal of Counseling Psychology, 39,* 139–157.

Tom, C. C. (1994). *Using process methods to recognize organized emotional patterns in EKG.* Paper presented at the American Psychological Association Annual Meeting, Los Angeles, CA.

Weeks, G. R., & L'Abate, L. (1982). *Paradoxical psychotherapy: Theory and practice with individuals, couples, and families.* New York: Brunner/Mazel.

RORY REMER is a professor in the Department of Educational and Counseling Psychology at the University in Lexington. GORDON R. BETTS is a counseling psychologist on the Bluegrass Regional Mental Health and Mental Retardation Board in Danville, Kentucky. Remer, the corresponding author, can be reached at the College of Education, 245 Dickey Hall, University of Kentucky, Lexington, Kentucky 40506-0017.

Sociometry: Tools for Research and Practice

THOMAS W. TREADWELL
V. K. KUMAR
STEPHEN A. STEIN
KEVIN PROSNICK

ABSTRACT. This article reviews basic sociometric tools and their analysis, provi information on computer programs to analyze sociometric data, and briefly examir consideration in conducting sociometric investigations.

THE APRIL 3, 1933, SUNDAY ISSUE of the *New York Times* announced t unveiling, by Jacob Moreno, of a "new science, named psychological geo raphy, which aims to chart the emotional currents, cross-currents, and und currents of human relationships in a community . . . at the scientific exhit of the Medical Society of the State of New York" ("Emotions Mapped," 17). The *New York Times* further described that "[t]he maps represent studi of attraction and repulsion of individuals within a group toward one anoth and toward the group, as well as the attitude of the group as a whole towar its individual members, and of one group toward another group" (p. 17). Moreno reportedly claimed at the Medical Society meeting, "If we get to tl point of charting a whole city or a whole nation . . . we would have an int cate maze of psychological reactions which would present a picture of a va solar system of intangible structures, powerfully influencing conduct, . gravitation does bodies in space" (p. 17).

There is little doubt that Moreno's sociometry is one of the most signi cant contributions to social and behavioral sciences given its widespre

applications in a variety of fields (e.g., developmental psychology, industrial psychology, individual and group psychotherapy, sport psychology, sociology, agricultural extension, education, government, health) to advance both research and practice (see, for example, Anshel, 1994; Breen, 1994; Buchanan, 1982; Gazda, 1982; Hinshaw & Melnick, 1995; Lee, 1991; Mouton, Blake, & Fruchter, 1960; Pareek & Singh, 1968). Scholars have viewed sociometry simultaneously as (a) a tool to gather data about relationships, (b) a tool to affect relational changes within therapeutic and work settings, and (c) a philosophy of life and living (see Mendelson, 1989).

Sociometry, in its most basic sense, can be best characterized as a collection of methods to investigate and evaluate networks of existing and preferred relationships. Specifically, sociometry is the study of interpersonal choices regarding criteria of interest to the investigator (Kumar & Treadwell, 1985). Sociometry is not a study of formal group structure (e.g., official hierarchies), rather it is a phenomenological study of people's interpersonal choices.

This article describes some of the basic sociometric tools for gathering information and analyzing data. Sociometric data may be obtained in writing or in action, as shown by a person placing his or her hand on the shoulder of a group member to display choices. The latter technique is referred to as "action sociometry" because interpersonal choices are displayed in action. The action technique is mostly used in applied settings when immediate feedback is needed.

Sociometry Tools

The basic approach in sociometric methodology is to ask participants to select individuals who, in their view, could accomplish certain tasks with (or for) them or who have specific behavioral characteristics (e.g., shyness, cooperativeness, sensation seeking, introversion, ability to lead). This method may also be used to inquire about significant others, events, pets, and objects in an individual's life (present, past, or anticipated) who make that individual's life either meaningful or miserable.

Bjerstedt (1956) differentiated between group-directed and individual-directed sociometry; Kumar and Treadwell (1985) used the terms *group-centered* and *individual-centered sociometry.* The former approach requires individuals to restrict their choices within an ongoing group; the latter allows choices from the larger community (deceased or living) to which they belong.

A third approach, "wishful sociometry," may also be used whereby individuals indicate their preference about wished-for relationships (individuals, groups, pets), objects (artwork, gifts), and activities (visit historical and cultural markers, experiment with novel ideas); (see Kumar & Treadwell, 1985; Carlson-Sabelli, Sabelli, Patel, & Holm, 1992; J. Moreno, 1953; Treadwell,

Leach, & Stein, 1993; Treadwell, Stein, & Leach, 1989). Self-selection i be allowed if needed; for example, a participant might wish to develop a l ter relationship with himself or herself (see Sywensky, Litsinger, & Treadw 1996). Wishful sociometry seems to be more commonly used in clinical pi tice than in research.

Method of Nomination Without Ranking

This method involves asking a respondent to nominate one or more in viduals (a) to perform a specific task, (b) who best reflect particular beh ioral characteristics, and (c) who he or she likes, dislikes, or feels indiffe toward (Ben-David, 1992; Bukowski, Hoza, & Newcomb, 1994). The no nation without ranking procedure does not require members to rank or their choices (e.g., first, second, third). Depending on the purposes of investigation, self-nomination may or may not be appropriate. The resp dents may be allowed to choose nominees from their community at la (individual-centered) or only the present group (group-centered).

Nomination data can be gathered in writing or by action within the contex a group. By action, group members may be asked to place their left hand on shoulder of one person and right hand on the shoulder of another person to (play their choices. Self-selection may be demonstrated by placing a hand one's own chest or forehead. Because some members are shy about be touched and touching others, it is important that action sociometry be used o after obtaining consent. The action method may be cumbersome to use when members are asked to display more than two choices simultaneously.

Method of Nomination With Ranking

This technique requires respondents to select more than one individ (usually between three and five) for a particular task, and also to rank or their preference. Nomination with ranking can be easily used as an acti method by asking members to place their left hand on a member's shoulder indicate their first choice and place their right hand on another membe shoulder to indicate their second choice. Responses are best collected in wt ing if three or more choices are to be ranked. Written responses are best if t data are to be subjected to statistical analysis.

Kumar and Treadwell (1985) pointed out that "there is no simple answer [the] question" of how many choices are to be allowed in a sociometric stu (p. 10). They recommended that in small groups of 5 to 10 individuals. mei bers may be invited to rank order all their preferences. In larger groups, allo ing only three to five choices makes data handling and analysis easier, part ularly if the data are to be used immediately in group work. J. Moreno (195

observed that either allowing unlimited choices or restricting the number of choices makes no difference in terms of who will receive the highest first choice. The unlimited choice method is useful if one wishes to assess an individual's degree of social expansiveness or social isolation.

Peer Rating Procedure

Asher, Singleton, Tinsley, and Hymel (as cited in Johnson, Ironsmith, & Poteat, 1994) had children rate how likely they would be to play with a particular peer, using a 3-point scale showing sad, happy, and neutral faces. Johnson et al. pointed out that such visual "ratings may be less objectionable to parents, teachers, and human-subjects review committees concerned about the effects of asking children to make negative verbal nominations of their peers" (p. 38).

Hayvren and Hymel (1984; see also Barclay, 1992) indicated that practitioners and researchers are "unwilling to administer negative sociometric measures . . . [that ask] . . . children to name peers whom they do not like or with whom they like to play . . . [because they] . . . would implicitly sanction the saying of negative things about others, and in fact, may cause children to view the disliked peers even more negatively" (p. 844). However, Bell-Dolan and Wessler's (1994) review of studies showed that the risk posed by participating in a sociometric study was no greater than "those encountered in everyday life. Children did not increase their negative interactions with unpopular peers, were not more socially withdrawn, and did not express feelings of unhappiness or loneliness following participation in studies that used sociometric measures" (p. 24). Nevertheless, Bell-Dolan and Wessler cautioned that because studies vary greatly with regard to various investigative procedures (e.g., consent procedures, confidentiality instructions, individual versus group administrations) "it is impossible to determine, across the board, whether sociometric procedures currently in use are ethically sound" (p. 24). Readers are referred to Bell-Dolan and Wessler's article for greater details on how risk may be minimized in sociometric investigations.

Social Atom

One of J. Moreno's (1947) most significant contributions in sociometry is the conceptualization and measurement of the social atom. The social atom signifies the smallest number of significant others (including pets, objects, groups, events) an individual needs to feel a sense of well-being, completeness, sociostasis, or social equilibrium (Hollander, 1974; Kumar & Treadwell, 1985; J. Moreno, 1947, 1953). The social atom construction can be either individual-centered or group-centered, and responses can be obtained either in written or action form.

Hollander (1974, cf. Kumar & Treadwell, 1985) differentiated among three types of social atoms: psychological, collective, and individual. According to Hollander, the psychological atom identifies those significant individuals (e.g., family members, friends, teachers, psychologists, social workers) who contribute to a person's sense of wholeness or completeness. The collective atom includes significant groups to which a person belongs (e.g., church, temple, YMCA, school, neighborhood club, gang). The individual atom includes those individuals who help the respondent maintain membership in the various groups mentioned in the collective atom. J. Moreno (1947) described a particular type of individual-centered social atom for which the respondents are asked to list their significant objects (money, clothes, books, cars) and pets; for lack of an existing term, Kumar and Treadwell (1985) designated this type of social atom as the *object atom*.

The traditional method of measuring an individual's social atom is to provide a series of concentric circles (see J. Moreno, 1960). A dot is placed in the center of a circle to represent the respondent, and several concentric circles are provided at increasing distances from the center dot. The respondent is asked to place his or her choices, using distance from the center dot as a measure of closeness. The method of concentric circles works well in ongoing groups. Even a glance at a group member's social atom can reveal conflicts with significant others that may provide themes for action in group therapy (see Kumar & Treadwell, 1986). However, such graphic displays of social atoms are not easy to analyze for research purposes. Furthermore, there are no known scoring systems for graphically represented social atoms. Consequently, their use has been limited to clinical work.

Treadwell and associates (Treadwell et al., 1989; Treadwell et al., 1993) developed the Social Network Inventory (SNI), which allows a comprehensive quantitative assessment of four social atoms: psychological, collective, individual, and ideal dream (wished-for). This instrument is designed to plot choices as well as ratings (closeness-distant) in four quadrants corresponding to each of the social atoms. The psychological quadrant allows for the inclusion of pets and objects. The inventory is formatted in four columns and allows for an unlimited number of choices.

For the psychological quadrant, respondents are asked to list the names of significant others (including objects, pets, and deceased persons) in Column 1; indicate their relationship to the person, pets, or objects in Column 2; rate their closeness on a bipolar 7-point scale ($1 = close$, $7 = distant$) in Column 3; and rate how close they think the persons and pets are toward them on a 7-point bipolar scale in Column 4 (a role reversal assessment). The instructions to complete the bipolar scale are appropriately modified for the collective and the wished-for quadrants (for example, the instruction for the collective quad-

rant is "How close are you to the group?" and for the wished-for quadrant, "How close do you wish to be to this person?").

In contrast to the traditional measurement of the social atom, the SNI provides not only qualitative but also quantitative self-report data. Furthermore, it provides for standardized administration, scoring, and mapping procedures. Treadwell et al. (1993) reported that the SNI is easily understood by the respondents.

Sociodynamic Sociometry

Carlson-Sabelli et al. (1992) and Carlson-Sabelli, Sabelli, and Hale (1994) have criticized the traditional sociometric measurement for (a) focusing on choices and ignoring why choices are made, (b) treating opposites (choice versus rejection and indifference) as mutually exclusive categories or as the opposite ends of a continuum (i.e., love and hate toward the same person can coexist resulting in push and pull processes operating simultaneously), and (c) using a linear scale whereby choices are rank ordered from least to most. Carlson-Sabelli et al. (1994) described a sociodynamic approach that uses the traditional nomination procedure (with or without ranking) along with the measurement of opposite processes of attraction and repulsion via the "plane phase of opposites"—or less technically "the diamond of opposites"—toward a person, activity, or opinion (p. 162). The diamond of opposites can be used to gather data in writing or in action. To use it in action, draw a large diamond in the center of a room and ask group members to place themselves within the marked areas of the diamond in a location that best reflects the intensity of their combined positive and negative feelings toward a significant other.

In Carlson-Sabelli et al.'s (1994) scheme, the bottom vertex of the diamond represents indifferent, neutral, or zero feelings, and the top vertex represents contradictory, ambiguous feeling characterized by intense but opposite (equally positive and negative) feeling. Thus, the area within the diamond of opposites is divided into four quadrants: (a) bottom (weak feelings of both attraction and repulsion), (b) top (strong contradictory feelings of both attraction and repulsion), (c) left (attraction), and (d) right (repulsion) (see Figure 1).

According to Carlson-Sabelli et al. (1994), the diamond can be used to prepare interpersonal profiles for a variety of criteria such as harmony-conflict, approach-avoidance, and attraction-repulsion represented as opposite axes of separate diamonds. Respondents are asked to rank order their significant others in terms of how much time the respondent (a) wishes to spend with their significant others (ideal rank order) and (b) actually spends with their significant others (actual rank order). Next, they locate their significant others by marking points in each of the diamonds (harmony-conflict, attraction-repul-
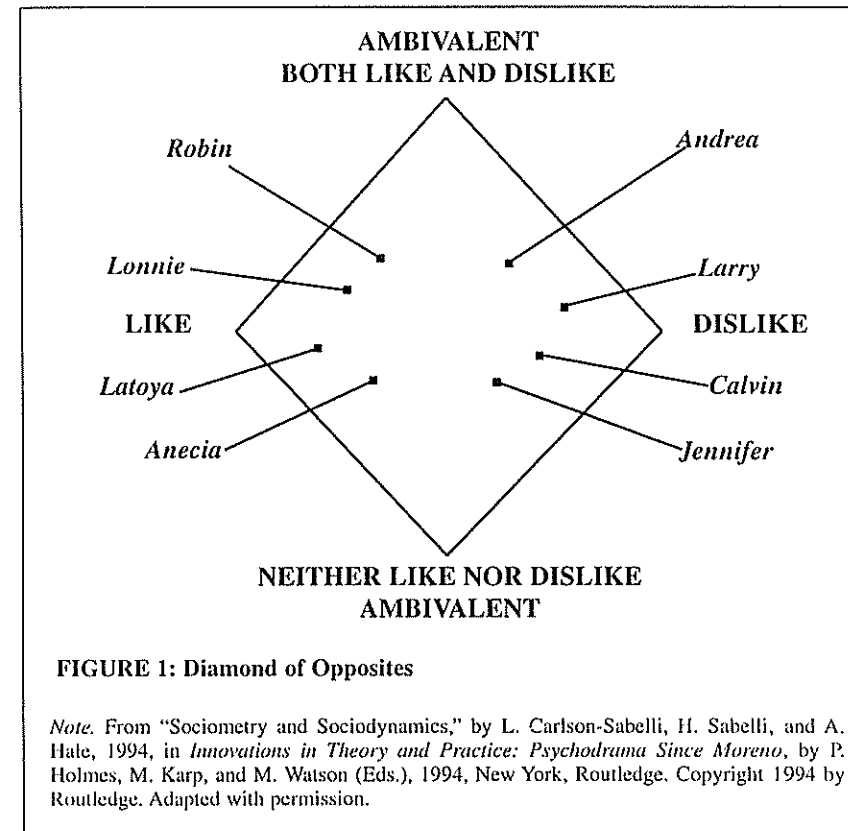

FIGURE 1: Diamond of Opposites

Note. From "Sociometry and Sociodynamics," by L. Carlson-Sabelli, H. Sabelli, and A. Hale, 1994, in Innovations in Theory and Practice: Psychodrama Since Moreno, by P. Holmes, M. Karp, and M. Watson (Eds.), 1994, New York, Routledge. Copyright 1994 by Routledge. Adapted with permission.

sion, and approach-avoidance) first to indicate the actual rank order and second to indicate the ideal rank order. Connecting the dots within each diamond provides interpersonal profiles (for criteria of interest) for significant relationships, which can then be compared. Carlson-Sabelli et al. mentioned that their approach can be used in conjunction with the SNI (Treadwell et al., 1993) to determine social distances. (See Carlson-Sabelli et al., 1992, 1994, for more information on the mathematics of the sociodynamic approach.)

Constructing Sociometry Questions

J. Moreno (1953) stressed the significance of using specific criteria in constructing sociometric questions. He defined a criterion as "the common motive which draws individuals together spontaneously, for a certain end [italics in original]" (p. 97). He also differentiated between diagnostic and action crite-

ria, although the former can be transformed to the latter. Questions using diagnostic criteria seek existing information, for example, "With whom do you go out to movies?" This question does not call for action, as in the case of the question, "Whom would you select to lead the group for the next hour?"

According to J. Moreno (1953), sociometric questions need to be differentiated from near-sociometric questions. Sociometric questions have the following four characteristics (Kumar & Treadwell, 1985, p. 3):

1. The questions attempt to determine interpersonal feelings (attraction, repulsion, indifference) in relation to an explicit criterion.

2. The criterion used is specific and action-oriented and not hypothetical, projective, or ambiguous.

3. When asked within the context of a group, the questions should serve an immediate group goal, such as for group warm-up or identifying roles (mother, father, brother, lover) for different individuals in the group or for subgroup structures, or a group theme for action (Treadwell, Stein, & Kumar, 1988).

4. The questions must specify whether or not choices can be made outside the group (J. Moreno, 1953; Z. Moreno, 1984, personal communication, cited in Kumar & Treadwell, 1985).

Near-sociometric questions use ambiguous, hypothetical, or projective criteria (e.g., "Who are you most comfortable with in the group?" or "Who in the group is most like yourself?" For additional examples, see Kumar & Treadwell, 1985).

Although the distinction between near-sociometric and sociometric questions is important, J. Moreno (1953) pointed out that the "sociometric procedure is not a rigid set of rules, but it has to be modified and adapted to any group situation as it arises" (pp. 101–102). Thus, both types of questions are helpful when leading groups. Near-sociometric questions may be particularly helpful in conducting warm-ups before moving to more specific task-oriented sociometric questions. The use of near-sociometric questions in research may lead to unreliable results because they are open to multiple interpretations by respondents in answering such questions.

In traditional sociometric investigations, certain key phrases are used to request nominations: "select a person," "choose a person," or "which person in the group . . ." Furthermore, the nomination requests may be worded to tap positive (select a person to work with) or negative (name the person that you do not wish to work with) feelings toward a person, activity, or belief. Kumar and Treadwell (1985) noted that phrasing questions to tap positive feelings may be preferred generally in action sociometry, because action makes the results obvious to the group members. A negative question requires deliberate rejection and may be threatening both to the choosers and to those chosen. In contrast, a positive question requires deliberate selection and, consequently, not being selected may not only reflect a lack of feeling rather than a well-

developed negative feeling. Feelings of deliberate rejection may cause unnecessary conflict within a group. On the other hand, negative questions may b helpful in locating problem situations to be resolved by the group (Bjersted 1956; Kumar & Treadwell, 1985). In the context of action sociometry, Kuma and Treadwell also suggested avoiding broad ambiguous questions (e.g "Who do you like most in the group?"), personality trait questions (e.g., "Wh in this group is most androgynous?"), and ego-threatening questions (e.g "Who is the most resistant member in the group?").

Whether one uses positive or negative questions in action sociometry, it i important to educate the group members before implementing sociometr regarding (a) different types of sociometric questions, (b) the four features c sociometric questions, and (c) the proper interpretation of selection decision (i.e., inform participants that not being selected does not imply rejection, an that selections are criterion-specific, not generalizable to other criteria).

In summary, while constructing sociometric questions, either for researc or for action purposes, it is important to ask the following questions (Kuma & Treadwell, 1985):

1. Is the question relevant to the goals (or stated hypothesis) of [the] inves tigation? What I am trying to measure, and why?

2. Is the question a sociometric question? Is the question open to multipl interpretations?

3. Does the question specify whether or not choices can be made to peopl outside of the group?

4. Is the question realistic?

5. Is the question timely? Are the data immediately usable for action pur poses within the context of a group?

6. Is the question potentially threatening to any one in the group?

Administering the Sociometric Instrument

Sociometric questionnaires are relatively easy to construct and administe A simple sociometric instrument contains (a) statements (or questions) re questing one or more nominations for a particular purpose, and (b) blank line to indicate one or more nominations. If the nominations are to be ranked, th blank lines may be prefixed by the phrases Choice 1, Choice 2, Choice 3, an so forth. (See Appendix for an example of a sociometric form.)

Some general guidelines, which readers might find helpful, for implemen ing a sociometric study are the following:

1. Regardless of whether the sociometric investigation is for research c clinical work, it is important to prepare a clearly stated informed conser form. For research, the informed consent form should include (a) a clear statc

ment for why such data are being collected, (b) an assurance that data will be held in strict confidence, and (c) a request that participants not share their choices with others or to make them public (see Bell-Dolan & Wessler, 1994 for more information on consent-assent procedures, especially if participants are children and minors).

2. For group work, the informed consent form should (in addition to what was previously mentioned) require group members to treat sociometric data as privileged information not to be divulged to outsiders. If action sociometry is to be implemented, the consent form should state that certain exercises involve touching other group members. If group process is being videotaped, the informed consent form must also be signed by camera- and videotaping-technicians. Furthermore, if videotapes are sent home for evaluation by group members, the informed consent form should include an agreement that no one else, other than the group members, will view the tapes.

3. For research with small groups (15 to 20 individuals), data, if needed, can be collected anonymously by handing participants a sheet with names and identification (ID) numbers. If two people have the same name, nicknames may be assigned and made known to all participants along with the corresponding ID numbers. The participants are instructed to use only the ID numbers in reporting their nominations.

4. Completion of sociometric instruments at home is not recommended because members may compare answers or not complete the questionnaires in time.

5. In ongoing groups, it is important to recognize that sociometric data are highly personal, and being chosen or not chosen might be emotionally unsettling to some participants. Thus, the first one or more sessions should be spent educating group members about the nature of sociometry and how it will be used to facilitate group process to improve interactions among group members.

6. For general research guidelines, refer to the ethical guidelines published by the American Psychological Association (1992) and the Association for Specialists in Group Work (1990).

Analysis of Sociometric Data

Sociometric data provide a large amount of information about the nature of interactions within a group. Some of the basic sociometric indices commonly used by investigators to understand structural aspects of groups are reviewed here.

Analysis of Individual Status

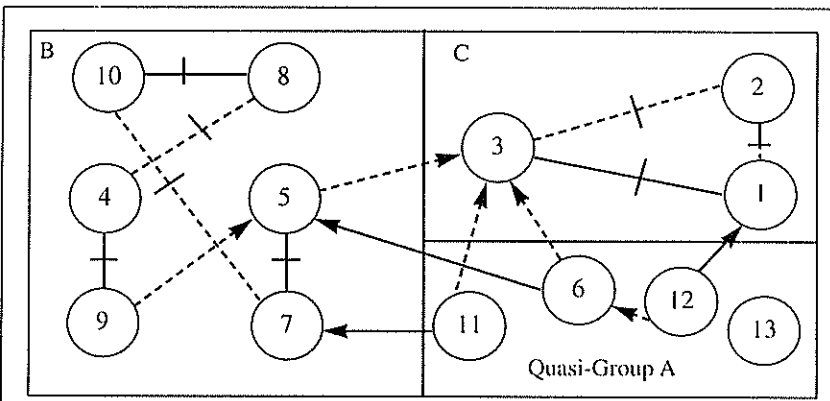*Positive stars and isolates.* The terms *positive stars* (described as stars of attraction in J. Moreno, 1953, p. 508) and *isolates* are used to identify the most and least popular individuals within a group when participants are as[k] positive criterion questions (e.g., "With whom would you like to associate' A positive star is an individual who receives the largest number of selecti[on] on a specific criterion of interest when using the nomination procedure w[ith] out ranking. When choices are rank ordered, then a positive star would be [the] most popular individual on the tabulation of the first choice. Of course, a [dif]ferent star may emerge on the second or the third choice.

An isolate is one who chooses, but receives no choices (see Figure 2, S[ee] group A). A less commonly used term in the literature is a *true isolate*—individual who refuses to choose and who is not chosen (see Figure 2, S[ee] group A; Jennings, 1950). There is no appropriate term for a person w[ho] refuses to choose, but is chosen (e.g., a person is elected as a positive star, [but] this individual refuses to choose). Future research may evaluate the signi[fi]cance of such individuals in group processes.

Kumar and Treadwell (1985) suggested that isolates and stars are best c[on]ceptualized as characteristics that occur in degree. Thus a person is more [or] less an isolate or a star—zero isolation would mean star status (chosen [by] everyone), whereas 100% isolation would imply no one has selected the in[di]vidual (the two extreme ends of a continuum). Conceptualizing the star–iso[lation] characteristic as a continuum allows the investigator to classify m[ore] than one individual as popular or isolated within a group. This conceptuali[za]tion is consistent with Bronfrenner and Carver's (cited by Criswell, 19[ ]) methods of using cut-off points to select group members who are "conside[red] to be overchosen, and the point below which an individual is underchosen [or] socially neglected" (p. 210).
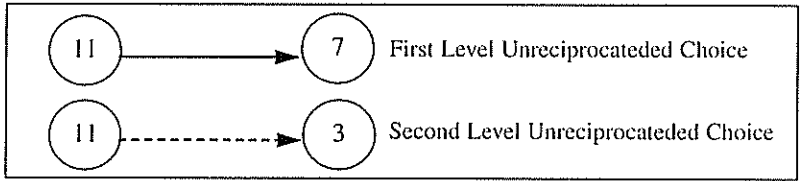
Positive stars are pivotal individuals who can link group members to f[orm] coalitions to provide leadership on a particular task. Kumar and Tread[well] (1985) suggested that the term *leader* be used for an individual who emer[ges] as a star on many different criteria; such an individual may be elected by [the] group to be its representative or to serve as the main officer (e.g., preside[nt]). For lack of a suitable term, a person not chosen on multiple criteria may [be] designated as a *general isolate.*

Brusa, Stone, Beck, Dugo, and Peters (1994) have defined four types [of] leaders in therapy groups: (a) task leader—one who "influences norm dev[el]opment, goal clarification, style of communication, and many other dim[en]sions of group life," (b) emotional leader—"the best-liked person and the m[ost] important support person to other members," (c) scapegoat leader—"often [an] object of attack or nonverbal negative feelings from group members," and [ ] defiant leader—"who openly expresses an ambivalence about participation [in] group" (pp. 82–83). (See Brusa et al., 1994 for a sociometric test to identi[fy] these different types of leaders.)

Key to Sociogram

One-way Choice

First Level Unreciprocateded Choice

Second Level Unreciprocateded Choice

Mutual Choice

Mutual Choice, 2nd Level for Subject #3
2nd level for Subject #2

Mutual Choice, 1st Level for Subject #2
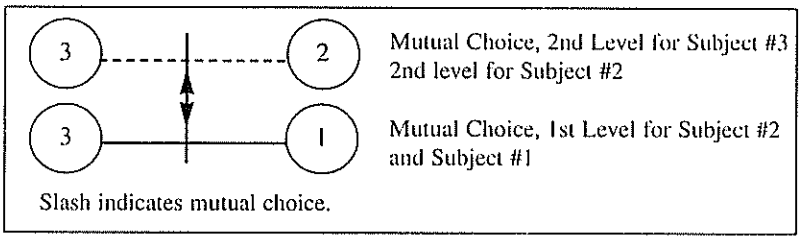and Subject #1

Slash indicates mutual choice.

FIGURE 2: Sociogram Depicting Group Structure

Negative stars. The most frequently chosen individuals on a negative crite-rion question (e.g., "With whom you would not like to associate?") are called negative stars (J. Moreno, 1953, p. 508, described them as "stars of rejec-tion"). However, there seems to be no appropriate term for the least chosen individuals on a negative criterion question. Such individuals are not isolates in the sense of being excluded from the group. If one defines isolation in terms of exclusion from a group, then by definition a star of rejection must be an iso-

late who will be excluded from an activity. Edwards (1960) defined an isolate "as one who receives only 'neutral' or 'dislike' choices" (p. 220).

Negative stars are equally as influential as positive ones, because they may affect the group's direction and cohesion. Negative stars should not necessar-ily be perceived as negative, because, like positive stars, they can exert their pressure to balance group functioning.

Other methods of classifying individual status. Peery (1979) developed a procedure for identifying from nomination data four types of individuals: pop-ular, amiable, rejected, and isolated. His procedure requires the participants to make nominations on both positive (like most) and negative (like least) criteria. The total number of positive (p) and negative (n) votes are then used to com-pute two indices: social impact is the sum of p and n votes (p + n) and social preference is the difference between p and n votes (p – n). Using the mean scores on two variables as the point of intersection between the two variables, one can identify the four types suggested above: (a) popular–high social impact (above the mean on both p and n); (b) amiable–positive social preference, but low social impact (above the mean on p but below the mean on n); (c) reject-ed–negative social preference but high social impact (above the mean on n but below the mean on p), and (d) isolated (below the mean on both p and n).

Coie, Dodge, and Coppotelli (1982) used Peery's method of computing social impact and social preference scores to divide the individuals into six types: popular, rejected, neglected, controversial, average, and other. Their method of classification involves first tabulating frequencies of positive (p) and negative (n) nominations and converting them into standard (Z) scores. A social preference (SP) is then defined as the difference between standardized p and n scores. A social impact (SI) score is defined as sum of the standard p and n scores. Each person is then classified into one of six categories using the following cut-off points:

1. Popular: SP > 1.0, p > 0, and n < 0
2. Rejected: SP < −1.0, p < 0, and n > 0
3. Neglected: SI < − 1.0, p < 0, n < 0
4. Controversial: SI > 1.0, p > 0, n > 0
5. Average: SP between −0.5 and 0.5, SI between −0.5 and 0.5
6. Other: all remaining individuals

Coie et al.'s (1982) method has been used in several studies (Asher & Dodge. 1986; Hinshaw & Melnick, 1995).

Analysis of Interactional Patterns

The previous section presented an analysis of status or relative position of an individual within a group. This section focuses on analyzing interactions

among members to discover mutuality or reciprocity of choices, nonreciprocity of choice, and subgroup formations (cleavages and cliques).

Mutuality of choice. A mutual (reciprocal) choice is one in which two people select each other on a given criterion. In an ongoing group, identification of mutual choices is often helpful in forming teams, making role assignments within the team (e.g., to serve as initiator, gatekeeper, provider of support). Mutual choices on positive and negative nominations may be called positive and negative mutuality reflecting mutual acceptance and rejection respectively.

In nomination procedures by which people rank order their choices, analysis, although cumbersome, may provide interesting insights. For example, one might find that person A gives his first choice to B, but on the second choice B selects A. This is an example of "different level reciprocity" (see Figure 2).

Kumar and Treadwell (1985) differentiated between different levels of mutuality; for example, first level mutuality (mutual first choices), second level mutuality (mutual second level choices), and so forth. Levels of mutuality reflect the intensity of attraction or repulsion, depending on whether positive or negative nominations are called for. However, the situation becomes complex when A gives first choice to B, but on the third choice B chooses A. In such cases there is mutual attraction between the two people, but the intensity of A's feeling toward B is greater than vice versa. Kumar and Treadwell have suggested a weighting scheme to investigate the degree of mutuality. If participants are allowed three choices, the mutual first, second, and third level choices are assigned the weights of 3, 2, and 1, respectively. A first level choice reciprocated at second level is assigned 2.5 points, and so on. The authors emphasized that this weighting scheme is arbitrary, and there may be other ways of assigning weights.

Nonreciprocity of choices. These choices reflect a one-way pattern of relationships within a group. Thus, in a four-member group, person A chooses B, B chooses C, C chooses D, and D chooses A. This may also be referred to as a chain, which is typically found in the initial stages of a group formation. The number of nonreciprocal choices is usually reduced as participants get to know one another.

Subgroup formations. Subgroups are groups within groups. A subgroup consists of a smaller set of individuals who are largely connected with each other on a particular criterion of interest. A simple example of a subgroup among six members would be three pairs of mutuals. One might also consider this as an instance of a cleavage. That is, the group is sharply divided on a major issue (or issues) with no selections made across groups (Sax, 1989). In

Figure 2, Subgroup B is characterized by three mutual first choices who are connected to each other by second level choices.

A clique is another example of a subgroup that is defined in terms of group of people who only select each other (see Figure 2, Subgroup C Cliques may result from cleavages (Sax, 1989). Cliques can be criterion-specific or exist as stable subgroups across a variety of criteria. Thus, it is important that investigators clearly specify their use of the term. Treadwell and Leach (1987) used the term *quasi-subgroup* to describe a subgroup that consists of members connected to each other by one-way choices. Thus, quasisubgroups lack mutually interactive relationships (see Figure 2, Subgroup A).

Processing Sociometric Data

Computers have made the formerly laborious task of plotting sociogram by hand and computing various indices much easier. There are at least five computer programs:

1. The NARSOC (Naugher Sociometric), written by Naugher (1975)
2. CompSoc (a modified version of NARSOC), written by Treadwell and Leach (1987; Treadwell et al., 1993)
3. Netmap, designed by John Galloway (cited by Blake & McCanse, 198
4. Snyder, Mowgli, Assor, and Stellrecht's program for Macintosh 51 computer (cited by Hale, 1987)
5. Group, written by Muir (1994)

The Group and CompSoc programs (both compatible with IBM PC) are the public domain and copies can be obtained by contacting the authors. A version of CompSoc for Windows 95, GraphPlot, has been released by Martin Sa ton and Thomas Treadwell. GraphPlot may be accessed on and download from the World Wide Web (http://www.voicenet.com/~msaxton/GraphPlot).

Conclusion

Sociometry, a phenomenological methodology for investigating interpersonal relationships, has been used in various research and applied settings Although there are advances being made in sociometry (see Carlson-Sabe et al., 1994), the basic methods of nomination with and without rankin remain popular with investigators. Computer technology has made it possib not only to expedite data analysis but also to use sophisticated statistic analysis. The computer programs should be particularly helpful in trainin students on sociometric procedures. It is possible that the availability of con puter software will provide a fresh impetus to greater use of sociometric too in research and practice.

The International Journal of Action Methods

Psychodrama, Skill Training, and Role Playing
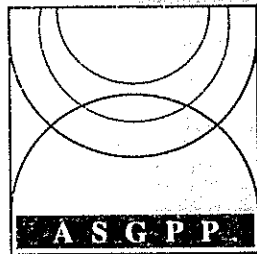
ASGPP

FOUNDED IN 1942

For more information,
call or write:

ASGPP
301 N. Harrison, #508
Princeton, NJ 08540
(609) 452-1339

The American Society of Group Psychotherapy & Psychodrama is dedicated to the development of the fields of group psychotherapy, psychodrama, sociodrama, and sociometry, their spread and fruitful application.

Aims: to establish standards for specialists in group psychotherapy, psychodrama, sociometry, and allied methods; to increase knowledge about them; and to aid and support the exploration of new areas of endeavor in research, practice, teaching, and training.

The pioneering membership organization in group psychotherapy, the American Society of Group Psychotherapy and Psychodrama, founded by J. L. Moreno, MD, in April 1942, has been the source and inspiration of the later developments in this field. It sponsored and made possible the organization of the International Association on Group Psychotherapy. It also made possible a number of international congresses of group psychotherapy. Membership includes subscription to *The International Journal of Action Methods: Psychodrama, Skill Training, and Role Playing*, founded in 1947 by J. L. Moreno as the first journal devoted to group psychotherapy in all its forms.