# The Measurement of Personal Influence in Organization and Community

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ABSTRACT

Discussions of personal influence in situations in communities and organizations are ordinarily abstract and theoretical. In this paper, a practical method for the measurement of influence in interactional terms is developed. The approach combines the use of Likert scales, sociometric techniques and a simplified version of "blockmodeling" using mathematical matrices. The method is outlined using a hypothetical social service agency with a seven-member staff.

Introduction

Despite the interests of its founder, the late J.S. Moreno, in social reform, the practice of sociometry has not made substantial inroads in the thinking of social practitioners in the post-war period.[1] It is the purpose of this article to outline a procedure, based upon sociometric methods of data collection and an analytic method using matrices first suggested by Festiger in 1945, to measure personal influence in social situations in communities and formal organizations. This problem of influence is central to the on-going concerns of those Moynihan has characterized as "professional reformers."[2] Thus, any procedure which addresses this central issue should have intrinsic interest and potential significance for these applied social scientists operating as "change agents" in various community and organizational settings.

## Problem

Considerable progress has been made in recent years in social science handling of the seemingly intractable problem of power and its correlates.[3]  Of particular interest to this article have been the efforts of a group of "behavioral" political scientists to forego the concept of power, in favor of the more definable, observable, and behaviorally measurable concept of "influence."[4]  In general, however, these efforts have not sought to go beyond the definitional and observational question to the equally interesting issue of the quantitative measurement of personal influence.

Influence can ordinarily be seen as a situational and interpersonal emergent of strategic interaction.  The exercise of influence involves interpersonal behavior in which interactants have agendas of motives and intentions which may or may not be apparent to others.  In such interactional episodes, one party to the encounter can ordinarily be assumed to have included within a vocabulary of motives an intent to change, reinforce, clarify, or in some other way affect, the behavior or the attitudes of the other, or of observers who are also parties to the situation.  In many influence situations, all interactants may be seeking to influence each other, simultaneously.  Two possible exceptions must be noted here, since they require separate treatment:  One involves the situation in which one party to an interaction is unintentionally influential upon another; for example, the eminent public figure whose "casual conversation" with a young person aids the latter in making a career choice.  Such cases often involve status differences or other situational characteristics which convince one of the interactants to only partially reveal the "true" impact of the interaction to the first, thus obscuring the latter's view of the situation.  The second case involves the special situation in which both interactants are seeking to influence the "audience" of observers rather than one another.

Communication is an underlying social process basic to all efforts at influence--whether they involve face-to-face encounters or mass communications.[5]  Although the exact relationships involved in the communication of influence on either level are not entirely clear,

certain fairly standard configurations have been identified. Dahl, for example, says that most authorities agree on the following bases of influence: 1) money and credit; 2) control over jobs; 3) control over the information of others; 4) social standing; 5) knowledge and expertise; 6) popularity, esteem, and charisma; 7) legality, constitutionality; 8) ethnic solidarity; and 9) the right to vote.[6] In other words, any person or group who could be rated high on any one of these dimensions would ordinarily be regarded as more influential than a person or group rated low.

Two major issues are immediately raised by this "resource" conception as a basis for the measurement of influence. The first is the question of "weighting": in situations involving two or more of these categories of potential influence, how are we to consider their relative effects. How much influence, based upon contol over jobs, equals how much influence based upon social standing? This is a problem which is not immediately solvable at present, and as a result, the method outlined here will seek to avoid the weighting problem entirely. Rather than relying upon a weighting scheme, which would be itself dependent upon the establishment of an "objective" criterion or scale, the method outlined here relies explicitly upon the informed judgements of those actually involved. It is, in that sense, an "intersubjective" rather than an "objective" measure of influence, and should be recognized as such.[7]

The second major problem raised by the current understanding of influence involves the question of interpretation of the configuration of influentials and influences in situations involving more than two persons. The most widely discussed examples of such situational regularities in community and organizational studies respectively are the concepts of "power structure" and "formal organization", usually represented as heirarchies of roles or positions.[8] Students of influence have generally been highly critical of the concepts of power structure and formal organization, but have generally left unanswered the question of what, if anything, a large number (or, more correctly, sequence) of influence-interactions "add up to." One of the major problems, of course, is the great likelihood that in reality, such "chains of influence" do not correspond very closely with the neat, logical and symmetric "structures" of a formal heirarchy implied by both the models of power structure and formal organization. (See Figure 1)

The question of a measurement approach for influence will be dealt with through the use of a rather loose concept of "influence networks" consisting of sequential influence-interactions in a fixed time period. Use of the term "network" here is intended to convey a sense of the great likelihood of a large number of different sequential combinations of influencing--some "structured" (or "systematic") and others merely episodic and situation-specific.

The method outlined below appears to have very interesting, practical possibilities as a "data collection" or "intelligence gathering" technique for planners, decision-makers and others for whom information about the distribution of influence is a matter of importance. For such actors, the existence and unique structure of an influence network is a highly problematic concern. Although the necessary conceptual simplifications detailed in this presentation are primarily to facilitate purity, the method itself may be rendered more sophisticated and useable quite readily. At present, the single greatest conceptual simplification necessary in the study of influence would be the assumption of an "open" awareness context in which everyone involved is more or less aware of the efforts at influence of others in the situation.[9] Needless to say, a closed context is infinitely more difficult to collect valid, reliable data on. However, the possibilities for use of this approach in relatively open contexts--such as small towns or small social agencies of the type discussed below--should not be minimized.

Methodology Overview

In the following pages, a procedure is set forth for ascertaining the existence of networks of influence in social situations, for determining the structure of such networks, and for estimating fluctuations in the strength of influence "flowing" from person to person through the network. The measurement procedure itself is grounded in the mathematics of matrices (matrix algebra), although it is not necessary for us to venture far into that domain in order to establish the case for the procedures employed here.

The basic elements, or tools, employed in this method will be a square matrix sufficient to record the entire set of interactions relevant to a situation as a set of diads. Each actor, whether person or organization, is represented by a unique row and column of the

matrix.[10] The second basic tool is a scaled questionnaire or other
data collection instrument suitable for generating at least ordinal
(and, preferably interval or ratio level) data.[11] In the more sophis-
ticated approaches mentioned above, practitioners may substitute
various unobtrusive measures for the questionnaire. We shall begin
our investigation with the questionnaire, and use the matrix to analyse
data which are generated. Conceptually, preparation of the question-
naire and the matrix go hand in hand, since the size of the matrix also
determines the population to whom the questionnaire will be distributed.
The question of sampling in this context becomes extraordinarily complex
and difficult; and therefore, we shall assume throughout that the
questionnaire will be administered to a 100 percent sample--to all the
relevant parties to the situation.

## Situation

For purposes of illustration, let us assume that we wish to assess
the patterns of influence in a small social agency. Assume, for
example, a seven-person staff (say, in a small clinic, family service
agency, or the like) consisting of a director, assistant director, and
five service workers each with clearly defined responsibilities. One
works only with small children, one with alcoholics, one with adoles-
cents, etc. We shall be concerned immediately with the problem of
determining whether these staff members attempt to influence one
another (generally or in specific situations), the overall pattern of
influence exerted, and the level of influence exerted or attained by
each person involved.

Immediately, we face one of the crucial questions in the measure-
ment of influence: Do we wish to determine the exact influence
applied in a given set of interactions (when a new client sought help
from the agency last Tuesday) or to estimate generally the "influence
position" of various persons engaged in recurrent interaction? The
question of influence-in-general, is essentially an exercise in his-
torical prediction, so that we must recognize from the very start a
certain tentative nature to such predictions. Consequently, we are
most often likely to employ this approach in specific situations,
where some possibility of generalizing exists.

Let us assume what is a fairly typical case in organizations: One of the staff members (call her Carol) has proposed an innovation in the staff operation (say, proposing a new "program" of services to the board of directors).[12] A second staff member (call him James) has learned of the proposal, and countered with a second proposal that a different program be submitted to the board at its next meeting.

The issue of which of the two proposals to submit must be resolved by the director (Stan) since it is his responsibility (recognized by all concerned) to prepare the agenda for board consideration. Moreover, he has decided to submit only one for reasons of his own. The problem he faces is a classic decision problem: On what basis is he to choose among alternatives? The problem facing the others in the situation (the Assistant Director, Tony, and the other three service workers, Eunice, Steve, and Bette) is a different one, however. If the question is momentous for example, or even if it is not, they may not wish to commit themselves to a losing proposition. On the other hand merely as speculation, they may wish to guess how things will come out. From their vantage point (and ours), it seems unlikely that the issue will be resolved solely on rational grounds. For one thing, they obviously cannot "enter his mind". Also, as is often the case, there is no clearcut evidence upon which to determine that one or another of the proposals is superior. If anything, this is an "apples and oranges" problem; there are no clearcut criteria for settling the matter on its merits. It seems likely, therefore, to all parties and most observers, that the question will be resolved through the exercise of influence. (In that, it is a very common organizational problem indeed!) Thus, if we can determine the predominant patterns of influence, we can predict the likely outcome: If Carol has been very popular with the director (call him Stan), as well as highly regarded in the community for her expertise, and Jim has not, but has instead been regarded as something of a crank, tolerated only because he will be retiring in four years, the influence question may be fairly straightforward. Popularity, reputation, and expertise, are afterall, important sources of influence according to the literature.[13]

By contrast, if our assessment (and the assessments of Tony, Eunice, Steve, and Bette) has it that Carol and Jim are quite evenly matched in their influence with Stan the question becomes a dead-heat.

Uncertainty prevails, and we shall just have to wait and see. It is in situations such as this that the influence-measurement methodology suggested above may be most useful: cases in which decisions are to be made based upon influence, and where grounds for rational choice among alternatives are unclear. For the matrix procedures outlined should allow us to take two important steps:

1.  First, to test the hypothesis that Carol and Jim are about even in their influence with Stan.

2.  To systematically assess other patterns of influence involved in this situation. In particular, we shall be interested in the influence of the non-participants in this situation (Tony, Eunice, Steve, and Bette) and the indirect influence potential through them for Carol and Jim, respectively, to affect Stan.

To begin with, then, we shall visualize the situation involved in terms of a 7 by 7 square matrix like the following one:

Figure 1

|        | Stan | Tony | Eunice | Carol | Steve | Bette | Jim |
|--------|------|------|--------|-------|-------|-------|-----|
| Stan   |      | X    |        |       |       |       |     |
| Tony   |      |      | X      | X     | X     | X     | X   |
| Eunice |      |      |        |       |       |       |     |
| Carol  |      |      |        |       |       |       |     |
| Steve  |      |      |        |       |       |       |     |
| Bette  |      |      |        |       |       |       |     |
| Jim    |      |      |        |       |       |       |     |

The conceptions we shall employ here are that each box or cell of this matrix shows a single possible influence diad between two staff members. The cells read horizontally indicate the effects of a single staff member upon each of the others, while reading the cells vertically reveals the total set of influences upon a given staff member.

Figure 2

Agency As A Heirarchy

Stan

Tony

Eunice    Carol    Steve    Bette    Jim
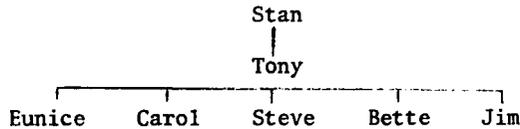
For purposes of illustration, the "x" in the above table illustrates the assumption of the classic heirarchy hypothesis of organization theory shown in Figure 2. It is assumed, in this case, that on any given matter, Stan (and only he) "influences" Tony and Tony influences the remaining five staff members.

Reproduction of matrix of this type is often a complex and difficult business, however. We may convey essentially the same information in a slightly revised format (called a "blockmodel") simply by constructing the matrix with a "0" in an empty cell and a "1" in a cell where a relationship exists. In this form, the above heirarchy is shown as follows:[14]

```
0100000
0011111
0000000
0000000
0000000
0000000
```

The matrix approach has the effect of abstractly separating the "influences upon" each person from the "influences exerted" by that person allowing determination of the direction of influence. Such

directionality is one of the most desirable features of the matrix
method, as we shall see below.  It provides us with a reasonable means
of constructing serial or "chain" effects of influence.  It is not
always desirable, however.  We cannot, for example, identify "barriers"
in the influence system.  Nor are we always able, using this blockmodel
to zero in on the exact "pressure points"; those persons who are most
central to the influence patterns involved.  One very handy way of
getting at each of these is through the use of the matrix transpose. The
transpose of any matrix is defined as the matrix which is attained by
substituting rows for columns and vice versa.  The transpose of the ma-
trix above, for example, is:

                        0000000
                        1000000
                        0100000
                        0100000
                        0100000
                        0100000
                        0100000

     By subtracting this transposed matrix from the original, as
follows, we get an estimate of the "net effect" of influence.  Positive
values indicate the exertion of influence, negative numbers indicate
"receipt" of influence and zeros in this case may be either no influence
or (as we shall see below) a neutralization or cancelling of effects:

                        0 100000
                        -1 011111
                        0-100000
                        0-100000
                        0-100000
                        0-100000
                        0-100000

     Examination of the rows and columns of this matrix using these
conventions confirms what we hypothesized above:  The director alone
is involved in influence efforts (the rest of the cells are empty)
through the assistant director, and the negative numbers suggest that
there is no active resistance (counter-influence efforts) from those

being influenced.  Subtraction of a transpose from a matrix, then, is a practical means of assessing "net influence" in situations.

We can identify the various "pressure points" involved in a situation by addition.  By summing the rows and columns of the original matrix, we are able to estimate total influence exerted, and total influence upon, each person respectively.  Thus, in our example, summing the rows reveals that the director influences one person; the assistant director five and each of the other staff members none; while the director is influenced by no one; the assistant director by the director only; and each of the other staff by one person (the assistant director). Major questions of transitivity arise with this procedure when an interval scale (such as the one employed below) is substituted for the nominal scale used here.  Can we suggest, for example, that a row or column score of 26 is "twice as much" influence as a score of 13? Great care is needed in interpretation of the results.

An interesting possible interpretation at this level is to compare row or column totals with the total score attained by summing row totals (a "column vector") and column totals (a "row vector") as in the following:

$$
\begin{array}{c|c}
0100000 & 1 \\
0011111 & 5 \\
0000000 & 0 \\
0000000 & 0 \\
0000000 & 0 \\
0000000 & 0 \\
0000000 & 0 \\
\hline
0111111 & 6
\end{array}
$$

By converting either row or column totals to percentage ratios of the total, this figure provides us with a crude index of the approximate "centrality" of each figure in the influence effort.

$$
\begin{array}{c|c}
 & .16 \\
 & .84 \\
 & 0 \\
\overline{0.16.16.16.16.16.16.} & 0 \\
 & 0 \\
 & 0 \\
 & 0
\end{array}
$$

For example, there were a total of six interaction diads in the classsic heirarchy, and the assistant director was involved (as influencer) in five of them.  Clearly, he is a very influential figure in this situation as viewed from the vantage point of the classic heirarchy approach.  Instead, receipt of influence is uniformly distributed among participants.  They also suggest, interestingly enough, that the director is only as influential as the rest of the staff, while the assistant director looms large.

Let us try, now, to apply these insights using the blockmodel approach to a situation more real than that represented by the classic heirarchy hypothesis.  Essentially, this involves speculation about the presence or absence (as well as the direction) of an influence relationship in each of the 49 diads suggested by our matrix.  Assume, for example, that the director considers it part of his responsibility to attempt to influence each of the staff on important questions.  We may show this in the blockmodel as a row vector as follows:

0111111

(Assuming, of course, that the issue of his influencing himself is moot, and therefore inserting a "0" in the diagonal--an assumption also followed in the other cases.)

The assistant director, in turn, may be less uniformly influential.  Assume, for example, that he is more popular with the women than with the men staff members and as a result more likely to exert influence upon female staff members in this situation.  That would produce the following row vector:

0011010

Staff member Eunice, in turn, is part-time and generally unconcerned about matters of agency governance.  In this (and most) situations, she can be counted on to attempt to influence no one:

0000000

Carol, on the other hand, will at least make an effort (leaving aside for the moment, how effective or strong) to influence everyone:

1111111

Steve is a staff member whose influence is asymmetric with Tony's. That is, he ordinarily avoids the female staff members as much as he possibly can, and therefore can be counted upon to influence only the males on the staff.

1100001

Bette has a classic, heirarchical vision of the organization, and therefore she sees no need to influence anyone other than Stan and Tony:

1100000

Finally, Jim, as the author of the counter-proposal can likewise be counted upon to attempt to influence everyone:

1111111

Putting all of these assumptions together, then, we get the following configuration (including column and row totals).

```
0111111 6
0011010 3
0000000 0
1111111 7
1100001 3
1100000 2
1111111 7
4544344 28
```

Through this procedure then, we have estimated that there will be a total of 28 influence-diads in this situation, and that in terms of efforts to influence, the key actors are likely to be Carol and James, the authors of the proposals and Stan, the director. Nothing surprising there! However, we have confirmed that this approach is apparently faithful to our assumptions. When we examine the column

totals, however, it is mildly surprising to learn that more attention (measured in diads) will be devoted to Tony, the assistant director, than to any other staff member!  Further, even though we have said that Eunice plays no active role in agency affairs, it appears she will probably receive as much attention in influencing efforts as Stan, Carol, Bette, and Jim; while Steve, as a price for avoiding the female staffers, will likely receive less attention than anyone else on the staff.

Now, to test for "net influence" let us subtract our matrix from its transpose as follows:

```
0111111       0001111        0 11 0 00 0 | 2
0011010       1001111       -1 01 0-10-1 |-2
0000000       1101001       -1-10-1 00-1 |-4
1111111   -   1101001   =    0 01 0 11 0 | 3
1100001       1001001        0 10-1 00 0 | 0
1100000       1101001        0 00-1 00-1 |-2
1111111       1001101        0 11 0 01 0 | 3
                                         _____
                            -2 14-2 02-3   0
```

Based upon this calculation, we can make several predictions about the "net effect" of influence in this situation. The first is the presence of an equilibrium of influence exerted and received in the sense that the total sum of influence is zero.  This is less important, however, than the fact that an estimate of the net sum of influence exerted upon each person can apparently be derived in this manner.

Secondly, we can make certain other predictions about individual participants based upon these data.  For example, by defining the direction of the values of the resultant matrix as indicative of whether or not each participant in a diad attempted to influence the other without an effort at counter-influence (1), was influenced without countering (-1) or engaged in mutual efforts at influence (0) we can identify the likely influentials in this situation.

Further, by one additional step (subtraction of the "total" row vector matrix from the "total" column vector matrix), we can determine which participants came out ahead - in the sense of influencing more

people than they were influenced by, and which did not. The procedure, of course, automatically screens out "0's" or "dead heats", in which both parties attempted to influence each other. For the raw scores, such data may be obtained by subtracting the original row vector matrix from the column vector matrix. This procedure, in this instance, yields:

$$
\begin{vmatrix} -2 \\ 1 \\ 4 \\ -2 \\ 0 \\ 2 \\ -3 \end{vmatrix}
-
\begin{vmatrix} 2 \\ -2 \\ -4 \\ 3 \\ 0 \\ 2 \\ 3 \end{vmatrix}
=
\begin{vmatrix} -4 \\ 3 \\ 8 \\ -5 \\ 0 \\ -0 \\ -6 \end{vmatrix}
$$

## Interval Scale

From this point, it is a relatively straightforward matter to devise and administer an interval scale for assessing the relative strength of influence exerted by the various parties. Two predominant approaches are likely: On the one hand, the analyst might seek to develop a questionnaire-based "influence scale" taking into account each of the major items included in the definition above. The other approach, to be used here, involves the use of a Likert-Scale, in which subjective assessments of probable influence are converted into ordinal-level data.[15]

The scale employed for illustration here consists of five items, estimating in rank order the amount of influence expected in a given situation: The values are:

> 0 - Influence unknown or undetermined
> 1 - No apparent influence
> 2 - Casual acquaintance
> 3 - Mutual self-respect; some influence likely
> 4 - High loyalty probably
> 5 - "In the pocket" (Controlling influence certain)

We can apply this scale to the construction of the data matrix in the manner already illustrated, with the possible additional intermediate stage of administering a questionnaire to determine values. (A questionnaire of this type would involve essentially a modified form of sociometric question, and should be given to each of the participants orally or in writing.)

If one were attempting to develop an influence scale of the type mentioned above, the questionnaire would be essentially factorial in design with each question intended to sample a portion of the domain. In that case, use of the items identified by Dahl as "bases" of influence would probably prove very useful.[16] Use of the Likert-Scale technique, however, would probably involve only a single question of the following type:

1. "Please rate the degree of general influence you have with each of your co-workers, using the following numerical ratings: (Select the item which most closely corresponds with your true relationship with that person.)"

1 - I have no apparent influence with this person.
2 - We are casual acquaintances, but agree on many things.
3 - He/she listens to what I say. We can usually work something out.
4 - He/she will usually go along with what I suggest.
5 - He/she does what I ask.

In situations involving a large number of persons, a qualification may also be appropriate, as follows:

"Please identify only the persons you actually know, or know of. Indicate "0" for those who are unknown."

Finally, to employ the procedure of cross-checking responses, and establishing their general reliability, a third question might also be in order.

2. "Please rate the degree of general influence that
your co-workers have upon you: (without looking
back to your prior responses) select the statement
which most accurately describes your relationship
with each person:

1 - This person has no effect upon me.
2 - We know each other, and I would listen if they tried
to persuade me of something.
3 - This person usually has some good points, and I
listen whenever possible.
4 - This person is very reasonable, and I seldom disagree.
5 - I always do what he/she asks.

Again, for purposes of illustration, assume the following pattern
of responses: On the initial run, Stan indicated that all of the staff
scored "5" ("they always do as I say"). When pressed, he indicated
that what he had in mind were the "big issues" by which he seemed to
mean questions clearly within his authority as director. On the
question of the new program choice (where he felt caught between Carol
and Jim) he indicated the following response pattern:

0543443

These responses are interesting in two respects: In Stan's
opinion, Tony is completely loyal--the prospect of his disloyalty is
out of the question. Secondly, he indicated that whatever choice is
made, he fears the loser (Carol or Jim) will "jump ship" and take the
matter directly to the board. Hence, he scores them low.

Tony, as indicated previously, has better relationships with
female than with male staffers as suggested in his responses:

3044342

Eunice, part-time staff member, feels that she is a veritable
isolate in the agency, as indicated by her responses:

3201121

Carol, by contrast, is confident of several staff members, but still uncertain of Stan:

<div align="center">354053</div>

(Note that she apparently feels she can even influence Jim, the author of the counter proposal!)

Steve, as we suggested earlier, is not likely to be very effective with the full-time female staff members, who dislike him.  He is, however, largely unaware of their views toward him and consequently scores his influence uniformly:

<div align="center">4444044</div>

The interviewer initially disagreed with this assessment but was unable to do anything about it.  The problem could be resolved by comparing responses on question 2 with the first question.  If each staff member rates not only their own, but all staff members' influence, we could compute a mean score and major deviations from the mean can then be "red flagged" for special investigation as a part of the analysis.  In Steve's case, let us assume that this resulted in an adjustment to this scores as follows:

<div align="center">3441013</div>

(If there is doubt about the acceptability of such adjustments in a particular study, identical operations can be performed on both the unadjusted and the modified matrices as indicated below, and the resultant predictions compared.)

Bette, as expected, responded in conformity with her heirarchical vision, and likewise,  her scores had to be adjusted.  Below are her unadjusted and adjusted scores:

<div align="center">4411101       4333304</div>

Finally, Jim, the author of the counter proposal scored himself as follows:

<div align="center">4441330</div>

Altogether, we have the following blockmodel:

```
0  5  4  3  4  4  3 | 23
3  0  4  4  3  4  3 | 20
3  2  0  1  1  2  1 | 10
3  5  4  0  4  5  3 | 24
3  4  4  1  0  1  3 | 16
4  3  3  3  3  0  4 | 20
4  4  4  1  3  3  0 | 19
20/23/23/13/18/19/16
```

Again, several things are immediately apparent.  First, Stan
(score = 23) and Carol (24) are roughly equal in their apparent
ability to influence staff on this issue, while Jim (19) lags
several points behind.  This may be portentous of the final outcome,
particularly if Carol should win Stan over (in which case, Jim would
appear to be no match).

Further, as suspected, Eunice (10) is not likely to influence
anyone in this situation; not only does she rank last among ability to
exert influence (row totals), she also has the lowest of all scores
in each individual column.  Interestingly, however, she is tied at the
top of recipients of influence with Tony (column totals of 23 each).
While Carol, perhaps due to her partisanship, ranks lowest at 16 (the
person the staff collectively feels least likely to influence).

```
0543443        0333344         0 2 1 0 1 0-1 |  3
3044342        5025434        -2 0 2-1-1 1-2 | -3
3201121        4404434        -1-2 0-3-3-1-3 |-13
3540453   -    3410131   =     0 1 3 0 3 2 2 | 11
3441013        4314033         0 1 3-3 0-2 0 | -1
4333304        4425103        0-1 1-2 2 0 1 |  1
4441330        3213340         1 2 3-2 0-1 0 |  3
```

When we compute the row totals of the difference matrix, as
previously, a clearcut prediction emerges:  Carol is likely to be
most influential overall.  She has "positive" influence with all
staff members except the director with whom she is an even match.

Further, Stan siding with Jim against her might be unwise, since she still would have strong support (a net score of 2 or higher) among four other staff members. Finally, Eunice's negative position here is further illustrated by her row score (-13) and the fact that her influence is not numerically superior in a single diad. She is clearly at the bottom of the pecking order in terms of influence!

Influence Structures

In addition to the diadic relations of influence shown, we are also able to use the matrix format to estimate some elementary "structures" of influence involving three or more persons. For example, if we concentrate, for a moment, only on cells with a value of "5" in the original matrix, we see the following pattern:

```
0500000
0000000
0000000
0500050
0000000
0000000
0000000
```

This pattern is suggestive of two fairly stable and interlocking coalitions among the staff members.[17] Stan and Tony form one, and Carol, Tony, and Bette the other. Tony's position in this situation is obviously critical (and apparently at odds with Stan's assessment of him!) Whatever influence is generated around and upon Tony, however, is not likely to be transitive (that is, passed on to another) since neither Carol (3) nor Stan (3) are influenced by him to the degree that they influence him (5). He is, in that sense, the end of the line. Furthermore, Tony may well face problems of divided loyalty if Stan and Carol disagree in this situation, since both rate him as completely loyal.

A quite different pattern emerges when we examine the combined
scores of "5" and "4":

```
0540440
0044040
0000000
0540450
0440000
4000004
4440000
```

By adopting a simple search procedure, we can begin to develop
the complex patterns inherent in the data: Move laterally along a
row until a significant cell (i.e., a score of 4 or 5) is located.
Then, move to the corresponding row and identify significant "second
order" linkages to the initial row. From there identify "third order"
linkages, etc. Ordinarily, such a procedure should be followed until
a dead end is reached, or a loop is made - that is, the original, or
"first order" row is again identified. Two methods of elaborating
such loops are possible. If, on the one hand, one is interested in
a direct "path" of influence, (such as the first strong relation
encountered in each row, only one row should be selected.) For
purposes of notation, we can identify each of the elements in this
"string" as a vector of the values with letters corresponding to the
first letter of each name for easy identification. In the above
example, that would produce a third-order vector leading nowhere
($5^S$, $4^T$, $0^C$). The only loop leading from Stan back to him is the
"path" of influence with Bette forming the second-order vector ($4^S$,$4^B$).

The second method of identifying these various chains of influence
is with the use of sociometric diagrams revealing the full range of
possibilities, as follows:
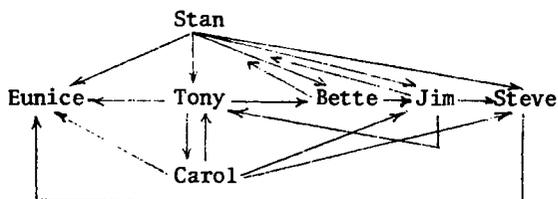
It is clear that there are no isolates in this influence scheme.
Generally, however, in situations involving substantial numbers of
persons, such diagrams are often unwieldly, and the analyst may have
better luck with the vector and subscript notations, or with simplified
diagrams showing only the relevant chains of influence:

$$Stan \longrightarrow Tony \longrightarrow Carl \longrightarrow Bette \longrightarrow Jim$$

Whether it is possible, in such circumstances, to estimate the
transitivity of influence (i.e., how much influence Stan inadvertently
might exert upon Bette--and upon himself--through this chain) cannot
be assessed from this hypothetical example.[18]  The possibilities do
indeed appear intriguing enough to warrent further analysis.

## Conclusion

The purpose of this article was to set forth a measurement proce-
dure for assessing influence in social situations.  In particular, we
were concerned with measuring influence in communities and formal
organizations.  Two sets of procedures were presented and discussed.
Data were generated using sociometric questions with forced responses
to Likert scales.  These data were then analysed, using matrices.
Analysis of the data were suggestive of a number of tentative conclu-
sions.  The first and foremost was the seeming feasibility of the
procedure.  Secondly, this procedure was able to correctly identify
"key influentials" in the hypothetical situation, as well as identify
the existence of two interlocking coalitions of influentials, whose
common member was the least influential in each coalition.  Fourthly,
a procedure for assessing "indirect influence" (roughly interpretable
as "the influences upon those who are influential upon me" were noted.)
Finally, through presentation of the data in a conventional sociogram,
it was detected that there are no true isolates in this particular
situation (from the standpoint of exerting or receiving influence)
despite the fact that initially one of the participants (Eunice) was
said to be.  The procedures reported here appear to offer a theore-
tically interesting and methodologically practical basis for assess-
ment of the existence, and character, of influence in social situations.

The major limitation of this technique, at present, would be the
question of its validity.  Specifically, it seems highly possible that
in many community and organizational situations, participants would be

unwilling to provide honest responses to sociometric questionnaires.
In other instances, participants may simply be unavailable. One
optional approach, of course, is for the observer to estimate responses,
based upon available observational data. Or, it may be possible to
construct unobtrusive measures to substitute for the questionnaire. In
any event, it seems highly likely that this sociometric method could be
employed in measuring patterns of influence in a host of settings.

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17. Coalition in this context refers to intersecting influence diads with at least one common member.

18. The issue of the transitivity of influence is highly complex. In most research models where "influence" would be cast as either an "independent" or "dependent" variable, however, the issue is simply foreclosed by the design.