A MULTIDIMENSIONAL ANALYSIS OF THE 1976 ELECTION: AN OVER TIME STUDY

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The theory behind the use of multidimensional scaling (MDS) for the measurement of socio-cultural change and its applications to political communication research has been discussed extensively in the literature (Barnett, Serota and Taylor, 1977; Cody 1976; Barnett and Woelfel, in progress). For this reason, the theory will not be discussed here. Rather, it is my intent to describe a single set of data gethered during the 1976 presidential campaign. It is hoped that through this process the methodological procedures will be clarified and the utility of MDS further demonstrated.

Procedures:

On September 2, 1976, twenty students enrolled in a political communication course at an eastern technological school were asked the following three questions:

1. What issues are you going to use to determine who to vote for in the upcoming presidential election?

2. What attributes or characteristics do you think the President of the United States should have?

3. What attributes or characteristics do you think the President of the United States should not have?

Consistent with the procedures described by Barnett, Serota and Taylor (1974, 1976) and Cody, Marlier and Woelfel (1976), this three-question pretest was conducted to generate the concepts which would be used to monitor attitudes toward the 1976 election.

The first question identified the issues which the population under study was going to use to determine their voting decision. The second and third questions were asked in order to make use of the theoretical notions of multiple attribute models and implicit personality theory (Cody, Marlier and Woelfel, 1976; Cody, 1976). Frequency counts of the answers to these questions indicated that <u>foreign policy</u>, <u>defense policy</u>, <u>economic policy</u>, and <u>unemployment</u> were the

issues of most concern to this sample. The three attributes most often mentioned were, <u>intelligent</u>, <u>honest</u> and <u>experienced</u>. These seven concepts, along with the candidates'· names (<u>Gerald R. Ford</u> and <u>Jimmy Carter</u>), the party labels (<u>Democratic Party</u> and <u>Republican Party</u>) and self (<u>Myself</u>) were used to construct the questionnaire.

The final five concepts were added for theoretical reasons (Barnett, Serota and Taylor, 1974, 1976). The vote decision may be predicted by the interaction among the candidates' qualifications and personality characteristics, party identification, the issues and their relation to the voters themselves. Hinckley, Hofstetter and Kessel (1974) performed secondary analysis on over 1600 cases of the 1968 data from the Survey Research Center at the University of Michigan. They found that four variables: party identification, the candidates' experience, their personal qualifications, and the issues accounted for about 70% of the variance in voting. Similar notions are discussed by Butler and Stokes (1976: 191):

> It may help if we think in terms of the links that are formed
> between issue and party and between self·and issue, for
> this determines the influence of issues on the strength of the
> parties. We shall have to explore in detail what these links
> involve and how widely their nature varies. But we cannot deal
> adequately with the role of issues electoral change without
> paying due attention to how both types of bonds bear on the
> remarkable assortment of issues that confront the electorate
> over time.

These bonds or interactions among variables may be measured accurately through the use of dissimilarity judgements or distance estimates among all possible pairs of concepts identified above. These estimates form the basis of multidimensional monitoring of attitudes. In this study, direct quantitative pair comparisons were generated for all the concepts listed above against a criterion of "John F. Kennedy and Dwight D. Eisenhower as 50 Galileos apart." The· theory behind the use of a criterion metric is discussed further by Woelfel (1974) and Gordon (1976).

The individual concepts were placed in random order and then the pairs were ordered as specified by the Ross Matrix (Ross, 1939). The Ross Matrix optimizes the order for stimuli in the method of pair comparisons. The method maximizes the distance between a stimulus and itself in the order of presentation and equalizes the number of times the stimulus appears as the first or second member of the pair. In this way, the effects of order can be minimized.

The instrument was adminsitered to the 20 students who served as the pretest subjects. They were instructed to present a punched deck of cards with their responses to these pair comparisons once a week during the fall semester, for twelve weeks. Thus, they were a panel.

There are a number of problems with panel designs. Among them are the effects of testing or sensitization and subject mortality (Campbell and Stanley, 1963). For these reasons, past research (Barnett, Serota and Taylor, 1974, 1976) has argued against the use of panels and recommended the use of independent random samples (generated from the same population) for each measurement. However, continual long-term monitoring on independent equivalent samples can be prohibitavely expensive. The pragmatics of funding thus limits the number of data points that can be gathered. As an alternative, small panels, as in this study, may be used. The information that is lost in generalizability due to the small sample is gained in the large number of data points which may be gathered over time. This practice is becoming more common in the social sciences (Krull and Paulson, .1973). This study's design may be considered a "time series experiment" (Campbell & Stanley, 1963: 37-43). The election itself, may be considered the manipulation, with eight measures prior to the election and four following. This is graphically displayed below.

0	0	0	0	0	0	0	0	X	0	0	0	0
9/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/2	11/4	11/11	11/18	11/25

A common criticism of political communication research is that only the time period prior to major elections are observed and that people's political attitudes at other times are not studied (Agranoff, 1976; Kraus and Davis, 1976). This may result in a bias view of political attitudes. Since this study has a number of measures after the election, it will report on people's attitudes after the election. Thus, it represents an initial attempt to deal with this criticism.

Results:

Past political metric MDS research has reported the means matrix and the spatial manifold for each measurement and the comparisons between the measures after rotations to congruence have taken place (Barnett, Serota and Taylor, 1974, 1976). In the interest of brevity, all 35 tables will not be presented here. However, they are available upon request. The data analysis procedures as they occurred will be discussed. It is hoped that this process will demonstrate the utility of MDS for monitoring political campaigns.

Woelfel and Barnett (1974) and Barnett, Serota and Taylor (1974) suggest that considerable information about the effects of information on socio-cultural change may be gained by examining the changes between serially-ordered spaces and by calculating the change scores, velocities and accelerations of the entire spaces or the individual concepts within the spaces. The average change scores between the spaces, the cumulative change scores, and the two candidates motion are presented in Table one. They are displayed graphically in Figure one. In this paper, I will concentrate on the change scores rather than on holistic indicators, as in my previous work. Velocities and accelerations will be presented later.

TABLE ONE AND FIGURE ONE ABOUT HERE

Table one presents the information required to evaluate the time series experiment--to determine the effects of the election on political attitudes. From these data, it is apparent that there is stable change after the election regarding the concepts that are used to determine the vote decision. There is virtually no variance in this rate of change. This is not to suggest that there is no change among the concepts, only that they are changing at a constant rate. For example, after the election, Jimmy Carter grew further from myself. One possible explanation for this motion might be that as President-elect Carter approached his inaguration, the distinctions between him and the common man became clearer. In general, it seems plausible to suggest that the political attitudes tended to stabilize after the election.

Table one also makes it possible to determine the point during the campaign at which the greatest attitude change occurred. By determining this point, it becomes possible to discover the critical events of the campaign. The greatest overall change between two spaces, 67 units, occurred between October 14 and 21, or between one and two weeks after the second presidential debate (see table one and figure one). It was during this event that Gerald Ford made his famous faux pas that Eastern Europe was not under the domination of the Soviet Union. The motion of the individual concepts between these two measurements provides the evidence that the second debate was the causitive agent. Gerald Ford moved 137 units; myself, 96 units; and intelligent, 77 units between the two measures. When the direction of motion is examined, it reveals that Ford moved away from myself (227 units), intelligent (172 units) and foreign policy (128 units).

Also worth noting is the lag in attitude change of about one week. During the week immediately following the second debate, the overall motion was only 46 units. Ford's motion was 35 units. This compares to 137 for Ford and 67 for the overall space the following week. Despite this limited movement, the

redefinition of Ford, foreign policy, and intelligent began to take place. The
distance between Ford and myself increased 53 units; Ford and intelligent, 24
units; Ford and foreign policy, 60 units. Reasons for this lag will be
discussed later.

What were the effects of other campaign events--the first debate (9/23),
the release of Carter's Playboy interview (9/20) and the Butz resignation?
The first presidential debate preceeds Jimmy Carter's greatest redefinition
by between one and two weeks. In the week immediately following the first
debate, Carter moved 88 units, compared to the mean motion of all concepts of
55 units. The next week, he moved 82 units compared to the mean of 59. His
direction of motion is illustrative; away from both Ford (86 units) and the
Republican Party (11 units) and toward economic policy (46 units) and unemploy-
ment (38 units). During the same two weeks, Ford moved away from economic
policy (10 units), unemployment (21 units) and Jimmy Carter (86 units). Thus,
it seems that the first debate clarified differences between the candidates
regarding economic philosophy. Worth noting is that the change continued for
two weeks after the event. This may reflect the lag in attitude change des-
cribed above or the effects of other campaign events.

The Playboy interview seemed to have had minimal effects on this sample
of male college students. The limited change that did occur found Carter
moving away from experienced by 25 units. Perhaps, the interview was perceived
as something a seasoned politican would not have undertaken. There seems to
have been no change directly attributable to agriculture secretary Butz's
racial slur and his subsequent resignation. This could perhaps be explained
by concepts (not included) that delt with the issues of agriculture and civil
rights, or to the sample, which was made up entirely of urban whites.

As a student of political communication, I am interested in the effects
of political advertising on voting. Patterson and McClure (1976) and Atkin
and associates (Atkin, et al., 1973; Atkin, 1976) report that political adver-
tising provides substantial information, and thus exposure to these commercials
may be a good predictor of political attitudes. Previous research on this
sample indicates that television commercials had little effect on voters
certainty (Barnett and Hughes, 1978). Traditional political wisdom suggests
the placement of campaign ads as close to the election as possible (Agranoff,
1976). Indeed, Ford's "Media Blitz" began October 23, only ten days prior to
the election. During this period, he spent over $4 million or about half his
total media budget in the industrial states alone. From the date in table
one, we can evaluate this strategy's effectiveness. The overall change in
the space between October 21 and 28 was only 39 units, the smallest since
early September. This figure becomes more illustrative when post-election
data are considered. It is only five units less than the lowest post-election
change. Both the rates of motion for Ford and Carter stabilized at this time.
The change during this period was only five untis greater than the greatest
post-election change for Ford and within the range of the rate of change for
that period for Carter. It may be concluded that the constant rate of change
which followed the election began somewhat prior to the election, thus
suggesting a lack of effect for last-minute media blitzes.

The data in table one also were used to determine velocities and acceler-
ations necessary indicators of the measurement of process (Arundale, 1971, 1973)
within the overall space and for the two candidates. This was performed by
regressing individual change scores against the order in time when that value
occurred. As can be seen in figure one, the best fit regression line between
these two variables is not linear. Therefore, the square, cubic, quartic, and

quantic components also were entered into the regression analysis. The result is a polynomial with the form of the general linear equation, except that the exponents for nonlinear terms are present.

Overall velocity of the space was:

$$Y=.56-x^5+.199x$$

The variance accounted for by the square, cubic and quartic components did not differ significantly from zero. Its derivative or acceleration was:

$$dx/dt=5x^4+.199$$

This curve explains only 3% of the variance in the actual obtained scores. Clearly, it is not a good fit. Because of the small amount of explained variance by the polynomial, this equation may be of some other form, perhaps a logarithmic transformation or a exponential transform of a sinusodial equation.

The velocities of both <u>Ford</u> and <u>Carter</u> can be described better by a polynomial than the overall velocity. For Carter the best fit polynomial was:

$$Y=-.62x^4+.22x$$

The variance accounted for by the square and cubic terms did not differ significantly from zero. It explains 27% of the variance in obtained scores. <u>Ford</u>'s polynomial was:

$$Y=20.73+X^4-.29X$$

Again, the variance accounted for by the square and cubic terms did not differ significantly from zero. This equation explains 58% of the variance in obtained scores.

While velocities of the candidates appear somewhat discrepant, their accelerations are similar except for the change in sign.
Carters:

$$dx/dt=4x^3+.22$$

Ford's was:

$$dx/dt=4x^3-.29$$

The fact that data were taken at only 12 points in time provides one explanation for the poor fit the polynomials have with the actual data. Random error and unreliability in any single measurement could alter the descriptive equations considerably. Also, as suggested above, the equations could be of some form other than a polynomial, most likely an exponential transform of a sinusodial. Equations of this form would require far more data points with which to fit the curve.

Discussion and Summary:

The data analysis revealed a variety of interesting findings. Among them were the constant rate of attitude change after the election, the measured time lag in the effects of the debates, and the lack of impact of the media blitz late in the campaign.

The overall space and the motions of the individual candidates stabilized after the election. While there may be many reasons for this, let me suggest two. First, attitude change is a function of the information that people receive (Saltiel and Woelfel, 1975; Woelfel and Saltiel, 1974). After the election, no new information regarding the candidates, political parties, or the issues was presented to the populace. Even if information about these concepts was presented in the mass media and exchanged through interpersonal interactions, its quantity was greatly reduced. Information necessary to alter the rate of attitude change was no longer newsworthy: the race was over. Uncertainty about the identity of the next president was reduced, thus the information was no longer presented in the media or discussed interpersonally as frequently.

Secondly, reduction of uncertainty provides a further possible explanation.

This may be a necessary condition for attitude change. Recent research by Barnett and Hughes (1978) has shown that voting behavior may be predicted by the voters' certainty. This is not to suggest that uncertainty about an attitude alone is a sufficient condition for attitude change. Clearly, new information is needed in order to alter the uncertain relations among the concepts composing the attitude. It may be suggested, however, that the election reduces the uncertainty about the future of the presidency to th? point where the polity's overall attitude becomes stable. Thus, even if novel information about the relations among the concepts is presented to the polity, their certainty about the future is so great that the attitude remains stable.

The greatest overall change in the space occurred between one and two weeks after the second debate. During that period, perceptions of Gerald Ford were redefined maximally. Jimmy Carter's greatest redefinition occurred between one and two weeks after the first debate. In both cases, however, the loci of the concepts changed to a small degree in the direction of the greatest change immediately following the events. While there are a number of possible explanations for this time lag, let me suggest three: (1) an actual lag in attitude change, (2) the time it takes for information to diffuse through the social system, and (3) the agenda setting function of the media.

Attitude change may not be instantaneous. Individuals may require time to process the complex interactions among all the concepts which make up political attitudes. Nearly half (49%) of the total variance in these spaces was found on the imaginary dimensions. Thus, it may take people some time to intergrate any new information into this complex set of relations.

The second explanation concerns the dissemination of the information causing the attitude to change. Since Lazarsfeld, Berelson, and Gaudet (1944), we have known that political attitudes are altered primarily by information passed

through interpersonal networks--rather than disseminated directly through the
mass media. While mass media provides rapid dissemination of new events,
interpersonal networks require a much longer time to diffuse novel ideas. Only
a small percentage of the population serve as opinion leaders who interpret
the news event and tell others about the implications of these events. Many
people, after learning the information, keep it to themselves, thus slowing
dissemination. The treatment of news by the media generally lacks the in depth
analysis which increases the information relevance and impact. Despite the
importance of the presidential debates, it does not seem unreasonable that
their impact was not felt for at least one and perhaps two weeks.

The remaining explanation grows out of the media's agenda setting function.
In a certain sense, the presidential candidates set the agenda for the news
media during the debates. Issues that they raised became the issues reported
in the media and discussed by the public. The first debate raised economic
policy issues. During the week that followed, the news media discussed the
differences in the expressed policies, determined the accuracy of the strategies
used by the candidates, and measured public reaction to the debate. Following
the second debate, the media demanded clarification of Ford's statement about
Eastern Europe, determined reactions to the statement, and analyzed the impact
of the statement. Thus, these events stayed in the news for a considerable
period of time. Therefore, the peak impact of these events may not have been
felt until a week had past.

Another finding worth mentioning is the lack of change during the week
prior to the election. This suggests that the media blitz late in the campaign
did not work. Again, let me suggest three possible explanations. First, as
Saltiel and Woelfel (1975) have shown, attitudes are easiest to alter when the

the amount of information on which the attitude is based (its inertial mass) is low. The presidential campaign had began in January with the New Hampshire primary; Ford had been president for two years; there had been three presidential debates; the news media had covered every action of the candidates for months. Thus, it seems reasonable to suggest that by the last week of the campaign so much information composed the attitudes of the voters that the candidates would stabilize.

Second, both candidates concentrated their media advertising during the final ten days of the campaign--although Carter's was spread somewhat more evenly throughout the campaign. Thus, there were equal numbers of counter-acting messages from both candidates. This, too, would tend to stabliize attitudes. Additionally, if these messages were to have any effects, due to selective perception, they would reinforce existing attitudes.

Finally, the lag observed after the debates also may come into play with the final media campaign. There simply was not enough time for these new messages to diffuse through the social system. This factor combined with the lowered level of uncertainty and the lack of relevance of the messages after the election would tend to limit changes in attitudes after the election.

Some limitations of this study which should be pointed out. First, this was only a single political campaign. Data reported here are only descriptive and may not be generalized to all political campaigns. Second, there were only 20 subjects. This may limit the confidence of the internal validity of the results, although with 66 pair comparisons and 12 over-time measures this is unlikely. Third, subjects were all students studying political communication. This may limit external validity. Because of the lack of sufficient funding, however, they provide a better alternative than not researching the phenomenon at all.

Finally, future research is planned to determine the consistency of the
observed lags. If they are found to occur in other situations, reasons for
the lag will be determined. Future research will be performed for a greater
length of time with more measures within a given time period on more general
samples. In this way, it will become possible to determine precisely the
lag period rather than using the arbitrary measured period of one week as the
time lag. Also, the additional measurements will make it possible to accurately
define the rate of change over time.

In summary, this paper has described the 1976 Presidential campaign using
metric multidimensional scaling to monitor the political attitudes of a group of
voters over a 12 week period. From the data, it was determined that their
attitudes toward the caididates, issues, and parties stabilized after the
election and that the first two debates were the most important events of
the campaign. Their greatest effects, however, were felt between one and two
weeks after the events. It is hoped that this paper will further clarify
the data collection and analysis procedures of MDS and help to demonstrate
its utility for the observation of political campaigns.

TABLE 1

CHANGE SCORES BETWEEN SPACES*

Time	Average Change †	Commulative Change	Ford	Carter
1	37	37	61	29
2	42	79	67	37
3	55	134	59	88
4	59	193	53	82
5	46	234	35	46
6	67	306	137	57
7	39	345	51	41
8	45	390	42	36
9	46	436	40	32
10	44	480	46	48
11	44	524	39	45
Mean change	47.6		57.3	49.2

*Change is measured in terms of galileo units using a 50 point criterion pair.

†The individual change scores have been round to the nearest integer. However, the means were calculated from change scores with significant digits at .1.

FIGURE 1
CHANGE SCORES OF SELECTED CONCEPTS
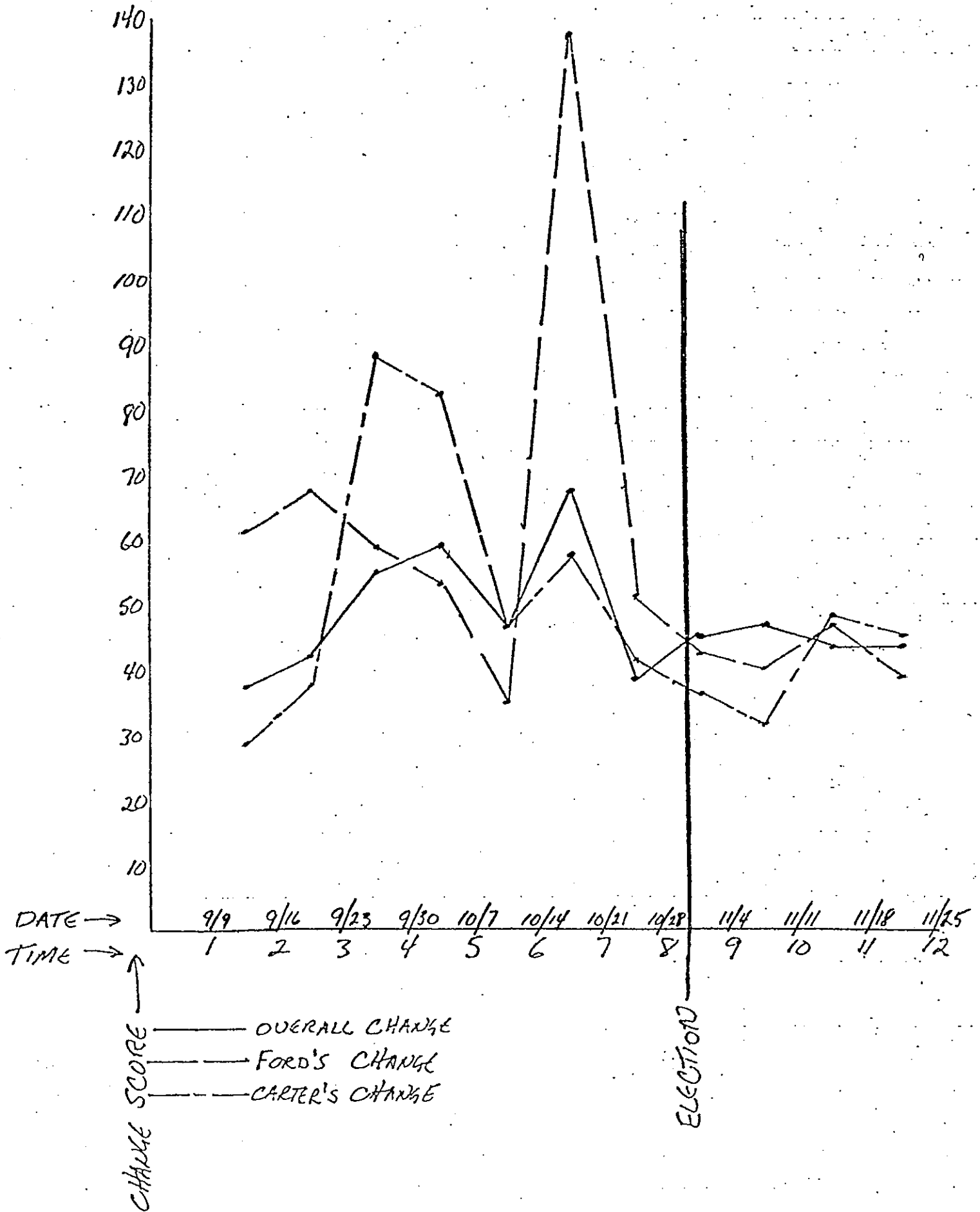
REFERENCES

Agranoff, R.
1976   The Management of Election Campaigns.   Holbrook Press: Boston.

Arundale, R.B.
1971   The Concept of Process in Human Communication Research.   Ph.D. Thesis,
        Michigan State University: East Lansing.
1973   "Discussing the idea of process: some implications for theory and research
        on communication."   Paper presented at International Communication Assoc-
        iation, Montreal, Quebec, April.

Atkin, C.K.
1976   "Political advertising effects on voters and children."   Paper presented
        at American Psychological Association, Washington, D.C., September.

Atkin, C.K., Bowen L., Nayman, O. B. and Sheinkopf, K.
1973   "Quality versus quantity in television political ads."   Public Opinion
        Quarterly.   37: 209-224.

Atkin, C.K., Galloway, J. and Nayman, O.B.
        "Mass communication and political socialization among college students."
        Paper presented at American Association for Public Opinion Research, Ashville,
        N.C. May.

Barnett, G.A. and C. E. Hughes.
        "The effects of media exposure on uncertainty reduction and voting".
        Paper presented at International Communication Association, Chicago, April.

Barnett, G.A., Serota, K.B. and Taylor, J. A.
1974   "A method for political communication research."   Paper presented at
        Association for Education in Journalism, San Diego, August.
1976   "Campaign communication and attitude change: a multidimensional analysis."
        Human Communication Research 2:227-244.

Barnett, G. A. and Woelfel, J.
        The Theory and Uses of Metric Multidimensional Scaling: with Applications
        for Political Communication.   In progress.

Butler, D. and Stokes, D.
1976   Political Change in Britian.   St. Martins's Press: New York.

Campbell, D. T. and Stanley, J.C.
1963   Experimental and Quasi-Experimental Designs for Research.   Rand McNally:
        Chicago.

Cody, M.
1976   "An application of the multiple attribute measurement model: Measurement and
        manipulation of source credibility."   M.A. thesis, Michigan State University:
        East Lansing.

Cody, M.J., Marlier, J. and Woelfel, J.
1976   "An application of the multiple attribute measurement model: Measurement
        and manipulation of source credibility."   Paper presented at International
        Communication Association, Portland, OR. April.

Gordon, T.F.
1976 "Subject abilities to use metric MDS: effects of varying the criterion
        pair." Paper presented at Association for Education in Journalism,
        College Park, MD., August.

Hinckley, B., Hofstetter, C.R., and Kessel, J. H.
1974 "Information and voting: a comparative election study." American
        Politics Quarterly 2: 131-158.

Kraus, S. and Davis, D.
1976 "The Effects of Mass Communication on Political Behavior. The Pennsylvania
        State University Press: University Park.

Krull, R. and Paulson, A. S.
1978 "Time-series analysis in communication research." in Hirsch, P.M., Miller,
        P. V. and Kline, G. F. (Eds.) Methological Strategies for Communication
        Research. Sage: Beverly Hills, CA.

Lazarsfeld, P., Berelson, B. and Gaudet, H.
1944 The People's Choice: How the Voter Makes up His Mind in a Presidential
        Campaign. Columbia University Press: New York.

Patterson, T.E. and McClure, R.D.
1976 The Unseeing Eye: The Myth of Television Power in National Politics.
        G. P. Putnam's Sons: New York.

Ross, R. T.
1939 "Optimal orders in the method of paired comparisons." Journal of Experimental
        Psychology, 25: 417-421.

Saltiel, J. and Woelfel, J.
1975 "Accumulated information and attitude change." Human Communication Research.
        1: 333-344.

Serota, K.B., Cody, M.J., Barnett, G.A. and Taylor, J. A.
1977 "Precise procedures for optimizing campaign communication." In Ruben B.
        (Ed.) ICA Communication Yearbook, Transaction Books: New Brunswick, N.J.475-42.

Woelfel, J.
1974 "Metric measurement of cultural processes." Paper represented at Speech
        Communication Association, Chicago, December.

Woelfel, J. and Barnett, G. A.
1975 "A paradigm for mass communication research." Paper presented at Inter-
        national Communication Association, New Orleans, April.

Woelfel, J. and Saltiel, J.
1974 "Cognitive processes as motion in a multidimensional space." Unpublished
        manuscript, Department of Communication, Michigan State University.