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ABSTRACT
                The hypotheses that there will be a significant
difference (1) in the number of responses generated according to
economic issues, (2) in the number of responses generated according
to social issues, (3) in the number of responses generated between
the category of economic issues and the category of social issues,
(4) in cue ranking by response frequency between economic and social
issues, (5) in cue ranking of importance by subjects on economic and
social issues, and (6) subject ranking of cue importance and
frequency of cue importance on economic and social issues were tested
in this study. Three social issues (gun control, student busing, and
air pollution) and three economic issues (unemployment, government
loans to big business, and wage and price control) were chosen. A
total of 45 college freshmen responded to the social issues, and 45
freshmen responded to the economic issues. After the subjects
responded to all of the issues, their responses were collected and
the subjects were given a list of cues and were asked to rate each
cue in terms of its importance in generating responses. The results
indicated that cues tend to be topic bound and that there is a
correlation between perception of cue importance and actual use of
cue in generating responses. (WR)

CUE SET STIMULATION AS A
FACTOR IN HUMAN RESPONSE GENERATION

John L. Petelle

The notion that the human organism has a propensity to categorize is
one which goes back at least to the time of Aristotle. In fact, the
Aristotelian concept of "categories" and "category systems" does much to
undergird modern empirical theory in this area. That man does have a
tendency to categorize and cluster his information is a concept which has
been demonstrated by such modern researchers as Mandler and Pearlstone,[2]
Coffer[3] and Charles Osgood,[4] to mention but a few. The use of cueing
systems as a strategy in human information retrieval has been an area of
research investigated by a number of psychologists and social psychologists.[5]
More recently some of the characteristics of human recall have been inves-
tigated by Bruder[6] et al. That the use of a cue system is superior to
free recall in human retrieval is probably a matter no longer in question.
The emphasis, however, in research in this area has been upon the use of
cue systems to evaluate human recall of stored information. Little inves-
tigation has been concerned with the use of cue systems in initiating
human response generation and/or in improving human problem-solving. It
is worth noting, that in the June, 1972 (p. 4) issue of Spectra, Earl
Wallace stated that a renewed interest on the part of the rhetorician in
the ancient concept of invention is indicated in his ". . . new concern
for invention, i.e., for systems of topics that aid in recalling experience
during moments of utterance and that direct search and inquiry into what is
needed and not ready at hand."[7]

The use of symbolic cue systems is then, a retrieval strategy,
utilizing language as the primary stimulus to effect conceptual behavior.
That there is a relationship between though: processes and language pro-
cesses has been pointed out by Staats,[8] as well as by Nelson who has
maintained that "cognitive activity is related to language categories. . ."[9]
Nelson has extended such thinking to research in speech communication by
pointing out that "The Problem now is one of equating the superordinates
of language and cognitive categories with those superordinates emanating
from the classification schemes for ideas and arguments."[10] In a subse-
quent article, Nelson stated, "Topoi are viable classifiers regardless of
subject matter, and they are generalizable in all cases."[11] Using the
Wilson and Arnold topical system,[12] Nelson demonstrated that subjects
using the cued recall system generated more responses to highly meaning-
ful issues than did subjects using a free-recall strategy. That the Wilson
and Arnold cue system, or any other cue system for that matter, has such
a degree of universalness as suggested by Nelson seems suspect to this
experimenter. Questions which immediately come to mind are: (1) Are all
cues in a cueing system viable contributors to the improvement of informa-
tion retrieval? (2) Are the majority of responses generated the result of
a limited number of cues? (3) Are some of the cues more appropriate for
some topics than for others? (4) Is there a correlation between subject
perception of cue importance and subject response generation according to
cues? Based upon considerations such as these, the following hypotheses
were formulated:

1. There will be a significant difference in number of
   responses generated according to economic issues.

2. There will be a significant difference in number of
   responses generated according to social issues.

3. There will be a significant difference in number of
    responses generated between the category of economic
    issues and the category of social issues.

4. There will be a significant correlation in cue ranking
    by response frequency between economic and social issues.

5. There will be a significant correlation in cue ranking of
    importance by subjects on economic and social issues.

6. There will be a significant correlation between subject
    ranking of cue importance and frequency of cue import-
    ance on economic and social issues.

PROCEDURES

The experiment proceeded according to two phases.

Phase I

Inasmuch as most problem solving seems to involve issues of either a

social or economic nature, three social and three economic issues were

chosen. The primary criteria utilized in the choice of these issues was

that the experimenter believed them to be of high interest to the student

as well as being currently relevant. The social issues chosen were gun

control, student busing, and air pollution; the economic issues selected

were unemployment, government loans to big business, and wage and price

control. Phase I of the experiment consisted of using the Wilson and

Arnold System. A total of 45 subjects responded to the social issues, and

45 subjects responded to the economic issues. The subjects were mostly

freshmen students enrolled in the fundamentals program during the fall

semester, 1971, at the University of Nebraska-Lincoln. For convenience of

administration of the experiment, the 8:30, 9:30 and 10:30 sections were

arbitrarily chosen. The instructions given the subjects were as follows:

At the bottom of this sheet you will find a concept underlined.
Directly beneath the underlined concept will be a "cue" term.
Using that term as a cue to generate responses to the concept,
generate as many one-word responses as you can. You will have
one minute to generate these responses. For example:

Compulsory Health Insurance

Existence

1. Life	4. Illness
2. Death	5. Protective
3. Hospital	6. Preventive

You see the concept, Compulsory Health Insurance. Beneath that
concept is the "cue" term--existence. Using the term, existence
when you see the concept, Compulsory Health Insurance, what
responses relative to Compulsory Health Insurance immediately
come into your mind. Do not stop to evaluate these responses;
merely write them down. The above example indicates that when
using the term, existence, as a means to generate responses about
Compulsory Health Insurance, the above person generated the
responses of life, death, etc. When your instructor tells you to
turn the page, do so and begin. Remember, you have one minute
to generate as many one-word responses to the underlined concept
as you can.

Phase II of the experiment proceeded as follows: After the subjects

had responded to all of the issues, their responses were collected and they

were handed the list of cues and given the following instructions:

You have used 16 different "cues" in generating responses to a
concept. Please rate each of the "cues" in terms of its
importance to you in generating responses. Use the following
code:

Code	Importance
1	Very minor
2	Low
3	Average
4	High
5	Extreme

RESULTS

A one-way analysis of variance on the economic issues yielded an F
of 48.44 (p $<$ .05; [insert Table 1]). Tukey's Honestly Significant
Difference Test was then applied between each of the economic issues. The
results revealed significant differences (p $<$ .05) between two of the issues
[insert Table 2] . Hypothesis Number I was thus supported. A one-way
analysis of variance was then run on the social issues and yielded an F of
5.08 'p $<$ .05 [insert Table 3]). Tukey's HSD Test was then applied
between each of the social issues with one significant difference found
(p $<$ .05; [insert Table 4]). Hypothesis Number II was thus supported. A
comparison of group means on the categories of economic issues and social
issues yielded a "t" of 2.60 (p $<$ .05; [insert Table 5]). Hypothesis
Number III was thus supported.

The sixteen cues were then ranked from one through sixteen on the
basis of the number of responses each generated on economic and social
issues. Spearman's rank order correlation coefficient was then utilized and
an r_s of .765 was found (t=5.90). Hypothesis Number IV, therefore,
received support. A Spearman rank order correlation coefficient was then
run on the subject rankings of cue importance on economic and social issues
(r_s .893; t=8.36). Hypothesis Number V also received support. A Spearman
rank order correlation coefficient was then applied to the cue ranking of
importance by subjects on economic and social issues and number of responses
generated by cues on economic and social issues (Economic: r_s .741; t=5.67;
p $<$ .05; Social: r_s .660; t=5.10; p $<$ .05). Hypothesis Number VI was, then,
supported.

INTERPRETATION OF RESULTS

The interpretation of results is difficult in light of the statistical analysis. The significant ANOVA and subsequent significant Tukey's conducted on the frequency of cue response on economic issues would lead one to believe that perhaps the cues are topic bound. That is, the Wilson and Arnold cue set is more viable as an aid in response generation for some topics than for others. While only one significant difference was found between the social issues, the same conclusion might be drawn. The significant difference between the categories of economic issues and social issues further substantiates this interpretation. That more significant differences occurred between the economic issues than the social issues and a greater number of responses were generated among the social issues might indicate, that as a cue set, the Wilson and Arnold cue system is more viable for socially oriented issues. In inspecting the data more closely, additional insight was gained. In terms of total number of responses generated according to cue, the three most productive cues on both economic and social issues were the cues of existence, possibility--impossibility and form. Furthermore, the three least productive cues in terms of frequency of response on both economic and social issues were the cues of correlation, feasibility and spatial. Two tentative conclusions may be drawn from this inspection. First, the perfect correlation on economic and social issues of the three most productive and three least productive cues helps explain the significant r_s between these issues. Secondly, on the basis of such high correlation between most productive and least productive cues, it might be concluded that only a part of the Wilson and Arnold cue set is necessary.

The significant r_s found on subject ranking of cue importance on economic and social issues indicates that subjects found certain cues particularly helpful on both economic and social issues. Subject rank ordering of cue importance on economic and social issues revealed that subjects ranked existence as first in importance, and desirability as second in importance. At the same time, subjects ranked the cue spatial as least in importance on both economic and social issues and the cue correlation as second lowest in order of importance.

The significant r_s between subject ranking of cue importance and the actual frequency of responses they generated according to cue can probably be explained as follows. Both subject ranking and actual number of responses resulted in the cue existence being ranked first and the cue spatial being ranked last on both economic and social issues; furthermore, the cue correlation was ranked 14 by actual frequency and 15 by subject perception of importance on both economic and social issues; and the cue possibility--impossibility was ranked 2 by actual frequency of response and 3 by subject perception of importance on economic issues and 2 and 5 respectively on social issues. Other discrepancies between ranking of frequency response and subject ranking of importance tended to be relatively small.

CONCLUSIONS

Conclusions to be drawn from this study should be considered tentative. As previous research has indicated, the use of a cue system does increase response generation. This study would indicate that (1) certain cues in the Wilson and Arnold set are more viable than others; that

there is a certain universality or greater utility among some of the Wilson and Arnold cues, but that the "set" as a whole is more restricted than Nelson suggests; (2) that the cues tend to be topic bound; (3) and that there is a correlation between perception of cue importance and actual use of cue in generating responses. A number of questions, however, still remain unanswered. For example, will subjects of high verbal ability and high integrative complexity utilize a cue system more effectively than subjects of low verbal ability and low integrative complexity? Will a subset of the Wilson and Arnold system (i.e., top four or six cues) be as productive as the entire set? Perhaps one final point should be made. This study should not be considered as a completed experiment, but rather as a part of a series of experiments designed to explore an area of human communication which has received little attention. Hopefully, questions which might be generated from this study will lead other researchers to investigate this area from a variety of dimensions. Research in these areas is currently being carried on at the UNL.

TABLE 1

Summary Table of the Analysis of Variance
Effects of Cue Systems on Economic Issues

	SS	dF	MS	F
Between groups	6755.25	2	3377.63	48.44*
Within groups	2928.44	42	69.73	

*p < .05

TABLE 2

Tukey's HSD Test between Economic Issues

	Means	Unemployment	Big Business	Wage & Price Control
Unemployment	46.733	_____	23.8000*	27.7333*
Big Business	70.533		_____	3.9333
Wage & Price Control	74.466			

*p < .05

TABLE 3

Summary Table of the Analysis of Variance
Effects of Cue Systems on Social Issues

	SS	dF	MS	F
Between groups	1505.86	2	752.94	5.08*
Within groups	6224.75	42	148.21	

*p < .05

TABLE 4

Tukey's HSD Test between Social Issues

	Means	Gun Control	Student Busing	Air Pollution
Gun Control	65.3999	_____	4.7334	13.9333*
Student Busing	70.1333		_____	9.2000
Air Pollution	79.3333			

*p < .05

TABLE 5

Comparison of Group Means between Economic & Social Issues

	M	SD	t
Social	71.62	13.26	2.60*
Economic	63.91	14.84	

*p < .05

FOOTNOTES

[1] Professor Petelle is Chairman of the Department of Speech and Dramatic Art, University of Nebraska--Lincoln. Thanks is also due to Mr. Earl McDowell, research assistant, who aided in some of the data preparation and to Dr. Vincent Di Salvo for his advice on some of the computer programs.

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