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ABSTRACT

The fields of social and cognitive psychology and political science have offered several experimental designs for assessing the presence, type, and complexity of scripts (memory structures used to encode knowledge of an action) or event schemata. Script measurement is a potentially valuable tool for the study of information and news processing because the mass media typically present action-based sequences similar in nature to scripts. Most of the studies aimed at demonstrating the presence of a schema rely on hypothetical passages and indirect measurement strategies based on recall tests, clustering of related concepts, and inference based on prior knowledge. The study of information processing has focused on consensual or shared schemata--similar images for action-based or event stimuli shared by people in general. Media researchers are especially concerned with the assumption that people select specific schemata when processing various types of information supplied by the media--politics, sports, and weather, for example. The external validity of schema measurement has not been sufficiently assessed, though internal validity is rarely a problem in properly conducted experimental research characterized as a posttest only control group design. For the study of news and information processing, external validity should be sought using real news and information for stimulus material rather than hypothetical passages. References are included. (SRT)

METHODOLOGICAL APPROACHES TO SCHEMA MEASUREMENT:

Applying 'Script' Measures to Mass Media Information Processing

By Robert H. Wicks

Paper accepted for presentation at the annual convention of the Association for Education in Journalism and Mass Communication (Theory and Methodology Division) in Norman, Oklahoma, August 1986. The author gratefully acknowledges the thoughtful and reflective comments on earlier drafts of this paper made by Dr. Fred Fico of the School of Journalism at Michigan State University.

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ABSTRACT

Schema measurement is a new frontier for communication and social cognition researchers. Recent research provides evidence that the schema concept may have significant utility in terms of explaining the processing of news and information in the mass media. But a variety of scholars have argued that adequate measurement approaches must be linked to the schema construct if it is to move toward acceptance as a formal theory. This report addresses this point.

Researchers in the domain of cognitive social psychology and political science have offered measurement approaches aimed at assessing the degree to which people employ consensual schemata. These approaches are rooted in conventional measurement techniques such as recall examinations, cluster analysis and inferential testing. This paper will offer a critique of these methods and provide a set of hypothetical examples illustrating the manner in which communication and mass media researchers may benefit from script measures.

PURPOSE

The purpose of this report is to review and explore the various approaches to schema measurement. The specific form of schema measurement to be considered is that of event schemata or 'scripts.' Both terms are synonymous and refer simply to action-based schemata. Schank and Abelson (1977) use the term script to refer to the memory structure a person uses in encoding his general knowledge of a certain situation-action routine. Approaches to 'script' measurement will serve as the focus since news and information provided in the mass media is typically presented in action based sequences similar in nature to scripts as conceptualized by Schank and Abelson.

Social psychologists and political scientists have offered several experimental designs aimed at assessing the presence, type and complexity of scripts. Experimental approaches permit manipulation of messages. Only a single study of interest to media researchers has utilized survey data in the course of schemata measurement (Lau, 1984). Graber (1984) used the schema construct to explain the findings of her panel study on political information processing, but she made no attempt to quantify the schemata used by the members of the panel.

The experimental design typically employed might best be described as conforming to the posttest-only control group design. Campbell and Stanley (1966) explain that true experimental designs employ methods of randomization to assure that all groups are equal prior to introduction of the stimulus. Most of the work in schema measurement has conformed to this

requirement. But recent experiments have emphasized individual difference among groups studied leading to assignment to a treatment group based upon a variable such as expertise. These emerging measurement approaches rely on quasi-experimental approaches. Therefore, script measurement is possible in both experimental and quasi-experimental settings.

Virtually all of the experimental research approaches involve instructions to subjects designed to invoke a specific schema. Stimulus materials (normally in the form of a topical text concerning the schema hypothesized schema) are then introduced to the subjects. The subjects are then tested to evaluate presumed script guidance of message processing. Measures commonly used include: 1. recall tests; 2. clustering of related concepts and 3. inference based on prior knowledge.

This paper is concerned with schemata measurement as it applies to communication and mass media researchers. The focus will therefore center on script measurement--a specific type of schema measurement. Following a general overview of script measurement approaches, the focus of this report will shift to an assessment of political schema measurement. Processing of political information has been singled out since it accounts for the greatest volume of news and information provided by the media. In addition, some work in political script measurement has already been conducted providing a foundation upon which to build. Hypothetical examples will be provided during the course of this report to facilitate an understanding of the experimental designs and methods to be introduced.

HEMA THEORY: THE USE OF INDIRECT SCHEMATA MEASURES

ailed theoretical analyses of the schema concept have ovided by authors in social psychology (Fiske & Taylor, atie, 1981; Norman & Bobrow, 1975), political science 1973; Lau, 1984) and communications (Reeves, Chaffee & 82). Several plausible models detailing the scheme n process have been suggested by these authors. But eoretical models must be supplemented with workable designs and measurement approaches to be of utility.

archers have alternately used terms such as prototypes & Mischel, 1977) and social scripts (Schank & Abelson, describe active information processing and retrieval. Lippmann first wrote of stereotypes--a precursor to the tion--in 1922 in his classic work Public Opinion. Schema uggests that in the course of information processing, s with expertise in a given topical domain typically veral schemata rather than a single schema. Conversely, th limited experience in a domain typically use fewer (or a single schema) in evaluating information.

abstractness of the schema concept prompted early s to simply 'assume' the presence of schemata in n processing. This assumption stemmed from the lity of techniques capable of getting inside peoples' valuate the presence or sophistication of a particular But during the past decade, several indirect approaches

to schema measurement have been employed that to so circumvent this problem. These techniques have helped the foundation upon which the schema notion rests.

While less than perfect, these indirect measures p pathway whereby the schema notion may move toward accep formal theoretical construct. Most of the studies demonstrating the presence of a schema rely on m approaches that test recall, evaluate inferential ca and assess the tendency of an individual to cluste concepts.

Cognition researchers propose that high r information is related to well developed schemata information is assimilated easily into a developed Clustering of concepts measures the manner in which peo related concepts together. Inferential abilities are a represent schema presence and sophistication since peo well developed schemata for a particular domain typicall easier to draw on past experience to fill in missing inf Researchers typically use several measures concurrently the validity of the scores obtained. A close watch i kept on the experimental design to assure relisble resul

The communication field has a rich research trad evaluating the effects of media messages on audiences society. Research has focused on topics such as the i television on children and potential for media inspire behavior. Much of this work is based on theoret methodological approaches advanced in social psychology.

d measurement offers the promise of putting this past into context. It promises explanations as to why messages have an effect on certain people leading to responses and behavior. Schema theory offers the to explain different impact of messages on different of the audience. Quantitative measurement offers the of assessing the degree to which people consensually ripts in information processing. While less precise uring column inches in a newspaper or counting stories evening news, schema measurement promises useful on on the extent to which the messages serve a purpose. l psychologists suggest that several concurrent easures such as recall, inference and clustering offer that people indeed call upon similar or different in the course of information processing. Schema t concerns measuring the presence of generic knowledge --not specific knowledge in a given topical domain. s have typically invoked a schema--democracy for nd then assessed the manner in which people evaluated n based upon the invoked construct.

imental approaches have been the mainstay of schema t techniques. But recent researchers have also begun e survey approaches with some success. A measurement ed on survey data will be evaluated presently. The al approaches will be evaluated subsequently.

THE SURVEY APPROACH

Lau (1984) utilized open-ended survey questions fr Center for Political Election Studies (CPS) at the Univers Michigan as a gauge of schemata. Each of the survey qu introduced one of the four categories (issues, groups, par candidate personality factors). The precise wording question was as follows:

> Now, I'd like to ask you what do you think are the good and bad points about the parties. Is there anything in particular that you like about the Democratic Party? (If yes:) What is that? Anything else?

Up to three responses were recorded. The questions p the label for the schema--in this case Democratic Respondents answered the questions based on upon the sum t all of their knowledge concerning political parties. This of inquiry is known as cued-free recall. Taylor and Fiske suggest that this method is one of the least precise meas schema content.

Lau (1984) acknowledged the limitations and deficienc this technique suggesting that the responses inevitably include a good deal of random noise, which will decre power of the analyses to find significant effects." Comm provides most people with something to say about a 'p party' or a particular 'politician' when provided w label--if for no other reason than to avoid creati impression that they are uninformed. Recent work by (1984) supports this proposition.

Schema theory rests on the assumption that general k

res guide processing of specific informstion. In order to is proposition, specific informstion must be provided to spondent snd then followed up with measures believed to information processing cspabilities. Accurate and ate responses to survey questions msy indeed demonstrate sence of a well developed schems. However, researchers ace again resort to simply sssuming that it is the schems ot specific knowledge) that has been tapped. The next of this report will endeavor to demonstrate that entel procedures, with their manipulative cspabilities re promise for the study of event schemats.

RIMENTAL APPROACH

bulk of litersture on schems messurement comes from psychology, a science steeped snd deeply rooted in the ntal trsdition. Most schems resesrch designs query als on s specific set of informstion or a 'knowledge set' as been provided by the experimenter. This enables the er to evsluste recsll based upon the specifics of the ion provided. This approach guards against purely ral or improsptu snswers.

jects are typically presented with an unfamiliar set and then asked to answer questions or drsw es. Schems theory suggests that individusls possessing s fined scheme in thst domsin will have more success at of relsted information, infer more and tend to cluster concepts more than individuals with an ill defined It is this introduction of the knowledge set that makes

the experimentel epproech superior to the survey Individusls are required to recsll, cluster and infer a specific knowledge set. Survey techniques drew u general knowledge. Thus, individusls with well defin in s given topicsl domain will process new informstion that domsin better than individusls with sn ill defin Unlike the survey technique, it is possible to evs greater precision the amount of a specific set of mes wss processed.

Experimental approsches represent the most recent in the srea of schems messurement. A variety of scho recently offered improvements on some of the earlier precise messurement methods (Csntor & Mischel, 1979; Feldman, 1981; Markus & Smith, 1981; Ostrom, Pryor 1981). The litersture employing experimentsl approsche outstrips any other approsch to schems me The logical starting point in this inquiry into m approaches requires the specification of variables use resesrch. Most studies in the pest hsve msnipulated e perspective of the individusl or the label for a schems. These manipulations have served ss the i varisbles.

The amount of recall, inferential abilities and of concepts have traditionally served as the dependent The oldest literature on measurement of consensual s barely a decade old. A review of this emerging body o literature may be in order.

LITERATURE REVIEW OF EXPERIMENTAL APPROACHES

e and Kinder (1981, pg. 173) report that research
ed "in schema terms has demonstrated a preferance for
and refining general principles of information
g." Much of this work has focused on consensual or
emata. Experiments on consensual schemata have tested
esis that people share schemata--that people in general
p similar images for action based or event stimulus
Abelson and Schank (1977) propose that part of our
is organized around hundreds of stereotypical
with routine activities. Examples would include
a dentist or ordering a meal in a restaurant. This
n is supported by a series of recent studies (Anderson
t, 1978; Bower, Black and Turner, 1979; Fiske, Taylor,
Laufer, 1979). But more recent work also suggests that
differences provide for substantially different levels
sing of information based on script development (Fiske,
arter, 1983; Graber, 1984; and Markus, 1977).

, Black and Turner (1979) suggested that consensual
e rooted in a form of 'cultural uniformity' which tends
people to share perceptual stereotypes concerning the
which certain routine typical events unfold. They
ed that subjects presented with a hypothetical scenario
information or misremember facts from a story based on
expected to transpire. The researchers operationalized
thesis by asking student subjects (N=161) to generate a

script (dependent measure) based on their expectations
series of common events such as "ordering a meal in a re
(independent variable) should unfold. They then asse
consensual agreement on characters, props, action cont
the other elements of the stories generated.

But they went further than simply reporting that pe
to conceptualize social information in a similar fash
researchers tested recall on implied information by
second set of respondents (N=18) to read a series of
stories. Each story was different but many were related
of general themes. For example, stories entitled "Th
"The Dentist" and "The Chiropractor" were all includ
subjects then wrote down all of the information they cou
about certain stories. The results were subjected to an
which stated actions were compared to unstated script ac
finally to other actions.

In another experiment, Bower, Black and Turner (19
subjects (N=12) to study two sets of actions--one set c
actions for a script in a logical order and a second set
action items incorrectly arranged (independent variable
then asked the respondents to arrange a set of cards d
the actions in the original order (dependent measur
results were analyzed using ANOVA to determine whethe
misremember information to make it conform to the an
script.

Anderson and Pichert (1978) looked at the processin
directed social events in another set of experime

measure was level of processing based on information rooted in the directives of the researcher. The nt variable was goal directed processing operationalized g respondents to assume a given perspective. Students ad a story about the behavior of two boys while skipping The action in the text was set in the home of one of the he passage contained information of interest to a ve home buyer and a burglar. A total of 72 facts (or s) were provided.

of the students were assigned to the group asked to text from the perspective of a burglar (burglar schema) other half read it from the perspective of a home buyer er schema). Then they wrote down all they could recall e story. After a distractor task, the students were ed to recall facts from the story but half of each group to do so from the other perspective. The researchers lied the recalled facts from the differing perspectives ate whether or not processing was different depending perspective of the individual attempting to retrieve the on. An ANOVA performed on the data suggested that ons to take a new perspective led subjects to invoke a t provided cues for processing of different categories nformation.

, Taylor, Etcoff & Laufer (1979) explicitly instructed ubjects (N=50) to take the point-of-view of individuals they provided. The researchers instructed the students an accident from the point of view of the motorcyclist

or the cabbie involved in the mishap or from the perspe spectator. The set of experiments were designed to t based on visual point-of-view influences. The students series of questions based on a text they had read accident. The questions probed specific details such of the events leading up to the accident. The stud assessed responsibility for the accident to one of th involved. The recall and attribution data were each separately.

The independent variable in this experiment perspective of the person reading the text. The measures were drawn from the answers to the open-ended An ANOVA involving recall suggested that recall is enha on visual perspective and goal orientation. Of prime this study is that people selectivly processed visual all of the information was semantically equal. Each s instructed to read the text from a particular poin Specific groups of people processed information in manner based on a point-of-view schema invoked researchers.

These experiments have tended to demonstrate th apparently conceptualize simple action-based routines i fashion. But what of more complex scripts? Can we fact that individual differences in people may cau variation based upon socio-cultural differences in peopl

It is this very point that Markus addressed pioneering work on individual differences in self

1977; Markus & Smith, 1981). Markus hypothesized that
ma will determine the type of self-judgments that are
that these judgments will vary in latency depending on
ence and content of self-schemata. She also predicted
ividuals with self-schemata (operationalized as highly
or independent) should find it easier to describe
behavior that is related to their schema and should be
y more certain about prediction of their behavior along
nsion than individuals with an ill-defined self schema.
ua (1977) demonstrated that people process information
ly depending upon the degree to which a particular
domain is salient. She used the term 'schematic' to
individuals with significant interest or knowledge in a
r stimulus domain. 'Aschematic' conversely refers to
ls with little or no knowledge or interest in a
r domain. The specific design and measurement
s utilized in this research are of little importance
researchers since design and measurement techniques
in the evaluation of self-schema are strikingly
from those employed in script analysis. But this work
nguished because of the design and measurement
tions--that of individual differences--are clearly an
concern to news and information providers.
a provided a foundation upon which others have built.
Koeske (1983) proposed that knowledge possessed by
n a given topical domain) is denser (they possess more
and concepts are better integrated) than knowledge

possessed by novices in that domain. Their work reflect
underpinning of schema theory--that 'experts' may be exp
draw on more schemata when processing information t
'novices.' It should be noted that use of the
(aschematic) and the expert (schematic) dichotomy is not
to imply that all people can be neatly categorized as on
the other. Categorization of people simply represents
on a continuum, thereby establishing the variance essen
experimental research.

Fiske, Kinder and Larter (1983) suggest that
understanding depends vitally on past experience a
individuals will vary enormously in both the availab
schemata and how available schemata are used. The "po
involved should differ from the uninvolved in their proc
information about politics: in the nature of schemata
to them, in the ease by which such schemata are invoked
facility with which such schemata are employed in in
processing." As such, assimilation of information s
facilitated if an individual is politically astute.

Fiske, Kinder and Larter (1983) designed a s
experiments intended to evaluate specific differe
political information processing. They assembled a
political 'experts' and a group of political 'novices
operationalized this concept by evaluating individual l
political involvement using standard measures provided
Center for Political Studies at the University of Michig
researchers predicted that political experts and novic

information consistent with their shared prior knowledge
at they hypothesized that the experts would also use
ion inconsistent within the knowledge set provided. This
ted by asking students (N=82) to participate in a media
The researchers prepared a text about Mauritius, a little
ountry in the Indian Ocean. The text was laden with
tending toward democratic and communistic forms of
nt. The opening sentence of the text manipulated the
set by suggesting the country was communistic,
ic or neither (independent variable).

students were then asked to recall as many facts as
They also made inferences about the country by
answer to questions not included in the text. Amount
l was measured by counting the facts recalled and
g the recall data to an ANOVA on knowledge (communist/
ic/neither) by expertise (high/low) by information type
t/democratic). Inferences were analyzed using an ANOVA
edge set (communistic/democratic/neither) by expertise
). The researchers also utilized a measure of
l clustering (Adjusted Ratio of Clustering) which
the manner in which like concepts cluster together.

relevance of all of the individual difference studies
summarized (Fiske & Kinder, 1981, pg. 177).

> "Through practice, experts acquire more-and complexly organized knowledge, which includes egies for dealing with particular domains. knowledge structures-in our theoretical ulary, schemata-encompass both declarative edge (descriptions of attributes) and dural knowledge (rules or strategies for the f that knowledge)."

These experiments suggest that people tend to con
action based routines in a similar fashion based in lar
cultural norms dictated by the society. Yet differi
roles (among other reasons) accounts for individual d
in people. Thus schema measurement offers the oppor
assess the degree to which people share action based st
Script analysis provides a specific blueprint for assu
information is assimilated easily for audience se
aggregates. However, each topical domain must be
individually. This suggests that instead of simply
people on general information preferences such as featu
versus political news, it is essential to dissect each
of news. Such an approach will inevitably involve co
refinements of the measurement approaches that have her
explored.

Political information will serve as an appropriat
point in this endeavor since some work in this area ha
commenced. The following section will provide a
rationale for the selection of political information.

SCHEMA USAGE IN POLITICAL INFORMATION PROCESSIN

Scholars since Lippmann (1922) have proposed that
schemata in the course of news and information processi
concern to media researchers is the assumption that peo
specific schemata when processing various types of i
(politics, economics, sports, weather, etc.) suppl
media. Schema measurement hinges substantially

ication and measurement of consensual schema usage among
e members.

litical information offers promise with regard to schema
ment for the following reasons.

Political schemata have been studied and analyzed in the political science literature: As such, suitable measurement models may be applied in attempting to segment audiences based on consensual schemata.

Proliferation of political information: Political information seems an appropriate starting point in analyzing the manner in which information and consensual schemata interact since political news and information is presented with greater regularity than any other type of information.

litical information is all around us. Gans (1979, pg. 16)
that approximately 35% of all of the news stories on
(network) news programs are political in nature. If other
ally tangential types of news stories are included, the
rises to above 40%. A more recent content analysis
1985) suggests that 30% of the stories on American
k) newscasts are primarily political and 53% deal
ially with politics. The sheer volume of political
s to which people are confronted on a daily basis makes it
al choice for the study of applying schema theory to news
ormation processing.

litical information provides an excellent opportunity for
y of schema measurement for a variety of other reasons as
Most Americans remain rather indifferent to, and generally
nformed about, much of what transpires in the political
despite the sheer volume of political information to which

the average person is exposed (Converse, 1975; Sears, 1969)
average person is extremely selective when approaching the
of political information available (Graber, 1984). The pote
for obtaining political information is relatively high but
average person's typical investment in developing poli
expertise is relatively low (Converse, 1975; Downs,
Lippmann, 1922).

But while many people may process relatively
political information, political experts (Fiske, Kinder & L
1983) apparently process and retain political information
relative ease. The political expert is believed to empl
greater number of schemata in the course of inform
processing than does the novice. Politics allows the
assemblage of groups with widely divergent processing abil

Graber (1984) is perhaps the first and quite possibly
only researcher to thus far conceptualize the a
significance of schema research for mass media scholars.
absence of a trough full of literature in the communic
concerning schema application, an illustration of its pot
utility based upon a recent event will be sketched.

President Aquino in the Philippines recently captured
and national attention by striking a chord rooted in human
and democracy. National and world attention quickly focused on t
island because it presumably activated a related and well
schema--that of people taking charge of their lives.

Effectively striking a well defined communal schema ine
paves the way for transmission of information capable of s
a collective chord among audience members thereby lead
enhanced audience loyalty and increased size.

EXAMPLES OF SCRIPT MEASUREMENT APPROACHES

search literature from the past decade clearly suggests people share stereotypical scripts. Cultural norms, for dictate the set protocol be employed in the course of out at a restaurant. These norms lead to shared conceptual of typical action-based events or consensual script. But esearch does not to imply that scripts are identical or t between people. The restaurant script of a wealthy may include tipping of the maitre d'--an attribute not ily included in the dining out script of the less well-

how might media researchers utilize such research? A of hypothetical examples will be provided intended to an explanation of the potential applied significance of easuremant in media research.

pose the anchorman on the evening news reports that an le accident has taken place. Mere mention of the may prompt people to visualize the scene of an le accidant. Generic accident pictures based on prior ce and stored in the mind will be summoned to create a accident script. More of the script may be filled in if a is told that an antique Corvette and a school bus . And more still if the person knows that the accidant at the cornar of Elm Street and Vine. But will the ttend to information about the accident provided on the news? The answer is yes if the information is schema But if people share consensual schemata, what makes an

event schema-relavant for one person and schema-irre another. The following example from political science top clarify the picture (Converse, 1975, pg. 97).

EXAMPLE 1

> "If an informed observer hears a surprising policy statement in the news by the secretary of defense, he may prick up his ears and pay close attention. He related this information to what he knows of recent policy, what he knows of the secretary's relationship to the president, what he knows of past positions the secretary may have taken, and the like, since he is intensely interested to detect even small reorientations of national policy. In short, he automatically imports enormous amounts of prior information that lends the new statement high interest.
>
> The poorly informed person hearing the same statement, finds it as dull as the rest of the political news. He only dimly understands the role of the secretary of defense and has no vivid image grounded in past information as to the inclinations of the current incumbent. His awareness of current policy is sufficiently gross that he has not expectetion of detecting nuances of change. So the whole statement is confronted with next-to-no past information at all, hence is just more political blather: in five minutes he probably will not remember that he heard such a statement, much less be able to reconstruct what was said.

This example clearly illustrates the range of political schemata possessed by two different people. to measure consensual schemata, it will be essential schemata in a relatively large sample and then find Lau developed his typology of schemata typically em political information processing from the election carried out by the Center for Political Studies at the of Michigan. This typology will serve as a starting political schema measurement since it offers the opport evaluate several of the fundamental political concepts.

exhaustive--indead--more or fewer categories could be
However, it seems to offer broad knowledge bands while
ng certain specific characteristics to each component of
ogy. The typology includes issues, political parties,
(politician) personality factors and attributes
d with specific social groups. While information
and most people use each of these schemata at certain
t seems possible that people may use greater or lesser
f these schemata based upon individual differences such
ise. Consider this example.

EXAMPLE 2

Suppose that 70% of the people who are exposed
olitical information through the television
media rely primarily on their 'politician'
a in interpreting the information. And suppose
nation suppliers typically invoke the 'issues'
perty' schema in the course of presenting the
mation.
Neither the audience nor the information
ier derives maximum utility from the message
this scenario. Quite simply, the messages are
nted in a manner which is difficult for the
ity of the people to process. And the
nation supplier runs the risk of losing
nce members unable to process the information.

ne measurement is essential to evaluate which schemata,
what extent these schemata, are used by members or
of the audience. Thus specification of shared schemata
eople is essential if media information suppliers
wish to provide information in a highly processable
to a definable (presumably large) audience segment or
of segments.

l testing of information processing is related to
n recall. Social psychologists suggest that accurate

and abundant recall reflects efficient information proc
And the literature suggests that recall testing is an es
element of all script measurement. But heretofore, the sp
concerning recall measurement have been skirted. This w
remedied in the example to follow.

Hypothetical Example Of Recall Testing

Consider this scenario. A group (N=100) of individ
asked to view a television newscast with equivalent amou
the four types of political information identified by Lau
independent variable will be goal directed information pro
and the dependent measure will be absolute recall. Fiske,
and Larter (1983) have done work similar to the example be

EXAMPLE 3

Suppose a sample (N=100) is divided into five equal groups (N=20 per group). They are asked to view political stories embedded in a newscast. A total of 20 political facts is provided. (Five facts for each of the four schemata are offered).

Group 1 is told they will be asked to recall party information. Group 2 is told they will be asked to recall candidate (politician) personality factors. Group 3 is told to recall issues information. Group 4 is told they will be quizzed on group information. Group 5 (control) is told that they will be asked to recall the information in the newscast. Each subject views the newscast.

Each subject is then asked to recall the information they were directed to process. After this task is complete, they will be asked to recall each of the other categories of information. Each response might then coded using the four-part typology for political information (issues, groups partie or politicians). The results will be subjected to an ANOVA in which goal directed processing may serve as the independent variable and recall of information specific to the categories will serve as the dependent measure.

pothetical ANOVA table has been provided below. The data
that each group successfully performed the task of
the specific information requested better than the
ree types of information. However, the table also
that people tend to process group oriented information
tall = 2.8) with relative ease and issue related
on (mean recall = 1.6) comparatively poorly.

ETICAL MEAN RECALL OF POLITICAL INFORMATION IN NEWSCAST

up (100)	Info. Type	Knowledge Set: Party	Cand.	Issues	Group	Mean Recall
N/20)	Party	2.8	1.6	1.2	2.8	2.1
N/20)	Cand.	2.1	2.8	1.3	2.7	2.2
N/20)	Issue	2.0	1.7	2.0	2.5	2.1
N/20)	Group	2.0	1.8	1.4	3.2	2.1
N/20)	Control	1.8	1.9	2.1	2.6	2.1
		2.1	2.0	1.6	2.8	

mation yielded from this table may guide media
n managers on efficiently supplying information to the
It may also for example, alert media managers to the
y that people in a given market process information
issues poorly. Therefore, special attention may be
the manner in which issues are portrayed through the
rification and simplicity in presentation are essential
ive message transmission.

results of the measurement approach above may provide
ployable guidance for programming based on consensual schemata for
al populace. However, this approach can be easily
for specialized audiences. Suppose for example that a
decides to tailor the message for political elites.

He may simply follow the path forged by Fiske, Kinder a
(1983) in measuring the processing abilities of specific
segments. Using political involvement, for example
criterion variable, news managers may study processing t
of specific audiences.

Hypothetical Example Of Adjusted Ratio of Clustering (ARC

The second measure known as the adjusted ratio of cl
(ARC) method (Bousfield & Bousfield, 1966; Ostrom,
Simpson, 1981; Roenker, Thompson & Brown, 1971) inde
deviation of clustering from levels based on chance. Cl
in free recall identifies the presence of schem
demonstrating that items within similar categories
cluster. Conceptual clustering of concepts provides
that people do group thoughts and ideas--a major as
underlying the schema theory

Schema theory suggests that people cluster similar
as a strategy to organize social information. Supp
example that a group of subjects are read a list of wor
contains the names of animals randomly interspersed a
names of flowers. Researchers have found that the order
items are listed in free recall reflects their associa
organized memory. Specifically, subjects with well
animal and flower schemata will cluster the animals in c
of the recall sequence and flowers in another (Ostrom,
Simpson, 1981).

A number of indices for clustering of free recall h

The relative advantages and disadvantages of many of clustering methods have been outlined by Shuell (1969). method--the Adjusted Ratio Clustering (ARC) technique-- lated highly (.90) with other measures (Ostrom, Pryor & 1981). For this reason, it alone will be considered. e derived from ARC measures represents the ratio of category repetitions above chance to the total possible repetitions above chance (Ostrom, Pryor and Simpson. he following equation represents the theoretical ARC g formula.

$$ARC = \frac{R - E(R)}{\text{Max } R - E(R)}$$

the total number of observed repetitions. (A repetition is defined as occurring anytime two items from the same conceptual category are reported contiguously.)
the chance number of category repetitions.
the maximum number of category repetitions

employ this technique, adjacent pairs of items must be Since the raw number of adjacent pairs is confounded l recall of each type, the clustering scores have to be for the number of pairs expected by chance (Fiske, arter, 1983) which in turn is a function of the number n a given topical domain.

se a researcher was interested in demonstrating that es' concepts cluster together. The following applied y be employed in conceptual cluster analysis.

$$ARC = \frac{Ri - [Mi \frac{2}{N} (N-1) \frac{2}{k}]}{(n-k) - [m \frac{2}{N} (n-1)]}$$

where Ri = observed number of pairs (issues)
mi = total recall (issues)
N = total recall (issues, politicians, party and
k = number of categories = 4
m = maximum possible number of category repetition

The same formula will be used repeatedly for each four concepts. The numbers generated will be summed acco group and averaged. They will then be submitted to anoth test in the following manner.

EXAMPLE 4

Suppose that two people with different levels of political expertise are asked to watch a television newscast which contains several political stories. And they are directed to pay attention to information that concerns social 'groups.' The total number of facts provided for each category of information (parties, groups, issues and candidates) is five for a total of 20 facts. The first person (Pa) recalls all of the groups information contiguously and the clusters related concepts in a bunches. The second person (Pb) recalls very little of the information and none of the concepts are clustered contiguously. Such that:

Pa = AAAAADBBCBBCCCCDDBDD
Pb = ABCDABCD

where Pa = the political "expert"
Pb = the political "novice"
And A = facts recalled concerning political "grou
B = facts concerning political "parties"
C = facts concerning "politicians"
D = facts concerning "issues"

Using the formula provided, it is possible to generate a coefficient for clustering where perfect clustering in this case would be .242 (as with Pa), and poor recall with no clustering would represent be -.35 (as with Pb). Clustering of 1.0 is possible only when a single category stimulus is invoked. When multiple categories are invoked, the perfect score drops.

emonstration of this techniques may help.

AAAAADBBCBBCCCCDDBDD

ject Pa clustered all of the A's (group concepts) for a total of four pairs. This person recalled five oup concepts). Total recall for A's (groups), B's), C's (politicians) and D's (issues) was 20. The number ories is four (issues, parties, politicians and groups). num number of category repetitions for A's is four.

refore:

$$ARC = \frac{4 - [5 \div (20-1) \div 4]}{(20-4) - [4 \div (20-1)]} = \frac{3.67}{15.15} = .242$$

HYPOTHETICAL CLUSTERING OF POLITICAL CONCEPTS
Knowledge Set

wledge el	Info. Type	Party	Cand.	Issues	Group	Mean Cluster
pert a)	Party	.21	.14	.17	.18	.18
	Cand.	.18	.22	.21	.19	.20
	Issue	.08	.14	.23	.20	.16
	Group	.12	.17	.19	.24	.18
vice b)	Party	-.26	-.23	-.30	-.35	-.29
	Cand.	-.30	-.28	-.19	-.35	-.28
	Issue	-.26	-.24	-.05	-.35	-.23
	Group	-.34	-.07	-.05	-.35	-.20

sual inspection of clustering table offers evidence that lement and corraborate the recall table demonstrated Specifically, the individual with the well developed schemata (expert = Pa) clustered facts related to the of political information better than novices. Such a uld be of little surprise. However, by combining and the cluster scores of all of the individuals it is

possible to predict which components of the informatio most easily processed by the greatest number of Furthermore, as with the recall example, informatio programmed for specific segments by grouping politica and novices separately.

It should be noted that the largest possible coeffi any category in this example is .24. By adding cluster scores together, it is possible to obtain a picture of total clustering. And of course, a perfect clustering in all categories would yield a 1.0. In s where clustering and recall are extremely poor, the c can go below -1.0. This instance is illustrated ab example, summing the group scores above will yield -1. suggests that positive and negative scores do not have the same meaning. However, Ostrom, Pryor and Simpson (1 that negative scores larger than -1.0 are the exceptio than the rule.

It should also be noted that the ARC formula i tests recall as it tests clustering. Recall is a pre for any form of clustering. Concepts cannot be clustere cannot be recalled. Thus the recall and clustering tabl tend to reflect the same sorts of trends--although di are not uncommon. But taken together, they are as reflect the presence of an action schema or script.

al Example Of Inferential testing

third approach involves evaluation of inferential
ea. Typical inferential tests involve asking members
ject pool to infer from information not provided in the
set. The following example should facilitate an
ing of this approach.

EXAMPLE 5

iske, Kinder and Larter (1983) examined
dge-based strategies in political cognition
unction of expertise.
tudent subjects ware divided into experts and
s based upon measures of political
ement developed by the University of
an's Center for Political Studies for use in
national surveys.
ubjects read a description of a previously
n third world country (Mauritius) after being
that it was communist, democratic or
ified. Concepts typically associated with
acies and communistic forms of government
intersperaed throughout the article. An
e of a democratic concept was "An open and
press keeps Mauritian citizens informed about
al events and what is going on in
ment." An example of a communist concept is
tians generally do not speak out in
tion to the government." Subjects were not
hat Maritius is actually a British Island in
dian Ocean.
he subjects in this experiment were then
to make inferences about Mauritius. They were
questions like "How easy or difficult do you
it would be for a citizen to emigrate from
ius?" Note that none of the inference
ons were directly addressed in the text. All
ses were provided on anchored 9-point scales.
he sum of these mentions was submitted to an
is of Variance (ANOVA) on expertise
ow) by description (communist/democrat).
ata suggest that novice or low-involvement
ts made inferences that were more consistent
the set (or label) provided, while experts
nferences more influenced by inconsistencies
description.

tudy conducted by Fiske, Kinder & Larter (1983)

suggests that the political novices simply began the for
schemata based on the facts provided and the label give
text. The political elites conversely used d
information and inconsistencies in formulating respons
results suggest that differences in processing, b
available schemata, exist in the course of p
information.

RELIABILITY AND VALIDITY

Reliability concerns are paramount with regard to
measurement since this research area has only recently
and is therefore comparatively unexplored. It has be
that schemata cannot be directly measured and that re
must often rely on indirect measures such as recall exam
clustering in free recall (ARC), and inferential testing.
also been pointed out in the literature review th
measures have recently been used concurrently to cross-ch
other.

Multiple indicators are typically used to as
reliability of the schema measures obtained. Several
taken concurrently reflecting similar patterns of proces
believed to validate each other. Social science res
generally trusted only when several measures demonstrate
especially when the focus of the research is in a relati
or unexplored measurement domain (Simon & Burnstein,
Schema researchers have used several techniques to get

on of these organized knowledge structures. But the
asure that permeates virtually all of the literature on
asurement is that of recall testing.

testing has been employed in most of the studies during the past
nderson & Pichert, 1978; Bower, Black & Turner, 1979;
Evans & Fulero, 1978; Fiske, Kinder & Larter, 1983;
aylor, Etcoff & Laufer, 1979; O'Sullivan & Durso, 1984;
r & Cantor, 1978). But recall testing alone cannot be
d a reliable measure of schema presence or
ation. Hence inferential testing and clustering
s have thus been employed to buttress the argument that
flects the knowledge contained within a schema.
early work in script measurement (Bower, Black & Turner,
ied almost exclusively on recall testing. More recent
tended to include all three techniques (Fiske, Kinder &
1983). It should be noted that these two studies cited
peared in journals within a four year span and that new
nt approaches will likely continue to emerge for the
e future. But it is impossible at this point to assess
degree of certainty whether any of these approaches is
uperior to any other. These measurement approaches are
at neither meta-analyses nor Monte Carlo studies have as
been conducted to assess the relative worth of these

the absence of formal studies of schema validity upon
draw, the measurement approaches will be critiqued in a
ve fashion utilizing the formal definitions for "content

validity, criterion related validity and construct
(Zeller & Carmines, 1980).

Content or face validity is a system of using logic,
sense and previous work in the interest of specifyin
variables represent an abstract concept. Schema theory
the assumption that a script serves as the central pr
model for any given sequence of events encountered
individual. Individuals with well developed schemata in
domain will logically recall new information in that
better than others with poorly developed schemata. Rec
serves as the dependent measure. Schema theory suggests
information can be more easily assimilated when a
schema is available. This proposition seems plausible
probable from a common sense standpoint.

A person will also logically infer more from a
information if he possesses a well developed schem
individual simply has a greater knowledge base upon which
and will find it easier to find parallel situations in
which serve as a model for current incoming informatio
individuals well versed in a given topical domain will
cluster related concepts when asked to do so based upo
enhanced appreciation of the boundaries for a given conc
professional baseball player will be able to cluster al
league teams. The less interested observer may include
football teams in the list and fail to include several
teams.

Criterion related validity is established when the

a scale and a variable can be reasonably gauged. It is
ree to which an operational definition categorizes
in the same way as a well-accepted (or criterion)
nt does. Criterion validity is normally gauged through
of a correlation coefficient to determine the degree of
on between the new measurement and the criterion
(Phillips, 1985). Criterion validity may come into play
ma measurement especially in development of the
nt instrument and during the coding of open-ended

ot measures typically ask people to recall facts based
knowledge set provided by the researcher. Coders must
the responses to assess the degree to which people
or grouped certain conceptual items. If the sorting
s are too similar, for example, coders may fail to sort
ses in a similar fashion. High intercoder reliability
tes appropriate analysis of the data. Criterion
refers to highly specific elements of the research
ther than the broad concepts assessed in the area of
face validity. If an experiment is set up in a manner
people comprehend and perform a given task properly and
is analyzed such that agreement is strong between
en criterion validity is high.

ardized tests such as the Graduate Record Exams (GRE)
predict the ability of an individual to perform in
school reasonably well. Tests of schema presence may
serve a similar predictive function by providing

guidance for information providers on shared pr
abilities. But standardized tests such a GRE examinatio
had the luxury of time which has proven their validi
reasonable certainty. Coding of these tests is done
unambiguous fashion in which a correct (or incorrect) res
selected from several possible answers.

Unlike the GRE tests, schema measurement tests
limited research tradition upon which to draw. T
especially vulnerable with regard to criterion v
Concerning schema measurement, the stimulus or knowledge
ideally be provided to all respondents under similar con
Each experimental subject must understand the directions
by the experimentor. But it is not essential that the
messages be comprehended equally by each subject. It is
these differences in comprehension and retrieval th
ultimately serve as evidence of schema presence (or
presence). Hence criterion validity hinges vitall
intercoder agreement, development of an unambiguou
collection instrument and clear articulation of the te
performed.

Schema measurement is a new frontier for communicat
social cognition researchers. One may certainly make t
that schemata do not exist--that the variables measured
reflect memory or chance clustering. But this argu
precisely the reason that measurement approaches ai
explored. And it is this criticism that leads logically
domain of construct validity.

struct validity is present if the reseercher can ate that a scale measuring an abstract concept is related r scales. Construct validity typically begins with a is on how a set of idees or concepts may be relsted. ust then be developed to measure the concepts. Results nt with predictions tend to suggest that construct is present.

is precisely this point which has been sddressed by ers during the past three yesrs. Scholsrs of cognition Fiske, Kinder and Larter (1983) have provided several on the same responses to demonstrate that the results one may argue thet clustering of concepts is hopelessly with recall of facts since facts must be recalled hey can be clustered. But the cluster scores obtsined e ARC measures will be considerably lower if the l recalls a greet deal but fails to cluster related The scales used to measure scripts including recall, and clustering heve tended to yield the anticipated ased on formal hypotheses. Agreement between scales, or tending in the same direction suggest that the schema ossesses construct validity when proper measurement s are employed.

erforming experiments, researchers must be aver mindful ems associated with internal and externel validity. validity is the besic minimum without which any t is uninterpretable (Campbell & Stanley, 1966). to the concept of internel validity is the question of

whether or not measurement is able to determine experimental manipulation made a difference in a instance. The research described in this report de clearly that people share consensual schemata and that differences sccount for variation in schemata u availability.

Internal validity is rarely a problem in properly experimental research characterizad ss a posttest-only group design. Campbell and Stanley note that all of th essociated with internal validity (history, maturation, instrumentation, regression, selection and mortality) controlled in this design. It is in the domain of validity that this dasign is celled into question.

External validity pertains to the generelizability results of an experiment or to "what populations, treatmant variables and measurement variables can this e generalized (Campbell & Stanley, 1966)." Virtually al work on scheme measurement has been conducted in the l using stimulus materials specifically designed to schemeta. More experiments demonstrating resl spplications of schemsta will help this construct mov formal acceptance.

Tha specific thraet to external validity centers types of experiments which have been carried out. Peo typically been tested on consensually shared scripts of nature such as ordering a meal in e restaurant. Or t recall of facts pertaining to broad generic concepts ba

concept such as democracy or communism. But do people employ scripts in the processing of day - day news on? Do people employ different types of schemata in the f processing specific types of information provided by media?

avoid ending on a string of questions, it must be ged that the external validity of these measures is in Researchers have done little to assess the degree to ple employ scripts in the course of processing news and n. Viewing a newscast with information concerning the response to Libyan rocket fire over the Gulf of Sidra y cause an individual to summon schemata different from t may be employed in the course of processing a passage and of Mauritius.

the time is right to begin assessing the degree to e measures may be considered externally valid. And the followed in this regard involves using 'real' news and n for stimulus materials rather than hypothetical The measurement approaches discussed will serve as a for more elaborate approaches. The schema concept some ripening--and measurement approaches will aid in But as Fiske and Linville (1980, pg. 553) note, "the r-headed overall view of the schema concept--or of any mer--is to let a thousand conceptual flowers bloom."

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