

COGNITIVE COMPLEXITY AND THE EFFECTS OF THOUGHT ON ATTITUDE CHANGE¹

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Subjects varying in cognitive complexity rated 35 six-trait sets according to how much they would like a person who had the qualities listed; then each subject re-read one set, thought about the person described, and wrote an impression of the person and re-rated the person on an evaluative scale. Each subject then completed the same procedures for a second trait set as a same-subjects replication. Contrary to Abraham Tesser's explanation of the effects of thought on attitude change, the attitudes of cognitively complex subjects were not more likely to polarize after thought: no differences between complex and noncomplex subjects were obtained with the original set, and with the replication set noncomplex subjects were more likely to polarize. The results also suggest limitations on the generality and powerfulness of the polarization phenomenon.

In a variety of studies, Abraham Tesser and his co-workers have investigated the effects of thought on attitude change (Tesser and Conlee, 1975; Tesser, 1976; Tesser and Cowan, 1975, 1977; Tesser and Leone, 1977; Clary *et al.*, 1978). The standard experimental arrangement in these studies is one in which each subject initially gives evaluative ratings of a large number of briefly presented stimulus objects; the subject is then re-presented with one object which he initially rated moderately and is either given an opportunity to think about the object or is distracted from thinking about the object, and then is asked to reevaluate the object. Using a variety of stimulus materials (persons, groups, social issues, women's fashions, football tackles, paintings), Tesser and his colleagues have found that attitudes polarize under conditions of thought: attitudes that were initially moderately positive become more extremely positive, those initially moderately negative become more extremely negative. As Eagly and Himmelfarb (1978) note, these results may have significant implications for the interpretation of the effects of persuasive communications on attitude change. Various experimental manipulations (say, of message characteristics) may not influence attitude change directly, but only indirectly simply by inducing the receiver to think about the attitude object.

The explanation Tesser offers for the polarization phenomenon (see, *e.g.*, Tesser and Leone, 1977; Tesser, 1978) is that one's thoughts about an object are directed by one's cognitive schemas for that object, and that cognitive schemas typically have a principle of evaluative consistency built into them. Hence when an individual is given the opportunity to think about the stimulus object,

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s/he will add new beliefs about the object which are evaluatively consistent with the initial (moderate) attitude and/or reinterpret existing cognitions so as to make them evaluatively consistent with the initial attitude, and hence the initially moderate attitude will, as a consequence of thought, become more extreme.

The most direct evidence for this explanation is provided by two experiments conducted by Tesser and Leone (1977). In the first study Tesser and Leone, reasoning that most persons have better developed schemas for perceiving individual persons than for perceiving groups, used a design like that sketched above to compare the effects of thought and distraction with persons and groups as attitude objects; they found polarization under thought conditions more likely for person stimuli than for group stimuli. The second study employed male and female subjects with football tackles and women's fashions as the stimulus objects. Tesser and Leone reasoned that male subjects (by virtue of having better developed schemas for football than the female subjects had) should be more likely than females to polarize on re-rating the football stimuli, while female subjects should be more likely than males to polarize for the fashion stimuli. These hypotheses were confirmed. Taken together, these two studies suggest that relatively advanced perceivers in a given domain, as a consequence of having better developed schemas for the domain, place greater reliance on evaluative consistency as a principle of cognitive organization than do less sophisticated perceivers (and hence advanced perceivers polarize under conditions of thought).

There are, however, several studies which suggest just the opposite conclusion: that developmentally advanced perceivers place less reliance on evaluative consistency principles than do less advanced perceivers. For example, children depend heavily on Heiderian balance schemes for predicting social relationships (Atwood, 1969; Saltz and Medow, 1971); indeed, many young children place such emphasis on evaluative consistency as a principle of cognitive organization that they believe that a "good baseball player who becomes a liar loses his ability to catch and hit well" (Saltz and Medow, 1971, p. 1537). As the child matures, of course, less reliance is placed on such balance schemes.

Investigations of the use of balance schemes among adults differing in cognitive complexity have produced similar results. Cognitively noncomplex subjects (*i.e.*, those with less developed interpersonal schemas) are more likely than complex subjects to employ balance schemes in learning social structures and are also likely to continue to employ such schemes even when these have been disconfirmed (Press *et al.*, 1969; Delia and Crockett, 1973).

Another study inconsistent with Tesser's explanation is Markus's (1977) investigation of what she called self-schemata, "cognitive generalizations about the self, derived from past experience, that organize and guide the processing of the self-related information contained in an individual's social experience" (p. 63). She studied females with and without self-schemata along a particular dimension of behavior, independence-dependence. The term "Aschematic" was used to refer to persons "without schema on this particular dimension" (p. 66); Markus obtained data which confirmed that "the Aschematics have no articulated cognitive generalizations or self-schemata along the dimension of independence-dependence" (p. 72). Two kinds of Schematics were identified, Independents (those with self-schemata along the dimension who judged themselves to be relatively independent) and Dependents (those with self-schemata who judged themselves to be relatively dependent).

Markus made several comparisons between Aschematics, Independents, and Dependents, but the comparison of signal interest here concerns whether, when given a list of positive and negative trait words related to the independence-dependence domain, Aschematics, Independents, and Dependents would differ in the extent to which they saw these words as self-descriptive:

For the Aschematics there was a substantial relationship between the percentage of individuals judging a word as self-descriptive and the positivity of the word ($r = 0.53$, $p < 0.05$). This relationship was not evident for the other two groups of subjects (Dependents, $r = 0.11$; Inde-

pendents, $r = 0.21$). As a group, then, the Aschematics appear to be relatively more affected by the positivity of the adjective and may use this attribute to decide whether a particular word is self-descriptive. Independent and Dependent subjects are relatively more willing to use negative labels for their behavior. It may be that an individual with a schema about her behavior on a particular dimension is aware of both the positive and negative aspects of it . . . (Markus, 1977, p. 71).

Related evidence is provided in studies of the kinds of impressions cognitively complex and noncomplex perceivers form of another person. Supnick (1964, cited in Crockett, 1965) and Delia (1978) both found that noncomplex perceivers were more likely to write evaluatively onesided impressions of another person than were complex perceivers, suggesting that evaluative consistency is a more important principle of belief organization for noncomplex than for complex perceivers.

Thus evidence from a variety of investigations suggests that perceivers with more developed schemas place less reliance on evaluative consistency principles than do less advanced perceivers. With respect to the phenomenon of attitude polarization, then, the critical issue seems to be this: under conditions of thought, will polarization of attitudes occur predominantly among developmentally advanced perceivers (as Tesser's explanation suggests) or among developmentally less advanced perceivers (as the literature discussed above implies)? A careful investigation of this issue requires a domain-specific measure of schema development rather more sensitive than, *e.g.*, Tesser and Leone's (1977) use of stereotypic sex differences in perceiving football tackles and women's fashions; and ideally the measure of individual differences would be one for which evidence concerning reliability and validity is already available.

The present study was designed to meet just these requirements: the stimulus domain chosen was persons, and the individual difference measure was a version of Crockett's (1965) Role Category Questionnaire measure of cognitive complexity, an index of developmental advancement in the domain of person perception (details of the measure are provided below). Subjects participated in an experiment similar in overall design to Tesser's research, save that no distraction condition was included; since the issue at hand concerns individual differences under conditions of thought, the inclusion of a distraction condition was deemed unnecessary.

Briefly, subjects rated a large number of six-trait sets according to how much they would like a person who had the six qualities listed. Then each subject re-read one description, was asked to think about that stimulus person for a minute or two, and then wrote an impression of that stimulus person and reevaluated the person. The stimulus descriptions that were re-rated varied along two dimensions: the dominant valence of the information and the degree of evaluative consistency of the information. As a same-subjects replication, each subject also re-read and completed the same tasks for a second six-trait set.

METHOD

SUBJECTS

Subjects were 80 students enrolled in introductory communication courses at two midwestern universities. During regularly scheduled class sessions (approximately six weeks before the main session), each subject completed a two-peer version of the Role Category Questionnaire (Crockett, 1965). Each subject wrote a description of one liked and one disliked peer; approximately seven minutes were taken for the writing of each impression. Each description was scored for the number of interpersonal constructs it contained following the procedures of Crockett *et al.* (1974). The scores for the two descriptions were then summed to yield each subject's cognitive complexity score. Reliability of the codings was determined by having a second coder independently score 20 randomly selected protocols for complexity; the interrater reliability coefficient by Pearson correlation was 0.98.

Since not every subject produced usable data for both the original and replication trait sets (see below), the complexity scores were rank-ordered separately for those satisfactorily completing each set. Each ordering was broken at the median, thereby defining high and low complexity groups.

Crockett's measure of cognitive complexity was employed in preference to Bieri's more frequently used repertory grid measure (Bieri *et al.*, 1966). Significant questions have recently been raised about the validity of Bieri's measure (Bavalas *et al.*, 1976; Honess, 1976; Fransella and Bannister, 1977; Jackson, 1978), and when Crockett's and Bieri's measures have been directly compared (Horsfall, 1969; Jackson, 1978), Crockett's has proven superior on grounds of both reliability and validity.

PROCEDURE

The main experimental session was conducted during regularly scheduled class sessions, but within a given class subjects were randomly assigned to treatment conditions.

In the first part of the main session, each subject rated 35 trait sets according to how much they would like a person who had the qualities listed; each trait set consisted of six adjectives. Subjects were told that students in an advanced communication class had worked on a class project concerning the manner in which persons form impressions of one another:

Each student in class was given the name of another class member. Six persons who knew that class member well were then interviewed; the six acquaintances each indicated what one characteristic that person had that they thought best described them. On each of the following pages the six characteristics mentioned about a given individual will be listed. For each person, please glance over the characteristics, form a general impression of what that person is like, and indicate how much you think you would like or dislike that person by placing a check mark at the appropriate place on the scale provided. Please work quickly; your first general reaction is what's important.

The evaluative measure consisted of the subject's response to the question "In general, how much do you think you would like this person?" on a 15-point scale bounded by the phrases "Very much" and "Not at all", with the midpoint labeled "Neutral".

Of the 35 trait sets, 27 were "filler" sets generated by randomly selecting traits from Anderson's (1968) list of 555 personality-trait words. The other eight sets were specially prepared "stimulus" sets; all traits used in the stimulus sets were drawn from Anderson's high-meaningfulness sublist. Four of the eight stimulus sets were designated "original" sets; the other four sets (composed of different traits) were the "replication" stimulus materials. Each group of four stimulus sets fitted a 2×2 design in which the dominant valence of the information (positive or negative) and the degree of evaluative consistency (consistent or inconsistent) were factors.

The eight stimulus sets were constructed so that, using Anderson's (1968) normative ratings (here transformed from Anderson's 0 to 600 scale into a -300 to +300 scale), all of the positive trait sets were very nearly equally positive; the mean evaluation of the traits in the original sets was 62.17 in the positive-consistent condition and 62.00 in the positive-inconsistent condition, with corresponding replication set means of 60.17 and 60.83. All of the negative trait sets were very nearly equally negative and, additionally, roughly equal in evaluative extremity to the positive sets; the original set means were -61.17 in the negative-consistent condition and -61.17 in the negative-inconsistent condition, with replication means of -60.17 and -60.17.

The degree of evaluative consistency was manipulated by constructing trait sets composed either of six traits of one valence (the consistent conditions) or of four traits of one valence and two traits of the opposite valence (inconsistent conditions). The degree of evaluative consistency was roughly equal in all

the inconsistent trait sets. In the original sets, the mean evaluation of the four positive traits in the positive-inconsistent condition (by Anderson's normative ratings) was 155.25 while the two negative traits had a mean of -124.5; this closely corresponds to the negative-inconsistent condition in which the four negative traits had a mean evaluation of -155.25 while the two positive traits had a mean rating of 127.0. The corresponding means for the inconsistent conditions in the replication sets were 146.0, -109.5, -146.0, and 111.5.

The eight stimulus trait sets were randomly mixed with the 27 filler sets to compose the 35 trait sets rated by subjects in the first part of the main session. The stimulus sets appeared at positions 6, 11, 14, 18, 22, 25, 29, and 33.

After the initial ratings of the 35 sets had been completed, each subject was re-presented one of the four original stimulus sets. The subject was told that one of the students (named either David S., Larry G., John L., or Charlie W.) in the advanced communication class had "volunteered to be a 'target person' for this second part of the questionnaire. The six characteristics that David's acquaintances thought best described him are listed on the next page." The subject was asked to look over the description and to "try to form an impression of the kind of person David is; think of what he would be like and of how you might describe him to a friend. When you've thought about David for a minute or two and have an impression of what he is like, please turn past the description."

The subject was then asked to write his or her impression of the stimulus person and was asked to "give as complete a description as possible, including what kind of traits, habits, mannerisms, and beliefs he has." After writing the impression, the subject first completed the same general evaluation question used in rating the 35 trait sets and then a number of other questions not germane to the present report.

For the replication, each subject was re-presented one of the four replication stimulus sets and completed the same dependent measures with the same instructions. In the replication, each subject received the stimulus set that was the mirror opposite of the original stimulus set s/he had read; thus a subject who had re-rated an original positive-consistent set would re-rate a replication negative-inconsistent set.

DEPENDENT MEASURES

The measure of polarization was Tesser's binary polarization index, in which a subject whose attitude polarizes (*i.e.*, moves toward the extreme without changing valence) receives a score of 1 and a subject whose attitude does not polarize receives a score of 0. For further discussion of this measure, see Tesser (1976, pp. 186-7).

ANALYSES

The data for the original and replication trait sets were analyzed separately. Only subjects who rated the relevant trait set as moderate (ratings of 3, 4, 5, 6, 10, 11, 12, or 13 on the 15-point scale) in the initial evaluation were included; a total of 53 subjects produced usable data for the original sets, 49 for the replication sets. The inclusion of only moderate initial attitudes follows Tesser's standard procedure (see, *e.g.*, Tesser and Conlee, 1975, p. 263; Tesser and Cowan, 1977, p. 220). Since polarization consists of an attitude's becoming more extreme in the direction of the initial attitude, extreme initial attitudes (because they do not allow for polarization) and neutral initial attitudes (because a shift in either direction could be construed as polarization) are unsatisfactory for a test of the polarization phenomenon.

Given unequal cell sizes, the appropriate unweighted means analyses of variance were used in a $2 \times 2 \times 2$ design, with Complexity of the subject (complex vs. noncomplex), Valence of the information (positive vs. negative), and Consistency of the information (consistent vs. inconsistent) as factors.

For the appropriateness of analysis of variance for binary data, see Winer (1962, p. 139) and Lunney (1970).

RESULTS

For the original trait sets, the only significant effect was a main effect for Consistency ($F(1,45) = 13.13, p < 0.001$), indicating that subjects who read inconsistent information were more likely to polarize ($\bar{X} = 0.502$) than those who read consistent information ($\bar{X} = 0.067$). No effect for Complexity was observed ($F(1,45) < 1.7$).

For the replication trait sets, there was a main effect for Complexity ($F(1,41) = 8.97, p < 0.01$), with noncomplex subjects more likely to polarize ($\bar{X} = 0.445$) than complex subjects ($\bar{X} = 0.086$). There was also a significant Complexity \times Valence \times Consistency interaction ($F(1,41) = 4.8, p < 0.05$). The means for this interaction are displayed in Table 1, and indicate that when complex subjects did polarize they were most likely to do so in the positive-inconsistent and negative-consistent conditions, while noncomplex subjects were most likely to polarize in the positive-consistent and negative-inconsistent conditions.

TABLE 1: POLARIZATION INDEX MEANS

		<i>Positive</i>		<i>Negative</i>	
		<i>Consistent</i>	<i>Inconsistent</i>	<i>Consistent</i>	<i>Inconsistent</i>
Complexity	High	0.000	0.143	0.200	0.000
	Low	0.444	0.286	0.250	0.800

DISCUSSION

These results cast doubt on Tesser's claim that persons with more developed schemas in a given domain place greater reliance on evaluative consistency principles than do less advanced perceivers. With the original trait sets, no differences in polarization between complex and noncomplex subjects were found, and with the replication sets it was the less advanced (noncomplex) perceivers who were more likely to polarize.

It is important to emphasize that no previous study of the phenomenon of attitude polarization under conditions of thought has employed a careful individual-difference measure of the sort required to adequately test Tesser's explanation, and hence the lack of support in the present data for Tesser's hypothesis is particularly significant. The present findings are consistent with the earlier cited evidence indicating that less advanced perceivers place greater reliance on evaluative consistency than do advanced perceivers, and suggest that this conclusion can be extended to encompass the effects of thought on attitude polarization. The absence of careful individual-difference measures in previous polarization work suggests that the putatively "advanced-schema" groups in earlier research may actually not have had more developed schemas than the "less advanced" groups, but may instead have differed on some dimension other than the theoretically relevant one (*e.g.*, interest in the stimulus object).

The results involving the valence and evaluative consistency of the trait sets were unexpected; these factors were included primarily as checks on the generality of the results. Tesser and Cowan (1975) varied the evaluative consistency of their adjective lists and found no effects for this manipulation, and nowhere in Tesser's work on attitude polarization are interpretable effects found for valence. What the present results might indicate are possible limitations on the generality of the polarization phenomenon, but without more extensive and detailed corroborating evidence, very little can be confidently said about the effects of these factors.

However, the generality of the polarization phenomenon may be questioned in other ways. For example, if one examines the actual change scores for the present data, the mean change for both the original and replication sets is a change toward moderation (means of -1.57 and -1.24 , respectively; negative numbers indicate depolarization). For the original sets complex and non-complex subjects displayed roughly equal amounts of depolarization (means of -1.69 and -1.44 , respectively, yielding a nonsignificant t (51) of -0.28); for the replication sets complex subjects showed a greater amount of depolarization ($\bar{X} = -2.17$) than noncomplex subjects ($\bar{X} = -0.36$; t (47) = -2.09 , $p < 0.05$).

But, as Tesser has noted (Tesser and Cowan, 1975, p. 269; Tesser and Leone, 1977, p. 346), the change score measure can be greatly affected by a few extreme scores, and it is for this reason that the binary polarization index has been used as a dependent measure both in Tesser's polarization work and in the present study. Treatment means on this binary index are equivalent to the percentage of cases exhibiting polarization, and it is perhaps noteworthy that Tesser rarely finds conditions in which more than 55% of the attitudes exhibit polarization. In the present study, even though all subjects essentially underwent a "thought" manipulation, relatively few subjects polarized. For the original trait sets, 15 subjects polarized and 38 did not ($\chi^2 = 9.98$ $df = 1$, $p < 0.01$); for the replication sets, 13 polarized and 36 did not ($\chi^2 = 10.79$, $df = 1$, $p < 0.01$).

Thus on a number of grounds one might doubt the powerfulness and generality of the phenomenon of attitude polarization under conditions of thought. When such polarization does occur, the present data, in conjunction with previous research, suggest that the phenomenon is most likely to occur among persons with relatively underdeveloped schemas for the domain in question.

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