

DIFFERENCES IN THE ASSIMILATION OF SUCCESSIVE BLOCKS
OF INFORMATION AS A FUNCTION OF COGNITIVE COMPLEXITY

by

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TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
A. Background	2
1. The Successive Assimilation of New Information	4
2. Degree of Conflict	10
3. Individual Differences in Awareness of Mode of Information Processing	12
II. METHOD	13
A. Subjects and General Procedure	13
B. Pre-Test	14
C. Experimental Task	15
D. Dependent Measures	18
III. RESULTS	20
A. Cognitive Complexity	21
B. Level of Conflict of the Initial Information	30
C. Subjects' Evaluation of John	34
D. Individual Differences in the Awareness of Mode of Information Processing	42
IV. DISCUSSION	49
A. Integration and Differentiation of the Impressions	49
B. Absolute Shift in Evaluation	52
C. Awareness of Mode of Information Processing	53
D. Implications	54
1. Integration in Cognition	54
2. Interpersonal Attraction	56
E. Consequences of Mode of Interpersonal Functioning	56

Introduction

Recently, there has been increasing interest in studying individual differences in the way people perceive others. In particular, numerous studies have shown that interpersonally complex vs. less complex¹ people form impressions of others that are organized at a formally higher level of development (Nidorf and Crockett, 1965; Meltzer, Crockett and Rozenkrantz, 1966; Kenny, 1968; Crockett, Delia and Gonyea, 1972). All of these investigations, however, have studied individual differences in impression formation in static situations, where bivalent (affectively inconsistent) personality information was presented to the subject. The purpose of this study is to look at the assimilation of new information into an impression initially formed from bivalent personality information, as a function of: a) the cognitive complexity of the perceiver (within the interpersonal domain) and b) the degree of conflict of the initial bivalent personality information.

Historically, this study is part of a shift from concern with the accuracy of perception of others to the process involved in person perception. The process orientation has stressed the study of types of impressions that are formed as a function of both the characteristics of the perceiver and the characteristics of the person described.

¹Interpersonal complexity is measured by counting the number of constructs people use to describe others.

Background

Early in this century Darwin (1872) aroused interest in the problem of how we recognize emotions in others. Then, in the 1930's the focus of concern in the area shifted to an examination of whether perceivers can "accurately" perceive the other (Tagiuri, 1969, p. 398). These studies reflected such concerns as: the characteristics of an "accurate" as opposed to an "inaccurate" judge of personality, how to specify the trait dimensions which reflect the personality of the other, and ways of consensually validating qualities of the other (Bruner and Tagiuri, 1954, p. 640).

In the past few decades the concern with veridicality of the judgemental process has waned, and current work is primarily focused upon the processes involved in impression formation. Common to nearly every variation of this orientation has been an attempt to identify variables which influence the formation of an impression; that is the investigation of the perceiver's impressions of another as a function of the characteristics of the perceiver, of the personality information, and of the experimental context.

In particular, a number of studies have concentrated on the relationship between the structural qualities of a perceiver's interpersonal cognitive system and the structural properties of his impressions (e.g. Harvey and Ware, 1966; Crockett, 1965; Kenny, 1968). This focus on the formal organizational properties of an impression (Kaplan and Crockett, 1968) is in contrast to the majority of work in the area which stresses the perceiver's evaluation of the other on a variety of adjective check-list dimensions (e.g. Anderson & Barrios, 1961).

The structural approach, rooted in the organismic-developmental framework of Heinz Werner, has emphasized both the structural qualities of the person's interpersonal construct system and the formal organizational properties of the perceiver's impressions of another person (degree of differentiation and hierarchic integration). Drawing from a basically biological metaphor, Werner characterized the development of an organism according to an idealized summary of the process which he called the "orthogenetic principle". This principle states "wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration" (Werner, 1967, p. 126). Hence, the notion of development is centered on the structural aspects of change within the organism (which approximates the idealized framework of the definition). Changes in the organism with respect to other factors would not be seen as "developmental" according to Wernerian theory. For example, a coral reef can be described as growing in size but in this case the change involves neither differentiation of parts (a reef is composed of the skeletal parts of myriad individual organisms), nor an integration of the parts involved into higher order structures.

Within the domain of person perception, Crockett (1965) has compared and contrasted individuals who differ in the structural complexity of their interpersonal cognitive systems with respect to the types of impressions they form of others. Crockett has defined cognitive complexity in the following manner: "An interpersonal cognitive system will be relatively complex if it contains a large number of

interpersonal constructs, and if these constructs are integrated to a relatively high degree" (1965, p. 49). Following Werner's theory, Crockett reasoned that more complex (highs) as opposed to less complex (lows) individuals should form more highly integrated impressions of other persons (1965, pp. 52-58). A number of studies have supported this assumption (Meltzer, Crockett and Rozenkrantz, 1967; Kenny, 1968; Noymer, 1966; Miller, 1969).

Since individuals who differ in cognitive complexity assimilate and structure information differently during the impression formation process, a new focus is thus obtained which may provide greater insight into understanding both the way in which a perceiver both forms an impression of another person and, in particular, the way in which he successively elaborates his impression of that person.

The Successive Assimilation of New Information and Individual Differences in this Regard

Asch, in several of his classic studies of impression formation (experiments VI and VII, 1956), tested whether an impression is the result of a simple summation of individual traits (bits of information) or whether the meaning of each piece of information is developed in the total context of the impression. In one empirical test of this question, Asch read the following list of traits to 2 groups of subjects: intelligent-industrious-impulsive-critical-stubborn-envious. Group 1 received the list as given while group 2 received the reverse order. Following their reading of the lists subjects wrote out short impressions and made evaluations on an adjective check list. The results of both of these measures indicated that the impressions tended

to reflect the initial part of the series more strongly than the rest of the list. Similar "primacy" effects have been reported by other investigators (c.f. Luchins, 1958; Anderson and Barrios, 1961).

In extending this work, Luchins (1958) found that most subjects tended to form recency impressions when he required the subjects to write out impressions after the presentation of each of two univalent blocks of information. In this case most subjects' impressions reflected the valence of the most recent block of information. Luchins speculated that the act of writing out impressions after the first block of information pressured subjects to extend, clarify, elaborate, and concretize their otherwise fleeting impressions. Therefore, it appeared that they were unable to integrate the second block of information with the impression they had already formed.

All of the studies described so far, however, have ignored the possible existence of consistent individual differences in impression formation. In a critique of Asch's 1946 studies, Luchins (1948) took sharp issue with Asch's blanket assumption that one ought to search for "processes which hold generally in spite of individual differences" (Asch, 1946, p. 283). Luchins felt there was no justification for assuming a priori a general process and perhaps ignoring a crucial individual differences factor (Luchins, 1948, p. 319). Asch himself expressed some uneasiness at having skirted the individual differences issue but (perhaps justifiably) defended his approach on the grounds that "a proper study of individual differences can best be pursued when a minimal theoretical clarification has been reached" (Asch, 1946, pp. 283-284). In addition, Luchins also questioned Asch's assumption and data interpretation that "when a task

of this kind is given, a normal adult is capable of responding to the instructions by forming a unified impression" and that his impression will be "complete and rounded" (Asch, p. 261). In attempting to replicate Asch's results, Luchins reported that his subjects gave a "wide array" of impressions and that it "would be far fetched to say that most of them were unified, complete and rounded" (Luchins, 1948, p. 322).

Gollin (1954) also took issue with Asch's conclusion that a perceiver's impression of another will inevitably result in a "unified, complete and rounded" impression. Basing his work on a Wernerian analysis of the formal organizational characteristics of impressions, Gollin provided a beginning to Asch's "minimal theoretical clarification" of individual differences. Gollin had subjects view a film strip in which a girl was depicted as behaving alternatively promiscuously, immorally, kindly, and considerately. After viewing the film, subjects wrote impressions of the girl. Gollin was able to classify three distinct types of responses from his data: 1) "aggregate" impressions where both major qualities were retained but no attempt was made to relate them in any way, 2) "simplified" impressions where only one major character quality was retained, and 3) "related" impressions which not only included both character qualities but also attempted to account for their presence in the person.

Gollin concluded from his study that impression formation is not determined solely by either external characteristics of the situation (such as order of presentation of the information) or by the personality characteristics of the perceiver. Rather, the process

is very much an interaction of external factors with the organizing cognitive processes of the perceiver.

Gollin (1958) and Rosenbach (1968) have extended this structural analysis to ontogenetic differences in the behavioral domain of impression formation. Both studies found more advanced modes of organization employed as age increased.

Following Werner, ontogenetic differences should parallel individual differences in structural complexity in the same domain. Thus, with respect to the primacy-recency effect found by Luchins, Mayo and Crockett (1964) hypothesized that more as opposed to less complexity individuals should: "(a) form a less univalent impression from the first univalent block of information and (b) change this impression less completely upon presentation of a block of information opposite in valence." (Crockett, 1965, p. 71). Mayo and Crockett thus assumed that highs would be able to make a broader range of inferences from the ambivalent constructs than lows and that highs would then be able to assimilate the information in such a way that they would form a more ambivalent impression than lows. This hypothesis was supported.

From these results, it appears that highs, compared to lows, are better able to integrate the "conflicting" univalent blocks of information. This hypothesis was tested by Rozenkrantz (1961), in an extension of the study by Mayo and Crockett. The results provided some support for the hypothesis.

Work conducted within a Wernerian framework in impression formation so far has tended to focus on either (a) the organizational properties of impressions formed from different types of personality information;

or (b) ways of assimilating inconsistent information within an organized impression. All of this work can be viewed as the initial step towards an investigation of how information of another is successively assimilated into the perceiver's impression of another person. That is; one's impression of another is not static, but rather changes as a function of incorporating increasing amounts of information in a variety of behavioral situations at different times. This view of impression formation as an on-going process seems to correspond more closely to the real life process. Our ideas and feelings for others do not fall together in a single enduring structure, but rather appear to follow some sort of process of change.

The following questions can be raised in response to this inquiry:

(1) What changes occur in the formal organizational characteristics of an impression during the process of forming impressions of another over time?

(2) What is the relationship of the formal organizational characteristics of impressions to the changes that occur in the perceiver's evaluation of the other?

(3) How do these relate to the perceiver's interpersonal cognitive complexity?

On the basis of previous work already discussed, (Mayo and Crockett, 1964; Rozenkrantz and Crockett, 1966; Kenny, 1970) it is expected that highs will in general form more organized impressions than lows.

It is also expected that the organizational properties of the impressions will be highly related to evaluative judgements. Thus,

when there is a shift in valance from one univalent block to another, lows would be expected to change their evaluative judgements rather sharply as they will not be integrating previous information; in other words, to a large extent their evaluations will be based on the immediate incident. Highs, conversely, would be expected to form a less changeable pattern of evaluations in that they will have an integrated framework from which to judge behavior.

Finally, the question remains of what changes will occur in the organizational properties of an impression over blocks of information and, in particular, how this will be related to the complexity of the perceiver's interpersonal construct system? In a previous study which focused on the microgenesis² of impression formation, Noymer (1968) hypothesized that both highs and lows would initially form developmentally primitive impressions of the other; with more information available to the perceiver, Noymer expected that more as opposed to less complex perceivers would form progressively more advanced impressions. The results showed, however, that at all stages of the microgenetic process, highs formed developmentally more advanced impressions than lows.

While Noymer's study focused on the changes that occur through microgenesis, this study investigates the changes that occur through presenting successive instances of the behavior of a person. If it is possible to generalize from Noymer's study, it would seem that no interaction would be found between cognitive complexity and change in the organizational character of the perceiver's impressions of

²This term refers to the process which occurs between the presentation of a stimulus and the final stabilized percept that is formed.

the other over blocks.

Since this was one of the main interests of this investigation, it was decided to further explore this question by varying the degree of conflict of the initial block of information presented. The rationale for introducing this variable will be presented in the following section.

Degree of Conflict

One paradigm which has been used to study the processes involved in the perceiver's perception of another person has been to present the perceiver with information in which certain elements are felt to be inconsistent or conflicting. Both Haire and Grunes (1950) and Pepitone and Hayden (1955) found that subjects had considerable difficulty in forming an impression of a person based on information which contained conflicting elements. Subjects in one of Asch's experiments (1946, experiment VIII) also reported extreme difficulty in reconciling two inconsistent trait profiles; they were initially told that the profiles described two different individuals and were subsequently told that they were really the same person.

Situations in which cognitively inconsistent or conflicting information is presented to a person have been studied within the balance framework (Heider, 1958). In a situation in which a person is obliged to observe conflicting information about another person, Heider's balance theory suggests that there will be a strong tendency for individuals to form either an overall liking or an overall disliking for the other person (Heider, 1958). In addition, Heider's

theory assumes that a state of balance is inherently more harmonious (in the Gestalt sense) than a state of imbalance. Therefore, attributing both positive and negative characteristics to the same individual should pressure the perceiver to resolve the inconsistency; that is, a strain toward balance should occur.

A number of studies (Gollin, 1958; Rosenkrantz and Crockett, 1965; Nidorf and Crockett, 1965; Mayo and Crockett, 1964; Meltzer Crockett and Rosenkrantz, 1966) combine to illustrate that cognitive complexity is an important variable in assessing how individuals handle discrepant information. The Wernerian conception basic to these studies holds that in forming impressions both high and low complexity persons tend to resolve the imbalance; but in very different ways. Briefly, it is assumed that high complexity persons tend to resolve inconsistency by forming a relatively well-integrated account of the information while, in contrast, low complexity persons tend to resolve the inconsistency either by acknowledging it (e.g. "he's inconsistent") or by centering on either the positive or the negative attributes given and ignoring or discounting the remaining information.

The focus of this investigation is on individual differences in the assimilation of univalent blocks of information. A previous study (Press, 1972) has shown that subjects tend to assimilate information at a formal level of organization that is the same or lower than the level of organization of their initial impression. Thus, in Press's study it is clear that the initial level of organization was a strong determinant of the level of organization of the revised impression.

Several studies have shown that degree of conflict of the information presented is directly related to the level of organization of an impression. Both Kenny (1968) and Press (1972) have shown that impressions formed from conflicting as opposed to univalent information are organized at a formally higher level. Furthermore, the results from a study carried out by Crockett (in preparation) in which the percentage of positive and negative elements was varied, can also be interpreted as supporting this notion. A consistent increase in level of organization was found by introducing a greater number of opposite-valenced elements into the list. By systematically varying the initial level of organization, it is hoped that greater understanding of the progressive course of assimilating successive blocks of information for both more and less complex perceivers will be possible.

Individual Differences in the Awareness of Mode of Information Processing

In a pilot study of the present experiment, (in which Ss were asked to form impression from a series of alternatively positive and negative valenced incidents) subjects were queried as to how they felt about the task and whether they had experienced any difficulties in doing the task. Their spontaneous responses seemed to fall into three categories: "I tended to concentrate on each incident as it came and mostly ignored the things he did earlier", "I couldn't forget his earlier behavior and I felt that I had to include it"; the third category included responses which fell somewhere between these two and also included indeterminate or irrelevant (for this dimension) replies.

These data seem to suggest that the subjects could report the process that they were using to understand the information. The extent to which their reports correspond to the theoretical scheme presented here, however, remains an empirical matter. On the basis of previous work (Kenny, 1968; Press, 1971), it appears that more complex individuals would be more likely to report that they had to account for the information; less complex individuals would be more likely to report that they tended to take each incident as it came. This would correspond to the results of past findings, already discussed, which showed that highs integrate conflicting personality information at higher levels than lows. Thus, it is hypothesized that there will be a direct relationship between complexity and the degree to which subjects feel that they "have to" account for all the information presented.

Method

Subjects and General Procedure

48 male and 49 female students were solicited from seven large introductory psychology classes at Kansas State University. The students were awarded class credits for their participation. The subjects thus selected were given both the pre-test and the experimental task within one 45 minute session. The experimenter directed the subjects through each part of the pre-test and then a) instructed the subjects in the experimental task and b) told them to proceed at their own rate.

Pre-test

Subjects were initially given a modified version of Crockett's eight-role category task to assess the cognitive complexity of the subjects' interpersonal construct system (see Appendix A for a complete description of this task). In this task, Ss are told that the experimenter is interested in knowing, in the Ss' own terms, the characteristics which a set of individuals have. The Ss are then asked to describe each person in as much detail as possible.

The measure of cognitive complexity is obtained by counting the number of different constructs used in each role description and summing them to form a total score. The term "construct" refers here to any word or series of words which express something about the person being described. For example, the phrase "Joe is a nice guy" is counted as 1 construct; "He always helps other people when they need help but he doesn't like to waste his time" is counted as 2 constructs ("he...help" is one and "he...time" is another). Purely physical descriptions are excluded because it is felt that they do not convey how the S understands the other person. The higher the total score, the higher the cognitive complexity.

With respect to the number of roles used, recent studies have found little difference in discriminatory power between tasks which contained 8 roles as opposed to tasks which contained 1-4 roles (Delia, 1970; Press, personal communication). For this reason, Ss in the experiment were given a task which requires them to describe people who fit the following roles: "a peer that you like, a peer that you feel neutral towards, and a peer that you dislike". After

they were given a few minutes to think of people to fit into these categories, Ss were asked to mentally compare and contrast the people they had in mind. They were informed that they would be given 3 minutes to describe each person as fully as they could. It was explained that the reason for timing them was to minimize differences in verbal fluency and writing ability among individuals. The E also instructed Ss that he would tell them when to start and when to stop. After the instructions were read aloud by E and silently by Ss, E encouraged Ss to raise questions any time during the session if anything was not perfectly clear.

As in past studies, the descriptions were scored for the total number of constructs used to describe the various roles.

The distribution of subjects scores were dichotomized at the median into low, and high complexity groups. The low³ complexity scores ranged from 12-25 and the high complexity scores ranged from 26-47.

Experimental Task

Following the pretest, each subject was given an impression formation task. In this task, Ss were first asked to form an impression of "John, a student at a midwestern university" from two behavioral

³Rozenkrantz (1962) reports that this measure does not correlate with tests of intelligence and shows only a low positive correlation with verbal fluence. While other approaches to cognitive complexity have appeared (Bieri, 1955; Harvey, Hunt, and Schroder, 1961; Witkin, et. al.; Scott, 1962) with varying degrees of success, none has had as direct an application to processes of social perception and impression formation as Crockett's. Further, it is interesting to note that Bieri's measure does not correlate with Crockett's (Irwin, Tripodi, and Bieri, 1967). For a discussion of some of the different approaches to cognitive complexity see Vannoy (1965).

incidents; one positive and one negative in valence. They were then asked to successively integrate six univalent behavioral incidents into their ongoing impressions of John. After each block of information they were asked to describe John in as much detail as possible and to evaluate him on an 11-point scale.

Before Ss began the task, E read with Ss the instructions on the cover sheet of the booklet (full instructions are presented in Appendix B). The instructions emphasized that the Ss were to incorporate the new information into each impression. It was also stressed that they should assume that each time they described John they would be describing him to someone who knew nothing about him and who had not read any of their other impressions.

Subjects were told, in addition, that they could work at their own pace. An open ended question was presented at the end of the booklet: "Describe how you went about forming your impressions of John. Did you have any difficulties? If so, what in particular bothered you?". Finally, a three point scale was given which asked Ss how they went about the task. The wording of this scale was based on a composite of self reports from an earlier pilot study. The scale ranged from "I tended to concentrate on each incident as it came and mostly ignored the things that he did earlier" to "I couldn't forget his earlier behavior and felt that I had to include it".

Subjects were randomly assigned to one of four conditions defined by the dimensions of initial conflict (low vs. high) and order of the incidents (positive first vs. negative first). Each of the two orders was preceded by two incidents which, according to 20 judges,

contrasted either strongly or weakly in degree of conflict. These 2 conflict incidents were presented together on a single page while all the other incidents were given separately. The valence of the incidents following the 2 conflict incidents was counterbalanced. This resulted in 2 orders: +--+ or -++-.

Thus, four possible conditions were presented to Ss:
 high
 or
 low
 conflict/ +--+ and or conflict/ -++-.

An attempt was made to write vivid incidents that would both convey to Ss a feeling for a real-life person and clearly reflect a positive or a negative behavior on John's part. Two judges selected the eight anecdotes from a pool of about twenty based on these criteria which were subsequently tested in a pilot study.

Design Summary

Cognitive Complexity	Conflict	Order	Blocks
High	Low	1	1 2 3 4 5 6 7 ± + - - + + -
		2	± - + + - - +
	High	1	same as above
		2	
Low	Low	1	same as above
		2	
	High	1	
		2	

Dependent Measures

Four dependent measures were taken from the study. These were:

- 1) Formal level of differentiation
- 2) Formal level of organization
- 3) Valence rating
- 4) Absolute valence shift.

These measures were obtained in the following manner:

1) Degree of differentiation

The degree of differentiation of the impressions was measured by counting the number of constructs, within each description, which were attributed to John. A sample of 25 randomly selected protocols scored by two trained judges yielded a pearson products moment correlation of 0.97.

2) Level of Organization

The level of organization of the written impressions, used as a measure of the degree of hierarchic integration of the impressions, was assessed through a system based on abstracting the degree to which the attribution of incompatible information is, first, recognized and, second, integrated or accounted for (see Crockett, 1970, for a complete explication). These levels are defined and illustrated below.

Level 1: Simple aggregation is defined by a complete lack of recognition of the affective incompatibility; it includes the attribution of qualities of both socially desirable and socially undesirable information without any indication of their possible affective inconsistency.

John is a very warm, friendly, humanitarian type person. He has a love for children as well as for his peers. He doesn't hesitate to lend a helping hand. John does tend to neglect his school work and he is not totally honest in obtaining his grades.

Level 2: Univalent impressions (implicit recognition of incompatibility) contain personality traits of one affective valence only; either all positive or all negative. Since the impression does not contain any opposite valenced elements, it appears to implicitly recognize the incompatibility.

John likes to brag about what he does and show he is better than other people, smarter and so on. He goes out of his way to show how much better he is. He is self-centered.

Level 3: Explicit recognition (minimal integration): Here the subject gives direct evidence that he recognizes the incompatibility, but does not use a superordinate scheme to account for this variability. The recognition may be evidenced by statements such as "John is both good and bad", "he is inconsistent", "he is two-faced", etc.

John is sensitive to the feelings of others, he is a friendly person. He is willing to make friends easily. But, his drawback is that John is not willing to work for his own grades.

Level 4: Integration At this level the incompatibility is dealt with either through an external (or differential observers, truncated role, varying contexts) or through an internal resolution (internal motivational states) but not both.

John is dependable. He shines in emergency situations when help is needed immediately. He is still a bit immature, perhaps a little conceited. He is more concerned about immediate need than long-term plans and about things close to him than things close to others.

Level 5: Full integration At this level the incompatibility is dealt with in terms of an "implicit personality theory" which explains why John is the way he is. This is accomplished in part by expanding on John's internal dynamics through an explicit description of how these interact with situational factors.

John is self-centered and oblivious of others' feelings. He is occasionally able to relate to others' needs but only when the needs make him feel important. He easily disregards how other people feel, perhaps neglects to even consider it. He craves recognition for the good he does.

Within each of the five levels, there are three sub-levels corresponding to a minimal, average, and advanced stage of each of the more general levels.

Hence, each impression was scored on a fifteen point scale, with points 2, 5, 8, 11, and 14 being the average sub-level for each of the five formal stages in order. A reliability check with an independent scorer of 61 randomly selected impressions yielded a product-moment correlation of 0.86 between the ratings of the two judges.

Results

The results will first be presented for (1) the formal measures derived from the written impressions and (2) the subjects' evaluation of John. This will be done first for the effects found in relation to the cognitive complexity of the perceiver's interpersonal construct system, followed by the results when the "awareness of mode of information processing" is substituted for cognitive complexity.

Results for the dependent measures will be given in the following

sections:

I. Measures derived from written impressions.

1. Degree of differentiation

2. Level of integration

II. Measures derived from subjects' evaluation.

1. Evaluation

2. Absolute shift in evaluation from block to block

These dependent measures were analyzed in a $2 \times 2 \times 2 \times 7$ (X 6 with respect to the last factor only) harmonic-n (Winer, 1962; Ranken, 1972) complete factorial analysis of variance with trend. The between group factors were: cognitive complexity (high vs. low), initial degree of conflict (low vs. high), and order of the remaining univalent blocks (+--+ vs. -+--+). A trend analysis was computed for the repeated measures factor, blocks of information.

This section will present the results for the two formal measures of organization derived from the written impressions; level of integration and degree of differentiation. Since the variable of cognitive complexity and initial degree of conflict did not interact, this section will be organized around the main effects and interactions found for a) cognitive complexity and b) initial degree of conflict.

Cognitive Complexity: As predicted, there was a highly significant difference in both the degree of differentiation ($F(1, 89) = 12.69, p < .001$) and the level of integration ($F(1, 89) = 27.35, p < .001$) between the impressions of high and low complexity subjects. Highs' vs. lows' impressions were more differentiated (Means = 5.7 vs. 4.6) and more highly integrated (Means = 9.14 vs. 7.17).

Of particular interest were the results for the interaction of cognitive complexity with the repeated measures variable of blocks of information. The means for differentiation and integration are shown in Figs. I and II respectively.

For degree of differentiation there was a marginally significant interaction of cognitive complexity over blocks of information ($F(1, 89) = 1.84, p < .10$), with a highly significant linear component ($F(1, 89) = 7.85, p < .01$). For lows, there were no differences for degree of differentiation among the seven blocks of information; for highs, on the other hand, there was a significant increase from block 2 to block 3 only. There were no differences between the first two nor among the last five blocks. Thus, the differences between highs and lows increased over blocks.

This interaction was contained within an interaction of complexity with order over blocks of information (Fig. III, a & b) ($F(6, 534) = 2.35, p < .05$; linear = $F(1, 534) = 5.86, p < .05$; quartic = $F(1, 534) = 4.2, p < .05$). The results just described held more clearly for order 2 (where the first univalent block - block 2 - was negative) than for order 1 (where the first univalent block - block 2 - was positive). Furthermore, it appears that in both orders the valence of the information affected the degree of differentiation of the impressions differentially for highs and lows. For lows, positive information led to an increase in degree of differentiation; negative information to a decrease. For highs, on the other hand, negative information frequently led to an increased degree of differentiation.

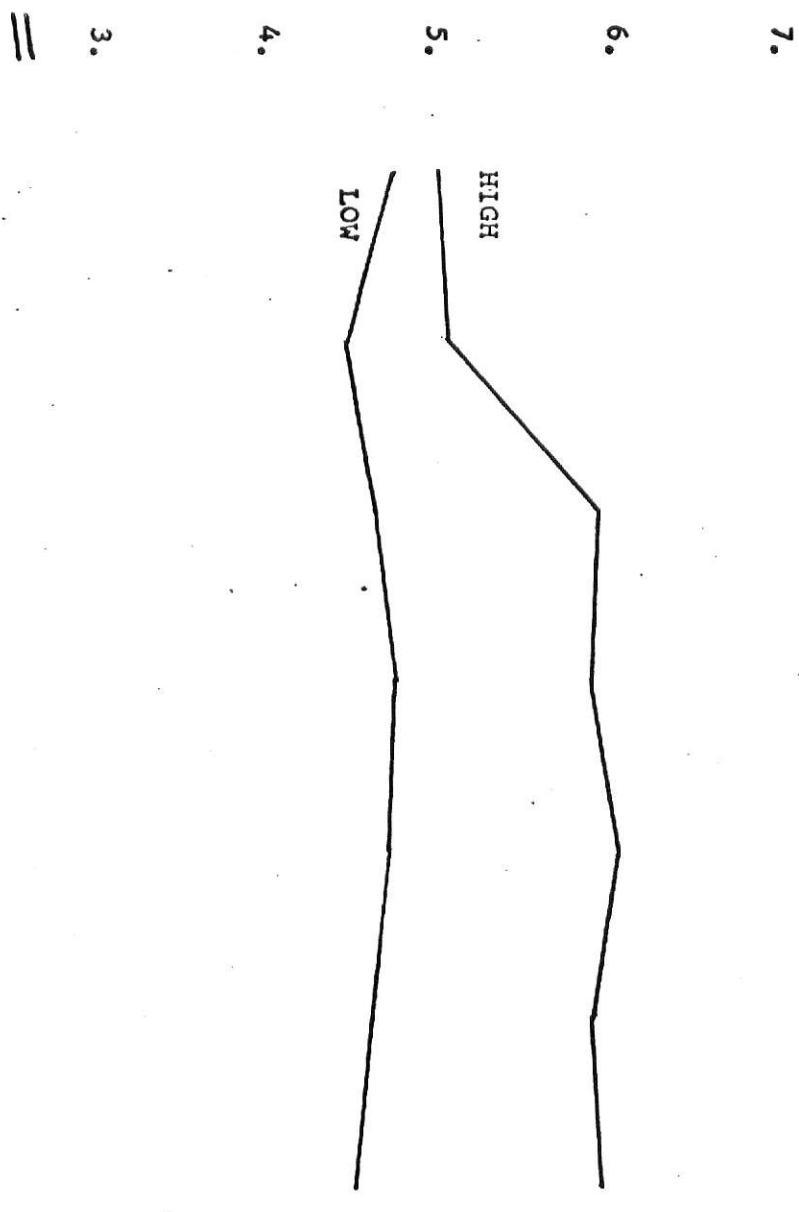
For level of integration, the results did not show an interaction

Figure I. The Degree of Differentiation
of the Written Impressions for High
vs. Low Cognitive Complexity
Groups for Each of the Seven Blocks
of Information.

**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

Mean Number of Constructs

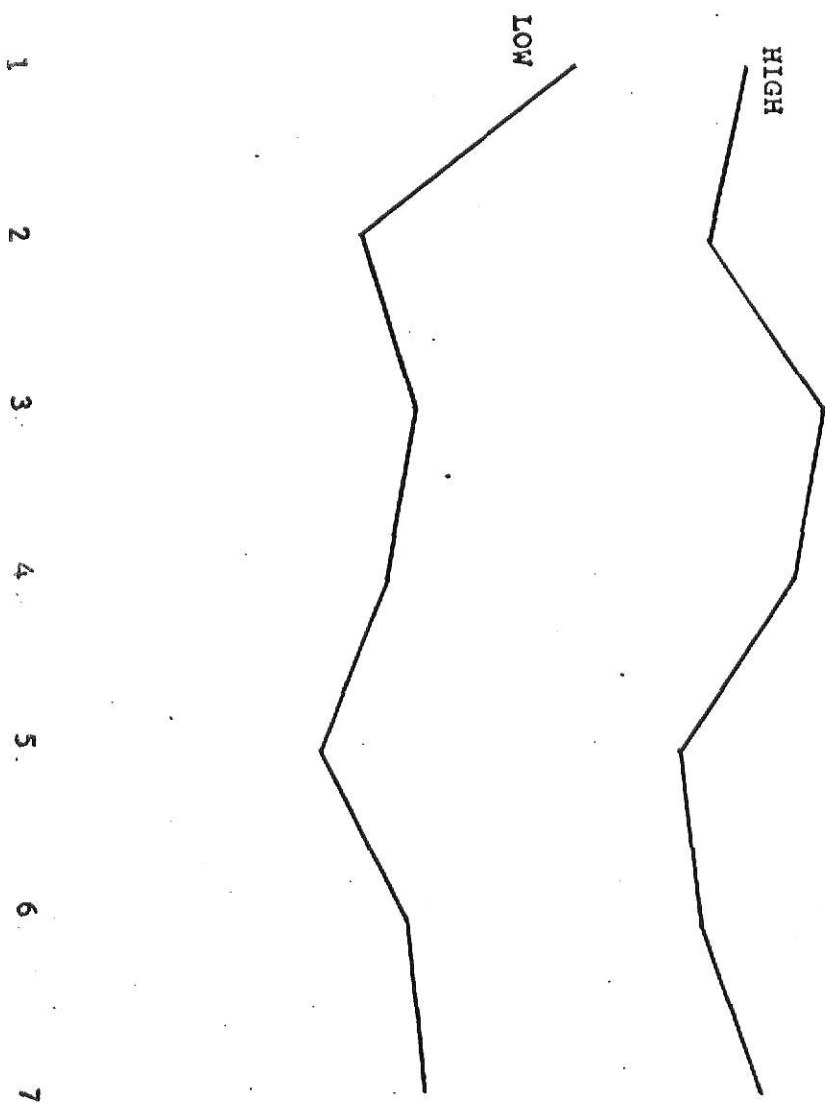


Blocks of Information

Figure II. The Level of Integration
of Written Impressions
for High vs. Low Cognitive
Complexity Groups for Each of
the Seven Blocks of Information.

Level of Inteazration

10
9.
8.
7.
6.
=



Blocks of Information

Figure III. Degree of Differentiation
of Written Impressions for High
vs. Low Cognitive Complexity Groups
for Each of the Seven Blocks of
Information.

Order 1 - (Figure a)

Order 2 - (Figure b)

ORDER I

7.

6.

5.

4.

3.

=

Mean number of Constructs

HIGH

LOW

+

+

-

-

+

+

-

1

2

3

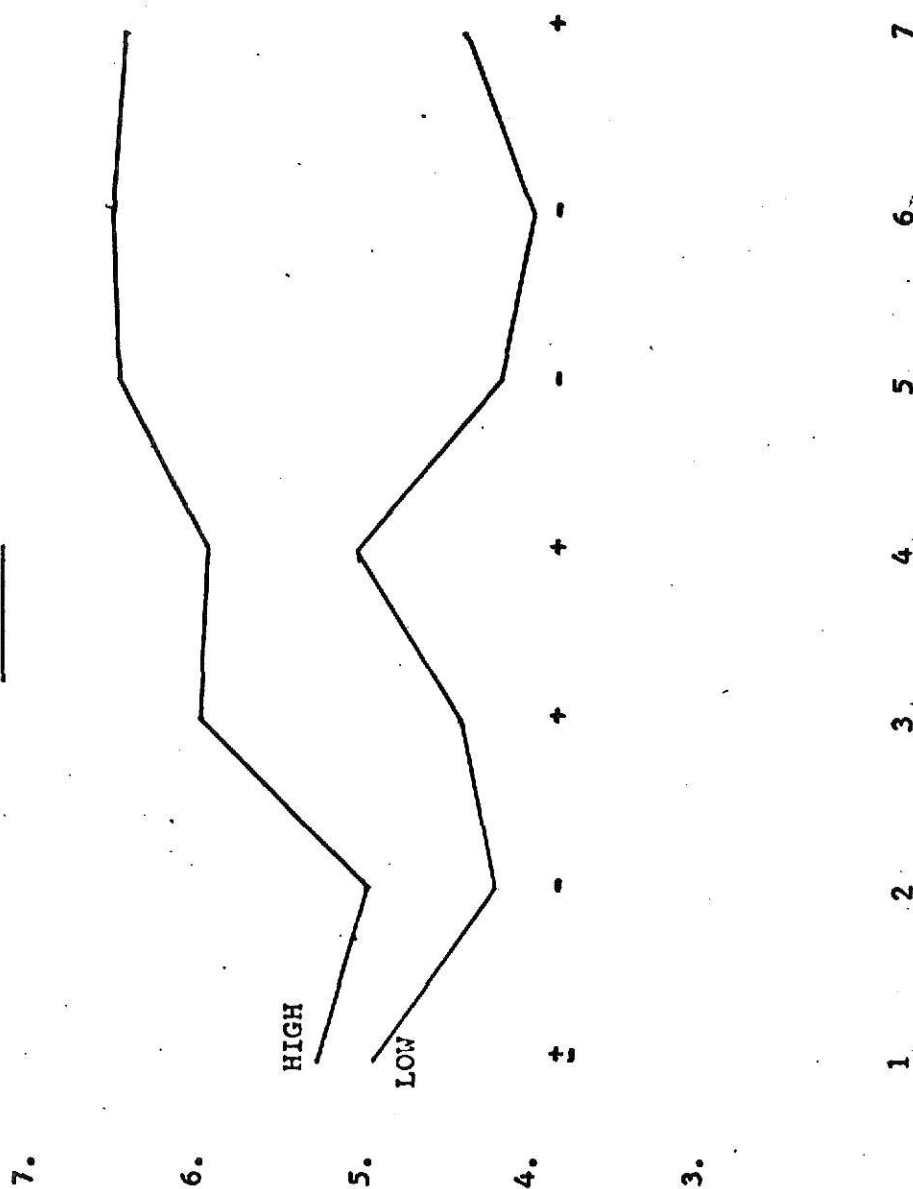
4

5

6

7

Blocks of Information

ORDER IIBlocks of Information

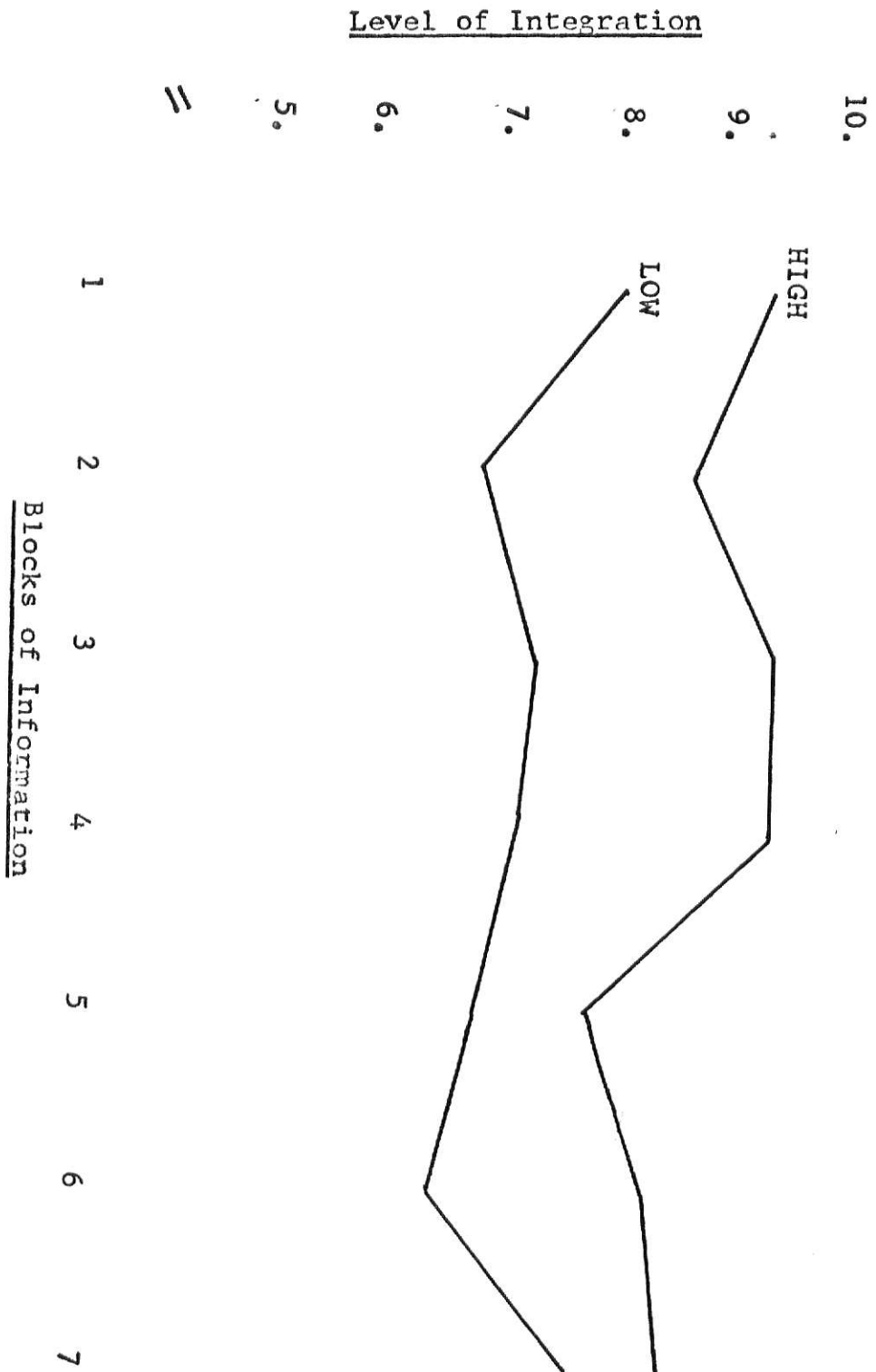
of cognitive complexity over blocks of information. However, corresponding to the results described for differentiation, there was a significant interaction of cognitive complexity and order over blocks of information ($F(6, 534) = 2.3, p < .05$) with a highly significant linear component ($F(1, 534) = 6.94, p < .01$), as shown in Figures IV a and IV b. Corresponding to the findings for degree of differentiation, the results showed an interaction over blocks between highs and lows for order 1. For order 2, however, there was again a divergence between highs and lows over blocks of trials. For this order, a change in valence led to an increase in level of integration for highs but a decrease for lows. Thus, for order 2 only, the results showed for both dependent measures a significantly greater difference between the initial vs. the final impressions of highs as opposed to lows. It should be noted that the results are not due to initial differences, but rather to the change that occurred as highs and lows assimilated successive blocks of information into their impressions of John.

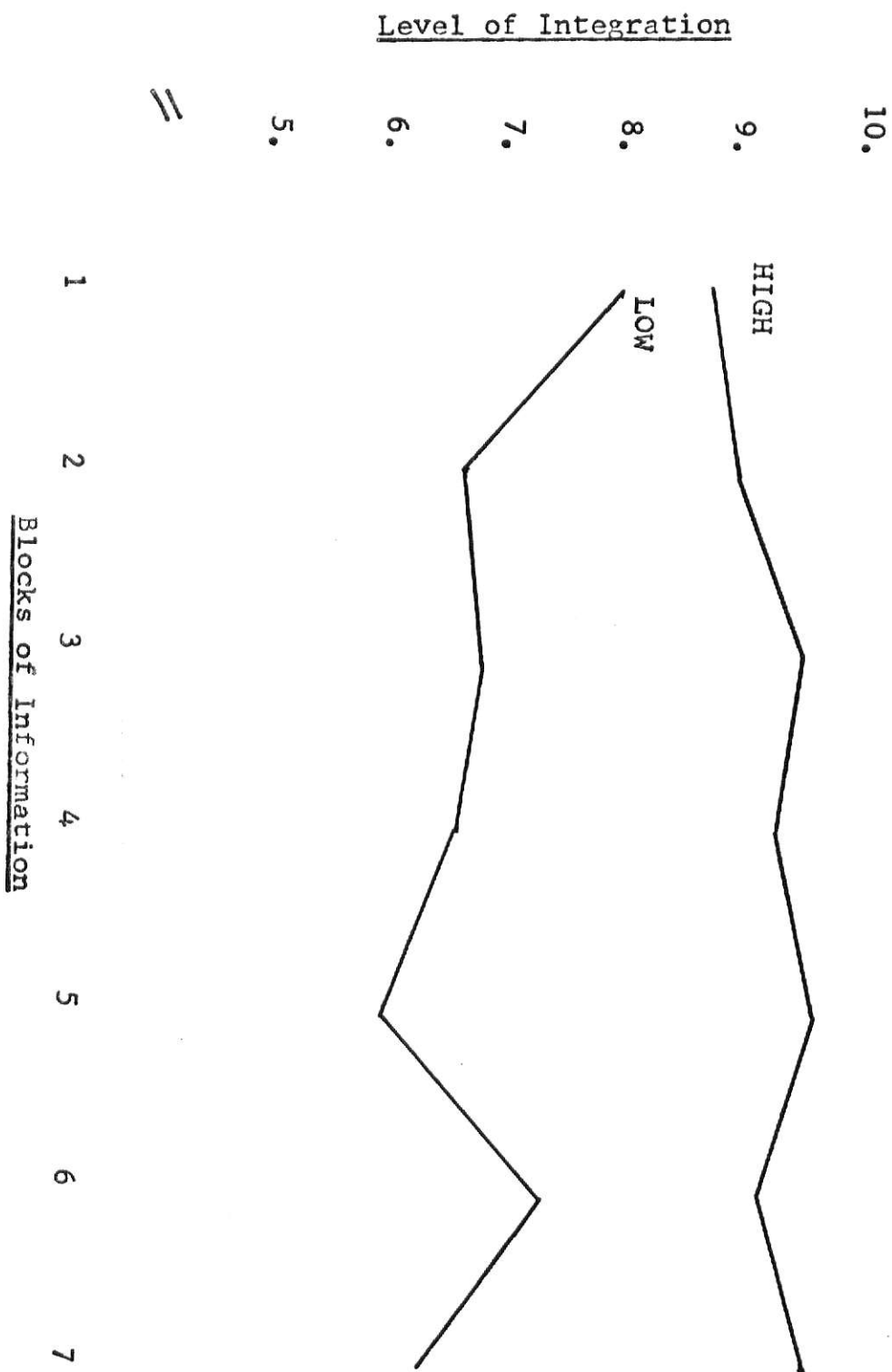
Level of Conflict of the Initial Information:

There was no main effect for initial degree of conflict. There was a marginally significant interaction of conflict over blocks of information ($F(6, 534) = 1.93, p < .10$). Generally, this result reflected a tendency of the high conflict group to start with a relatively high number of constructs and then decrease over trials and, conversely, for the low conflict group to start with a relatively small number of constructs and then to increase over trials. In addition, there was a significant complexity by conflict by order over blocks interaction

Figure IV. Level of Integration
of Written Impressions for High
vs. Low Cognitive Complexity Groups
for Each of the Seven Blocks of
Information
Order 1 - (Figure a)
Order 2 - (Figure b)

ORDER 1



ORDER 2

($F(6, 534) = 4.162, p < .001$) which was uninterpretable.

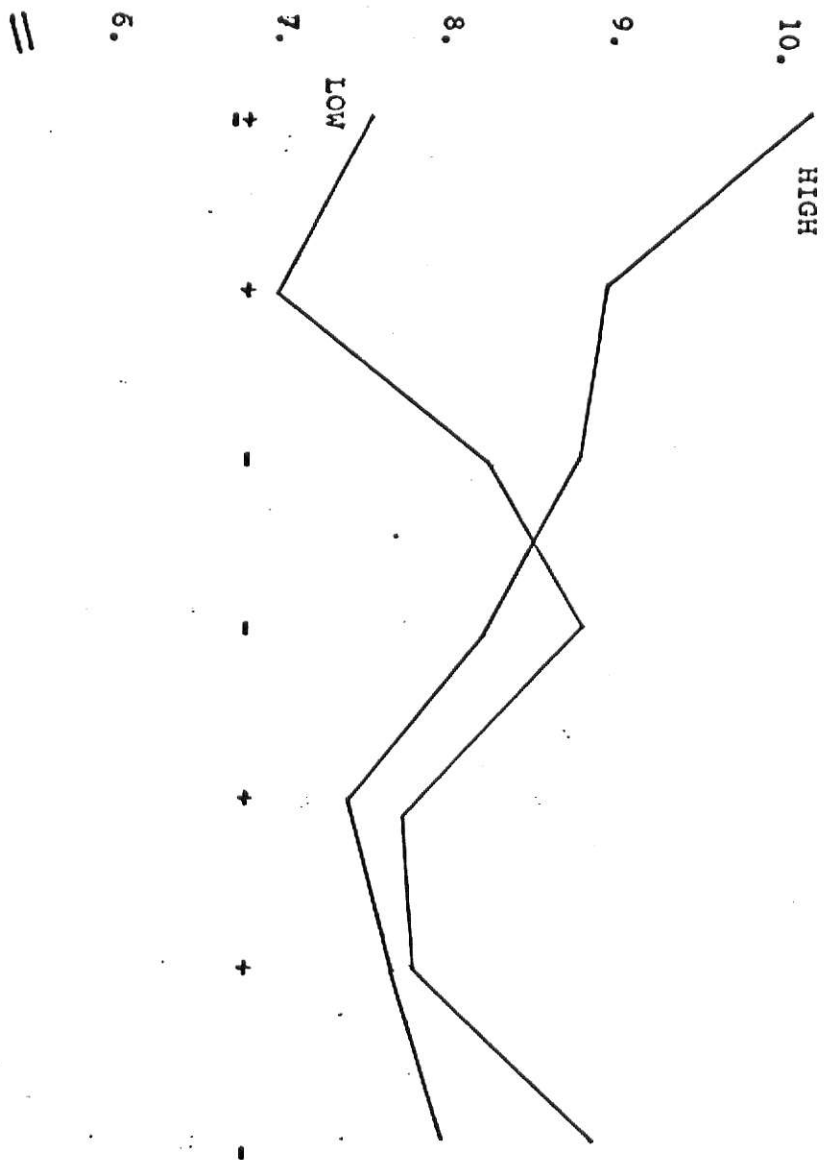
The results for level of integration were similar to those for degree of differentiation. There was also, however, a main effect for initial conflict such that the mean level of integration was higher for the high than for the low conflict group (Means = 8.57 vs. 7.94).

The interaction of conflict over blocks ($F(6, 534) = 8.44, p < .01$) was contained within an interaction of conflict with order over blocks ($F(6, 534) = 2.29, p < .05$) as shown in Figures V a and b. Initially, there was a large difference between high and low conflict groups for both orders. For the high conflict group, regardless of order, the level of integration tended to go down. For the low conflict group, the presentation of negative information tended to increase the level of integration while presentation of positive information tended to decrease the level of integration. Furthermore, for both orders, the first negative block of information led to the greatest increase in level of integration for the low conflict group only (see Figures v a and b) in level of integration for the low conflict group only.

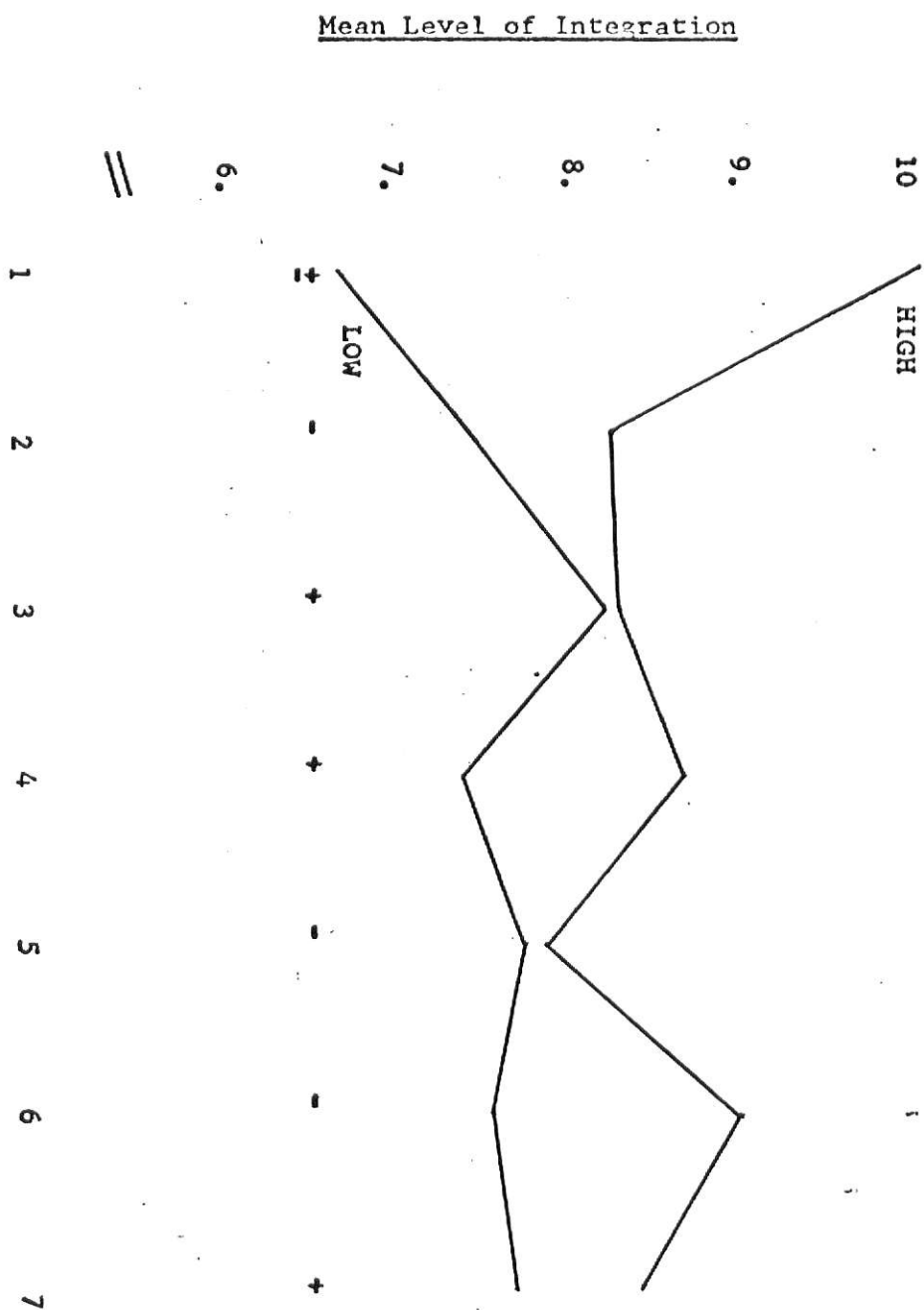
Subjects' Evaluation of John

The subjects' evaluation of John was obtained from their degree of like or dislike for John as indicated on an 11-point scale. In order to more clearly abstract the differences that were expected to occur between high and low complexity subjects as a function of assimilating new information, the evaluation scores were also transformed by taking the absolute degree of shift in evaluation from one block to the next.

Figure V. (a & b) Mean Level of Integration
for High vs. Low Conflict Groups
Over Blocks.
Order 1 vs. Order 2

ORDER 1Mean Level of IntegrationBlocks of Information

1 2 3 4 5 6 7

ORDER II

In agreement with past studies, (Kenney, 1968) there was no consistent bias in the subjects' evaluation of John as a function of cognitive complexity; that is, highs vs. lows did not in general tend to perceive John in a more positive or a more negative way.

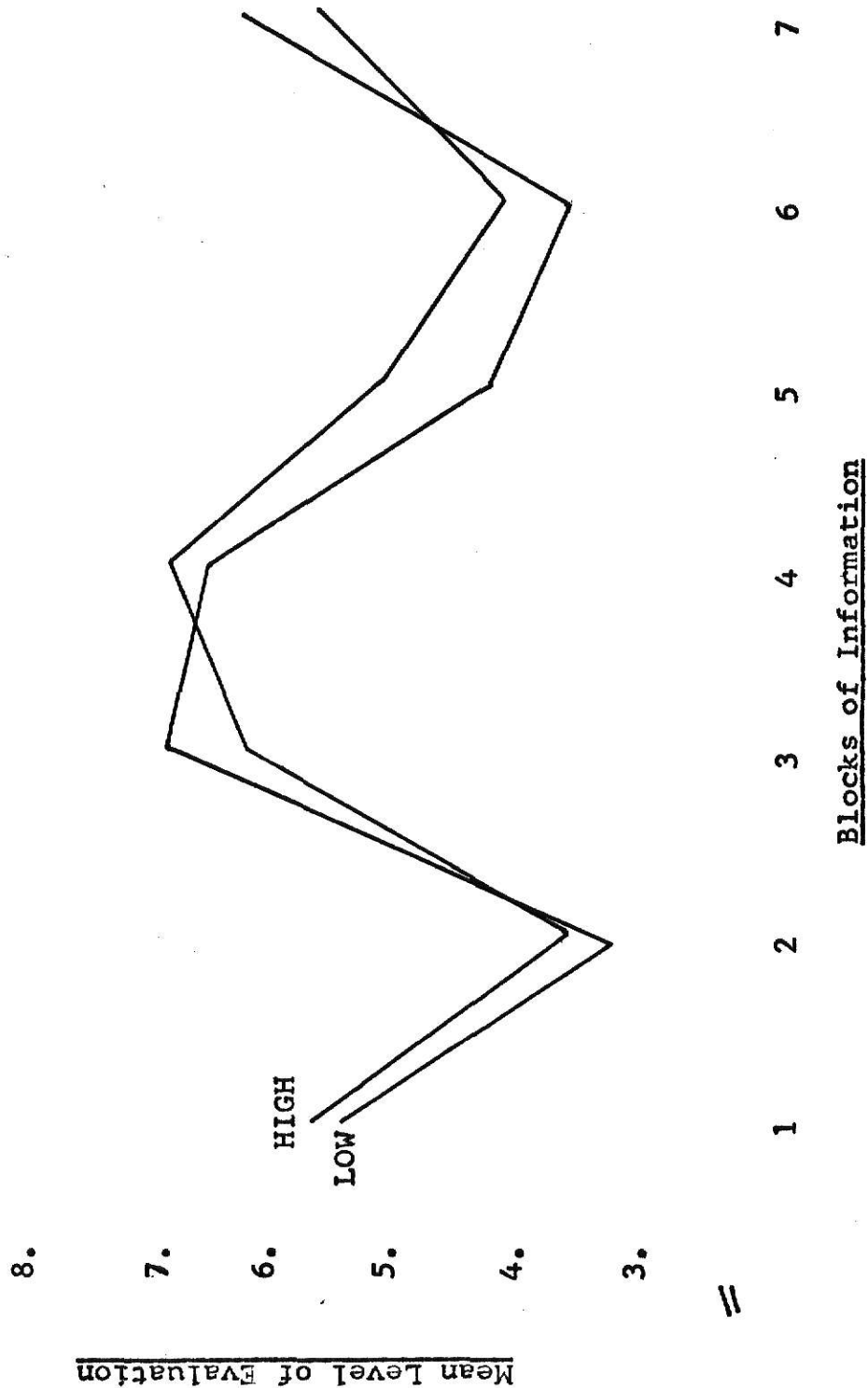
The results showed a main effect for the independent variable of degree of initial conflict ($F(1, 89) = 6.11, p < .05$). Subjects in the high conflict situation had a neutral evaluation of John, while subjects in the low conflict situation evaluated John somewhat positively (Means = 6.12 vs. 5.34 respectively). No higher order interactions for conflict were found for this variable.

With respect to the order of the univalent information (Figure VI a and b) (+--+ vs. -+--+), there was a main effect for order ($F(1, 89) = 4.25, p < .05$), which was contained within an interaction of order over blocks of information ($F(6, 534) = 52.03, p < .001$). While initially there are no differences with respect to order, as expected, positive univalent information resulted in a positive evaluation, and negative information resulted in a negative evaluation. Averaged over blocks, order 1 (+--+) resulted in a somewhat positive evaluation of John and order 2 (-+--+) resulted in a somewhat neutral evaluation, indicating a primacy-effect for subjects' evaluation of John.

It was expected that the degree to which subjects would shift their evaluations of John from block to block would vary as a function of cognitive complexity. As expected, there was a significant interaction of cognitive complexity and order over blocks ($F(6, 534) = 3.04, p < .01$). This result can most clearly be seen by presenting the results for the second dependent measure of subjects' absolute

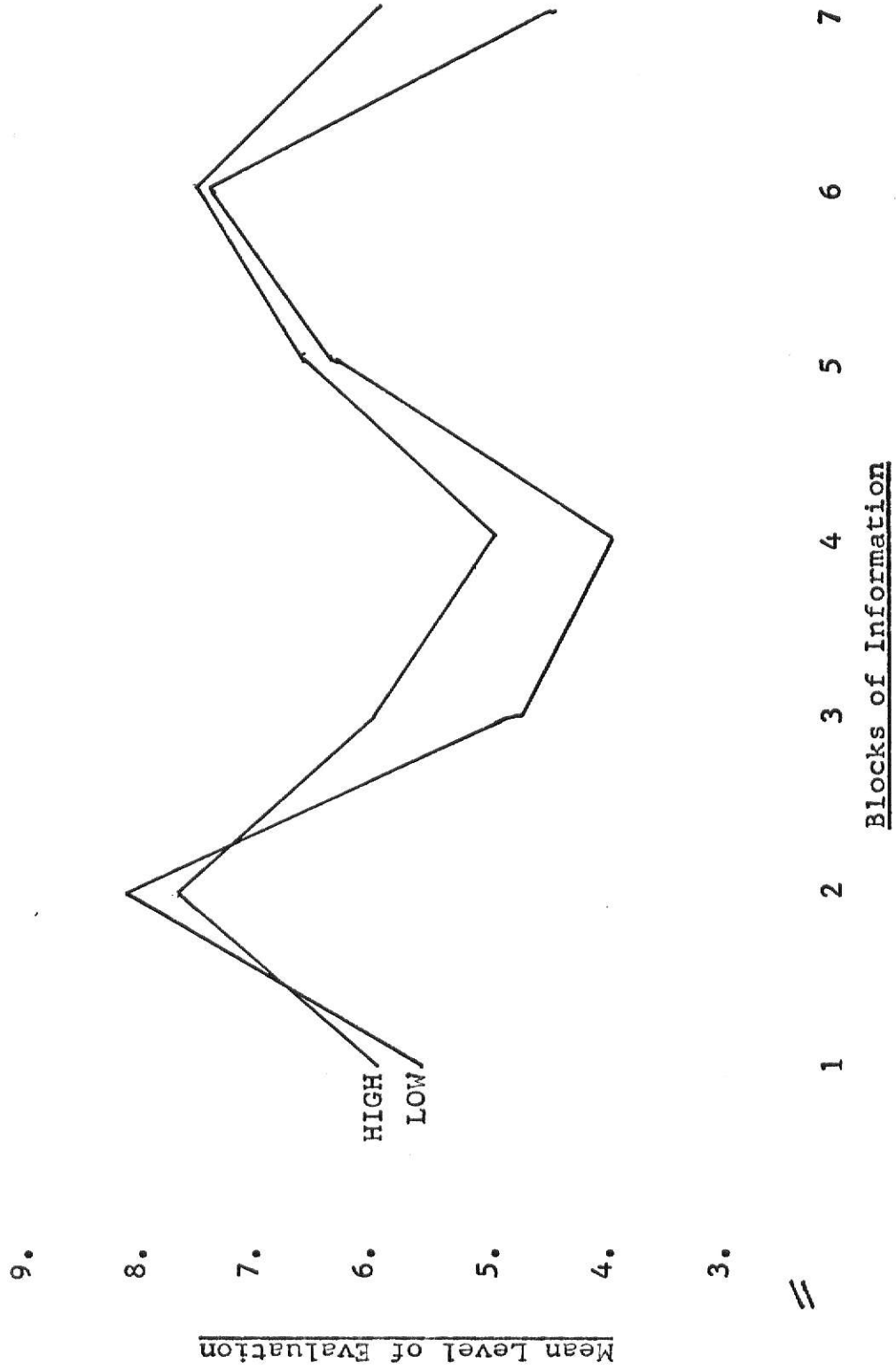
Figure VI. Mean Level of Evaluation
for High vs. Low Cognitive
Complexity Groups Over
Blocks of Information
Order I - (Figure a)
Order 2 - (Figure b)

ORDER 1



=

ORDER 2



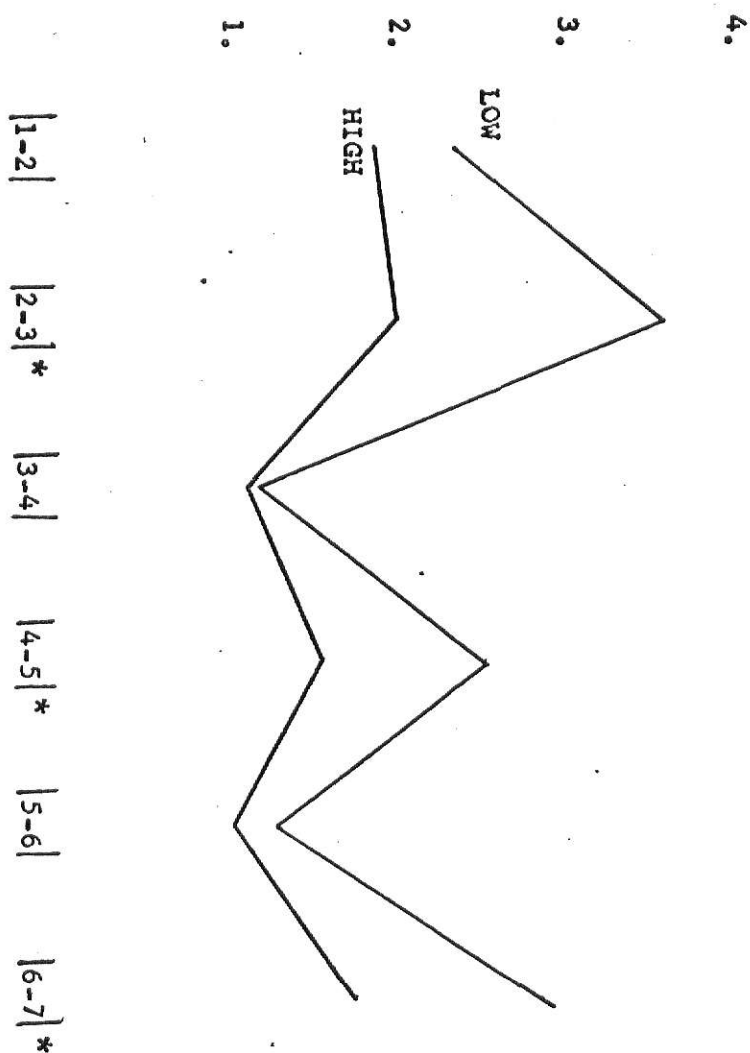
shift in evaluation from one block of information to the next.

Overall, lows showed a greater change in evaluation over blocks than did highs ($F(1, 89) = 7.10, p < .01$). Of greater interest was the interaction of complexity over block shifts ($F(5, 445) = 2.44, p < .05$; quintic component ($F(1, 445) = 7.50, p < .01$). As hypothesized, whenever a shift in valence of the information occurred (block shifts; |2-3|; |4-5|; |6-7|), lows changed their evaluations to a greater extent than did highs. On shifts where there was no change in valence between blocks, there was not a significant difference between highs and lows in evaluation shift (see Figure VII).

Individual Differences in the Awareness of Mode of Information Processing

A Chi-Square analysis of the relationship between cognitive complexity and the awareness of mode of information processing variable was significant ($\chi^2 = 10.02, p < .01$). The direction of the difference was as expected. Thus, of the 36 subjects who checked number 3 on the scale ("I couldn't forget his earlier behavior and I felt that I had to account for it") 67% were highs; of the 23 subjects who checked number 1 on the scale ("I tended to concentrate on each incident as it came and mostly ignored the things he did earlier") 73% were lows.

Figure VII. Absolute Valence Shifts
Between Blocks of Information
for High vs. Low Cognitive Complexity
Groups.

Absolute Valence Shift

Block Shifts (Shifts in valence between incidents occur on
starred blocks)

Table 1

		Scale			
		1	2	3	
Cognitive Complexity	High	5	15	23	43
	Low	18	17	13	48
		23	32	36	91

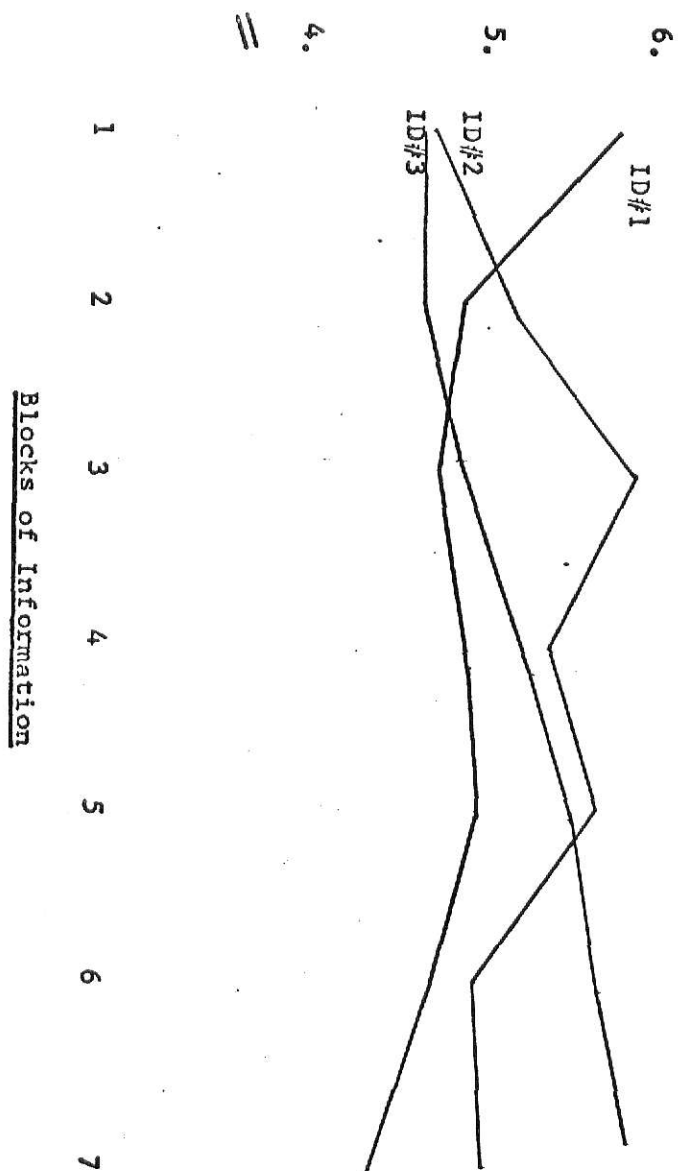
In order to examine the relationship between the mode of information process or (M.I.P.) variable and the dependent measures previously discussed, the M.I.P. variable was substituted for cognitive complexity in a set of subsidiary analyses. The results for these analyses corresponded highly with the analysis using cognitive complexity. Some exceptions did occur, however. For degree of differentiation, there was no main effect for the variable in the number of constructs employed by any of the three groups (1 vs. 2 vs. 3). However, there was a significant interaction of M.I.P. over blocks of information ($F(12, 474) = 2.38, p < .01$). Subjects who checked scale point "1" started high on the first block (Mean = 5.82) and steadily dropped over trials (Block 7 Mean = 4.5). Conversely, subjects who checked scale point "3" started off low on the first trial (Mean = 4.68) and steadily increased over trials (Block 7 Mean = 5.58). The results for all three scale points are shown in Figure VIII.

For level of integration there was a main effect for the M.I.P. variable ($F(2, 79) = 16.23, p < .001$); Means = 6.48 for #1; 8.48 for #2; 9.27 for #3. There was no interaction with order over blocks of information.

For evaluation, in contrast to the results found for cognitive complexity, there was main effect for the individual differences variable ($F(2, 79) = 13.87, p < .001$; Means = 5.14, 5.13, 6.81 for 1, 2, 3, respectively). In contrast to groups 1 and 2, subjects who felt that they had to account for the information (those who checked scale point 3) formed a more negative impression of John.

Again, there was an interaction of the M.I.P. variable with order

Figure VIII. Mean Number of Constructs Produced
By Subjects in Individual Differences
Group 1 vs. Group 2 vs. Group 3.

Mean number of Constructs

over blocks of information ($F(12, 474) = 9.50, p < .001$) which corresponds to the significant interaction of this variable over block shifts ($F(10, 395) = 8.55, p < .01$) for the dependent measure of subjects' absolute shift in evaluation from block to block. In the analysis, the only group who significantly shifted their evaluation of John when the valence of the information changed was group 1; the group who checked that they tended to concentrate on each incident as it came and ignore the things that John did earlier.

Discussion

1. Integration and differentiation of the impressions.

The over-all performance of highs and lows in this study was consistent with previous work (Crockett, 1965; Rosenkrantz and Crockett, 1965; Miller, 1969; Nidorf and Crockett, 1965; Kenny, 1967) in that highs formed impressions which were more differentiated and more integrated than the impressions formed by lows.

Looking only at differentiation of the impressions over blocks of information, after the initial conflicting bivalent block both highs and lows moved to relatively stable patterns; highs rose to about 6 and lows dropped to about 4.5 constructs per impression. This result seems to highlight two aspects of the impressions process with relation to differentiation: (1) After an initial "orientation" phase, persons move to a relatively constant phase in which they tend to use the same number of constructs in their impressions. and (2) Highs vs. lows use relatively more constructs in their stabilized phase.

Focusing now on the formal characteristic of integration, highs

formed consistently more integrated impression than lows. In particular, when presented first with univalent negative information (order 2), highs subsequently wrote more highly integrated impressions; lows wrote less integrated impressions. This interaction over blocks of information was not present, however, when the first block of univalent information was positive (order 2). The implication of this differential performance for highs vs. lows will be discussed in a later section.

For initial level of conflict, the level of integration of the impressions was higher when the initial bivalent information was more as opposed to less conflicting. Also, somewhat analogous to the effects found for complexity, integration increased when negative information was presented, particularly to the low conflict group.

In attempting to account for this effect, several studies have explored the issue of the effect of positive vs. negative information on integration.

Kenney (1968) and Press (1971) found that impressions based on negative information were organized at a higher level of integration than those based on positive information. Feldman (1962) defined the "modifying capacity" of a trait as the trait's ability, when paired with another trait to shift the joint evaluative component towards its own evaluative component. His results showed a correlation of -0.69 between the modifying capacity of a trait and its evaluative component; the more negative the trait, the greater its tendency to "pull" other traits towards itself while resisting being shifted by the other traits.

The tendency for greater integration to occur with negative

information has also been suggested by Peabody's (1967) critique of Ozgood, Suci & Tannenbaum's (1957) factor analytic work on semantic space. One of the basic dimensions employed by people, according to this work, is an "evaluative" dimension which peabody argued is confounded by a "descriptive" component. Thus, Peabody has argued that socially undesirable aspects of a description can be seen as more extreme forms of socially desirable characteristics. For example, in the dimension "behaves in a risky way vs. does not behave in a risky way", corresponding positive traits are "bold" and "cautious". However, more extreme forms of the traits might be characterized by "rash" and "timid". Hence, "rash" and "bold" can be seen as sharing a common descriptive component with "rash" being a more polarized form and "bold" a less polarized form of the same cluster of behaviors.

Applying Peabody's model helps account for the valence results found in the present experiment where negative vs. positive behaviors were organized at a higher level. Negative information is seen as more surprising than positive (Feldman, 1968), more informative (Peters, 1958; Jones and Davis, 196), and more polarized as in Peabody's analysis. Since negative behavior is seen as going against the norm and since it is linked with disliked rather than liked people, it is seen as being more unusual behavior. Subjects seem to feel that they need to defend their position by stating their views more precisely and putting limits on the scope of applicability of their generalizations. Press (personal communication) has provided further support for this idea. He found that when subjects described people known to them, they are much more likely to use integrative, superordinate construct elaborations in

describing disliked than for liked people. Press concluded that positive behavior has a much broader range of possible contexts and can be seen across many situations without being surprising. For negative information, however, Press again found that subjects were likely to qualify and extend their descriptions of the person and thus present a more integrated impression.

II. Absolute Shift in Evaluation

The results indicated that lows tended to shift markedly in their evaluations of John when the univalent blocks changed in valence while highs, on the other hand, tended to maintain a relatively stable evaluative picture.

It appears likely that the explanation for this finding lies in the differential ways of handling the information for highs vs. lows. Lows tended to focus on each block as if it were in isolation and they clearly did not appear to form any meaningful relationships between behavior across incidents. Highs, on the other hand, tended to relate earlier behavior with current behavioral incidents through the employment of higher order conceptual schemas. Lows, then, tended to form relatively univalent, recency impressions while highs tended to form relatively integrated impressions. Putting this together with the finding for valence shift suggests a relationship between cognitive and affectual processes. In this experimental context, the evaluation of John on a "like-dislike" dimension, inversely covaried with the degree of integrative constructs employed by the subjects. The higher the degree of integration, the lower the absolute shift in evaluation.

This phenomenon may be partially understood in the light of Wernerian theory. Thus, the behavior of lows may be viewed as concrete and labile. In a sense, low interpersonally complex persons have little ability to impose their schemas on the interpersonal world; they depend on the immediate, concrete situation to which they passively respond rather than actively organize. Werner considers that higher development necessitates a progressive subject-object differentiation and:

This increasing subject-object differentiation involves the corollary that the organism becomes increasingly less dominated by the immediate concrete situation; the person is less stimulus bound and less impelled by his own affective states. A consequence of this freedom is the clearer understanding of goals, the possibility of employing substitutive means and alternate ends. There is hence a greater capacity for delay and planned action. The person is better able to exercise choice and willfully rearrange a situation. In short, he can manipulate the environment rather than passively respond to the environment. This freedom from the domination of the immediate situation also permits a more accurate assessment of others. The adult is more able than the child to distinguish between the motivational dynamics and the overt behavior of personalities. (Werner, 1965, p. 127)

Thus, the strategy employed by the lows reflected a passive, concrete orientation toward understanding John. The strategy employed by highs, conversely, seemed to be one of actively organizing and structuring the behaviors around a superordinate structure.

Awareness of the Mode of Information Processing

The results indicated that the subjects were able to identify fairly accurately the process they used to deal with the information. The interesting question in this regard is whether low level integrators were merely reflecting a "style" of performance or whether their

behavior reflects a capacity of their cognitive functioning. The focus of the question is on the lows because it is well known that higher level functioning can be impeded by various external forces (e.g. drugs, fatigue, overloading, general stress) while it is not at all clear that lower level functioning can be raised; regardless of proding. Although the awareness finding suggests that lows interpreted the instructions according to their capacity for coping with the problem, the results are in no way conclusive. Rosenbach (1968), however, conducted a study in which the capacity question was specifically explored. Subjects in this experiment were individually interviewed after they had participated in an impression forming task. When they were pressed to account for new information it was found that their level of integration either stayed the same or went down.

Further exploration of this question is clearly needed. For example, besides interviewing subjects and asking them if they could imagine any other way of conceptualizing, they might even be given examples of integrated and differentiated impressions and be taught to understand the factors involved in constructing such impressions. In terms of the present theoretical conception, though, such training and modeling approaches would be assumed to have limited value in creating long range, generalized changes in the person's construing processes.

Implications

Integration in Cognition

What is the value or advantage of an integrative mode of processing

information? In development, increases in differentiation should be accompanied by the growth of hierarchically integrated structures or more "bonds of relationship" for the person to function effectively. A cognitive system that simply grows in number of parts would soon overwhelm its possessor with its unwieldiness. Empirically, Bannister and Kelly (1960, 1961) have found that schizoid persons exhibit a high degree of differentiation between their constructs but the system fails to function as a whole because of a lack of integrating links between constructs. Such a highly labile system is excessively accomadatory and therefore has great difficulty imposing organization upon the complex information impringing upon the person.

Since development should entail an increasing ability on the part of the person to deal more effectively and flexibly with the problems confronting him, it follows that structures for organizing (simplifying) and processing increasingly complex information must be developed. These structures must also permit the person to handle the complexity of his ever expanding information base without large scale distortion or radical transformation (to rigid patterns) of the information (as this would indicate that the person is not really dealing with the information but merely erecting defence mechanisms to avoid confrontation). It is assumed in Wernerian theory that a person will move to higher levels only if he finds these levels are more adequate in dealing with the world. It is also assumed that a cognitive system which is more highly developed will allow the person greater flexibility and, hence, an increasing ability to adapt (either himself or the world) to new problems.

Interpersonal Attraction

If the results of this study hold in situations outside of the laboratory, then several implications follow for interpersonal attraction. First, it appears that low complexity persons would tend to vacillate between liking and disliking others to a greater extent than would high complexity persons. However, this may be an over-simplistic extension of the data; since in the experiment subjects were "forced" to read discrepant behaviors, it is certainly possible that in real life situations low complexity persons may avoid receiving dissonant information. Or, they may find it easier to transmute actual behavior to forms which fit their conceptions than the printed words in the experiment.

It may be interesting to look at several other areas in this domain: What types of friendships do differentially complex individuals form?, Do low complexity persons tend to break off friendships more often than highs?, What is the quality (superficial to meaningful) of the interpersonal relations of differentially complex individuals?, Are differentially complex individuals attracted to similarly developed or more highly developed individuals?

Consequences of Mode of Interpersonal Functioning

The results of this study suggest that differentially interpersonally complex individuals employ very different strategies in their interpersonal lives. It is an interesting question whether one or the other strategy is a more "successful" mode of functioning. The term "success" need not conote strictly utilitarian concerns, but merely describe the range

of options open to either mode and the quality of interpersonal relationships. Aside from the question of veridicality of judgement (which, as has been previously discussed, is a dubious pursuit) it may be possible to look at such things as: the degree of effectance individuals feel in coping with their interpersonal worlds, the general types of lives they lead (are their differences in the life styles of high and low complexity people?) and, how satisfied are high vs. low persons with their interpersonal lives?

The research in this paper has considered only interpersonal cognitive functioning. It would be interesting to explore, in further research, whether any of these effects are more general. It is conceivable that the somewhat constricted behavior of the lows may be part of general cognitive syndrome which extends into other domains.

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DIFFERENCES IN THE ASSIMILATION OF SUCCESSIVE BLOCKS
OF INFORMATION AS A FUNCTION OF COGNITIVE COMPLEXITY

by

NELS W. KLYVER

B. A., State University of New York, 1969

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

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Manhattan, Kansas

1972

ABSTRACT

The purpose of this study was to investigate whether subjects high in cognitive complexity would integrate information differently into an organized impression than low complexity subjects. On the basis of previous research and theoretical considerations it was expected that highs would form more differentiated and more integrated impressions than lows.

It was also expected that lows would be more bound to the immediate block of information in forming their impression and would therefore shift their liking or disliking for the person described as the immediate incident shifted in valence.

Both of these hypotheses were supported in the study.

The subject population consisted of 97 students who were recruited from large introductory classes. Half were male and half female. Each subject was pretested on his level of cognitive complexity through a task which involved writing about various people whom he knew. The complexity score equalled the total number of interpersonal constructs the subject used in describing all the persons.

Following this pretest, each subject was given a booklet containing six univalent anecdotal stories about a central character. These were preceded by a block containing two opposing univalent incidents. The subjects were instructed to work through the booklet at their own pace and were asked to respond to a scale after each incident which asked the degree of like or dislike they had for the central character.