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COLE, JAMES WOODARD

INDIVIDUAL DIFFERENCES IN DECISION MAKING: A TEST OF
THEORIES OF EXTRAVERSION USING THE EMPLOYMENT INTERVIEW

The University of Oklahoma

PH.D.

1980

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THE UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

INDIVIDUAL DIFFERENCES IN DECISION MAKING:
A TEST OF THEORIES OF EXTRAVERSION
USING THE EMPLOYMENT INTERVIEW

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
in partial fulfillment of the requirements for the
degree of
DOCTOR OF PHILOSOPHY

BY
JAMES W. COLE
Norman, Oklahoma
1980

INDIVIDUAL DIFFERENCES IN DECISION MAKING:
A TEST OF THEORIES OF EXTRAVERSION
USING THE EMPLOYMENT INTERVIEW

APPROVED BY

Kirby Gilliland
Henry O. Jortkan
K. Melzer
W. J. Seward

DISSERTATION COMMITTEE

Acknowledgements

It is a pleasure to thank and acknowledge those people who have made significant contributions to both my professional and personal development. I would like to express my appreciation to the members of the dissertation committee, Dr. Kirby Gilliland, Dr. Larry E. Toothaker, Dr. Roger L. Mellgren, Dr. Alan Nicewander, and Dr. Charles Gettys, for their invaluable guidance in both the fruition of this manuscript and my professional growth.

In addition I would like to thank the graduate students who have added much to my life, people like Mark Olson, Stan Fisher, Diana Davis, Sherri Bracy, and Phillip Massad. I would also like to thank Dr. Robert E. Cramer, whose friendship has been invaluable during the highs and lows of graduate school.

My parents, Woodard and Mary Cole, have always provided me with encouragement, support and love. They have contributed much to this effort and I would like to sincerely thank them.

Finally and certainly not least, I would like to thank Vickie Wenninger for the emotional and intellectual contributions, and the personal sacrifices, she has made on my behalf. She deserves more than a mere thank you. I can only say I could never have finished without her.

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Abstract

Two theories of introversion-extraversion were tested using the decision making process in the employment interview. The employment interview was chosen since it provides unique predictions for the two theories regarding the final decision made by an interviewer. Eysenck's (1967) theory of extraversion hypothesizes differences between introverts and extraverts due to individual differences in arousal. This model would predict an interaction between extraversion and order of presentation of positive and negative information. Gray's (1972, 1973) theory of extraversion hypothesizes differences between extraverts and introverts in their relative sensitivity to rewards and punishments. Gray's model predicts higher ratings for extraverts than introverts when both positive and negative information is presented.

Results from both experiment one, using Farr's (1972) methodology, and experiment two, using the continual tracking methodology (Wesley, Note 1), indicated that the interaction predicted by Eysenck's model was present. While the main effect predicted by Gray was found in experiment one, it was found in both experiments that introverts exhibit primacy effects, while extraverts exhibit recency effects regardless

of the order of positive and negative information. The results suggest that Eysenck's theory explains the decision making process in the employment interview more consistently than Gray's theory. The discussion centers around a comparison of the two theories, as well as implications for training interviewers.

Individual Differences in Decision Making:
A Test of Theories of Extraversion
Using the Employment Interview

Introduction

One of the major, unresolved problems in the area of extraversion-introversion research has been the choice of a theoretical model. Several theoretical positions have been proposed, but at present two models are the most widely accepted, Eysenck's (1967) and Gray's (1972, 1973). Little research exists, however, which contrasts these two models in a single study. One of the major problems in comparing the two theories is that in areas of traditional research (i.e., conditioning, vigilance tasks, sensory deprivation, etc.) the two models often lead to the same predictions. It has been argued that similar predictions occur since Gray's theory is derivable from Eysenck's (Wilson, 1977, 1978), however, aspects of Gray's theory make unique predictions possible when appropriate research paradigms are employed.

One research area which may provide a unique way to test these two models is the decision-making process in the employment interview. Use of the employment interview as a means of testing the two models should provide two major benefits:

(1) unique predictions are possible for the two theories, and
(2) a clearer picture of individual differences in the decision-making process of the employment interview may be provided. In this paper the two major theories of extraversion-introversion will be reviewed, the decision-making process in the employment interview will be discussed, and tests of the two theoretical positions will be presented.

The concept of introversion-extraversion has its roots in the early work of Jung and others (Eysenck, 1947, 1953, 1970; Jung, 1933), but the most highly developed theory of introversion-extraversion, as well as the major volume of scientific research, have been linked to Eysenck (1957, 1967, 1970, 1971). According to Eysenck (1967), hypothesized differences between introverts and extraverts are believed to be the results of individual differences in the functioning of the ascending reticular activating system (ARAS), which is considered to be responsible for non-specific arousal in the cerebral cortex in response to stimuli. For a given amount of stimulation introverts are hypothesized to have more highly aroused ARAS functioning than extraverts.

While Eysenck's theory is primarily biological, most of the tests of the theory are by necessity behavioral. As predicted by the theory, introverts under low levels of stimulation acquire a greater number of conditioned eyeblink responses than extraverts (Eysenck, 1966; Franks, 1956, 1957). Introverts also have a lower threshold for pain than

extraverts (Barnes, 1975), and exhibit superior performance on vigilance tasks (which are monotonous) as would be predicted by Eysenck (1976; see also Bakan, 1959). Eysenck (see Howarth and Eysenck, 1974) has predicted differences between introverts and extraverts in verbal learning by using Walker's (1958, 1963) action decrement hypothesis. Walker hypothesized that any perceptual event sets up a perseverative trace that fades gradually over time. If arousal is sufficient, information is transferred to permanent memory through a process called consolidation. During the consolidation process, retrieval is temporarily inhibited to protect the trace against disruption. High arousal facilitates consolidation, but at the same time makes immediate recall more difficult. Therefore, it was predicted that extraverts would be superior on relatively short-term memory tasks, while introverts should be superior on long-term memory tasks. These predictions have been supported (W. M. Eysenck, 1974; Howarth and Eysenck, 1974).

Although a large body of research supports Eysenck's theory of extraversion-introversion, an alternative model has been proposed by Gray (1972, 1973). Gray bases his model on the premise that different centers of the brain control approach behaviors, while others control avoidance behaviors. It is hypothesized that introverts and extraverts differ in their relative sensitivities to threats of punishment and promises of rewards. Specifically, introverts are

hypothesized to be more sensitive to punishment, while extraverts tend to be oriented toward pursuit of reward with little or no heed to the consequences of behavior. Support for Gray's model comes principally from research on sedation threshold (see Gray, 1973) and from research on verbal conditioning (Gupta, 1974), but the model has not been as widely tested as Eysenck's. Furthermore, even less research exists which directly compares predictions of the two theories of extraversion-introversion.

The study of individual differences in decision making in the employment interview may provide an experimental paradigm that allows unique predictions from the two theories of extraversion-introversion, and thus, a test of the two models. Research on the employment interview has been reviewed five times in the last three decades (Mayfield, 1964; Schmitt, 1976; Ulrich and Trumbo, 1965; Wagner, 1949; Wright, 1969). These reviews have stressed the need for experimental studies of the decision-making process, but this suggestion has only recently been followed (Schmitt, 1976). Experimental studies of decision making in the interview process have focused mainly on assessing the relationship between a final overall decision of the "applicant's" favorability (i.e., to hire or not hire) and the order in which positive and negative information about the applicant is presented.

Initial studies on the effects of information order supported a primacy effect (Bolster and Springbett, 1961;

Springbett, 1958); i.e., information obtained early in the interview had a greater effect on the final decision than information obtained later. However, these studies have been criticized on methodological grounds, since the situation made it more likely that a favorable (i.e., a hire) decision would be made (Hollman, 1972). It was argued that the equal interval rating scale employed by Springbett had larger scale intervals in the rejection region of the scale than in the hire region of the scale. Recent studies have avoided this problem by using Hakel and Dunnette's (1970) norms. These norms provide the researcher with the favorableness of an informational statement, its importance in an interview situation, and the relative likelihood of the occurrence of an item in an employment interview.

Using these norms, Farr (1973) constructed eight hypothetical secretarial applicants, and manipulated both the type of information (factual vs. impressionistic) and the order of presentation of positive and negative information. Two findings stand out in Farr's study, (1) the order of positive and negative information accounted for most of the variance, i.e., 25 percent, and (2) a recency effect of informational favorability was found, i.e., information appearing last had a greater influence on the final decision than information appearing earlier in the interview. Since subjects made a periodic favorability rating (after every other informational item), Farr explained his results in terms of

an attention model. Briefly, this explanation states that if only one decision is to be made (as in Springbett, 1958), then a person forms a decision and loses interest. However, if the person is asked to make periodic judgements, then information is attended to as it is presented. While this explanation does explain Farr's findings, it has problems explaining other phenomena such as contrast effects (Schmitt, 1976).

One way of looking at the decision-making process in the employment interview is to view the process as a special case of impression formation (Hakel and Dunnette, 1970; Wesley, Note 1, Note 2); i.e., the process by which we form attitudes about another person (Asch, 1946). Attention models, similar to that proposed by Farr, have been presented as explanations for impression formation (e.g., Anderson & Hubert, 1963; Risky, 1979). It has been shown that impressions are formed early and that later information has little effect on the overall average rating, or impression, when only a general impression is required. Forcing the subject to attend to later information results in an impression which more closely resembles an average of the favorability ratings of the item presented (Anderson, 1972, 1977).

An alternative explanation for impression formation has been proposed by Rywick and Schaye (1974). They feel that the impression formation process utilizes information stored in long-term memory. Their conclusions are based on studies

which indicate that irrelevant tasks during information presentation reduce primacy in both recall and impressions, while delay of recall (which reduces recency in recall) does not affect impression order effects. It should be pointed out that these two theoretical approaches to explaining impression formation yield the same predictions when an overall global impression, or rating, is required.

The two theoretical approaches to explaining impression formation, and the research on decision making in the employment interview ignore the importance of individual differences. As Schmitt (1976) points out, there are "individual differences in decision making" and "more attention should be paid to these individual differences" (pp. 96-97). As already noted, introverts and extraverts vary on a wide variety of behaviors, and it is likely that they differ in decision-making patterns as well.

If we adapt Eysenck's concept of introversion-extraversion differences as being due to differences in arousability, and use either of the explanations of impression formation presented above, we can make specific predictions. Since extraverts are hypothesized to be less aroused, and, therefore, superior on relatively short-term memory tasks, it can be predicted that they would exhibit recency effects. Introverts, conversely, should exhibit a primacy effect due to better long-term memory. These predictions would appear to hold whether an overall rating is made (as in Springbett, 1958) or

a continual rating is made (as in Farr, 1973).

An alternative set of predictions result if Gray's model of introversion-extraversion is employed. If introverts are viewed as more sensitive to aversive stimuli, while extraverts are more sensitive to positive stimuli and if we assume that positive information can be viewed as rewarding, while negative information is viewed as aversive (e.g., Watson & Friend, 1969), then clear predictions can be made. Under Gray's model introverts should react to negative information, thus exhibiting a primacy effect when negative information is presented first, and a recency effect when negative information is presented last. Further, extraverts should attend primarily to positive information, thus they should exhibit primacy effects when positive information comes first, and recency effects when positive information occurs last.

Thus, the use of impression formation, or the decision-making process within the employment interview, provides a unique means of testing the two theories of introversion-extraversion. Further, the test of these two models may provide additional information about impression formation and decision making in the employment interview.

Experiment 1

Method

Subjects. Subjects were 32 introductory psychology students (16 males and 16 females) who participated for partial fulfillment of class requirements. Subjects were classified

by their scores on the Eysenck Personality Inventory (EPI) as either extraverts (scores of 16 or greater) or introverts (scores of 11 or less). Subjects were randomly selected after pretesting the subject pool (N = approx. 100) with cutting points representing the upper and lower 30 percent of the distribution of students.

Materials. Each subject was provided a test booklet. This booklet contained a brief set of instructions, and a description of the duties required of the applicant they were to rate (i.e., a job description, since research indicates that providing a job description to college students allows them to make decisions as accurately as trained interviewers; Wiener & Schneiderman, 1974). Following the introductory material, each subject was provided a list of 24 informational items, and a rating form for the first hypothetical applicant; and 24 informational items, and rating form for the second hypothetical applicant.

Design. Subjects were blocked on introversion-extraversion and sex, and then randomly assigned to an order condition. One-half of the subjects received a favorable-unfavorable (FU) statement order for the first hypothetical applicant and an unfavorable-favorable (UF) statement order for the second hypothetical applicant, while one-half received an UF order for the first hypothetical applicant and a FU order for the second hypothetical applicant. Thus the overall design was a 2(extraversion vs. introversion) X 2(sex of

subject) X 2 (favorability order) X 2 (applicant or trials), the latter being a within variable.

Procedure. Subjects were run individually. After determining whether subjects were introverted or extraverted they were randomly assigned to one of two order conditions, FU - UF, or UF - FU.

Each subject was provided an informed consent form which outlined the experiment as an exploration of the decision-making process in a simulated employment interview. After signing the consent form, each subject was given the test booklet and told to read all instructions carefully. After subjects finished reading the job description, they were asked if they had any questions. After any questions were answered, subjects were told to begin with the first applicant.

Each applicant consisted of 24 informational items (i.e., 12 positive and 12 negative), which were chosen from Hakel and Dunnette's (1970) norms. Items were selected which were either favorable (ratings of 5.00 to 7.00) or unfavorable (ratings of 1.00 to 3.00 on the norms), had no logical inconsistencies, and had relatively high importance. Subjects were instructed that they should treat each informational item as "a statement made by the applicant or an impression formed about the applicant".

For each "applicant," statements were presented two at a time, and after each set of statements a rating scale was presented. The rating scale was a 7-point scale which was

verbally anchored with "Extremely Favorable" (a 7.0 on the scale) and "Extremely Unfavorable" (a 1.0 on the scale). After the last pair of informational items, an overall rating of the applicant was requested, again on the 7-point scale. After completing the overall rating, subjects were asked to recall as many statements as possible. After completing the first applicant, subjects repeated the procedure for the second applicant (the two "applicants" were counterbalanced across groups so that no systematic bias would occur). After completing ratings for both applicants subjects were debriefed and thanked for their participation.

Results

The main dependent variable was the final rating of favorableness for each applicant, which was viewed as representative of the final decision. The ratings across trials were also obtained (within an "applicant") to assess changes in ratings and subsequently, changes affecting decisions about the applicant. Finally, the number of statements recalled were also obtained. The items recalled were obtained to assess individual differences in memory of both positive and negative items, and items presented early in the sequence (the first one-half of the statements) and late in the sequence (the last one-half of the statements). The former analysis of recall data is important in assessing Gray's theory, while the latter analysis is important for assessing Eysenck's theory.

Final ratings were analyzed using a 2 (extraversion) X 2 (sex of subject) X 2 (order) X 2 (trials, or applicant), mixed effects ANOVA with the latter effects being within variables. Since no significant effects were found for sex of subject, $F(1, 24) = 4.09$, $p > .05$, and no other effects interacted with sex, subsequent analyses were collapsed across this variable.

Two results are important for comparing the two theories of introversion-extraversion, a main effect for extraversion-introversion with no interaction which supports Gray's theory, or an interaction which supports Eysenck's position. For overall ratings, the main effect for introversion-extraversion was significant, $F(1, 28) = 4.65$, $p < .04$, and indicates that extraverts rate applicants more favorable ($M = 4.09$) than do introverts ($M = 3.56$), thus providing support for Gray's theory. However, the significant interaction between extraversion, order of presentation (FU - UF vs. UF - FU) and applicant (trials), $F(1, 28) = 154.37$, $p < .0001$, indicates a more complex relationship (see Table 1). Individual comparisons indicate a significant difference between extraverts when receiving an FU as opposed to a UF order (all pairwise comparisons throughout this study were based on comparing critical values, Games, 1971; in this case Tukey's method proved to be most powerful with $t_{.05, 8, 28} = 4.75$) on both the first applicant, $t = 6.15$, $p < .05$, and the second applicant, $t = 7.69$, $p < .05$, with the last items presented having

the most influence (i.e., a recency effect). Introverts also differed significantly in their ratings as a function of order on the second applicant, $t = 6.76$, $p < .05$, and on the first applicant the direction of the effect was in the predicted direction, but the difference failed to reach significance, $t = 3.70$, $p < .05$. Introverts' ratings were more highly influenced by early information, thus exhibiting a primacy effect. Only one other comparison, that between introverts on List 1 and extraverts on List 2 receiving a FU order, failed to support hypotheses derived from Eysenck's theory. No other main effects or interactions were significant in the overall final rating.

Insert Table 1 about here

The second dependent variable, analysis of individual ratings within an "applicant", as opposed to the overall final rating, did not support either theoretical model. Ratings within an applicant were analyzed using a 2(extraversion) X 2(order) X 2(applicant) X 12(informational items) mixed effects ANOVA, with the latter two being within variables. As expected there was an overall main effect for trials, $F(23, 552) = 110.72$, $p < .001$, but neither a main effect for extraversion, $F(1, 24) = 1.44$, $p > .05$, nor an interaction of extraversion by order by trials, $F(23, 552) = 1.11$, $p > .05$, proved significant. The latter was in the direction

predicted by Eysenck's theory.

Analysis of the number of items recalled was performed via two separate ANOVAs. The first analysis tested for recall differences in the number of positive and negative items recalled, using a 2(extraversion) X 2(order) X 2(positive vs. negative) X 2(applicant or/trial) mixed effects ANOVA, with the last two being within factors. Results indicated that there was a tendency to recall more negative ($\underline{M} = 3.83$) than positive ($\underline{M} = 3.03$) items, $\underline{F}(1, 28) = 7.40$, $\underline{p} < .01$. The interaction of extraversion with positive and negative items, $\underline{F}(1, 28) = 4.33$, $\underline{p} < .05$, indicated that while extraverts did not differ on the number of positive and negative items recalled ($\underline{M} = 3.31$ and $\underline{M} = 3.50$, respectively), introverts recalled significantly more negative than positive items, $\underline{t} = 2.83$, $\underline{p} < .05$ ($\underline{M} = 4.16$ and 2.75 , respectively; individual comparisons based on Dunn's method for two comparisons with $\underline{t} \frac{.05/2}{28} = 2.37$). No other main effects or interactions proved significant.

The second analysis of recall data was based on early (first 12 items presented) vs. late (last 12 items presented) information presentation. Results were analyzed using a 2(extraversion) X 2(order, FU - UF vs. UF - FU) X 2(early vs. late presentation) X 2(applicant or trial), mixed effects ANOVA, with the last two being within factors. Results indicated that there were no significant main effects or interactions.

Discussion

~~The results of this investigation seem to be most con-~~
sistent with predictions made from Eysenck's theory. While the main effect for extraversion is significant and appears to support Gray's contention that extraverts are more sensitive to reward, and thereby, positive information, while introverts are more sensitive to punishment, or negative information, the significant interaction makes interpretation of this main effect difficult. The significant interaction of extraversion with trials ("applicant") and order (FU - UF vs. UF - FU) indicates support for Eysenck's more complex hypotheses. Specifically, extraverts' final ratings were more highly influenced by information received late in the "interview", while introverts' final ratings were more highly influenced by information which occurred early. The finding of a significant interaction, thus indicates that the process of decision-making in introverts and extraverts is more accurately explained by Eysenck's theory.

The analysis of the other two dependent variables failed to provide clear support for either of the two theories. Analysis of ratings across applicants did not provide cross-over effects where information passes from positive to negative or vice versa, as Gray would predict. Further, there was no tendency of early ratings elevating later ratings by introverts as Eysenck would predict. The analysis of recall data partially supports Gray's theory. Introverts did recall

more negative information than positive information, but extraverts recalled both positive and negative items with equal frequency. The number of items recalled and the final decision thus seem unrelated. This appears consistent with Risky's (1979) contention "that memories of individual items do not directly mediate impressions" (p. 271). Thus, the overall impression may be formed from a combination of memories of items, but the individual items remembered may not necessarily reflect the final decision.

One experimental artifact which affects information retained is the rate of exposure (e.g., Klatzky, 1975; Loftus & Loftus, 1976), thus recall information from experiment one is difficult to interpret due to the self-paced measure of responding. Differences observed between introverts and extraverts could be due to other factors. Furthermore, as indicated earlier (Risky, 1979; Wesley, 1976), final decisions may be affected by the type of rating employed. To insure generality of the findings both continual ratings (as in experiment one) and global ratings must be employed. To explore these problems a second experiment was designed which controlled rate of presentation and allowed comparisons of the two rating procedures used in impression formation.

Experiment 2

Method

Subjects. Subjects were 32 volunteers from introductory psychology (16 males and 16 females), who participated for

partial fulfillment of class requirements. Subjects were randomly selected from those who fell into the introverted group (scores of 11 or less) or the extraverted group (scores of 16 or more) from a larger sample of students pretested on the EPI.

Apparatus and Materials. Photographic slides were prepared from statements taken from Hakel and Dunnette's (1970) norms. These statements met the same requirements as in Experiment One, and also described a secretarial applicant. In addition to the 48 informational statement slides (2 sets of 24 slides), there were 24 slides with the words "Please rate," and one slide with the words "What is your overall rating of the applicant?"

Slides were projected onto a screen in front of the subject from one of two projectors (Kodak Carousel Projector, Model 850H). On each projector a Lafayette Instruments Tachistoscopic shutter (Model #6210) was mounted. Both the slide projector's advance, shutter initiation, and length of exposure was controlled by a Midwest Scientific Instruments 6800 microprocessor. In addition, reaction time (RT) was measured with the microprocessor's real time clock.

In addition to obtaining reaction time, the microprocessor was used to obtain continual ratings and final ratings. These ratings were made by sliding a lever attached to a 100K ohm potentiometer (Allied Instruments Model #174-274) along a seven-point scale. Scale values ranged from 1.0 to 7.0 and

were verbally anchored with "extremely favorable" (7.0 on the scale) on one end and "extremely unfavorable" (1.0 on the scale) on the other end.

Design. Subjects were blocked on introversion-extraversion and sex. As in experiment one, subjects received either an FU - UF or UF - FU order, counterbalanced to insure minimal order effects due to lists. Further, one-half of the subjects in each order condition received a global rating, while one-half received a continual rating (similar to experiment one). Thus, the overall design was a 2 (introversion vs. extraversion) X 2 (sex) X 2 (favorability order, FU - UF vs. UF - FU) X 2 (type of rating), with the last factor being a within subjects factor.

Procedure. Each subject was run individually. Once the subjects were classified as either an introvert or extravert, they were randomly assigned to an order-type of rating condition. Each subject was then presented an informed consent form. After signing the form the subject was provided a job description.

After reading the job description, each subject was provided a set of instructions. During the instructions, all equipment and its use was fully explained to the subject. After all questions were answered and the subject was familiar with all equipment use, Trial One commenced. Trials differed according to rating condition. In the continual rating condition each trial consisted of the following: (1) an

informational item was flashed on the screen in front of the subjects for 4 seconds; (2) a stimulus "Please Rate" followed 2 seconds later; (3) a rating was then made by the subjects on the sliding scale; (4) the subjects then entered their rating by pushing the button marked "Push Here to Enter Response" and a reaction time was obtained; and (5) a 2 second delay then occurred before the next informational item appeared and the procedure was repeated until all 24 items in a set were presented. In the global condition the procedure was as follows: (1) an informational item was presented for 4 seconds; (2) a delay then occurred which lasted for 4 seconds plus a random time varying from .29 to 3.80 seconds (pilot data indicated that these times would correspond to the minimum and maximum reaction times in the continual rating condition); and (3) the next informational item was presented until all 24 items were presented.

After a set of 24 informational items were presented a slide, "What is your overall rating of the applicant?" was projected onto the screen. This slide was presented 15 seconds after the last trial of a set. Subjects then made their overall rating and entered the response as in the continual rating condition. After the final rating was entered subjects were asked to recall as many statements as possible in a 3 minute period. After the first set was completed the procedure was repeated with a second set of informational items. After completing the second set and obtaining recall

data, each subject was debriefed and all questions were answered.

Results

As in experiment one, the final overall rating of each hypothetical applicant was obtained as a measure of the final decision or the end result of the decision-making process. In addition, several other dependent variables were collected. First, the number of positive and negative items recalled (per applicant) were obtained as a measure of the information retained, and as a check for implications of Gray's theory. Second, the number of early items (first one-half of each applicant) and late items (second one-half of each applicant) recalled were analyzed as a check of information retained and of Eysenck's theory. Two dependent variables were collected only in the continual rating condition. First, the rating of each item was obtained to determine if items were perceived differentially by introverts and extraverts. Finally, the reaction time (or time to enter a rating) was obtained to determine if decision time differed between introverts and extraverts.

The final overall rating was analyzed using a 2 (sex of subject) X 2 (extraversion) X 2 (global vs. continual rating) X 2 (favorability order, FU - UF vs. UF - FU) X 2 (trials or "applicant") mixed design ANOVA, with the last factor being a within factor. Due to the absence of main effects for sex, $F(1, 16) = 1.97, p > .05$, and the absence of any significant

interactions with sex, subsequent analyses were collapsed across this variable.

Predictions derived from Gray's theory would indicate a significant main effect for extraversion-introversion, however no main effect was found, $F(1, 24) < 1.0$. Eysenck's theory would predict a significant interaction of extraversion, order, and trials ("applicants"), which proved to be significant, $F(1, 24) = 117.26$, $p < .001$. Individual comparisons on the means (see Table 2) indicate that all relevant pairwise comparisons (using Tukey's method) support Eysenck's predictions, save one, i.e., the comparison between extraverts on applicant 1 receiving a FU as opposed to an UF order.

Insert Table 2 and Table 3 about here

No main effects were found to be significant for the final rating, however one other significant interaction of interest was found. A significant extraversion by order of applicant by type of rating condition was found, $F(1, 24) = 5.19$, $p < .05$. An individual comparison of the average difference between means in the continual and global conditions indicate that this interaction results because more extreme ratings occur in the global conditions, $t(8) = 3.41$, $p < .05$ (see Table 3). Otherwise results conform to the pattern found in the three way interaction of extraversion, applicant, and order discussed above.

Another dependent variable collected on all subjects, the number of positive and negative items recalled, was obtained by comparing the items recalled to the statements presented. Analysis was performed using a 2(extraversion) X 2(global vs. continual) X 2(favorability order) X 2("applicant") X 2(positive vs. negative) mixed effects ANOVA, with the last two factors being within factors. No main effects or interactions proved to be significant. With the additional control of presentation time of the stimuli found in this experiment, differences found in experiment one disappeared.

The final dependent variable collected on all subjects was the number of early and late items recalled. Analysis was performed using a 2(extraversion) X 2(global vs. continual) X 2(favorability order) X 2("applicants") X 2(early vs. late) mixed design ANOVA with the last two factor being within factors. No main effects or interactions proved to be significant.

The other dependent variables were available only in the continual rating groups. The analysis of both ratings across trials and reaction time across trials were analyzed via a 2(extraversion) X 2(favorability order) X 2("applicant") X 24(trials) mixed effects ANOVA, with the last two factors being within factors. No main effect for extraversion and no interactions with extraversion were found. As expected a significant trials effect was found for both of the dependent variables. For ratings over trials the significant main

effect, $F(46, 552) = 23.62$, $p < .001$ indicated that subjects changed their ratings relative to positive or negative information. The significant trials effect for reaction time, $F(46, 552) = 1.92$, $p < .05$, indicates that the speed of making the rating slows down over trials.

Discussion

The significant interaction of extraversion, order of presentation of positive and negative information, and "applicants" (or trials) on the final rating lends further support to Eysenck's theory of introversion-extraversion. The absence of a main effect on the final rating for extraversion indicates that no support was found for Gray's theory of extraversion-introversion. In general, the results indicate that Eysenck's theory more adequately explains the decision-making process of introverts and extraverts in the present study.

In addition, it was found that recall data ratings of individual items across trials, and reaction time to input ratings had minimal utility in exploring the role of extraversion in decision making. The absence of significant differences in recall may result from the fact that the memory process, per se may not be identical with memory functions in decision-making (see Risky, 1979), thus recall data may be inappropriate for processes explored in this study. The absence of effects for ratings may be due to the fact that ratings of the individual items may reflect only the impression

formed for that item, not the underlying process which results in the final rating, thus yielding similar ratings on an item across individuals and thereby, low variability between different groups. Finally, reaction time or time to enter a decision, suffered from high within subjects variability, and may have had too few subjects per cell to yield stable results.

One interesting finding from this experiment was that the final rating tended to be more extreme when the subjects made only a global rating as opposed to a continual rating. Traditionally, global ratings have resulted in primacy effects (e.g., Springbett, 1958; Risky, 1979), particularly when a delay is imposed between the last item and the final rating. While this held for introverts in the present study, extraverts tended to exhibit a recency effect regardless of the rating condition. Since previous research has largely ignored individual differences, direct comparisons of these results to previous research is difficult. However, these results do have direct implications for the research on training, which stresses recognition of biases in rating (e.g., Schmitt, 1976). Recognition of the differences in decision-making found in this study should help in the design of training programs which more accurately reflect individual biases. Furthermore, the extreme nature of ratings when only global ratings are made lend additional support to the contention that continual ratings reduce bias. Thus, in addition to supporting Eysenck's theoretical model, important implications

for the employment interview were found.

General Discussion

The two experiments taken together indicate general support for Eysenck's theoretical model of introversion-extraversion. The design allowed both a test of Gray's and Eysenck's theory, and a means of exploring questions related to impression formation and decision-making in the employment interview.

The predictions from Eysenck's theory were based on hypothesized memory differences between introverts and extraverts. Specifically, introverts were predicted to exhibit primacy effects due to their better long-term memory; conversely, extraverts were predicted to exhibit recency effects due to better short-term memory. Both of these predictions from Eysenck's model were supported if the final rating is used as an indication of information remembered.

One problem with treating differences as due only to memory strengths is indicated by the absence of predicted results in information recalled. However, results from impression formation research indicates that the items recalled do not reflect the final impression (Riskey, 1979). Instead impressions are viewed as centering around a sequential process in which each new item updates the impression (Anderson & Hubert, 1963; Riskey, 1979).

The results of these two studies suggests that impression formation in introverts and extraverts differs as a

function of memory and a sequential process. Specifically, introverts are seen as more highly aroused, therefore consolidating early information for longer periods, and preventing later information from having as great an impact on the overall decision. Introverts exhibit a primacy effect because of the relative strength of the early information. Extraverts on the other hand, being relatively lower in arousal in the same situation do not consolidate early information as long, thus later information is not blocked by the consolidating process, and has a greater effect on the final decision. Extraverts, therefore exhibit a recency effect. The two studies reported here support this explanation of the decision-making process in introverts and extraverts.

Predicted differences from Gray's theory were based on hypothesized differences in the relative sensitivity of introverts and extraverts to punishment and reward, respectively. The partial support for this position in experiment one was seen to be questionable due to the presence of the significant interaction. The absence of support for predictions based on Gray's theory in experiment two indicates that Gray's theory did not adequately explain the results of these two studies.

One potential reason that Gray's model was not supported by the experiments could be that the assumptions based on the rewarding and punishing nature of information were not met. It has been suggested that for information to take on

rewarding or punishing functions, the information must be seen as relevant to the individual, i.e., the interviewer (Watson & Friend, 1969). If the information was not seen as relevant, then predictions cannot be accurately made from Gray's model. However, pilot data indicated that subjects perceived the relevance of the information to the job in question. Thus, it is assumed that the assumptions required for predictions from Gray's model were met.

One other issue related to the studies involves the training of interviewers to avoid biases. Previous research (Wexley, Sanders, & Yukl, 1973) indicates that contrast effects may be overcome by training that involves behavioral feedback. However, Latham, Wexley, and Purcell (1975) found that a similar training technique did not reduce primacy effects. The findings that these biases are related to underlying differences in personality should allow a more effective training program to be developed. Specifically, training should involve a recognition of potential biases to which an individual might be subject, and a behavioral feedback method to reduce these biases. However, additional research is needed to assess the validity of the approach.

In general, the experiments presented suggest that Eysenck's theoretical model of extraversion is more consistent in explaining individual differences in decision-making in an employment interview than Gray's. Furthermore, the results suggest that additional information may be gained in

the area of employment interview decision-making by considering individual differences and their effects.

Reference Notes

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Table 1
 Mean final rating of two hypothetical applicants
 by introverts and extraverts under different
 orders of presentation (FU = favorable,
 unfavorable, UF = unfavorable,
 favorable) in Experiment 1

	Order	
	FU	UF
Extravert	2.69*	5.50
Introvert	4.63	2.51

*n=8

Table 2

Mean final ratings of two hypothetical applicants
by introverts and extraverts under different
orders of presentation (FU = favorable,
unfavorable, UF = unfavorable,
favorable order) in
Experiment 2

	Order	
	FU	UF
Extravert	2.77*	5.23
Introvert	5.86	2.02

*n=8

Table 3
 Mean final ratings of two hypothetical applicants
 by introverts and extraverts under different
 informational orders (FU = favorable,
 unfavorable order, UF = unfavorable,
 favorable order), and rating
 conditions, global or continual
 in Experiment 2

	Order	
	FU	UF
GLOBAL		
Extravert	2.49*	5.79
Introvert	6.03	1.66
CONTINUAL		
Extravert	2.98	4.44
Introvert	5.93	2.39

*n=4