Effects of expressed and measured value preference on decision speed*

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Decision speed was studied as a function of value preference determined by a subjective and a measured ranking of the six value areas of the Allport-Vernon-Lindzey Study of Values (AVL). Ss were sequentially presented with a list of 180 value-related words and were required to categorize each word into one of the six AVL value areas by pressing one of six decision levers. The latency between each stimulus presentation and the decision response was measured without S's knowledge. Decision speed was significantly influenced by practice and personal value preference. For each method of determining value rank, an inventory (AVL profile) and a subjective (introspective ranking) technique, the relationship between speed and value rank was generally U-shaped (i.e., words representing the most and least preferred value areas were categorized fastest).

The latency between a stimulus presentation and a decision response has recently been shown to be a useful dependent variable when measured without S's knowledge. For example, studying the factors which influence significant fluctuations in two-choice decision speed has added to a descriptive theory of decision-making performance (Geller & Pitz, 1968) and an understanding of sequential information seeking (Pitz & Geller, 1970). In a decision-making situation where Ss are forced to choose between two desired objects, pictures, or words, the time required to indicate a choice is dependent upon overt measures of preference. Specifically, Bergum & Dooley (1969) found a direct relationship between Ss' aesthetic picture preferences and speed of choosing among pairs. With mentally retarded children, Siegel, Williams, & Szabo (1968) observed speed of choosing one of two objects to relate positively to the value difference separating the two alternatives. The present study was designed to determine the influence of personal value preference in a multiple-choice decision-making situation.

In a multiple-choice decision task, Bergum & Lehr (1967) required Ss to evaluate a sequentially presented list of positively or negatively affective words along an interesting-dull dimension by pressing one of five response keys. Ss were faster at making evaluations at the "interesting" end of the response continuum than at the "dull" end.

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However, decision latencies for "dull" evaluations were not significantly different from the latencies for "neutral" decisions. The Ss of the present experiment were required to categorize, rather than to evaluate, stimulus words by pressing one of several response keys. More specifically, Ss responded to a list of stimulus words by categorizing each into one of six value areas, and the effects on category decision speed of Ss' relative interest in each value area was studied. The value preference of each S was determined by two independent techniques, introspective ranking and the Allport-Vernon-Lindzey *A Study of Values* (1951).

SUBJECTS

Introductory psychology students at Virginia Polytechnic Institute and State University (N = 376) were administered the Allport-Vernon-Lindzey Study of Values (AVL) and subsequently asked to rank subjectively according to preference the six value areas of the AVL. Specifically, after all Ss had completed and handed in the AVL, the six value areas of the AVL (i.e., theoretical, economic, aesthetic, social, political, religious) were written on the blackboard at the front of the room; Ss were instructed to rank the value areas from most to least preferred according to their own introspections. Sixty Ss (30 males, 30 females) were selected from the population of 376 on the basis of sex and their scores on the AVL. Specifically, 60 value-profiles were chosen so that 10 profiles (5 males and 5 females) corresponded to each row of the 6 by 6 Latin square derived by letting each AVL value area appear in each of the six possible ordinal positions.

STIMULI

A list of 126 words was constructed with each of the six value areas of the

AVL represented by 21 of the words. The words were selected on the basis of a previous group study in which a class of introductory psychology students (N = 165) categorized each of 840 nouns and adjectives into one of the AVL value areas. In constructing the list, only words which were categorized consistently by at least 80% of the student judges were selected, and an attempt was made to match the relative frequency of word usage between value areas by means of the Lorge L count (Thorndike & Lorge, 1944).¹

The stimulus words were back-projected on a 11 x 19 in. screen by means of a Kodak Carousel 800 slide projector. Three trays of 2 x 2 in. slides were used, Tray 1 containing 11 words from each value area and Trays 2 and 3 containing 10 words from each area. All 126 words were presented in Trays 1 and 2; Tray 3 contained words selected from the prior trays. For each S, the slide order was randomized differently within the trays, but all Ss received the three stimulus trays in the same order.

PROCEDURE

The first six slides in Tray 1, one word from each value area, were presented in the same order to each S and were used to explain the task to S (i.e., practice). The Ss were told that value-related words would be sequentially presented and that their task was to categorize each word following its occurrence by pressing one of the six decision levers, each labeled as one of the AVL value areas. The lever labels were varied between Ss so that each lever represented each value area for the same number of Ss (i.e., a Latin-square design). Following a category decision, the stimulus word was removed from the screen, and one of six feedback lights located above the six levers on S's response panel flashed momentarily to indicate the correct choice. This response feedback was automatically programmed by means of coded slides and photocell-operated relay logic (see Beamon & Geller, 1970, for details). The latencies between each stimulus presentation and a category decision (i.e., decision times) were recorded to the nearest millisecond with a Hunter Model-120A Klockcounter (Series D). Ss were not informed that their decision times were measured.

RESULTS

Only the decision times for correct decisions were considered for the present analysis, since all Ss made less than six errors in categorizing the 180 words. For normalization purposes, all latencies for correct decisions were converted to speeds (decision speed = 10/decision latency).

To study the effects of practice on

Fig. 1. Decision speed as a function of blocks of six trials for Trays 1, 2, and 3.

decision speed, the 180 trials were divided into blocks of 6 (i.e., 10 blocks per tray) and the average decision speed was figured across Ss for each trial block. Fig. 1 depicts the average decision speed for each successive trial block. A marked practice effect is evident for Tray 1, since average speed increased quite consistently with each successive trial block; for Trays 2 and 3, a consistent effect of trial block was not evident. The decision speeds to the repeated stimuli of Tray 3 were markedly faster than the speeds following the initially presented stimuli of Trays 1 and 2. A combined analysis of variance for all slide trays indicated a significant tray effect, $F(2,118) = 196.19$, $p < .01$, a trial block effect, $F(9,531) = 8.25$, $p < .01$, and a Tray by Trial Block interaction, $F(18,1062) = 7.75$, $p < .01$.

To evaluate the effect of Ss' value preference on decision speed, the six areas were ranked twice for each S, from the highest (rank = 1) to the lowest (rank = 6), on the basis of Ss' subjective rankings and their AVL profiles. For each S, the average decision speed for each ranked value area was determined by averaging over the correct decision speeds of each area. The relationship between average speed and value rank (VR), as determined by the two indices, is depicted separately for each slide tray in Fig. 2. For each tray, the

relationship between speed and VR was similar for both methods of determining VR.

An analysis of variance of speed as a function of VR was performed separately on each stimulus tray and for each method of determining VR. For Tray 1, a significant main effect was found for VR when based on AVL scores, $F(5,295) = 3.84$, $p < .01$, and for VR based on subjective judgments, $F(5,295) = 3.27$, $p < .01$. No

significant main effect of VR was found for Tray 2 regardless of the method in which individual ranks were determined ($F_s < 1$). For Tray 3, a significant main effect was found for VR based on subjective rankings, $F(5,295) = 2.55$, $p < .05$, but when based on AVL, VR did not significantly influence decision speed, $F(5,295) = 1.39$, $.25 > p > .10$.

DISCUSSION

The results indicated that the latency between a stimulus presentation and a categorization response was significantly influenced by practice and personal value preference. Independently of value preference, the average decision speed increased directly with trials for Tray 1 decisions; for Trays 2 and 3, the effects of trial blocks did not represent a consistent trend. In fact, the relationship between speed and trial block for Tray 1 typified a negatively accelerated learning curve, while for Trays 2 and 3, speed seemed to fluctuate around an asymptotic performance level. The faster speed level for Tray 3 is understandable, since each stimulus word of this tray had been previously presented for categorization.

For Tray 1 decisions, the relationship between speed and VR was U-shaped; for Trays 2 and 3, a U-shaped trend was only suggested. Thus, words representing the more preferred and less preferred value areas were generally categorized fastest. A post hoc interpretation of these results might be based upon the premise that Ss are more sensitive to words representing their most and least preferred value areas, and, therefore, value words of the extreme preference categories (high and low)

Fig. 2. Decision speed as a function of value ranks based on the Allport-Vernon-Lindzey A Study of Values and Ss' subjective rankings.

represent the least amount of conflict or response uncertainty. The added assumption that the greater response uncertainty for "neutral" words decreases as Ss adapt to the decision task provides an explanation for the flatter function for Trays 2 and 3.

Of those investigators who have found a dependent variable to discriminate reliably between different levels of subjective or measured interest, some have observed a linear relationship while others have observed a U-shaped function. The discrepant findings might obviously be attributed to differences in experimental design (e.g., dissimilar tasks, dependent variables, or preference indicators), but it might be worthwhile to consider incongruous findings as indicators of distinctions between mediating cognitive processes. For example, investigators who have studied the effects of value preference on visual recognition threshold have typically observed a monotonic relationship between duration threshold and VR (e.g., Postman, Bruner, & McGinnies, 1948). On the other hand, Postman & Schneider (1951) found value-related words of the most acceptable and least acceptable value areas to be favored in memory. Specifically, these authors found a U-shaped relationship between VR, as determined by the Allport-Vernon *A Study of Values* (1931), and the number of value words recalled after being tachistoscopically presented for the determination of recognition thresholds. Postman & Schneider (1951) explain these divergent effects of personal values on memory and recognition in terms of variation in degree of stimulus constraint in the perception and recall tasks. That is, a

shift from recognition to recall reduces the stimulus constraint produced by the physical stimulus in the perceptual task. Such a distinction between the perception and memory task does not explain the differential shapes of the observed relationships but does indicate that the perception and recall tasks probably involve different cognitive processes. Since the relationship between VR and decision speed was unlike the relationship typically observed between VR and recognition threshold but was similar to the observed relationship between VR and recall, the mediating cognitions involved in the decision task of the present study are perhaps more similar to the mediating processes of recall than perceptual recognition. Insufficient data forbids a reliable statement of similarities or differences between the thinking processes of these tasks, but at least decision latency has been shown to be a useful dependent variable, sensitive to subtle changes in experimental design which possibly implicate disparate cognitive processes. And, as indicated by others (e.g., Bergum & Dooley, 1969), the speed measure is perhaps minimally contaminated by bias variables such as experimental demand characteristics.

It is noteworthy that the observed relationship between speed and VR was similar for each method of determining VR, an inventory (AVL profile) and a subjective (introspection rank) technique. Other investigators who have studied the relationship between inventoried or measured values and subjective or expressed values have found Ss to have significant awareness of their measured values (e.g., Nickels & Renzaglia, 1958). The results of the present study

support that conclusion.

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NOTE

1. The list of 126 value words will be furnished upon request.