CONFLICT IN CHILDREN RELATED TO THE NUMBER
OF CHOICE ALTERNATIVES

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CONFLICT IN CHILDREN RELATED TO THE NUMBER
OF CHOICE ALTERNATIVES

THESIS

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By

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CHAPTER I

INTRODUCTION

One of the ways to view the process of perpetual behavior is to consider it a series of distinct or indistinct choices that are made in a succession of decision situations. These decision situations will incorporate a certain amount of conflict that may be of such proportion as to create closely related reactions such as vacillation, indecision, irresolution, etc., but, more generally, they are fairly insignificant in terms of stress induction. In support of this point of view, Berlyne (2, p. 31) has stated, "Conflict . . . must accompany virtually every moment of normal waking life in the higher mammals. Nevertheless, there must be more of it on some occasions than on others, and stimulus situations will obviously be conflictful to differing degrees." In a similar expression, Kiesler (12, p. 1) points out that "it is obvious that a decision making situation with more than two alternatives is not unusual and actually occurs very often in everyday life." Thus, the psychological process of choosing among alternatives, and the inherent conflict, is of major importance in the understanding of human behavioral patterns.
This importance has been emphasized among several contemporary theorists (2, 3, 11, 12). According to Siegel:

One might argue . . . that the data of psychology consist importantly of choices made by subjects at stated decision points. . . . Since choice is of such significance for the student of human behavior, choice behavior itself may merit intensive formal analysis - theoretical and experimental work directed toward the understanding and explanation of the act of choice (15, p. 2).

Other important areas which are applicable to conflict in decision making should be pointed out: It has been noted, for instance, that learning psychologists commonly observe choice behavior (15). Additional areas are preference studies, psycho-physical scaling methods, and multiple choice techniques.

Irrespective of this apparent significance, it is surprising to note that rather little work has been done in this area (15). Further, it has been pointed out by Lewis (13), that there have been even fewer studies of this sort using children as subjects. Nevertheless, Berlyne (2) has developed a rather comprehensive theory of conflict in which he formulates specific propositions concerning conflict in choice alternative behavior.

Information theory approaches this area in a circumstantial manner. Generally, in information theory, the method is to study stimuli and responses in terms of their probabilities of occurrence, thereby devising measures indicating the degree of dependence between the two. In decision making situations, the dependent variable is decision time, and one
may vary the number of stimuli (choice alternatives), the number of responses the subject (8) may make to the stimuli, and various combinations of the two. An additional approach is to vary the probabilities of the stimuli presented (8).

On the other hand, Berlyne (2), as pointed out above, makes specific assertions about conflict in making decisions among choice alternatives. Therefore, it is necessary, at this point, to look further at his approach. By way of introduction, Berlyne feels that conflicts between approach tendencies are more difficult to resolve than either conflicts between avoidance tendencies or approach-avoidance conflict tendencies. With this in mind, he describes the various properties needed in a measure of degree of conflict. Specifically: "Degree of conflict must surely increase with (1) the nearness to equality in strength of the competing response tendencies, (2) the absolute strength of the competing response tendencies, and (3) the number of competing response tendencies." (2, p. 32). Therefore, he feels, that it will follow, that conflict increases if the strength of the choice alternatives (competing response tendencies) is equal; the absolute strength of competing choice alternatives affects conflict; conflict increases as the stimuli become more similar.

When Kiesler (11, 12) recently conducted studies concerning conflict in children's decision times, among choice alternatives, he reported some rather interesting findings.
His results showed some previously unpredicted phenomena. Essentially, he found, in two different studies, that as the number of equally attractive choice alternatives increased, conflict decreased. He maintains that his findings are in opposition to Berlyne's (2) theory (specifically, axiom six), which states that, if the choice alternatives are equally attractive, conflict will increase as alternatives are added to the choice situation.

In a second phase of Kiesler's (12) study, he postulated that if part of the choice alternatives are decreased in attractiveness, and part of them remain equal in attractiveness, then conflict will increase. This is in opposition to Berlyne's (2) fifth axiom, which states that conflict is at a maximum when choice alternatives are equally attractive.

In a rebuttal, Berlyne (5) pointed out that in Kiesler's "forced-choice" situations, used to establish mean reaction times for his Ss, his two choice decision time was less than his four choice decision time. He cites this as evidence in support of his findings. Nevertheless, he also states in the same article that "some peculiar factors, which are difficult to identify, evidently came into play when Ss had to choose among ..." Kiesler's alternatives (5, p. 44).

Kiesler (10) maintains that these "peculiar factors" were evidenced in his "socially real" setting and would be evident in "any 'socially real' setting".
Thus, there is an obvious discrepancy in the findings of these two theorists. Barlyne (3, 4, 6, 7) offers a great deal of evidence in support of his theory, while Kiesler (10, 11, 12), on the other hand, offers equally convincing evidence to the contrary.

Purposes of the Study

The foregoing theoretical background gives rise to the purposes of the present study. These purposes, in order of importance, are to attempt to discover if there is a predictable relationship between conflict and an increase in the number of choice alternatives, to specifically determine if this hypothesized relationship exists in a predictable order in children, to endeavor to show that this hypothesized relationship is such that generalization of application to a natural environment is credible, and to attempt to discover if there are sex differences that may influence this relationship.

Related Literature

An early experiment on the relationship between decision time and the number of alternatives was performed by Hicks (9). He had ten lights arranged in a semi-circle with ten corresponding reaction time keys on a platform before the S. S was instructed to press the key corresponding to the light that came on. In each test trial, a different number of alternatives was arranged. It was found that the S's
reaction latencies increased with an increase in the number of choice alternatives. In other experiments of this type, i.e., a separate response for each separate stimulus, this finding has been frequently replicated. The significant point here is that, in studies concerned with the motor type of reaction time, there is a direct increase in the S's time needed to react in relationship to an increase in the number of alternatives. However, this is merely a measure of simple reaction time rather than conflict time, although a minimum amount of conflict may be involved. This type of reaction time refers only to the difficulty in performing a psychomotor task. Conflict time refers to the difficulty in making a decision among multiple alternatives.

In an earlier study, Barker (1) reported a positive relation between equality of attractiveness and the degree of conflict. Ss were presented with choices between pairs of drinks. Various fruit juices and other beverages were chosen because of their similarity of taste. Each S was presented all possible pairs out of a series of seven of these drinks. S's decision time was recorded for each pairing. Since S was presented with all possible pairings, he could determine his ranking of conflict among the seven drinks. He then computed the mean decision times for the varying degrees of conflict. Results showed that there was a greater degree of conflict as the tastes of a pair of drinks approached maximum
similarity. In some instances, $S$ could not perceive a difference in taste between two drinks. Further, it should be noted that perception time was identical for the various pairs (degrees of conflict). Thus, Barker indicated, with assurance, that the greater the degree of conflict, the greater the decision time.

Barker's study certainly has implications for practical application. An analogy may be drawn to a similar situation, in a natural environment, in which a choice is made between two equally attractive alternatives. Such an analogy may be seen when a child attempts to choose a piece of candy from a box of assorted chocolates. Further, consider the conflict involved in choosing a date if a young person must decide between identical twins. Of course, the latter is a much more complex situation, but the implications are obvious.

As mentioned earlier, Berlyne (2, 3, 4, 5, 6, 7) has done extensive work in the area of conflict involved in decision making among choice alternatives. Further discussion and evaluation of his related theory is appropriate at this point. In order to facilitate an understanding of the axioms relative to his theory, some definitions are appropriate:

$R_i = \text{A response}$

$n = \text{Number of responses}$

$C = \text{Degree of conflict}$

$E_i = \text{Strength of a response}$
The axioms, then, are stated as follows:

(1) $C$ is a symmetric function of $E_1 \ldots E_n$ (i.e., the value of $C$ depends on response strength but not which response has strength).

(2) $C$ is a continuous function of $E_1 \ldots E_n$.

(3) $C > 0$.

(4) If $n = 1$, $C = 0$.

(5) If $E_1$ is held constant, $C$ reaches an absolute maximum when $E_1 = E_2 = \ldots = E_n$.

(6) If $E_1 = E_2 = \ldots = E_n$ and $E_{n+1}$ with strength $E_{n+1}$ is added to the set, then $C$ increases.

(7) If every $E_i$ is multiplied by a constant $k > 1$, $C$ will increase. (2, pp. 34-35).

Thus, strength of the response ($E_i$) refers to the attractiveness of a particular alternative. Axiom six states that if the alternatives are equally attractive, conflict will increase if alternatives are added to the choice. This definite prediction of an increase in conflict with an increase in the number of alternatives is of specific interest.

In a related experiment, Berlyne (3) had Ss manipulate switches in response to one, two, or four lights. There were two types of choices involved: those described as "free" choices and those described as "forced" choices. The forced choices were measures of motor reaction time. One stimulus was presented at a time, and S had to react to it as quickly as possible. For each type of choice, there were two conditions: a two alternative condition and a four alternative condition. Each S was tested in all conditions.
For the four alternative condition there were four lights in a row before S; the two end lights were green and the two middle ones were red. S had two switches, each of which could be moved in two directions. In the forced choice trials, only one stimulus was lighted and S reacted accordingly. The switch on S's left was used to react to the two lights at his left; he pushed the switch forward if a green light came on and pulled it backward if a red light came on. The right switch controlled the two lights on the right in a similar manner. In a free choice trial, all lights came on. S could react in any way he pleased. According to Berlyne, the free choice trials were the conflict trials, and the forced choice trials were reaction time trials.

The two alternative condition was similar to the four alternative condition, except that only the two left or the two right lights were used. In the forced choice trials, only one light was presented per trial, and in the free choice trials, both lights were presented simultaneously. Results showed that there was an increase in decision time of free choice trials over forced choice. Of main importance is that for the free choice trials, the decision time for four alternatives was greater than that for two alternatives. From evidence such as this, Berlyne concluded that the conflict was greater in the four alternative condition.

In a review of this same study, Kiesler (12) - after describing free choice reaction time divided by forced
choice reaction time as a more appropriate measure of conflict time - pointed out that the per cent increase in time, for the two conditions (two choice, four choice), was practically identical. The respective percentages were 10.1 per cent and 10.4 per cent (12, p. 8). Thus, using Kiesler's measure, the conflict time for the two conditions appears to be about equal.

Relevant to the above, an unpublished study by Glixman, reported by Kiesler (12), also differentiated between conflict and no-conflict tasks. Glixman theorized that an increase in the number of alternatives in a conflict situation should produce less strength for each alternative and consequently the decision time should be shorter. However, in a no-conflict situation, the decision time should be longer with an increase in the number of alternatives. Glixman used children as Ss and set up a situation where the child was faced with a number of strings hanging from a board. The child's task was to pull one of the strings, which may or may not have been attached to a toy. In the no-conflict condition, every string was attached to a toy which the child could play with after pulling it within sight. In the conflict condition, only one of the strings led to a toy and the child has to decide which of the strings he would pull. If he pulled the correct one, he got the toy; if he pulled the wrong one, he got nothing. There were three conditions varying the number of alternatives.
The most important information to be derived from this study is that using Kiesler's (12) above described measure of conflict, there was a significant increase in conflict time with a decrease in the number of choice alternatives.

In his study, Kiesler (12) reported results similar to the above, using seventy second grade students. In two and four alternative conditions, he used thirty candy bars as stimuli. After having Ss arrange the candy bars in a preference hierarchy - ten most preferred, ten next most preferred, and ten least preferred - he had them choose four bars, reported as equally attractive, from the ten in the middle range. Using a rather elaborate apparatus, he had half of the Ss choose between two candy bars and the other half choose among four candy bars. Prior to this, he measured each S's motor reaction time by having them designate different colored squares. After recording all of the latencies involved, an analysis of his data indicated that there was more conflict involved in making a choice from two alternatives than was involved in making a choice among four alternatives. He established two measures of the degree of conflict, both of which showed significant results. One of the methods has been previously described. The other method is described as follows: Motor reaction time is subtracted from choice time for each S. The residual is considered, by Kiesler (12), to be an effective measure of conflict time. He presented substantial evidence in support of these measures.
Evidence on the question of sex differences in relation to conflict is vague. For instance, in a study by Wallenhorst (16), while different mean reaction times were noted between sexes, they were not statistically significant. It was also noted, however, that male reaction times were markedly more variable than those of females.

In another study, Milton (14) stated, "Earlier studies have shown that there is a consistent sex difference in problem solving, and that this may be particularly accounted for in terms of the sex role identification of the Ss solving the problem." While the sex role identification is probably not a factor in the present study, the former portion of this statement is significant to it. If there are sex differences in the present study, they can probably be explained more readily in terms of the differential processes of maturation.

Hypotheses

In view of the discrepancy in the area of conflict in the decision process, the following hypotheses were offered and systematically examined:

1. In a situation involving two, four, and six choice alternatives, there will be an increase in the amount of conflict as the number of choice alternatives decreases.
2. There will be a measurable sex difference in the degree of conflict as related to the decision process.
CHAPTER BIBLIOGRAPHY


CHAPTER II

METHOD

Subjects

Out of a total population of 130, 108 children were selected randomly by drawing their names from a box, according to the established rules for random selection. The total population represented three private schools in Dallas. Using age at last birthday, forty-eight of the children were five years old, and sixty of them were six years old. There was an equally proportionate number of boys and girls in each group. Each group was also equated as to age. The five year olds were enrolled in kindergarten, and the six year olds were enrolled in first grade. All were judged able to perform the tasks through teachers' reports. They were all making at least average progress in their school work. Each of the three sample population groups consisted of thirty-six children.

Apparatus

The apparatus used for the experiment may be described as follows:

1. A screen - measuring twenty inches in width and twelve inches from top to bottom, with a hand hole in the center, one inch from the top - was constructed out of
corrugated paper board. This screen was used to conceal the stimuli.

2. The stimuli, for measurements of motor reaction time and decision time, were placed one-half inch apart, and centered, on two stimulus-position boards that measured five inches by fourteen and one-half inches. The stimulus position boards were about five inches from the edge of the table.

3. Motor reaction time (RT) stimuli were six poker chips of the three different primary colors and the three different secondary colors.

4. The decision time (DT) stimuli were milk chocolate covered candy squares with a nouget, marshmallow center. These stimuli all looked essentially the same.

5. A stop watch, with one-tenth second graduations was used to record the two different latencies.

Design

The rationale behind the present research design was derived from the previously reported research. In review, a reasonable and convenient measure of conflict (CT) was described by Kiesler (5, 6) as choice time minus reaction time, i. e., DT - RT = CT. It was felt that he presented sufficient evidence to warrant its use. This was particularly important, because the two different positions on conflict mentioned earlier described two different approaches to an extension of RT as a measure of conflict. From Berlyne's (1)
point of view, total DT is measured as an indicator of conflict, while Kiesler (6) says that CT is considered to be that part of DT which is over and above RT. It has been shown that the two different methods reveal opposite results. The latter method is felt to be a more logical and accurate measure of CT.

Kiesler's (4, 5) purpose, in using different kinds of candy bars as choice alternatives, was to establish, as nearly as possible, his "socially real" setting. This is an admirable approach. Many research data are restricted to the laboratory, and are too specific for generalization to a natural environmental setting. A comment made by Harlow (2) sums up the situation rather well.

One shortcoming of the comparative studies has been the simplicity of the problems studied. Intelligence has been measured by the performances of albino rats in running mazes; drive, by the aimless wanderings of rats in revolving cages; emotions, by the reflex responses of decorticate kittens; and abnormal phenomena, by the cataleptic stupors of severely puffed-at rats and shocked pigs. (2, p. 105).

More recently, this laboratory restriction was commented on by Hilgard and Bower (3, p. 130) in a discussion of B. F. Skinner's approach to the study of learning.

While Kiesler's (5, 6) approach to this problem is more "natural" than the usual key pressing to flashing lights, there is a basic flaw in his method. While he attempted to equalize his candy bars, in terms of attractiveness, they still remained different candy bars, with differently designed and colored wrappers.
In an effort to more effectively equalize the stimuli in the present study, a method was arrived at which should equalize the stimuli and still maintain the natural environmental aspects. Testing was carried out in an actual, unoccupied schoolroom. Stimuli for the procedure were chocolate candies such as are found in boxes of assorted chocolates. It should be emphasized that while all candies were essentially the same, subjects were told that they were different, with emphasis on the quality of difference, thus creating a task involving conflict in choosing, rather than a reaction time task of simply taking.

All Ss were randomly assigned to the three different conditions (groups II, IV, and VI — with the roman numerals designating the number of alternatives for the respective groups). The first $S$ was assigned to group II, the second to group IV, and so on until all groups had equal numbers of thirty-six. The three groups were proportionately equated as to age and equated as to sex, i.e., each group had twenty-six-year-olds and sixteen five-year-olds, eighteen boys and eighteen girls.

The RT and DT stimuli were presented in sets of two, four, or six alternatives, according to the appropriate group. For group VI, all $S$s had a choice of the six positions. For group IV, however, half of the stimuli were placed in the four extreme positions, while the other half were placed in the four positions nearest the center. For group II, there were
five different stimuli placement positions, assigned individually, in a sequence across the board, for each S. This procedure should have randomized, across Ss, any position preferences.

Procedure

About five minutes were spent with each S. Ss were called into the testing room one at a time and seated at a low table facing E. As each S entered the room, he was asked to sit in the chair and place his hands in his lap. The RT stimuli were on the table, behind the screen, about six inches in front of S.

Ss were expected to respond according to a set of pre-arranged instructions. The instructions for each group were identical except where they referred to the number of stimuli or choice alternatives (see Appendix). After an introductory statement by E, in which S was informed that he would be allowed to "choose some candy" to eat, each S was asked to identify, respectively, the red, blue, and yellow poker chips, referred to as "circles" to Ss. In group II, for the first RT trial, the red circle was presented simultaneously with the blue one. Then the yellow circle was substituted for the red circle for the next two RT trials. For group IV, the red, blue, yellow, and green circles were used. All six of the circles were used for group VI. After each RT trial, E alternated positions of the next set of stimuli, so that S could
not "fix" on any particular color. In other words, for the RT trials, S needed only to scan the stimuli and identify the color. Therefore, very little conflict, if any, was involved in these RT trials.

After recording the RT latencies, the appropriate number of candy pieces were substituted for the circles, on the stimulus position board, behind the screen. Each S was told that he could now choose his candy for participating in the experiment. He was informed of the number of candy pieces behind the screen; S indicated that when he raised the screen this time, S was to decide which candy piece he wanted to eat and take it. The word "decide" was emphasized in the instructions so that S would not feel that he must take the first one he saw. Further, while all candy pieces were the same, and looked the same, S was told that each one was different, inside. For these DT trials, latency was measured from the time E raised the screen to such time that S touched one of the candy pieces, indicating his choice. He was then told he could eat his candy, and the next S was called. This procedure was followed until all Ss were tested.

The two research hypotheses stated in Chapter I were statistically examined as null hypotheses using a complex analysis of variance technique. For each S, the three RT trials were averaged to establish a base RT. Then this average was subtracted from DT to provide a measure of CT. All measures
were recorded to the nearest half-tenth of a second, and the .05 level of significance was established as the basis for rejection of the null hypotheses.
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CHAPTER III

RESULTS AND DISCUSSION

Results

The data were gathered according to the procedures outlined in Chapter II, and subjected to an analysis of variance in a 2x3 design. A significance level of .05 had previously been established as the criterion for rejection of the null hypotheses. The three groups were analyzed in terms of the three different numbers of choice alternatives, and in terms of sex differences. The F-ratio indicated a significant difference among the means of the three different conditions of choice alternatives. The F-ratios, for sex differences, and the interaction of the two independent variables, were non-significant. Table I shows the means of these variables.

TABLE I

FACTORIAL DESIGN FOR ANALYSIS OF VARIANCE
OF MEAN DIFFERENCES OF SEX AND NUMBER
OF ALTERNATIVES RELATED TO CONFLICT

<table>
<thead>
<tr>
<th>Variable</th>
<th>2 Altern. (II)</th>
<th>4 Altern. (IV)</th>
<th>6 Altern. (VI)</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Boys</td>
<td>1.854</td>
<td>1.258</td>
<td>0.73</td>
<td>1.281</td>
</tr>
<tr>
<td>Girls</td>
<td>2.026</td>
<td>1.073</td>
<td>1.146</td>
<td>1.415</td>
</tr>
<tr>
<td>Mean</td>
<td>1.94</td>
<td>1.165</td>
<td>1.876</td>
<td>...</td>
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</tbody>
</table>

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For the boys, it can be seen that there is a consistent increase in CT as the number of alternatives decreases. For the girls, while CT was at a maximum for two alternatives, there was an inverse relationship between the four and six alternative conditions. However, the difference of .073 is so slight, they are essentially equal. Regardless of the variation of all the scores, however, there was only a negligible difference of .134 between the sexes which was not statistically significant. This implication was substantiated by the analysis of variance as can be seen in Table II.

**TABLE II**

ANALYSIS OF VARIANCE OF THE RELATIONSHIP OF CONFLICT TO SEX AND NUMBER OF CHOICE ALTERNATIVES

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Variance Estimate</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Alternatives</td>
<td>19.8649</td>
<td>2</td>
<td>9.9324</td>
<td>6.5513</td>
<td>.01</td>
</tr>
<tr>
<td>Sex Difference</td>
<td>.4853</td>
<td>1</td>
<td>.4853</td>
<td>.3201</td>
<td>NS</td>
</tr>
<tr>
<td>Interaction</td>
<td>1.6425</td>
<td>2</td>
<td>.821</td>
<td>5.415</td>
<td>NS</td>
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<tr>
<td>Within</td>
<td>154.6407</td>
<td>102</td>
<td>1.516</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>176.6332</td>
<td>107</td>
<td></td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Table I also shows an increase in the predicted direction for the total means in the three alternative conditions.
Thus, referring to Table II, again, it can be seen that there is a significance in this relationship ($P < .01$).

This significance is seen more clearly in Table III, which illustrates the $t$-ratios obtained for comparison between the different pairs of choice alternative groups. A comparison between groups II and IV ($t = 2.554$, $P < .02$), and II and VI ($t = 3.452$, $P < .01$), reveals a significant increase in $O1$, in group II over both groups IV and VI. However, it is interesting to note that there was not a significant difference in $O1$ between groups IV and VI. ($t = .859$).

While these results also support Kiesler's (3, 4) findings, there was not a completely monotonic relationship, as predicted, for this study. Perhaps a logical and systematic examination of all the facts will serve to enlighten further.

Discussion

As has been mentioned previously, the principal area of interest of this study was the relationship between degree of
conflict (CT), and the number of choice alternatives. It was predicted in the first hypothesis, that an inverse relationship would be found to exist between the two variables, i.e., there would be a decrease in conflict as more alternatives were added to the number of choices. Implicit in this idea is that CT would be at a maximum with the fewest number (i.e., two) of alternatives. The results, discussed above, revealed that this was only partly true. Although, CT reached a maximum (for the three conditions) with two alternatives, and the inverse relationship was apparent, an interesting relationship was observed that had not been previously predicted in this study or in previous ones, e.g., Kiesler (3, 4), and Berlyne (1). This relationship, as shown in Table III, was discovered to exist between the four and six alternative conditions. Essentially there was no significant difference between the two conditions, thus it is assumed that conflict was about the same for the two situations.

In search for a possible explanation of this phenomenon, Berlyne (1) provides no enlightenment; his theory predicts a simple, monotonic relationship between increase in conflict and number of alternatives. Kiesler (4), on the other hand, began an explanation in suggesting that as the number of equally attractive alternatives increases, the task may require a greater expenditure of psychological effort, from S's point of view, than the observed consequences would seem to warrant.
Conversely, the effort required for two alternatives would be more reasonable in terms of consequences to $E$. Therefore he would spend more time comparing the two. A similar suggestion is made by Siegel (8, p. 43) in a discussion of the utility of a correct choice. However, Kiesler and Siegel were not actually attempting to explain the above mentioned phenomenon, and thus their explanations are not sufficiently encompassing.

Therefore, turning to Glixman (2), a more closely related explanation may be developed. As mentioned previously, he theorized that an increase in the number of equally attractive alternatives would produce less strength for each alternative. Expanding, somewhat, on this idea, it would appear to follow that this relative strength could not, realistically, continue to decrease interminably. Thus, logically, a constant level would be reached as alternatives were continually added to the decision situation. This relationship is tenable in consideration of the evidence resulting from the present study. Thus a predictable relationship may be derived from this evidence; conflict will decrease, as more alternatives are added to the situation, up to a certain level, at which a constant minimum of conflict will be maintained.

The second hypothesis — that there would be a measurable sex difference in the decision conflict herein described — was not confirmed. While some evidence obtained from previous research is consistent with the results of the present study, i.e., Lewis (5) found no sex differences in a reaction time
study of fourth grade children, Milton (6) stated that he had found evidence of sex differences in problem solving. Another investigator, Wallenhorst (9), found no significant sex differences in a study of reaction time and choice responses, but reported that "RT's of males were markedly more variable than those of females."

Thus, it was necessary to turn to another area, in hopes of explaining the non-significance of the present results on sex differences in conflict. This area is maturation, or the physical and psychological state of the organism that assumes a state of readiness to develop. Rush explains this process as one which develops "from the whole to the part, from the random to the orderly, and from the general to the specific." (7, p. 83). In other words, at first, children are generally alike, but as they grow, and become older, they "branch off" in terms of individual differences.

This process, then, may be applied to sex differences in a specific manner. If there are sex differences in the relationship of conflict and decision making, they are not apparent at these early ages of five and six, although they may become evident at a later state of development.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

SUMMARY

Disagreements in the literature provided the incentive for the present investigation of the degree of conflict in the decision process and its relationship to the number of choice alternatives, and subsequent sex differences.

Subjects were five and six year old children from three private schools in Dallas. They were asked to identify three different colored circles to establish an average base reaction time. Then - to measure the time it took them to make a decision - they were told they could choose a piece of candy for their efforts. Chocolate candy squares, that were all alike, were used as decision time stimuli. However, subjects were told that the candy pieces were all "different inside." This decision time, minus reaction time, was used as a measure of conflict time.

The two hypotheses relating to the present study were stated as follows: 1) In a situation involving two, four, and six choice alternatives, there will be an increase in the amount of conflict as the number of choice alternatives decreases. 2) There will be a measurable sex difference in the degree of conflict as related to the decision process.
These two relationships were examined as null hypotheses in a complex analysis of variance design. A significance level for rejection of the null hypotheses was set at .05.

In regard to the first hypothesis, more conflict was found to exist in choosing between two alternatives than among four or six alternatives. However, a $t$-test for significance between the means of the conditions showed that there was no significant difference between the four and six alternative conditions.

In reference to the second hypothesis, no significant difference was found to exist between the sexes in the age group studied. This lack of relationship was explained in terms of maturation.

The results were discussed in their relation to previous research in the area, and additional comments were made regarding the previously undisclosed finding that there was no significant difference in amount of conflict between four and six alternative conditions. Specifically, the suggestion was offered that a constant level of conflict was reached at a specific point when adding choice alternatives to the decision situation.
APPENDIX

INSTRUCTIONS FOR TESTING

Group II

Hello, ________, my name is Mr. Burleson. I'm going to ask you to do something for me, then I'm going to let you choose some candy which you can keep. Okay? (Answer) Fine!

First, I want you to look at some circles. There are two of them, and they are two different colors. They are both behind this box.

Now as soon as I raise the box, you put your finger on the red circle, okay? (Answer, followed by trials) Good, now put your hand back in your lap.

Now this time, as soon as I raise the box, put your finger on the yellow circle. (Trial) Good!

That was fine! Now I'm going to let you choose some candy which you can keep. There will be two pieces of candy behind the box. They will both look alike, but they are different inside, and you may have either one. So, this time when I raise the box, you decide, and take the piece of candy that you want. (Trial)

Okay, that's all. Thank you very much!
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