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ABSTRACT

The relationship between color cues, figure form, and size discrimination was investigated. Subjects were 28 kindergarten students selected at random from a lower socioeconomic elementary school and 28 grade-3 students from the same school. From a higher socioeconomic area school, 28 grade-3 students were selected. In addition, 12 slow readers in grades 4, 5, and 6 were matched with 12 normal readers from a different school. Cards were presented representing (1) a color, form, size discrimination, (2) a color-form distinction, and (3) color against size. Significant differences (.05) were obtained between kindergarten and grade-3 children on perceptual discrimination tasks. Kindergarten children tended to choose color as a basis for similarity over form or size. Also, results indicated a preference of form over size and direction over nondirection. A hierarchy of cue difficulty or a hierarchy of learning was suggested. Normal and slow readers did not differ on the perceptual discrimination tasks. Tables and references are included. (WB)

# PERCEPTUAL STIMULUS HIARCHY OF KINDERGARTEN, THIRD GRADE AND SLOW READERS

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The perceptuel style of e student who is slow in learning to read has been of interest to meny investigetors such as Koppitz (1963), Bender (1938), end Febian (1945). The methods of studying the perceptuel development of these students hes veried from esking the student to reproduce line drewings of various figures (Bender, 1938) to asking the student to indicate by pointing, which forms are like a comparison figure using a multiple choice formet (French, 1964).

Trabesso (1968) investigeted the espects of a visually presented stimulus that a child attends to naturelly. It is possible, for instence, that certein stimuli such as color, if learned as e besic tool in reading letters of the alphabet, could influence e child throughout his eerly years of elementery reeding experiences. He mey never learn the distinction of forms or direction of letters end this could retard his progress in reeding. If e child distinguishes "ts" from "fs" beceuse "ts" are purple, he has only learned

a lesser association according to Trabasso (1968).

If responding to colors of figures instead of to forms of figures is a basic response in unlearned readers, kindergarten children having little or no reading experience should choose colors as a basis for similarity over forms or sizes of figures more than a group of third graders who are fairly independent readers. Trabasso (1968) notes that the more cues there are in a learning situation, the more difficult it is to "weed out" the important cues. Slow readers may therefore fixate themselves to a basic cue such as color and never move on to form or size discrimination. If this hypothesis is correct slow readers referred by the school psychologist should choose color as a basis for similarity over form or size more than normal readers.

## Method

Subjects: The Ss were a) 28 kindergarten students selected at random from a lower socio-economic area (Sunset View Elementary) and a group of 28 third grade students from the same school; b) 28 kindergarten students from a higher socio-economic area (Grandview Elementary) and a group of 28 third grade students from the same school; and c) 12 slow readers from a school psychologist in the fourth, fifth, and sixth grades matched on sex, class, age, and I.Q. to 12 normal readers from a different school.

Apparatus: The first card represents a color, form, size discrimination. The second card of each set represents a color-form distinction and the third card shows color against size.

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Insert Figure 1 about here

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The choice was checked on a Stimulus Preference Hierarchy Score Sheet.

Design: The 28 members of each kindergarten class were compared to 28 members of each third grade class in both schools to test the foregoing hypotheses and to check for any socio-economic differences that could influence the results. The 12 referral readers were then paired with 12 normal readers in a matched group design.

Procedure: Each S was asked to look at the stimulus card with three figures on it and to select the two which he thought looked most alike to him. The score was recorded on the score sheet giving a value of one in the column indicating his choice.

## Results and Discussion

Table 1 shows the means and significance tests between groups for the three discrimination tests.

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Insert Table 1 about here

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The results lend clear support to the hypothesis that kindergarten children tend to choose color as a basis for similarity over form and size when compared to third grade children. This in turn suggests that color is a basic response which readually is replaced or takes a less important role as the child learns other discriminations. Reading problems may then occur if a child becomes fixated to the color stimulus and fails to learn the more important discriminations of form and size. The results however do not support this proposition as the slow readers along with normal readers consistently chose both form and size over color. Evidently factors other than perceptual discrimination may retard a child's reading progress. Emotional adjustment may be a variable of some importance. This factor was however not controlled for in this study. In order to investigate whether there were perceptual differences between our experimental groups on either size-form or direction-non-direction, the procedure was repeated for the cards in Figure 2.

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Insert Figure 2 about here
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Table 2 shows the means and significence tests for the three groups.

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Insert Table 2 about here
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The results show a preference for form over size in the higher socio-economic school (Grandview); the direction of differences was the same for Sunset. Third grade children in both schools consistently picked directional over non-directional cues suggesting a hierchy of discrimination. Some perceptual stimuli is probably more difficult to learn or is learned in a hierchial sequence in school. Again however no differences were obtained between normal and slow readers pointing to non-perceptual factors as basis for reading retardation for this sample.

## Summary

Significant differences were obtained between kindergarten and third grade children on perceptual discrimination tasks suggesting a hierchy of cue difficulty or a hierchy of learning. Normal and slow readers did not differ on the perceptual discrimination tasks.

## References

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Trabasso, T. Pay Attention, Psychology Today, Vol. 2, No. 5, October, 1968.

Table 1
Means and t values

| | Sunset View Elementary | | | Grandview Elementary | | | Normal Readers | Slow Readers | |
|---|---|---|---|---|---|---|---|---|---|
| | Means | | t | Means | | t | Means | Means | t |
| | K | 2 | | K | 2 | | | | |
| Color | 2.04 | .18 | *3.22 | 1.25 | .29 | 1.90 | .08 | .17 | 1.00 |
| Form | 6.54 | 8.54 | *3.14 | 7.14 | 8.71 | *2.77 | 8.83 | 8.83 | 0.00 |
| Size | .29 | .29 | 0.00 | .64 | 0.00 | 1.92 | .08 | 0.00 | 1.00 |
| Color | 2.21 | .07 | *3.23 | 1.54 | .11 | *2.49 | .83 | .25 | 1.48 |
| Form | 7.68 | 9.89 | *3.33 | 8.43 | 9.89 | *2.47 | 9.92 | 9.75 | 1.48 |
| Color | 5.82 | 2.75 | *3.63 | 5.39 | 2.75 | *3.33 | .58 | .58 | 1.36 |
| Size | 3.75 | 7.00 | *3.93 | 4.21 | 7.14 | *3.63 | 9.33 | 9.42 | 1.13 |

*p .05

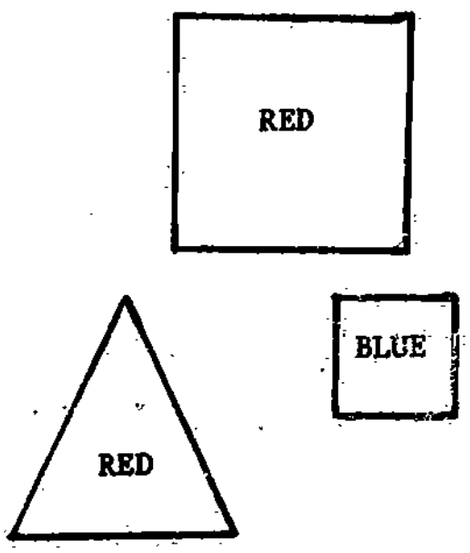
Table 2
Means and t values

| | Sunset View Elementary | | | Grandview Elementary | | | Normal Readers | Slow Readers | |
|---|---|---|---|---|---|---|---|---|---|
| | Means | | t | Means | | t | Means | Means | t |
| | K | 3 | | K | 3 | | | | |
| Size | 1.68 | 1.07 | 1.93 | 1.71 | .43 | *2.60 | 1.92 | 3.17 | .25 |
| Form | 7.79 | 8.68 | 1.43 | 8.21 | 9.36 | *2.96 | 7.92 | 6.83 | 0.00 |
| Direction | 5.71 | 7.96 | *4.13 | 5.61 | 8.75 | *6.63 | 8.58 | 8.75 | .31 |
| Non-Direction | 4.29 | 2.04 | *4.13 | 4.39 | 1.25 | *6.63 | 1.42 | 1.25 | .31 |

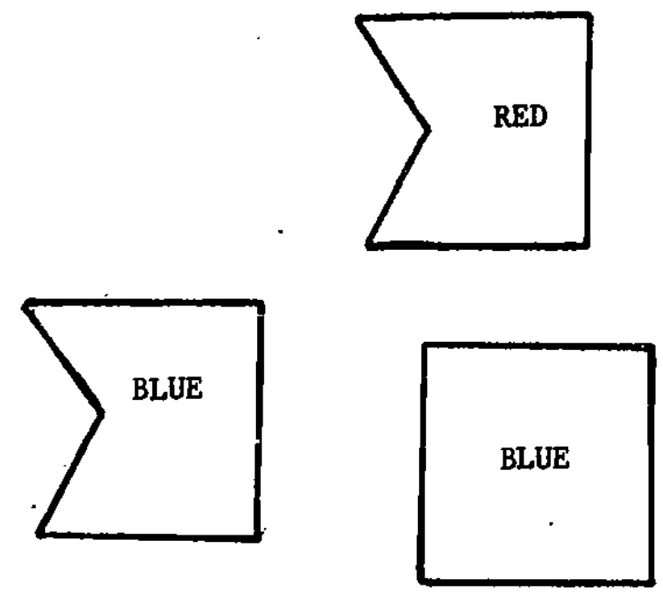
*p .05

Figure 1

1st Card
Color-Form-Size
Discrimination




2nd Card
Color-Form
Discrimination




3rd Card
Color-Size
Discrimination

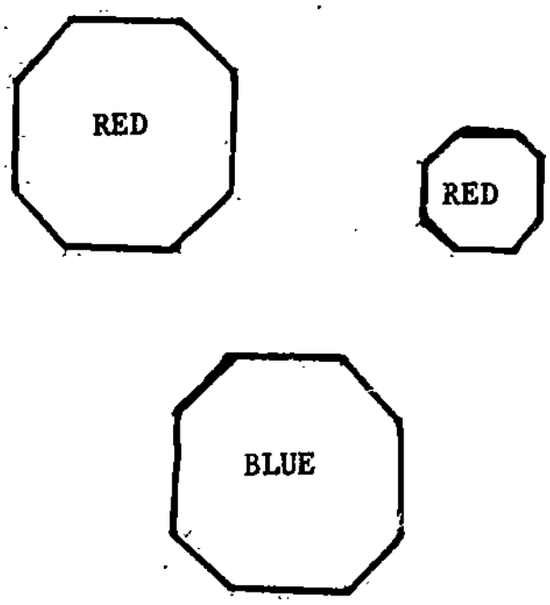
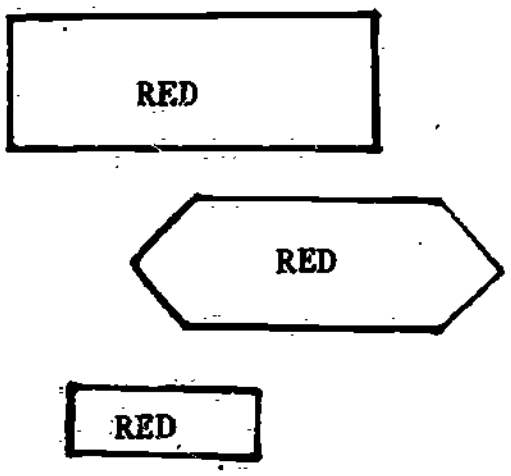


Figure 2

1st Card
Size-Form
Discrimination




2nd Card
Direction vs. Non-Direction
All-Red