ABSTRACT
              This study investigated whether the number of oral
reading miscues differs for reflective and impulsive children,
whether the proportion of miscues that are semantically appropriate,
syntactically appropriate, or graphically similar differ for the two
groups, and whether the two groups differ in their self-correction
behavior as it relates to these three cue sources. The subjects were
79 children in four first grade classes. The Matching Familiar
Figures Test was administered and scored by determining the average
time to the first selection of a response and the total num'·er of
errors. Each child whose average response time was above the group
median and whose number of errors was below the group median was
classified as reflective. Each child whose average response time was
below the group median and whose number of errors was above the group
median was termed impulsive. The results indicated that the
reflective children made fewer miscues that differed from the text
and fewer miscues of the most numerous category, word recognition.
The reflective children self-corrected a greater proportion of their
word-substitution miscues, specifically when their miscues were
semantically inappropriate to the text and when they were
syntactically inappropriate to the following portion of the sentence.
(WR)

AN ANALYSIS OF ORAL READING BEHAVIOR
OF REFLECTIVE AND IMPULSIVE BEGINNING READERS

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Examples of oral reading miscues:

Johnny was happy with his birthday (present) gift.
Jchnny was happy with his birthday (goat) gift.
Johnny was happy with his (brother) birthday gift.

Categories of miscues:

1. <u>Word substitution</u> -- The child substitutes a different word in place of a text word.

2. <u>Phrase substitution</u> -- Either the child's substitution or the text includes more than one word.

3. <u>Nonsense substitution</u> -- The child substitutes a nonsense word or part of a word is substituted in place of a text word.

4. <u>Habitual substitution</u> -- The child repeats a substitution he has previously made when he encounters the same word again in the text.

5. <u>Insertion</u> -- One or more additional words are inserted between two words.

6. <u>Omission</u> -- One or more of the text words is omitted.

7. <u>Unknown word</u> -- The child omits a word and says that he does not know it.

8. <u>Repetition</u> -- Either a word in the printed text or a word substitution miscue is repeated by the child.

9. <u>Regression</u> -- The child regresses to the beginning of a phrase or sentence and rereads it.

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Children appear to have different cognitive tempos which influence their approach to learning tasks and which have implications for a teacher's choice of instructional methods. One procedure for classifying children's cognitive tempos employs the Matching Familiar Figures Test (Kagan, Rosman, Day, & Phillips, 1964.) There are twelve items in this test. Each item includes a line drawing of a familiar object as a standard and six response choices, one of which is exactly like the standard and the remaining five very similar to it. If the child makes his first selection quickly when attempting to choose the matching response and also if he makes several incorrect selections before he determines the correct response he is classified as impulsive. If he deliberates longer before making his first selection and if he makes fewer incorrect selections he is classified as reflective.

One of the abilities which may be influenced by a child's cognitive tempo is his oral reading ability. Kagan (1965) has investigated the relationships between word recognition abilities in oral reading and tendencies toward reflection in second-grade children. Each child read four paragraphs aloud to an examiner who recorded every error and omission that was made by the child as he read orally. Kagan reported, "In general, children classified as impulsive, in contrast to reflective, in the first grade had the highest reading error scores at the end of second grade" (1965, p. 622). Kagan studied several categories of oral reading errors, some categories reflecting the

graphic characteristics of the printed words in comparison to the erroneous
responses, and other reflecting the semantic similarity of the printed words
and the errors. The error categories were combined in the analyses in such
a way that it is not possible to determine the relative degree of graphic
and semantic similarity of the erroneous responses to the printed words.
Neither did the analyses reflect the relative incidence of self-correction in
the different categories of errors. In effect, then, Kagan's study of oral
reading errors was quantitative rather than qualitative.

Recently a method of analyzing the qualitative aspects of oral reading
errors has been developed. (K. S. Goodman, 1969) In an article contrasting
quantitative and qualitative analysis, Yetta Goodman explained:

> Reader's miscues must be <u>evaluated</u> based on the degree to which
> the miscue disrupts the meaning of the written material. Once
> the miscue has been produced by the reader, it is then important
> to assess the effectiveness of the strategies he uses when
> meaning is disrupted. This qualitative analysis of miscues can
> enable a teacher to help a reader select appropriate written
> material. It also provides specific information regarding a
> reader's strengths and weaknesses which can be used to plan a
> personalized reading program. (1972, p. 32)

Fluent oral reading depends on the reader's ability to blend information
from three cue sources: graphic, syntactic, and semantic, in order to make
rapid responses to printed words. By means of a qualitative analysis of oral
reading errors, or miscues, it is possible to estimate how much attention a
child pays to the graphic cues and how much to semantic and syntactic cues
when he is reading orally and to determine the extent to which he self-
corrects miscues when they are graphically dissimilar as opposed to miscues
that are semantically or syntactically inappropriate. The analysis may sug-
gest whether the teacher needs to direct more of the child's attention to

one or another of these cue sources in order to help him read more accurately.

Oral reading is analyzed qualitatively by categorizing children's mis-cues as to semantic and syntactic appropriateness and graphic similarity, and as self-corrected or uncorrected. When a child identifies a word correctly, the word he reads is semantically appropriate in the context of the sentence, it is syntactically correct, and it conforms to the print exactly. When the child reads a different word in place of a printed word, the substituted word may be like the printed word in some ways but not in others. For example, in the sentence Johnny was happy with his birthday gift, if the child says present instead of gift his substitution is semantically appropriate since a present is the same thing as a gift, it is syntactically appropriate since both the printed word and the substitution are nouns, but its graphic form is different from the printed word except fot the final t. If the child says goat instead of gift, his substitution is not semantically appropriate but it is syntac-tically appropriate since it is a noun. The graphic form of this substitution has three things in common with the printed word: its length, the initial g, and the final t. If the child says brother instead of birthday, his substi-tution is not semantically appropriate but the two words are somewhat similar in graphic form. This substitution is syntactically appropriate if only the preceding portion of the sentence is considered, Johnny was happy with his brother, but it is not syntactically appropriate in the sentence as a whole: Johnny was happy with his brother.gift. The substitution of the word present for gift is considered to be a better miscue qualitatively than substituting goat for gift or brother for birthday since, although the latter two miscues are more graphically similar they do not approximate the meaning represented

in the print. In all of these examples the miscues were uncorrected.

Several investigators have performed qualitative analyses of first-grade children's oral reading miscues to determine differences between high and low achievers. (Clay, 1969; Weber, 1970, Biemiller, 1970) Briefly, the findings have been that high achievers produced a larger proportion of miscues that were graphically similar and that they self-corrected proportionately more than the low achievers. Neither the high nor the low achievers tended to correct the semantically appropriate miscues but the high achievers corrected a greater proportion of the semantically inappropriate miscues.

A child who pays closer attention to graphic cues and who is likely to correct miscues when they are semantically inappropriate would seem to be behaving reflectively according to Kagan's characterization of conceptual tempos. That is, a reflective child pauses to evaluate the quality of his thinking and the accuracy of his conclusions. On the other hand, the child who pays less attention to graphic cues and who is not likely to correct miscues even when they are semantically inappropriate would seem to be behaving impulsively. That is, he has reported the first idea he thought of with minimal consideration of its appropriateness or quality. The present study was designed to investigate whether the number of oral reading miscues differs for reflective and impulsive children, whether the proportion of miscues that are semantically appropriate, syntactically appropriate, or graphically similar differ for the two groups, and whether the two groups differ in their self-correction behavior as it relates to these three cue sources.

METHOD

The subjects who were available for this study were all of the 79 children who attended the four first-grade classes in one elementary school. About fifty percent of the children's fathers were engaged in professional and managerial occupations, forty percent were clerical, protective workers, or skilled and semi-skilled workers, and ten percent were engaged in unskilled labor. The Matching Familiar Figures Test was administered in November, oral reading samples were obtained in January, and Metropolitan Achievement Test scores were available from the school's routine administration in May. There were 72 children for whom all these test scores were obtained.

The Matching Familiar Figures Test was scored by determining the average time to the first selection of a response and the total number of errors across the twelve items. Each child whose average response time was above the median of the groups and whose number of errors was below the median of the group was classified as reflective. Each child whose average response time was below the median of the group and whose number of errors was above the median of the group was classified as impulsive. There were twenty-five children who were classified as reflective and twenty-six who were classified as impulsive.

A sample of each child's oral reading behavior was obtained by asking him to read orally the next story in his reader following the one he was currently studying in his class. Five reflective and five impulsive children read stories from the first reader, twenty reflective and seventeen impulsive children read stories from primers, and four children, all of them impulsive,

read stories from preprimers. (The oral reading sample of one impulsive child who made seventy-eight miscues in his reading of a preprimer story was not included in the oral reading analysis.) The examiner recorded each of the child's miscues, that is, the utterances which differed from a precise word-by-word reading of the printed text, in the first hundred words of the story he read. Each miscue was assigned to one of the following categories and then quantitative and qualitative analyses of the miscues were performed.

1. <u>Word substitution</u> --The child substitutes a different word in place of a text word.

2. <u>Phrase substitution</u> --Either the child's substitution or the text includes more than one word.

3. <u>Nonsense substitution</u> --The child substitutes a nonsense word or part of a word is substituted in place of a text word.

4. <u>Habitual substitution</u> --The child repeats a substitution he has previously made when he encounters the same word again in the text.

5. <u>Insertion</u> --One or more additional words are inserted between two words.

6. <u>Omission</u> --One or more of the text words is omitted.

7. <u>Unknown word</u> --The child omits a word and says that he does now know it.

8. <u>Repetition</u> --Either a word in the printed text or a word substitution miscue is repeated by the child.

9. <u>Regression</u> --The child regresses to the beginning of a phrase or sentence and rereads it.

RESULTS AND DISCUSSION

Number of Miscues

A quantitative comparison of the miscues of the twenty-five reflective
and twenty-five impulsive children demonstrated little difference between
the two groups in oral reading behavior. In Table 1 it may be seen that the
mean over all miscues was 9.64 for reflective children and 10.60 for impul-
sive children. However, when the miscues were dichotomized as either respon-
ses that differed from the text (categories 1 through 7), or responses that
were repetitions of words previously read (categories 8 and 9),qualitative
differences in oral reading behavior began to emerge. Reflective children
made fewer miscues that differed from the text, just as Kagan had observed.
Reflective children made more miscues that were repetitions of words previ-
ously read. (These two categories of errors were not included in Kagan's
study.)

Insert Table i about here

Number of self-corrections

Repetitions and regressions are often associated with self-corrections.
The fact that the reflective children have made more of these miscues sug-
gests that they may have higher proportions of self-corrections, also. Since
most of the miscues that differed from the text were word substitutions,
(see Table 2) the analysis of self-corrections, as well as all the subsequent
qualitative analyses,were based on this category only. When the word-sub-
stitution miscues were dichotomized as self-corrected and uncorrected it

was determined, as shown in Table 3, that the reflective children self-cor-
rected about the same number of errors as the impulsive children, but that
the impulsive children left more miscues uncorrected.

Insert Tables 2 and 3 about here

Kagan's concluding remarks in his oral reading study urged teachers of
remedial reading and reading readiness programs to help children overcome
impulsive tendencies by giving training in reflection. (1965, p. 627) Yet,
in his book Understanding Children Kagan referred to reflective children as
fearful of error, excessively inhibited, and cautious. He said that the
major cause of a reflective attitude is anxiety over making a mistake. He
advised teachers to encourage the reflective child to guess when he is
not sure and to be less critical of his mistakes (1971, pp. 128-129). It
is not clear from Kagan's remarks just what degree of reflective behavior is
thought to be desirable and what is undesirable. It might be assumed, for
example, that the tendency of the reflective child in the present study to
make more repetitions and regressions and to leave fewer words uncorrected
may be detrimental to his growth in reading ability: first, because reflec-
tive children may sacrifice rate of reading in order to read more accurately;
and second, because their self-corrections may not result in any gain in
meaning.

Rate of oral reading

In order to investigate the first concern, the children's oral reading
rates were computed. A comparison of the mean rates of reading revealed that
reflective children read orally as fast as impulsive children in spite of

their additional repetitions, regressions, and self-corrections (reflectives read 51 words per minute, and impulsives read 47 words per minute). To investigate the second concern, the children's self-corrections were studied in relationship to semantic and syntactic appropriateness.

Insert Tables 4 and 5 about here

Semantic and syntactic appropriateness

As shown in Tables 4 and 5, the majority of the word-substitution miscues of both reflective and impulsive children were semantically inappropriate. Neither reflective nor impulsive children corrected many semantically appropriate miscues. When the semantically inappropriate miscues were considered, however, reflectives had self-corrected fifty-one percent, while impulsive children had self-corrected only thirty-four percent. Since so few of the miscues were semantically appropriate (only 16 for reflectives and 14 for impulsives), the subsequent analyses were based on the semantically inappropriate errors only.

Insert Tables 6 and 7 about here

Tables 6 and 7 illustrate the fact that the relative use of syntactic cues was similar for the reflective and impulsive children. Most of their word substitution miscues were either syntactically appropriate to the whole sentence in which they occurred or were syntactically appropriate to the preceding, but not the following, portion of the sentence. Neither reflective nor impulsive children corrected very many miscues that were syntactically appropriate in the whole sentence, but reflective children were more

likely than impulsive children to correct miscues that were syntactically
inappropriate to the following portion of the sentence. There were very
few word substitution miscues that were syntactically inappropriate to the
whole sentence (only 10 for reflectives and 19 for impulsives) but propor-
tionately more of these were corrected by reflective children than by im-
pulsive children.

In summary, the reflective children made fewer miscues that differed
from the text, and in particular fewer miscues of the most numerous category,
word substitutions. The reflective children self-corrected a greater pro-
portion of their word-substitution miscues, specifically when their miscues
were semantically inappropriate to the text and when they were syntactically
inappropriate to the following portion of the sentence. Thus reflective
children appear to be self-correcting their miscues in order to reflect the
meaning of the text more accurately.

Silent reading comprehension

Although it is apparent that impulsive children are not self-correcting
as many semantically and syntactically appropriate miscues overtly in oral
reading, it is possible that they make these corr ctions covertly, and thus
actually comprehend the meaning as well as the reflective children do without
exhibiting the anxiety over their errors that reflective children have been
said to exhibit. As one way of investigating whether impulsive children
might be gaining as much meaning as reflective children when reading silently,
the mean Metropolitan Achievement Te c scores of the two groups were compared
The reflective children's mean standard score was higher on each of the four
reading subtests, and the difference reached statistical significance

comprehension subtest (see Table 8). Not only do the reflective children

appear to be concerned about meaning in their oral reading behavior, but also

they appear to be obtaining more meaning when reading silently.

'sert Table 8 about here

Graphic Similarity

The classification of children as reflective or impulsive is based on

the Matching Familiar Figures Test which is essentially a visual discrimi-

nation test. Thus children who differ on this test would be expected to

differ in their use of graphic cues in oral reading. In Table 9 it may be

seen that reflective and impulsive children showed little difference in

their use of graphic cues overall. For both groups a slight majority of word

substitution miscues began with the same letter as the text word. When the

miscues were categorized as to graphic similarity and the proporti of

self-corrections in each category were determined, differences in the use

of graphic cues became apparent. Table 10 shows that the reflective chil-

dren were more likely than impulsive children to self-correct their graph-

ically dissimilar miscues.

Insert Tables 9 and 10 about here

Sight Vocabulary

In order to determine whether the closer attention to the print as

exhibited by reflective children in their self-correction behavior might

pay off in the acquisition of sight vocabulary, their word recognition

abilities were tested in second-grade by use of the Standard Reading

<u>Inventory</u> word lists.(McCracken, 1966). There were twenty-two each of the
reflective and impulsive children for whom the word recognition scores could
be obtained. Of the reflective children there were fifty-nine percent who were
able to pass word lists above second-grade level while only thirty-two percent
of the impulsive children were able to do so.

Limitations

There are at least four important limitations which should be discussed
in relationship to the findings in this study. First, in this analysis of
oral reading miscues none of the observed differences has been tested for
statistical significance because the scores are summed over different sub-
jects reading from a variety of stories. The differences in mean number of
miscues do not appear to be large, yet they do suggest a practical signifi-
cance to reading teachers since it is recommended that children be instructed
in reading materials in which they typically make no more than five miscues in
one-hundred words. (Which of the categories should be counted as miscues is
a persistent controversy among reading experts, however).

Second, since intelligence tests were in disfavor in the school system
where this study was conducted it was not possible to ascertain whether the
differences in reading abilities that were observed might be related to intel-
ligence as well as to cognitive style.

Third, this oral reading analysis is based on children who were just
beginning to learn to read. An example of their inexperience was found in
the tendency of both the reflective and the impulsive children to leave
miscues uncorrected if the miscues were syntactically appropriate to the
whole sentence even when the miscues were semantically inappropriate. It

seemed as if the children had difficulty coordinating all the cue sources at once when making oral reading responses. It may be that children who are in a later stage of learning to read would make miscues that would be qualitatively different from the miscues of these beginners, and that the miscues of more experienced readers would interact differently with tendencies to reflection.

Fourth, a child's position on the reflection-impulsivity continuum is determined with reference to the median scores of the children who took the test with him. The present study was based on children who were predominantly of the middle socioeconomic class, and without more information about the tendencies toward reflection and impulsivity in groups of children representing a wider socioeconomic range it is difficult to judge the strength of the tendencies to reflection exhibited in these children's behavior.

SUMMARY

An index of reflection-impulsivity was administered to first-grade children. Samples of oral reading behavior, Metropolitan Achievement test scores, and Standard Reading Inventory word recognition test scores were obtained. Reflective children made fewer oral reading miscues than impulsive children, and specifically fewer word substitution miscues. Reflective children made more repetitions, regressions, and proportionately more self-corrections than impulsive children. The oral reading rates of the two groups were about the same. The reflective children self-corrected proportionately more word substitutions that were semantically inappropriate and more word substitutions that

were syntactically inappropriate to the following portion of the sentence.
Their performance on the Metropolitan Reading Achievement reading subtest was
significantly higher. The reflective children self-corrected proportionately
more word substitutions that were graphically dissimilar to the text words
particularly when the word substitutions were also semantically inappropriate.
More reflective children than impulsive children passed word recognition test
lists above second grade level when tested in second-grade. In general it
appeared that the self-corrections in oral reading behavior of reflective chil-
dren who are just beginning to learn to read reflect an attempt to obtain
meaning, and that reflective children also exhibit better reading comprehension
in achievement tests at the end of first-grade and possess more extensive sight
vocabularies in the first semester of second grade. Tests of statistical
significance of the observed differences in oral reading behavior were not
applied because the measures were summed over several children reading several
stories. It was not possible to determine the relative influence of intelli-
gence, stage of learning, and socioeconomic characteristics on the reading
abilities of the reflective and impulsive children in this study.

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Table 1   Mean number of all miscues

	Reflective	Impulsive
Miscues that repeat the text	4.4	2.8
Miscues that differ from the text	5.2	7.8
All miscues	9.6	10.6

Table 2   Mean number of miscues that differ from the text

	Reflective	Impulsive
Word substitutions	3.2	4.8
All other substitutions, and insertions, omissions and unknown words	2.0	3.0
All miscues that differ from the text	5.2	7.8

Table 3   Mean number of word substitution miscues

	Reflective	Impulsive
Self-corrected	1.5	1.6
Uncorrected	1.7	3.2
All word substitution miscues	3.2	4.8

Table 4   Percent of miscues that are semantically appropriate

	Reflective (number of miscues=81)	Impulsive (number of miscues=120)
Semantically appropriate	20	12
Semantically inappropriate	80	88

Table 5   Percent of self-correction by semantic appropriateness

	Semantically Appropriate		Semantically Inappropriate	
	Reflective	Impulsive	Reflective	Impulsive
Self-corrected	38	29	51	34
Uncorrected	62	71	49	66

Table 6   Percent of semantically inappropriate miscues
that are syntactically appropriate and inappropriate

	Reflective (number of miscues is 67)	Impulsive (number of miscues is 106)
Syntactically appropriate to the whole sentence	37	32
Syntactically inappropriate to the following portion of the sentence	52	52
Syntactically inappropriate to the whole sentence	11	16

Table 7   Percent of self-correction of semantically inappropriate miscues
by syntactic appropriateness

	Syntactically appropriate to the whole sentence		Syntactically inappropriate to the following portion of the sentence		Syntactically inappropriate to the whole sentence	
	Reflective	Impulsive	Reflective	Impulsive	Reflective	Impulsive
Self-corrected	21	26	74	45	43	12
Uncorrected	79	74	26	55	57	88

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Table 8 Mean word substitution miscues in oral reading
and Metropolitan Achievement Test standard scores by
reader level placement for reflective and impulsive first-graders

| | Reader Level Placement in January | | | | | | All Children | |
| | Pre-primer | | Primer | | First-reader | | | |
	Reflective N=0	Impulsive N=3	Reflective N=20	Impulsive N=17	Reflective N=5	Impulsive N=5	Reflective N=25	Impulsive N=25
Word substitutions in oral reading		5.33	3.64	5.41	1.60	2.40	3.24	4.80
Metropolitan Achievement Test								
Word Knowledge		42.3	59.3	56.6	58.0	62.0	59.0	56.0
Word Analysis		40.3	52.9	51.2	58.8	56.6	54.1	50.1
Reading		42.7	62.1	55.4	65.0	61.8	62.7*	55.1*
Total Reading		41.3	58.8	54.8	61.6	62.0	59.4	54.6

* t=2.61, df=48, p < 0.02

Table 9   Percent of semantically inappropriate miscues
that are graphically similar and dissimilar

	Reflective	Impulsive
Same initial letter	57	52
Different initial letter	43	48

Table 10   Percent of self-correction of semantically inappropriate
miscues by graphic similarity

	Same initial letter		Different initial letter	
	Reflective	Impulsive	Reflective	Impulsive
Self-corrected	41	38	64	31
Uncorrected	59	62	36	69