CONCEPTUAL TEMPO AS A PREDICTOR OF FIRST-GRADE READING ACHIEVEMENT

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Abstract. The primary purposes of this study were to (1) ascertain the effects of kindergarten conceptual tempo classification on middle of first-grade reading performance; (2) compare the results obtained by the traditional Matching Familiar Figures Test double median split classification procedure with results obtained by computing a linear score for each child which combined his MFF standard scores for latency and errors. Regardless of the classification procedure, conceptual tempo did not significantly influence reading achievement at the .05 level. When equated for kindergarten reading readiness scores, significant vocabulary and comprehension differences were not found for tempo, sex, or interaction. It was concluded that the conceptual tempo of kindergartners does not appear of utility in predicting their middle of first-grade reading performance.

Conceptually impulsive children have been found to perform significantly more poorly than their reflective peers on measures of word recognition (Kagan, 1965), auditory-visual integration (Margolis, 1976) and auditory discrimination (Margolis, 1977). Keogh and Donlon (1972) found that seriously learning disabled boys were more conceptually impulsive than moderately disabled boys. While this might suggest that conceptually impulsive children are more likely than reflective children to develop reading difficulties, other evidence mitigates against this supposition. Margolis, for example, found no significant differences between impulsive and reflective kindergartners on measures of reading readiness (Margolis, 1976) and auditory memory (Margolis, 1977). Moreover, the magnitude of the correlations found by Kagan (1965) between word recognition errors in the fall of grade two and MFF performance some six months earlier in
first-grade (-.20, \( p > .05 \) to .34, \( p < .01 \)) suggests that conceptual tempo is not a powerful predictor of reading performance.

The research relating conceptual tempo to primary grade reading achievement is deficient in several ways. First, because Kagan (1965) did not use normed instrumentation, his observation that reflective primary grade students made significantly fewer word recognition errors than their impulsive peers is of limited value in ascertaining whether the latter group can be characterized as having reading difficulties. Second, children have been traditionally classified as impulsive, reflective or neither on the basis of their Matching Familiar Figures Test (MFF) performance using a double median split procedure (DMSP) for response time and error.

The DMSP classifies children as impulsive if they respond faster and make more errors than the corresponding latency and error medians for the group tested; those responding more slowly and making fewer errors are classified as reflective. The DMSP has been criticized by Bentler and McClain (1976) and Egeland and Weinberg (1976) for the loss of discrimination occurring when all children falling within a particular category are considered equal (e.g., all impulsives are equally impulsive); for the loss of subjects who are neither impulsive nor reflective; and for not allowing for the synchronous observation of response time and error on external variables (e.g., reading achievement). Combining MFF response time and error into a standard score (suggested by Bentler and McClain, 1976) might reveal a different relationship between tempo and reading achievement than Kagan (1965) obtained by separately correlating response time and error with reading.

The purposes of the present investigation were to respond to the above concerns and to compare the results obtained by the DMSP to those obtained by computing a standard score response time and error composite for each child.

Method

All but one kindergartner \( (n=92; \bar{X} \text{ age} = 5.75 \text{ years}; \bar{X} \text{ PPVT IQ}=107.2) \) of an almost all-white middle class elementary school was administered the MFF, form F in March. When the children were tested with the Gates McGinitie Reading Tests, Primary Form A (GMRT) in February of the first-grade, 21% and 26% of the children falling in the extreme impulsive quartile \( (n=23; \text{standard score composite procedure; to be described}) \) were unavailable for the Vocabulary and Comprehension subtests, respectively, and 34% and 43% of the children falling within the extreme reflective quartiles \( (n=23) \) were unavailable for the Vocabulary and Comprehension subtests, respectively. Mann-Whitney U analyses of the standard score composites indicated there were no differences \( (p > .05) \) along the reflection-impulsivity dimension between those impulsives taking the examinations and those unavailable and those reflectives taking the
examinations and those unavailable.

The DMSP identified 16 boys and 10 girls as impulsive and 14 boys and 12 girls as reflective. Standard score composites were computed for each child (n=92) by adding his standard scores for response time and error after multiplying the standard error score by a minus sign to denote an error tendency consistent with conceptual tempo theory. Thus, in contradistinction to response time scores, error scores greater than the mean for the total group would be expressed negatively and error scores less than the mean, positively. An analysis of the composite scores of the DMSP impulsive and reflective groups showed the groups were mutually exclusive and significantly different (t=8.30; df=50, p < .0001). When extreme quartile composite comparisons were required, the lowest 23 scores denoted the impulsive group and the highest 23 scores the reflective group.

Results

Consistent with conceptual tempo theory, MFF response time was significantly related (r= -.38, df=90, p<.0005) to errors.

Regardless of the classification procedure (DMSP or extreme composite quartiles), t-tests did not yield significant differences at the .05 level between impulsive and reflective children on the Vocabulary or Comprehension subtests.

When the influences of kindergarten Metropolitan Readiness Test scores were extracted by an analysis of covariance procedure for children classified as impulsive or reflective by the traditional DMSP, significant Vocabulary and Comprehension differences were not obtained at the .05 level for conceptual tempo, sex or interaction. The same procedure and covariate yielded congruent results when considering the composite score of each child for which both Vocabulary and Comprehension scores were available.

Pearson product-moment correlations for composite scores and Vocabulary and Comprehension indicated achievement was orthogonal to conceptual tempo. Composite scores correlated -.03 (p > .05, df=63) with Vocabulary and .09 (p > .05, df=60) with Comprehension. The correlations between Vocabulary and MFF response time and Vocabulary and MFF errors were -.13 (p > .05, df=63) and -.11 (p > .05, df=60), respectively. For Comprehension, the correlations with response time and errors were -.09 (p > .05, df=60) and -.21 (p > .05, df=60), respectively. All probabilities were two-tailed.

GMRT standard scores for Vocabulary and Comprehension indicated that as groups, impulsives and reflectives were average readers. The standard score mean for GMRT subtests is 50 (sd=10). Neither DMSP groups nor extreme composite quartiles had a subtest mean below 49 or higher than 54 and all standard deviations were less than 10.
Discussion

Although the conceptual tempo of kindergartners does not appear predictive of first-grade reading achievement, the results of this study must be viewed with caution. This was one study with one group of children from one particular school with a high rate of subject attrition. Moreover, since this study was initiated, form F of the MFF has been criticized as too difficult for kindergartners (Egeland and Weinberg, 1976). Perhaps conceptual tempo will prove predictive if an easier version of the MFF is used or if composite scores are incorporated in multifactorial predictive batteries.

REFERENCES


