

# **Usefulness of the Lowenfeld Mosaic Test in Predicting School Readiness in Kindergarten and Primary School Pupils\*<sup>1</sup>**

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## **Introduction**

The aim of the present study was to determine whether or not the Lowenfeld Mosaic test might prove useful in predicting school readiness or unreadiness in children just starting kindergarten and the early primary grades. To determine this, we have analysed Mosaic responses of a sizeable group of beginning kindergarten, first and second grade subjects over a three-year period, noting whether the Mosaic response of any given individual remained consistent over a period of years; whether or not evaluations of children's Mosaic responses agreed with evaluations of their responses on other types of readiness tests (developmental, visual); and also noting correspondence or lack of correspondence between teachers' evaluations of readiness with results obtained from use of the Mosaic.

Data for the present study were gathered as part of a more comprehensive investigation of school readiness. Subjects were examined by three examiners, Frances L. Ilg, M.D., Richard J. Apell, O.D., and Louise B. Ames, Ph.D., who gave, respectively, a modified developmental examination, a fairly detailed visual examination, and the Rorschach and Mosaic tests. In addition, the WISC, both verbal and performance scales, was given to the majority of subjects.

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## Subjects and Procedure

### 1. Subjects

All subjects for the present study were students at the Hurlbutt School, Weston, Connecticut, during the period from September, 1957, to December, 1960. Originally included were the entire kindergarten population (81 children), one first-grade class (22 children), and one second-grade class (29 children). A few children were lost each year as they moved out of this school district. Data given here as to intelligence and father's occupation pertain to the entire group of children originally tested.

All subjects except the original second-grade group were examined four times: the fall of 1957, spring of 1958, fall of 1958, fall of 1959. The second-grade group was examined during, the fall terms of 1957, 1958, 1959 and 1960. Though ages of subjects varied somewhat within any given class, for the most part the kindergarten subjects were 5, 5 ½, 6 and 7 when examined; the original first-grade subjects were six, seven and eight; the original second-grade subjects were seven, eight, nine and 10 years.

The Hurlbutt School is a public primary school. The majority of subjects for this study fall in the high average category of intelligence, or. above, as follows: Mean IQ for the 60 kindergarten subjects for whom we have an IQ score is 111.15; mean for the 21 original first graders tested is 105.80; mean for the 23 original second graders on whom an IQ score is available is 108.18.

Most subjects came from professional or semi-professional families, as appears evident in Table 1.

**TABLE 1**  
**SOCIOECONOMIC DISTRIBUTION OF SUBJECTS: NUMBER OF RECORDS AT EACH LEVEL**  
**OF MINNESOTA SCALE OF PATERNAL OCCUPATIONS**

Class	81 Kinder- gartens %	28 First Grades %	31 Second Grades %	Total (140) %
1. Professional	14	21	16	16
2. Semiprofessional managerial	44	46	45	45
3. Clerical, skilled trades, retail business	27	11	16	21
4. Farmers	0	0	0	0
5. Semiskilled, minor clerical, minor business	5	11	7	6
6. Slightly skilled	1	11	3	4
7. Day laborers	1	0	0	1
No data	6	0	13	6

Both materials and method of administration of the Mosaic test are described in full in an accompanying paper (2) as well as in our book publication on this test (1).

## 2. Procedure

Original kindergarten and first-grade subjects were examined four times each, as indicated above, first after an interval of six months and then at yearly intervals. After each full set of examinations was finished, the three examiners conferred and evaluated each subject as + (ready for the grade he was in and ready for full promotion the following year); ± (questionably read); - (not ready). Indication was also made when a child seemed to need to be in a special class; and many intermediate ratings such as +± or ±- were given.

At the end of each year, teachers were asked to rate subjects as 1 (ready), 2 (questionable), 3 (not ready). These yearly ratings by teachers were not consulted by us until all examination data. They were then compared with our own findings. All of these comparative findings will be reported in our group publication which will cover

all readiness tests tried out (5). The present paper discusses the Mosaic findings in greater detail than was feasible in the joint publication.

Analysis of Mosaic data was somewhat subjective. All Mosaic products were first classified as unpatterned nonrepresentational, patterned non-representational, or representational (with several subheadings under each main classification) in accordance with a system of classification reported in an earlier study (1).

Then, taking into consideration this classification but also using considerable subjective judgment, we arranged Mosaic products for each group (each of four kindergarten classes, original first grade, original second grade) in rank order from best (or most effective or most mature) to worst (least effective or least mature) for each of the four separate examinations.

Then, finally, Mosaic findings compared with those of the other examiners and with teachers' judgments as, indicated below.

### **C. Findings**

The expectation that the Lowenfeld Mosaic that will be useful as part of a battery of tests designed to determine school readiness appears to be based on at least three assumptions. First, it must be assumed that the child's response to the Mosaic test, as to other tests, develops in a somewhat patterned, orderly fashion so that it is in general possible to identify a characteristic five-year-old type of response, a six-year-old type of response, etc. If this can be done, then presumably it would be possible to arrange the products of subjects in any given group in rank order from best (or most effective or most mature), to worst.

Second, if the Mosaic is to be useful in arriving at any judgment about school readiness, any given child's response should remain more or less consistent (within the group) as to its relative rank order. For the test to have predictive value a child who does well on the test at one given time should also be expected to do well on a subsequent administration; the child who does poorly should be expected to continue to do somewhat poorly. That is, allowing for normal uncertainties of rate of

development, there should be predictive value to any given single Mosaic response.

Third, to be useful as part of a school-readiness battery, the Mosaic response should agree to a reasonable extent with responses to other tests given in indicating readiness, unreadiness or questionable readiness, and also with teachers' evaluations of actual school performance.

## **1. Developmental Stages in Mosaic Productions**

Two earlier publications (1, 2), one a full-length book complete with illustrations, the other a monograph, detail our findings as to the age changes which occur in children's Mosaic productions. Both of these studies suggest that rather clear-cut age changes do occur in the child's Mosaic products, and that such systematic changes take place in a majority though not in all child subjects studied by us.

## **2. Rank Order Consistency, within Any Given Group, of Child Mosaic Products Made from Age to Age**

If our finding that children as they grow older make increasingly "mature" Mosaic products, then it should be possible to arrange Mosaic products of any given group of children in rank order from "best" to "worst," taking into account chiefly maturity or immaturity of performance with respect to the age in question, but also giving some consideration to accuracy and pleasing-ness of product.

We have thus arranged all of the present subjects who stayed in school long enough to be available for all four tests in rank order, from best to worst for each separate class group. Thus 61 original kindergarten subjects were considered, in their four separate class groups into which they were divided when we first saw them. (This seemed to us to be a more feasible procedure than ranking all in a single rank ordering.) Twenty original first-grade subjects were so ranked, and 28 original second graders.

Rank order arrangement of these subjects was admittedly somewhat subjective, certainly more so than would be the ordering of responses to a test which

could be rated by a single scoring figure. Such decisions as whether a "successful" object was "better" than a "successful" design, or whether an attractive slab was necessarily "worse" than a design, are most difficult to make, but since one person only made the orderings, at least the same type of judgment was used throughout.

Once such a rank ordering has been made, assuming that there is any useful predictability as to level of performance from one test to the next, presumably the rank order should remain somewhat consistent. The extent to which rank orders of any given class group did remain consistent from test to test was determined by the method of rank order correlation. Results are given in Table 2.

Study of Table 2 shows that there tends to be a substantial though by no means complete consistency of rank order of subjects, in any given group, from one test to another. Among the kindergarten subjects, Groups A and B, which show the greater consistency, were made up of the ablest children, judged on the basis of IQ and teachers' estimation of general readiness; Groups C and D, of the less well endowed.

The original first-grade subjects, as they proceeded into second and then third grade, and the original second-grade subjects as they proceeded into third, fourth, and fifth grade, showed considerably greater consistency of rank order than did the original kindergarten subjects. The greatest obstacle to consistency of ranking seemed to be certain individual subjects whose rank order changed markedly with time, in one instance from lowest to highest in the group. This degree of change was of course unusual but did occur.

Though a developmental study of our own (3) has suggested that there tends to be a marked consistency of rating for any one child on any given test on successive examinations, such consistency can by no means always be demonstrated, regardless of the type of test. Thus the Mosaic is by no means unique in not producing perfect consistency of rank order. However the fact that it is the original kindergarten group (5 or 5 ½ years-old at the time of the first test) which is the least consistent suggests to us that so far as this particular test is concerned, there is greater consistency of rank order as the child grows older. It appears to us (though this is a somewhat subjective

observation) that there is a rather large developmental step which must be taken between five and six years of age. Some children appear to be slower, or to have more difficulty than others, in making this step. Thus a child whose product ranked rather high, relatively, within his group at five years of age might not, when his 5 ½-year-old test was given, have taken this developmental step. Thus his 5 ½-year-old product might rank lower, relatively, within the group than did his earlier product. Once over this hurdle he might, at a later age, regain his relatively high position within his group.

TABLE 2  
CORRELATIONS AMONG RANKINGS OF MOSAICS AT SUCCESSIVE TESTINGS

Years	Group A (16 subjects)			Original Kindergarten Group B (13 subjects)			Original Kindergarten Group C (16 subjects)			Group D (16 subjects)			Original First Grade (20 subjects)			Original Second Grade (28 subjects)		
	5½	6	7	5½	6	7	5½	6	7	5½	6	7	6½	7	8	8	9	10
5	.82	.73	.49	.92	.86	.63	.88	.70	.09	.64	.48	.25						
5½	x	.86	.46	x	.95	.72	x	.73	-.04	x	.88	.79						
6	x	x	.51	x	x	.66	x	x	.38	x	x	.76	.85	.68	.80			
6½													x	.58	.72			
7													x	x	.82	.92	.87	.79
8																x	.91	.82
9																x	x	.92

At any rate, consistency of rank order in our oldest group who were seven, eight, nine, and ten years of age at the time of their four examinations, is extremely high. And even the original first-grade group who were six, seven and eight years of age when examined (there were two examinations given during their sixth year) show quite high consistency.

### 3. Relation Between Intelligence and Consistency of Rank Order

Since among the four kindergarten divisions the two groups considered by the teachers as on the whole the better endowed showed greater consistency than did the two less well-endowed groups, the possibility suggested itself that perhaps better endowed subjects tend to maintain a greater consistency of performance, and thus of rank order within their group, than do those who are less well-endowed. (However, working against this possibility would be the fact that extremely inadequate subjects might be very consistent in remaining at or near the bottom of the group, so for as rank order is concerned).

Checking this possibility, we find that the four kindergarten classes, in descending order of presumed excellence of students (by teachers' evaluations) have the following mean IQs: 117, 116, 117 and 104. Mean IQ for the first grade (which from test to test showed greater consistency of rank order than did any of the kindergarten groups) is 106; These figures give no support to our hypothesis.

Following up this possibility a little farther, we have determined the mean IQ, in each group of subjects, for the four most consistent and the four least consistent children. Table 3 shows that in every instance the mean IQ of the four most consistent exceeded the mean IQ of the four least consistent.

**TABLE 3**  
**MEAN IQs OF THE FOUR MOST CONSISTENT AND THE FOUR LEAST CONSISTENT SUBJECTS IN EACH GROUP**

	Kinder- garten A	Kinder- garten B	Kinder- garten C	Kinder- garten D	First	Second
Most consistent	129	119	125	112	109	117
Least consistent	114	116	113	97	96	104

These figures give slight support to the possibility that better endowed individuals do tend to behave more consistently, from age to age, in relation to the total group performance than do those who are less well endowed.

#### **4. Comparison of Rank Order Position and Readiness or Unreadiness for School as Judged on Other Tests**

Assuming that adequacy in response to the Mosaic test for any given age level does, no we consider probable, offer at least one bit of evidence of readiness for school performance at that level, we would expect that a child who was "ready" for any given grade would make a "better" Mosaic product than a child who was "unready." Thus in any given class group, we would expect the "ready" children to have a higher rank order than an "unsteady" child when products of oil children in the group are arranged in order, from best to worst, as was done with these data.

To determine whether or not this was the case, we have divided subjects (original kindergarten, original first grade, original second grade) into three groups: those judged by all three examiners as being, consistently ready from year to year; those judged ,by all three examiners as. being questionable; and those judged as unready. Only subjects were considered at this step for whom ratings of the three examiners agreed.

Then we calculated mean and median rank orders for: each group separately. Results are given in Table 4, which shows clearly that in every instance except for the second-grade subjects, the means and medians for the "ready" students were lower than for the "questionable" students. That is, the "ready" students in each instance were ranked. nearer the top of their group than the questionable and unready students. Furthermore, means and medians for the "questionables" were lower than those for the "not readies." This was true for all kindergarten subjects on each of the four tests; also for the first-grade students.

For second-grade students in each of the flour tests which they were given, mean and median rank order for the ready subjects was considerably lower than that for the "not readies," but on the first, third, and fourth tests the median for the "questionables" slightly exceeded that of the "not readies."

These figures thus bear out the expectation that those children in a class who make the better Mosaic products (those rated nearer the top of the group as arranged from best to worst) are more likely to be judged ready for demanded school performance than are those children who make less good Mosaics.

This correspondence, however, though it shows up well in the means and medians, is by no means perfect. Thus some subjects who make excellent Mosaic products are judged not ready on the basis of other tests, and vice versa. The extent to which this can be true is suggested by a study of Table 5, which gives the range of rank order of Mosaic products in the several groups. This table shows that though in general the ready subjects did have lower rank order (as arranged from best to worst) than the not readies, there was considerable overlap, especially in some groups. Least overlap 15&apos; evident in the original first-grade group, but as will be seen, in

original second-grade subjects, on the first test, one "ready" child rated as high as number 24 out of 28 in the group; whereas one "not ready" rated as low as number 6.

**TABLE 4**  
**MEANS AND MEDIANS, RANK ORDER\* POSITION OF SUBJECTS CONSISTENTLY READY, QUESTIONABLE AND NOT READY**

	Test 1	Test 2	Test 3	Test 4
<b>Original Kindergarten Groups (55 subjects)</b>				
<i>Ready</i>				
Mean	6.66	6.62	6.17	6.32
Median	6.66	5.00	6.00	5.00
<i>Questionable</i>				
Mean	8.00	7.35	8.05	7.60
Median	7.50	7.00	8.00	8.00
<i>Not Ready</i>				
Mean	10.91	10.66	10.08	10.75
Median	11.00	11.50	11.00	10.00
<b>Original First Grade (20 subjects)</b>				
<i>Ready</i>				
Mean	9.00	8.75	10.00	9.80
Median	8.50	7.50	10.00	10.80
<i>Questionable</i>				
Mean	11.00	10.14	11.00	12.43
Median	10.00	10.00	13.00	15.00
<i>Not Ready</i>				
Mean	16.00	18.00	14.66	15.00
Median	17.00	19.00	18.00	18.00
<b>Original Second Grade (28 subjects)</b>				
<i>Ready</i>				
Mean	12.25	10.87	10.37	13.00
Median	11.00	10.50	9.50	13.00
<i>Questionable</i>				
Mean	18.20	18.00	18.60	17.40
Median	23.00	19.00	22.00	20.00
<i>Not Ready</i>				
Mean	18.60	19.00	20.00	18.75
Median	21.00	21.00	20.00	19.50

\* Rank order arranged best to worst.

## 5. Extent to which Mosaic Response Agrees with developmental and Visual Examinations in Indicating School Readiness or Unreadiness

TABLE 5  
RANGE OF RANK ORDER IN THE SEVERAL GROUPS

	Test 1	Test 2	Test 3	Test 4
<i>Kindergarten</i>				
(55 subjects)*				
Ready (By 3 Ex's.)	( 1- 9)	( 1-11)	( 1-10)	( 1- 7)
Ready (By 2 Ex's.)	( 1-14)	( 3-16)	( 1-15)	( 1-16)
Questionable	( 1-16)	( 1-16)	( 1-16)	( 1-15)
Not Ready	( 7-14)	( 7-13)	( 2-13)	( 7-14)
<i>First Grade</i>				
(20 subjects)				
Ready	( 1-15)	( 3-16)	( 4-17)	( 4-14)
Questionable	( 3-20)	( 2-18)	( 3-19)	( 3-19)
Not Ready	(13-18)	(15-20)	( 6-20)	( 7-20)
<i>Second Grade**</i>				
(28 subjects)				
Ready	( 3-24)	( 1-24)	( 1-24)	( 1-22)
Questionable	( 2-27)	( 2-27)	( 2-27)	( 2-26)
Not Ready	( 6-28)	( 6-28)	(12-28)	(11-25)

\* Numbers in rank order do not go up to 55 as each of the four kindergarten classes was ranked separately.

\*\* Only 26 subjects available for Test 4.

Ideally, if a battery of different kinds of tests is to be given to determine a child's readiness for any given grade, results of the several tests should agree with each other in indicating such readiness or unreadiness. And very frequently they do. If a given child is markedly advanced in one area of behaviour, in this instance in his response to the developmental examination, it very often happens that he also shows himself to be advanced in visual behaviour and in his response to such a projective test as the Mosaic. A child who is conspicuously retarded on the developmental examination tends to give immature or inadequate responses to the visual and projective tests.

However this is by no means always the case. Development in any given child can proceed unevenly. This is frequently demonstrated in a child's response to the Gesell Developmental Schedule in infancy or in the preschool years (4), where any given child may well be advanced in language and personal-social behaviour, but considerably behind the average in motor and adaptive, for example.

Thus from our experience with other tests we would anticipate that there would be a conspicuous degree of correspondence in adequacy or inadequacy of response to the developmental, visual and projective tests (the three kinds of tests used in the present school readiness battery), but by no means complete correspondence<sup>2</sup>.

Table 6 indicates the extent to which each group of subjects (original kindergarten, first grade and second grade) agree, on each testing, in their responses to developmental and visual examinations.

**TABLE 6**  
**EXTENT TO WHICH MOSAIC RESPONSE AGREES WITH DEVELOPMENTAL AND VISUAL TESTS**  
**IN INDICATING SCHOOL READINESS OR UNREADINESS**

	Developmental and Visual agree			Mosaic agrees with other two	
	Total no. of cases	No. agree	% agree	No. agree	% agree
<i>Kindergarten</i>					
Test 1	78	53	68	46	87
Test 2	82	51	62	43	84
Test 3	66	46	69	31	67
Test 4	65	44	68	24	54
<i>First Grade</i>					
Test 1	25	22	88	20	91
Test 2	26	18	69	13	72
Test 3	22	14	64	9	64
Test 4	20	12	60	8	66
<i>Second Grade</i>					
Test 1	31	18	58	14	78
Test 2	29	18	62	13	72
Test 3*	29	20	69	10	50

\* Developmental and visual tests were not available for the second graders in their fourth year.

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As this table shows, there is agreement in the readiness evaluation made on the basis of the developmental and visual examinations in from 58 per cent to 88 per cent of the subjects in any one group. The greatest degree of agreement occurs in first-grade subjects (six-year-olds) on the first test. The smallest amount of agreement

<sup>2</sup> It is anticipated that after we ourselves have become more experienced in the evaluation of school readiness test responses, and when the Mosaic response in children is understood better, an even greater correspondence will make itself evident.

occurs in second-grade subjects (seven-year-olds) on their first test.

Considering only those cases where the developmental and visual evaluation agree, we have determined in what per cent of subjects the Mosaic evaluation agrees with the other two tests. Table 6 shows that this percentage ranges from a low of 50 per cent in original second graders on their third test, to a high of 91 per cent in first graders on their first test. In every group of subjects, the degree of agreement between Mosaic and other tests decreases from first to later testing sessions. Why this should be the use is most difficult to explaining. Certainly it does seem that we find it more difficult to reach an effective determination of school readiness as the child grows older.

## **6. Further Check on Mosaic on Indicating Readiness or Unreadiness**

A slightly different approach to the same data was made by listing all subjects (eight) who were judged consistently ready by all, examiners, and all subjects (12) who were judged consistently unready by all.

Then we checked to see how many of the consistently ready subjects were in the top third of their class group as MosaiCs were arranged in rank order from best to worst; and how many of the consistently unready subjects were in the bottom third of the group as to rank order. If the Mosaic were completely predictive presumably all of the consistently ready subjects would fall in the top third of their group; all of the unready subjects would fall in the bottom third.

For the consistently ready subjects, on every one of the four examinations swindle, 75 per cent of the subjects did- fall in" the top third of their group. Thus there appears to be a strong relation between school readiness and excellence of Mosaic performance.

For the consistently unready subjects, on every 58 per cent fell in the bottom third of the as to Mosaic performance, on tests 1 and 2, and only 50 per cent on tests 3 and 4. Thus though excellence of Mosaic performance and school readiness seem highly correlated, the same amount be said for unreadiness and poor MosaiCs

performance. Few “ready” children make poor Mosaics; but a good Mosaic does not appear to be necessarily a sign of readiness unless supported by good performance on other tests.

### **7. Quality of Mosaic Response: Compared with Teachers’ Judgment: of Readiness: or Unreadiness**

One of our chief interests in the present investigation was to determine the extent to which the quality of the child’s Mosaic response agreed with the teacher’s evaluation of his school performance.

At the end of each school year, teachers were asked to rate each child as ready for promotion to the next grade, questionably ready, or not ready. Ideally, if the ‘Mosaic response is predictive of school performance, all “ready” children would have received a + on their Mosaic, all “questionable” children a 1-, and all “not ready” children a —.

We have chosen for comparison Mosaic products made during the first year of our experiment with teachers’ judgments made at the end of that first year—this because teachers’ judgments tend to be more discriminating and incisive the younger the pupil. By the time a child is in the third grade or higher, assuming that he has continued to be promoted even though unready on our tests, a teacher appears to be very slow to give him a flat “unready” evaluation.

Table 7 shows the extent to which evaluations of the Mosaic response agreed with, teachers’ evaluations. Though correspondence is far from perfect, it will be seen that more often than not children judged ready by the teacher had earned a + on their Mosaic product; those rated questionable had earned a ± those rated not ready, a —.

**TABLE 7**  
**FIRST MOSAIC FOR EACH GROUP COMPARED WITH TEACHERS' JUDGMENTS**

Teachers' judgment	Mosaic rating			Mean mosaic rank order, best to worst
	+	±	—	
<b>Kindergarten Group I</b>				
Ready	10	3	0	8.07
Questionable	0	1	0	7.00
Not ready	0	0	3	12.00
<b>Kindergarten Group II</b>				
Ready	3	7	0	6.80
Questionable	0	4	2	9.33
Not ready	1	1	0	12.00
<b>Kindergarten Group III</b>				
Ready	3	2	2	7.85
Questionable	1	5	0	7.83
Not ready	0	1	4	12.75
<b>Kindergarten Group IV</b>				
Ready	3	4	1	7.62
Questionable	2	2	2	8.17
Not ready	0	0	2	13.00
<b>First Grade</b>				
Ready	7	0	0	7.43
Questionable	5	4	2	11.18
Not ready	1	0	0	18.00
<b>Second Grade</b>				
Ready	8	10	0	15.26
Questionable	4	2	0	10.17
Not ready	1	0	1	24.50
All judged ready by teacher	34	26	5	8.84
All judged questionable by teacher	12	18	6	8.95
All judged unready by teacher	2	2	11	15.37

A second method of comparison figured mean Mosaic rank order scores for all subjects (in each class group) for children judged ready, questionable, and not ready. As Table 7 shows, in most instances Mosaics of "ready" students were clearly indistinguishable from those of the "not ready" students. Accurate distinction between "ready" and "questionable" students was difficult to make.

#### **D. Discussion**

The Mosaic test, like any projective technique, has a double task. It presumably indicates the developmental level at which a child is performing, while at the same

time it gives clues as to personality structure. However, the Lowenfeld Mosaic is still a rather new test and developmental studies dealing with it are still in their infancy. Thus at our present stage of knowledge we cannot always distinguish immaturity from basically meagre endowment. It is hard to say whether the child who makes a poor Mosaic is simply immature, or whether he has an extremely meagre: personality endowment which may not "improve" even with added age.

Thus if a six-year-old boy makes a typical four-year-old circle of six large triangles, we cannot always be certain whether he is performing at a Knur- year-old level now but may later catch up, or whether he is merely showing a limited personality makeup and possibly low intelligence. Obviously, so far as school is concerned, if the poor product is confirmed by other tests as indicating immaturity, revised grade placement and a slower course in school may be indicated. If, however, the poor Mosaic indicates an impoverished personality but not accompanying immaturity, corrected grade placement may not be the solution. (In fact, there may be no "solution.")

Findings of the present study, as indicated above, are that the Mosaic test seems to agree well with other tests in indicating school readiness or unreadiness in five- and six-year-olds. By seven Years (second grade) and thereafter, it is somewhat less useful. The reason seems to be as follows:

In the first six years of life, the Mosaic, whatever it may tell about individuality, seems clearly to show developmental status. It is fairly easy for the experienced examiner to distinguish between two-, three-, four~, five-, six-, and in many instances seven-year-old products. This developmental distinction is somewhat harder to make by eight and nine years of age. (Also by eight or nine years and following, the Mosaic seems to tell us fully as much about basic individuality factors as it does about sheer development. Thus by these ages, the examiner is called upon to distinguish as much between different kinds of personality as between different developmental levels.)

Thus so far as five~ and six-year-old children are concerned ( kindergarten and first-grade beginners) the Mosaic appears to be quite useful in deter- mining school readiness since it quite clearly can indicate children who are not up to a five-

or six-year-old level of performance. Therefore it is useful in ruling out the extreme cases.

By second and third grade (seven and eight years) the extreme cases have usually been ruled out by normal school procedures. And the Mosaic of itself is now revealing as much about individuality as about developmental level. Thus its task is for both these reasons less than earlier, one of determining developmental level, and it is for this reason somewhat less useful as a test of school readiness.

However, even as late as seven and eight years of age, though here we would not wish to depend on the Mosaic alone to determine school readiness, it is still useful in spotting the atypical personality. Thus when other tests suggest questionable readiness, but the diagnosis is not clear, the projective tests often show an atypical personality and thus help considerably in clarifying the problem.

## **E. Summary**

The present study aims to determine the extent to which the Lowenfeld Mosaic test is useful in predicting school readiness in children from kindergarten through fifth grade, and the extent to which Mosaic-test results correlate with findings from developmental and visual tests, and with teachers' evaluations of readiness.

Subjects were 81 kindergarten children, most of whom were later available in the first and second grades, 28 first graders tested subsequently in second and third grades, and 31 second graders tested subsequently in third, fourth, and fifth grades. These children were students in a public primary school in Connecticut, the majority being of high average or superior intelligence and coming from professional or semi-professional families.

Earlier publications have attempted to show that clear-cut and to some extent predictable age changes do occur in the child's Mosaic product. These stages have been defined elsewhere (1, 2). Knowledge of these age changes, and of more or less what to expect at any given age, permitted us to arrange the products of each of our three groups of subjects in rank order, from best to worst. Rank order from test to test,

that is from year to year, was shown to be relatively consistent for all three groups of subjects. We also found some support to the hypothesis that better endowed individuals do in general tend to behave more consistently, from age to age, in relation to the total group performance than do those who are less well endowed.

Then a check was made to see whether or not the Mosaic test was useful in determining school readiness, and whether results on the Mosaic agreed with those in other types of tests. Subjects were divided, each grade separately, into three groups – those judged by all examined as being consistently ready from year to year; those who were questionably ready; and those who were unready. Mean and median Mosaic rank order was calculated, for each class, for the ready, questionable, and unready groups. Almost without exception, the means and medians for the “ready” students were lower (i.e., showing a better rating) than those for the “questionable” students; and means and medians for the “questionable” students were lower than those for the unready students. That is, subjects whose rank order showed them to be among the best in their group for their Mosaic product, were more likely to be ready as judged by other tests, than those near the bottom of their group in rank order. However, in spite of this there was a, rather wide range of rank order in every group. Thus some “ready” children did make a poor Mosaic; some “unready” children, a good one.

A specific comparison of Mosaic results with those of developmental and visual examinations shows that among the three groups of subjects and on the several annual tests, in those instances where the developmental and visual examinations themselves agreed, the Mosaic agreed with these other two tests in from 50 per cent to 91 per cent of the subjects in any one group. The greatest degree of agreement occurs in the first grade. (six-year-old subjects) and in kindergarten subjects (five-year-olds) on their first tests. Agreement becomes less good as subjects grow older.

Though correspondence between excellence of Mosaic product and teachers' evaluations of school readiness was far from perfect, it was found that more often than not children judged ready by the teacher had earned a + on their Mosaic product; those rated questionable had earned a ±; those rated not ready, at —. Our subjective impression was that teachers' judgments as to readiness or unreadiness were more incisive and discriminating, the younger the pupil. By the time a child is in third grade

or higher, assuming that he has continued to be promoted even though unready on our tests, a teacher appears to be very slow to give him a flat "unready" evaluation.

Present findings suggested that the Mosaic test is most useful in predicting school readiness, or at least in supplementing other tests in arriving at such a prediction, at five and six years of age, at which ages any readiness test can be most useful, practically, so far as determining school placement is concerned.

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