Dr Margaret Lowenfeld Trust

The Lowenfeld Kaleidoblocs Test

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Introduction

As the field of clinical psychology widens it becomes steadily more necessary that methods should be devised which can be used as a supplement to the interview technique. Whether this be the psychiatric applicants for a job it became increasingly evident that the work of the interviewer must include a survey of the main elements of personality.

Detailed tests of individual aspects of personality are readily available, tests of intelligence, of performance, of affect and of attitude, but all these take time to administer and score and must be administered one by one. This machinery is not suitable for use with interviewing, it is too cumbersome for instance for the general practitioner who is often sorely in need of means of quickly estimating temperament and demands too large and specialised a team of workers to be readily usable by the ordinary man and woman who needs to select staff. The Kaleidoblocs test is an attempt to provide a many facetted instrument which gives information upon a large number of different points and which enables an interviewer to make a rough assessment of personality which can be deduced directly from what is done with the material presented by the interviewer, individual aspects of which can be fully investigated later.

Although this was the original aim which led to the design of the test preliminary work with it showed that it had possibilities beyond those originally conceived.

During the war it was brought home to use that there is a great difference between the possession of inherent qualities and the power to mobilise these qualities for effective use in response to the demands of external reality. It can even occur that individuals with comparatively mediocre inherent endowment can make more effective response to external reality than others of greater inherent ability, if or certain types of personality. Such ability to mobilise inherent ability and use it effectively, arises out of a combination of a number of different factors whose interaction it is difficult to estimate. The Lowenfeld Mosaic Test was designed as one approach to the study of these factors and the Kaleidoblocs test is a development of this line of investigation to which three-dimensional blocks are used which are geometrically related to one another.

The test material is planned to consist of three elements A. a group of three curved pieces of wood which it is impossible to make use of without the exercise of some degree, however small, of imagination. B. Four triangular blocks coloured green which are part of the material for imaginative use, but which also permit of a strictly organised test of space perception and of spatial logic and c. 19 rectangular pieces of

wood of different strictly interrelated sizes. The exact composition of the test materials is as follows.

A. A piece of wood 12 units in length 1 ½ in width with a straight side and the other curved into the segment of a circle rising to a height of 2 units at its central and highest point. This piece is painted white on its plane surface, blue on its curved surface and red on its sides. Two separate pieces of wood each with one curved and one straight side, the straight side 6 units in length, the curved side fitting over half of the arc of the segment. When these two pieces are fitted over the arc these three pieces make a rectangular block 12 units x 2 units x 1 ½ units.

B. Four identical right-angled isosceles triangles, the short sides of which are equal to 2 ½, the thickness being 1 unit. These are all painted green.

C. A series of 19 rectangular blocks of different sizes, shapes and colours, as follows:

   1 rectangular block 5 units in length x 1 unit x 1 unit, painted blue
   1 rectangular block, 3 units in length x 1 unit x 1 unit, painted green
   2 rectangular blocks, 2 units in length x 1 unit x 1 unit, one painted red and one yellow

   2 flat blocks, 3 units in length x 1 unit x ½ unit, one painted red and one blue
   4 rectangular rods, 3 units in length x ½ unit x ½ unit, painted respectively red, green, yellow and white

   3 cubes, 1 unit x 1 unit x 1 unit, painted respectively red, green and white
   6 half-cubes 1 unit x 1 unit x ½ unit, four of which are painted respectively red, green, yellow and blue, and the remaining two white

Since both the centimetre and the inch are used as the unit of linear measurement, an arbitrary unit has been used which can be directly converted either into inches or centimetres as desired.

These pieces are geometrically related to each other as follows:-

a) When the blue, green, red and yellow rectangles are placed linearly along the side of the arc and the other pieces placed upon them arranged to the height of one cube, a regular rectangular block is composed 12 units in length x 1 ½ x 2 ½. If the four triangles be arranged in two squares one

above the other, these fit at the end of this block together composing a rectangle of 14 ½ units x 1 ½ x 2 ½.

b) The dimensions of the garden rectangle can be constructed either by 3 cubes; 6 half cubes; superimposition of the two flat pieces, or by arrangement together of the four rods.

c) The green and either the red or yellow rectangle together compose the blue rectangle and the red and yellow rectangle each equal in volume two cubes or four half cubes.

Colour. The colouring of the pieces is designed to make possible certain of the geometric problems included in the second part of the test and to enlarge the scope of the representational possibilities of the first part as follows.

a) **Arc.** This is painted blue on the curved surface, facilitates the construction with the blue pieces of a stage. The red of the sides is a suitable colour for a bridge, or roof, and the white of the plane surface is used at times, with the white pieces as 'ghost ship'.

b) Triangles. Green was chosen for the triangles as these are constantly used in section I of the test to represent trees, bushes or grass, and for uniform in colour as they are planned for use in a test of constructive ability in problems II of the instructions.

c) The colouring of the rectangular blocks has been arranged so as to make possible problems VII, VIII and IX.

General Characterisitcs of the Test

As explained in the Introduction the basic concept of the test is the provision of a limited number of materials in an easily portable shape which can be used in a very wide variety of ways. These fall into two main types – those concerned with the use of the materials for free imaginative constructions, and the use of the exact geometric qualities of the test materials for the posing and solving of a number of defined problems. The Kaleidoblocs possess the same characteristic as the Mosaic Test in that they combine the qualities of a test with those of an exploratory and expressive technique. When regarded from the angle of a test the materials and their use permit of each comparison and standardisation, particularly in relation to problems concerned with the manipulation of B and C. In relation, however, to the imaginative use of the materials can be used and, in this sense, the Kaleidoblocs, like the L.M.T., is a tool of expression which can be used repeatedly, either during psychotherapeutic treatment, or to study the process of development in individual children.

History of the Test

After a good many years' work with the Mosaic Test, it became evident that to a certain proportion of subjects the strictly geometrical shapes of the pieces and their two-dimensional effect restricted the use of the materials of the test for expression of non-verbal ideas and concepts. It was decided therefore to attempt to construct a test in three dimensional which would a) complement the L.M.T. and add possibilities of testing logical reasoning and spatial perception b) investigate the possibilities of providing varied material for imaginative use which should at the same time be new to the subject and not limited by skill.

It was during the 1939-45 war that the test was designed, and a limited number of sets manufactured. War conditions made manufacture of accurate sets difficult and also limited experimentation with them. Nevertheless, a good deal of varied experimentation became possible, and in 1949 a provisional set of Instructions was drawn up * which listed 21 possible designs for the triangles (diagrams supplied) and XIV problems.

During 1950 the author visited U.S.A. and had the opportunity of discussing the test with Dr. Bates Ames and Miss Learned of the Gesell Institute and with the Psychological Corporation. On return from U.S.A. work on the L.M.T. both limited the amount of time that could be given to the development of the Kaleidoblocs test through the parallels offered between it and the L.M.T. In the meantime, post-war conditions continued to make it difficult to secure satisfactory manufacture of the materials of the test (a difficulty not yet adequately surmounted), while increasing understanding of the possibilities of the test made the issue of fresh instructions essential. A detailed description of the test has therefore been delayed until the 1955 and the present is the first publication of the authors on the test.

Aims of the test.

There are strictly relative to the design of the materials and are as follows.

1. Study of Imaginative and Constructive Power.

We have at present no test or test materials with which dramatic, artistic, or imaginative ideas can be expressed in a manner in which everything remains constant for every subject, except what is actually done by the subject with the materials, and which is independent of skill and past experience.

To measure the degree and mode of creativeness of one individual as compared with another the possibilities open to each must be identical. The first element of the test achieves this aim by putting before the subject three pieces which can be used to form a sailing ship, an arch or bridge, a 'Chinese' gate, and undulating

highway, the proscenium of a theatre, or part of an abstract design, composed in either a vertical or horizontal position.

The distribution of shapes and colours among the other pieces and the arrangement of colours on the arc make all three groups of pieces suitable for use together in carrying out designs. Thus, if the arc is placed on its side on the table with half arcs as wings and the three bleu pieces placed in diminishing length in front of this, a stage with steps emerges. A green triangle on the green block can represent a tree – or on the green cube, a bush. The cubes and rods can be grouped on the 'deck' of the arc to represent the superstructure and funnels of a steamship, or the rods used as guns on the deck. The four green triangles are often used as bushes along a road or river. Some children use these pieces as gang-planks leading from the ship to a wharf or jetty.

Figure I… Illustrates an ingenious use of the pieces, by a boy of years, to form a human figure; and there are many other possibilities.

The similarity of shape in many pieces with differentiation of colour, gives an indication, by the use he makes of them, of the relative importance to the subject of form or colour.

It has been found that the constructions made with this material by subjects of all ages fell into the same major classifications as occur in the Mosaic Test.

2. Study of Processes of Thought in Adults

In the Mosaic Test it is possible to follow the processes of thought in a subject when offered the free use of strictly structured material within a given area: what is not possible, however, is to see the reaction of the subject to a set task. It was the desire of the author to find a means of discovering the mode in which subjects set to work to solve problems of a definite nature, such as are met with in life in tasks of organisation and administration, which led to the design of the four green triangles. Few subjects succeed in completing the whole of the 21 possible arrangement of the four triangles, and in their mode of attack upon the problem subject demonstrate quite directly their spontaneous reaction to problems involving organisation both of though and of materials.

3. Study of Personality

We have a very large number of tests which enable us to place a given subject in relation to his possession of qualities common to all human beings, but very few which enable us to differentiate the mode in which these qualities are combined in any one individual. Such tests as we possess, for example the Rorschach and the T.A.T., deal in the main with affective elements. It is the intention of the Kaleidoblocs to

supplement these with the possibility of investigating the mode in which intellectual, perceptive, logical, and imaginative qualities are combined in the given subject, and to do this with a single instrument which is of convenient size and simple structure.

4. **Vocational Guidance**

As an extension of 2, problems can be set with this material which throw light upon the subject's ability to image shapes in unfamiliar positions, to test 'packing' abilities, and the K factor. Here again the question of ode of attack becomes important.

5. Study of Development in Children.

As has been shown y Ames and Learned* the Kaleidobloc materials are a valuable tool for the study of two aspects of childhood:

a) In the working out of a general schema of development
b) In the study of individual differences and their relation to personality structure.

6. Study of educational difficulties in children

In the routine examination of children with educational difficulties it is valuable to be able to examine the ability to conceive of arithmetic and geometric facts from an angle of which the child has no previous experience. The inter-relations of the 19 pieces of group C make possible the presenting of an almost indefinite number of simple arithmetical and geometrical problems, beginning with as elementary a problem as addition and subtraction of units and recognition of elementary geometric shapes.

General Plan of the Test

If the full materials of the test are used, as for instance in personality studies which will be taken as the type used, the presentation of the test to the subject falls into three parts.

I. The presentation to the subject of all the 26 pieces spilled out in the haphazard manner on the table. The subject then is asked to do what he will with the pieces.

II. When this has been completed, discussed and recorded, pieces A and C are removed, and the subject presented with the four isosceles triangles only and asked to make as many different arrangements with these he can.

III. These triangles are then removed and, with the pieces composing C, a number of problems are set. This part of the test finishes with the addition once more of A and B to C and the request that the whole 26 pieces be built into a single rectangular lock

The detailed manner in which sections, I, II and III are presented varies according to the purpose the examiner has in mind.

Owing to the wide range of applicability of the test it is essential that at that outset the examiner should decide upon the exact nature of the results he wishes to achieve. The mode of presentation of the test should then be adapted to the goal to be reached.

Children

For example, Ames and Learned in their studies of 350 American children, composed of 25 girls and 25 boys of each of the following ages: 2, 2 ½, 3, 3 ½, 4, 5, and 6 years, define as their aim ". . .to determine to what extent this was a useful test when applied to young children. Would children respond positively to it? Could it be recorded in such a way as to make the results unable for research? Would behaviour from child to child e similar enough that any sort of norms or age standards could be set up? Would any patterned sequence appear as to the type of manipulation characteristic of the several age levels?

We were also interested to note the extent and type of verbalisation, dramatization, response to colour and shape of the blocks, types of structure built, as well as the child's manner of manipulation.

And lastly, would it be possible to determine individuality of personality differences y means of this test?"

Ames and Learned describe their procedure as follows: ". . .The subject is seated at the examining tale and is instructed as follows: Here are some locks, all different colours, different sizes, and different shapes. You make something with them. Anything you like".

Subject then is allowed to build, with no further instructions, until he indicates that he is finished. He is then asked, unless he has already told, "What did you make? Further comment may be elicited by the question, "What kind of a. . . . . ?"

As a rule, the subject will talk spontaneously as he builds, and Examiner may converse with him so long as no suggestions are made which would influence or interfere with his spontaneous production.

Total building time should be noted for each subject. However, since an occasional child may go on and on manipulating the blocks, using and re-using the same ones endlessly, we followed the policy of stopping subjects arbitrarily at the end of 10 minutes of building time. Among our subjects only a few were still working by the end of 10 minutes . . .”

It will be seen that in this approach the Examiners have presented the materials of the test to the children in a rigid and schematic fashion allowing of exact numerical comparison of response with response.

On this other hand if that test is to be used as one of the tools in a psychiatric estimation of a child of good intelligence referred for school failure, the mode of approach is as follows:-

The materials of the test should be presented spilled out upon the table without any definite arrangement and with the box concealed, and the child invited to do something with them, not mentioning to him that this is a test. The examiner sits silently beside the child observing the use made. The child will then either:-

a) Refuse to do anything with it, perhaps saying he does not know what to do.

b) Set out to make a definite construction with the materials, which may be:

    i. A representation of an object, person, scene, phantastic representation or idea.

    ii. A completely abstract design

    iii. An incoherent arrangement in which it is difficult to follow the mental processes involved.

In these constructs he may

    i. Use all the material

    ii. Attempt to use all the material and fail to do so

    iii. Deliberately omit blocks of a definite class such for example as the curved blocks

    iv. Selection certain of the blocks, discarding others

In these constructs he may

i. Make use of the three dimensions of the blocks, as when, for example, an arch, ship of building is made.

ii. Use the material as if it were two-dimensional, the blocks being laid flat on the table.

iii. Combine these two uses.

When the child says the construction is complete the examiner will discuss it with him, and endeavour, without the use of leading questions, to ascertain whether:-

1. He is pleased with what he has constructed and has enjoyed the working out of it.

2. Is displeased with his construction and considers it to be a failure.

3. Has no attitude towards it.

4. Would have liked to make something different from what he has constructed but found the materials unsuitable.

The examiner should then note his own objective estimate of the production and rate it in relation to the child's age and social background and whether or not any neurotic or psychotic elements appear, either in the structure itself or in the subject's reactions.

The curved pieces are now removed, and the examiner selects from the series of problems descried in the manual of Instructions that he considers suitable for investigation of the child's particular problem, and his performance is noted.

Report on the test is made through comparison of the child's responses to each item of the test with his reported school performance and through study of the nature of the responses themselves.

Adults

On the other hand, should the test be used with an adult or adolescent as part of an examination for vocational guidance the procedure would be as follows:

The materials of the test are presented spilled out upon a table with the box concealed. The subject is then informed that what he sees before him are the materials of a test, but one which is composed of a number of possibilities and brings in many

qualities. It is explained to him that it consists of two part, in the first of which he is asked to use his best endeavours to do something which seems to him both suitable and satisfactory with the materials, but of what kind is left for him to decide. When this first stage has been completed the curved pieces are removed and all, but the triangles put on one side. It is then demonstrated to the subject that the four triangles can be combined to form a solid block with smooth edges, either flat, one pair laid upon the other or stood on their sides. The four triangles are then separated, and the subject invited to see in how many ways he can combine them so as to make a solid symmetrical structure with smooth edges. A time is set for the carrying out of this exercise and there are 21 possible combinations of the triangles.

These triangles are then removed, and a selection made of the possible exercises in the manual of Instruction, suitable for the type, culture and probably abilities of the subject. His manner during the whole of the test and any remarks he makes being carefully noted.

Variants of the modes of presentation are adopted for the use of the test in examination of very neurotic subjects, of psychotics, or in cases where the examiner is interested in one particular quality: for example, the K factor. Remarkable differences in response to the test appear among 'normal' people and these differences do in actual fact correspond with the aptitudes of these people for practical tasks. Sometimes differences are unexpected, as when some problems are solved with almost lightning speed by one individual and prove almost insoluble to another of equal level of abstract intelligence and culture – and even at time of identical professional standing in the same profession.

It is only with experience that the subtleness and vividness of the picture of the personality of the subject which emerges during his performance of the test, becomes appreciated. It is a Lawrence K. Frank has written of this type of phenomena. . ."It cannot be too strongly emphasised that data are only data, and no matter how refined and precise may be the technique of recording or measuring those data, they must of necessity be interpreted or given some meaning according to a theoretical conception or mode. Today it is recognised in at least the physical sciences that there is no such thing as sheer empirical induction since the investigator always starts with a conception which he then formulates as a question or problem and selects methods he will use and makes the observations we can data, always in accordance with this prior conceptual formulation. Einstein remarked some years ago that one of the major errors of Nineteenth Century science was to believe that theory could be derived inductively from facts. Today, therefore, I think we can say that those who assert that they have no preconceptions and are concerned only with making observations and learning from the facts are exhibiting what might be called pseudo-objectivity, whereas a more meaningful kind of objectivity is expressed by an individual stating in advance his preconceptions or theoretical model so that the reader will be informed and under no illusions about the investigator's theoretical commitments. This means that theory

is now becoming not an explanation but rather a progress for research, and a conceptual model functions as a systematic representation of what is believed to be operating so that the investigator then can hold his model up against the world and discover what he has omitted or failed to take into account (see **American Scientist**, April, 1952, "The rain as a Mechanism," by MacKay, Kings College, London University) . . ."

Treatment of Results

The treatment of the results of administration of the Kaleidoblocs test to any subject will depend upon the goal of the investigation.

Young Children

In their two papers Ames and Learned have, in their treatment of their results, laid down a method by which the materials of the test can be used in the study of development in young children, for the differentiation of individual personality types and for comparison with Rorschach and L.M.T. The term 'test material' rather than the 'Kaleidoblocs Test is used advisedly here since these authors do not attempt to use any of the set problems included in the Instructions.

Although the 19 rectangular blocks have been used by the writer for the study of perceptions of colour and form in young children and in a limited number of educationally sub-normal children, the work has not been carried out in a sufficiently organised way to permit of the drawing of definite deductions. The response, however, of the children to a varied number of elementary problems has been encouraging.

Children of School Age

When the test is used for children of any age over 7 treatment of the results falls into two parts, treatment of the response to Section I and of Sections II and III.

Section I

While there is hardly any end to the varieties of response that can appear yet, as previously pointed out, these fall into the same main groupings as the responses to the L.M.T., but with the additional fact that both vertical or horizontal presentations can be made. The individual shapes have been deliberately arranged to be uneven in number and/or asymmetrical in colour so that symmetry, if it appears, might be deliberate and not accidental.

The grouping of the Kaleidoblocs locks into the three groups A, , C has been devised in order to make possible the study of individual variants in the use of unfamiliar material; repetitive material, and an irregular collection of rectangular blocks, symmetrically related in shape but not in colour.

As discussed below, the second and third groups of blocks bear a relation to the materials of the Vigotsky Test, and according to the manner in which they are made use of the examiner, can elicit a very wide variety of response from their subjects, bringing to light some of the range of data covered by the Vigotsky Test.

Significance in the subject's response to section I is heightened, as compared to the L.M.T., by the difference between the arc and half-arcs and the rest of the blocks.

As pointed out on p.8., a very common use of these blocks is to build them into a ridge. The relation between the bridge thus formed, however, and the rest of the blocks, can express as definite differences in the total significance of the response as can any of the standard classifications of the L.M.T.

For example, in Fig. 1 a straightforward ordinary presentation has been made of a well-constructed bridge, in which, however, 12 of the blocks have not been used and there is a heavy emphasis on buttresses to the bridge. In Fig. 2., on the other hand, the arc rests directly on the two half-arcs, and all the rest of the blocks are packed within the space between the uprights.

In Fig. 3 the blocks are 'laid' flat upon the tale, the half-arcs used in the reverse direction to that in Figs 1 and 2, the narrow ends projecting away from instead of supporting the arc, and the curves of the half-arcs both facing to the right. Within the central space the rest of the blocks are arranged in as nearly a symmetrical manner as is achievable with these blocks.

Correspondence to these differences of construction, Fig. 1 was made by a 13 year old schoolgirl of above average intelligence inclined to be anxious and to expend unnecessary effort (comparable to the buttresses) on her work, which reaches a high standard. Fig. 2 was made by a boy of 13 years of approximately the same intellectual ability, who was isolated, unable to mix or make friends and said to be 'strange'. Fig. 3, was made by a girl of 16 years of above average intelligence, said by her school to be sulky and difficult and to be in need of help.

The way in which any collection of responses in which these blocks are used falls into distinct groups, is very striking.

Section II. The main value of this section is the insight it gives into the mode of thinking of the subject.

Section III. As with all problem tests, these can only be used once and the choice of which shall be presented depends upon the general intelligence and age of the child and the purpose of the individual test. Only a beginning has been made of the work on this part of the test and no standard tables have yet been devised.

Adults

Section I. An interesting point observed in the results so far obtained is the tendency of adults of superior intelligence to use the material for abstract patterns.

Section II. Here, a with old children, the main value of the test is the light it throws not only on the subject's power of imaging the pieces in different positions but also on his mode of tackling a problem which has its own inherent logic. Rapid and logical performance of problems V, XI, XII, XIII, XIV, XV, indicates the ability to analyse up a complex "whole" into parts other than those which obviously constitute it; and to re-synthesize these parts into some other complex "whole". This ability has been found to extend to situations other than those dependent on the manipulation of actual concrete material such as that of the test. Failure on item XV in particular indicates the perseveration of one particular idea from which the individual is unable to break loose.

Section III. These problems have been devised to explore the subject's power of constructive imagination, of spatial perception and organisation, and of elementary mathematical deduction. It is the arrangement of successes in these problems with that in Problem II and the deductions drawn from Problem I that together give the information derivable from the rest as to the personality construction and abilities of the subject.

Summary A test is describe consisting of 26 blocks differently shaped and coloured and a brief account given of its history, its design and purpose. The comparison is made between this test and the Lowenfeld Mosaic Test and it is pointed out that while two sections of the test can only be used once, the first sections offers possibilities of frequent use in the study of development and in the process of psychotherapeutic treatment. The construction of the test is described, and a brief account given of its use for the testing of young children, children of school age and adults.