

**A STUDY OF THE USE OF COLOUR
IN SERIOUSLY-ILL, ILL AND HEALTHY CHILDREN'S
SPONTANEOUS DRAWINGS**

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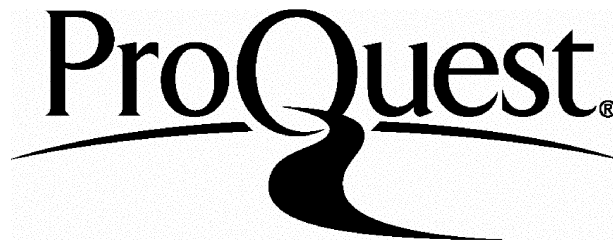
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Abstract

This exploratory study examined whether the number of colours seriously-ill and ill children used in their spontaneous drawings varied from those used by healthy children. The potential influence of sex, intellectual ability, anxiety and severity of illness was also examined.

Thirty children aged from 4-12, took part in the study. The results confirmed a statistically significant association between illness and a lower number of colours used by children in their first free drawing ($p .01$) but the level of significance faded over time (drawing No 2 $p < .02$ and for drawing No. 3 $p < .03$). However, post-hoc comparisons supported the differences in colour use between ill and healthy children. The investigation also showed that anxiety may have an effect but whether this is related to the size of figures or indeed the size of children's drawings on a page rather than their use of colour is not known.

Given that this was an exploratory study using basic measures many questions remain, but the association between colour use in children's drawings and their state of health has been placed on a research footing, and further studies are suggested.

The overall aim has been to broaden the field of enquiry into children's drawings to include colour content, placing this clearly within the field of developmental psychology.

INTRODUCTION

A moment's insight is sometimes worth a life's experience

Oliver Wendell Holmes

Past and present research into the psychology of children's drawings has been diverse and informative, but while anecdotal evidence of the importance of colour in their drawings is abundant, surprisingly, systematic psychological evaluation has been consistently lacking.

In this context the research of Bach (1966, 1975, 1980 & 1985) is considered important since it focused on spontaneous drawings of seriously-ill children and suggests not only an association between the child's drawing and emotional state but also their physical condition. Typically, children diagnosed with leukaemia demonstrated a striking lack of colour in their drawings produced during the anaemic phase of the disease.

The validity of these observations and the potential for evaluation of somatic aspects of free drawings would seem to have been largely ignored in the psychological and medical literature (Psychological Abstracts 1969-1997 and Medline 1969-1997). Theoretically, is it feasible that the colour content, or lack of it, in children's free drawings may be associated with their state of health?

Based on the clinical work of Bach, a preliminary study (Stephens-Parker 1990) was carried out to determine whether seriously ill children, aged between 4 and 12 and diagnosed with leukaemia, would use significantly fewer colours in their free drawings compared with children who were not seriously ill. A standardised set of coloured pencils was used throughout the investigation, and statistically significant results supported the possibility that the colour content, or lack of it, in the children's drawings may be associated with their state of health.

However, the findings of this preliminary research require rigorous investigation using longitudinal methodology before empirical support can be claimed for Bach's findings. Also in order to assess the relationship between the number of colours used in a free drawing situation and a child's state of health, other factors need to be examined.

Spinetta and Deasy-Spinetta (1981) emphasised the psychological state of the seriously-ill child, in particular anxiety. Equally, intellectual level may influence the number of colours used by children in their drawings. An independent measure of a child's functional status in response to disease, treatment, relapse or remission each time they draw is also relevant.

In the previous study (Stephens-Parker, 1990) the age of the children was not significantly associated with colour usage, nor was sex, but these will be examined.

Cultural background may affect children's use of colour but detailed investigation of this factor is outside the scope of this present research, although cross-cultural studies at some stage would be important.

The specific aims of this present study are therefore:

- (1) to replicate the previous study.
- (2) to investigate longitudinally whether the number of colours used by children in their free drawings varies with their state of health.
- (3) to examine other variables that may affect the colour use in children's drawings as follows:
 - a. anxiety
 - b. intellectual level
 - c. changes in a child's functional status
 - i) by use of validated play-performance scale
 - ii) by retrospective research sister's rating of a child's physical condition
 - d. age and gender of each child

The data were subjected to statistical analysis (SPSS-PC) and discussed.

Since this study is the first systematic attempt to investigate the use of colour in children's drawings and a possible link with their state of health, it is considered that by limiting the investigation to these basic measures this will increase their reliability and validity, and make replication with other paediatric or adult populations possible.

This was an experimental, longitudinal study and various practical and procedural problems occurred, for example, an adjustment in the development of the methodology. Details are given where appropriate.

2.

REVIEW OF LITERATURE ON CHILDREN'S DRAWINGS RELEVANT TO THIS STUDY

A picture says more than a thousand words

Ancient Chinese Saying

Historically, there have been two broad approaches to the study of children's drawings, namely Cognitive Developmental aspects and Clinical Projective Techniques.

2.1 Cognitive Developmental Aspects

From the late 19th century to the 1920s research interest in collating and classifying children's drawings relative to their development was widespread. Studies by Ricci (1887), Barnes (1893), Sully (1898), Roubier (1901), Kerschensteiner (1903), provided the basis for the classic work of Rouma (1913), citing clearly defined stages of drawing behaviour. This was supported by the important work of Luquet (1927) who suggested that children learn to draw beginning with simple presentation, move to representation and then on the realistic representation. Luquet's work strongly influenced Piaget (1921-1972) who connected drawing development with the child's cognitive growth, while emphasising the learning aspect. Kellogg (1970) supported a universal pattern of drawing development, citing the general trend among young children who scribble on paper irrespective of their cultural background, then gradually progress through sequential stages of representational pictures. However, Thomas & Silk (1990) maintain there is no evidence of a fixed relationship between age and drawing, quoting a study by Wilson & Wilson (1977) of elderly

immigrants to the USA who had not drawn since childhood, and who, when asked to draw, produced tadpole figures comparable to work normally produced by 4 year olds. Also Alland (1983) suggests claims of a universal pattern of drawing to be exaggerated. Research therefore suggests general trends in the emerging drawing behaviour of young children, but these may be modified as the child matures. Also practice at drawing and exposure to other people's drawings may be necessary for normal drawing development (Wilson & Wilson, 1977, 1985). Thus sensory feedback as well as maturation may be important.

The use of children's drawings was extended to assess intellectual development and first standardised by Goodenough (1926) using a point scoring system, and subsequently revised by Harris (1963) in what has become known as the Goodenough-Harris Draw-a-Man Test. This work formed the basis of other tests of intelligence based on drawings which include Human Figure Drawing by Koppitz (1968) and the Gessell Incomplete Man Test (Kellogg, 1970; Klepsch & Logie 1982). Reliability of the Draw-a-Man test has been demonstrated when restricted to one drawing per child, but not supported by studies using different drawings from the same child because children are known spontaneously to vary their drawings (Hammer 1958, Kellogg 1970, Spinetta 1981, Thomas & Silk 1990). In recent years, drawings as a measure of children's IQ are rarely used except to screen for those of below average intelligence as part of a battery of psychological tests.(Scott, 1981). This may in part be explained by Di Leo (1973) who found that emotional disorders in children distorted results and further often failed to match a child's intellectual capacity. Similarly, visual impairments and physical handicap in children could also distort results.

Of course, some children's intellectual maturity far outstrips their chronological age, and their figure drawings may resemble those of an older age group. Conversely, some children's intellectual maturity lags far behind their chronological age and their

difficulties may be mild or severe. A number of researchers have emphasized differences such as lack of organization and detail and faulty proportions between the drawings of children with and without learning difficulties (Burt, 1921; Goodenough, 1926; Earl, 1933; Israelite, 1936). However Rouma (1913) claimed that children with learning difficulties produce the same kinds of drawings as children without learning difficulties, although the latter produce them at a younger age. This suggests that the child who has learning difficulties is not producing figures which are particularly aberrant, but is simply proceeding through the stages of drawing at a slower pace than the child without learning difficulties. Golomb and Barr-Grossman (1977) compared the contrasting views and tend to support Rouma's findings, except they found that the children without learning difficulties tended to include more detail in their drawings. Similarly Cox & Howarth (1989) suggest that children with learning difficulties exhibit a developmental delay rather than a disorder or deviance in their drawing ability.

Influential among developmental theorists have been Luquet (1927); Piaget and Inhelder (1956); Harris (1963) and Di Leo (1973). Their work suggests that children's drawings reflect their state of conceptual, intellectual and cognitive development. Of particular relevance, has been Piaget & Inhelder's contention (1969) that children draw what they know rather than what they see, in other words, the drawings represent the world as the child perceives it and is capable of reproducing it. This hypothesis also has a long history, and has been supported by observations from researchers in different cultures (Ricci, 1885, from Italy, Piotrowska., 1941-1942, from Poland, and Eng, 1931, from Norway), Prudhommeau (1947), from France states the child draws from a *modele interne*. Wolff (1946), from USA noted children's art refers to an inner realism and indicates emotional development is an important element which influences the child's concept and drawings. According to Lowenfeld & Brittain (1987) drawing can provide the opportunity for emotional growth, and the extent to

which this is realised is in direct relationship to the intensity with which the child identifies with the work. Although not easily measured, the degrees of self-identification range from a low level of involvement with repetitious behaviour to a high level where the child is truly involved in creating meaningful and personally important drawings.

To recapitulate, more recent approaches to children's drawings have dropped the early 20th century idea of universal stages of the development of ability. Consequently, the use of sampling children's drawings as an indicator of development has also fallen into disuse. In their place researchers suggest sensory feedback, maturation and intellectual maturity need consideration when studying children's drawings, but their understanding and feelings may also be important.

2.2 Projective Techniques

The alternative and equally influential perspective, also relevant to this study, has been projective techniques that traditionally use children's drawings to assess personality traits, and as emotional indicators.

Projective techniques and art therapy have evolved from within a psychoanalytic framework, notably based on the theories of Freud and Jung, whose work has had a profound impact during the course of this century. However for Freud (1931) tracing psychological material to its infantile origin always took precedence over the possibility that the same material might contain within it the seeds of better adaptation and thus be construed as teleological. Further, Freud had an ambivalent view of art that was challenged by Storr (1989) who suggested Freud never grasped the notion that art might be a way of enhancing man's grip on reality rather than escaping from it. A different view was taken by Jung (1973) who argued that the psyche is not merely a repository for repressions or forgotten subliminal impressions, but is a creative force

containing expressive as well as repressive elements. He suggested that art represented a new synthesis between the inner subjective world of the artist and external reality. Bender (1952) suggests children's drawing of a person can be useful in assessing possible psychopathology. Machover (1949) produced the Draw-a-person test based on the assumption that a child projects his/her self image into his/her drawings. In addition to a scoring system assessing intellectual ability Koppitz (1968) devised a classification of 'emotional indicators' from analysing children's drawings, but unlike Machover took into account the changes in children's drawings which are said to be characteristic of normal development, by defining a classification of objectively defined developmental indicators. According to Cox (1992) Koppitz's emotional indicators in drawings discriminate reliably between emotionally disturbed and undisturbed children, making this a useful clinical and therapeutic tool. This system was also used by Buck (1966) to develop The House-Tree-Person test that again has had wide clinical application, but the quantitative scoring method has been criticised (Anastasi, 1976).

Burns & Kaufman (1972) cited research and application of Kinetic Family Drawings (KFD) comparing them with other projective drawing techniques. The KFD is based upon children's drawings of various family members including themselves, and is said to be an indicator of family pathology. Burns & Kaufman cite size, ordinal position, inclusion or omission of family members in relation to the child and each other as the principal scoring items. Its main use has been with school-age children and adolescents. Bolander (1977) assessed personality through tree drawings, based on the Jungian psychoanalytic assumption that the tree is a symbolic representation of the artist's psyche. While interesting some of her findings are considered speculative. Children's drawings have been used widely in psychotherapy, child-guidance work and latterly in medical settings. For example, Spinetta (1981) revised the KFD and used it to assess the relationships within the family coping with childhood cancer.

Replicating Spinetta's work were Cornman (1988) and Eng (1988) who concluded the KFD-R is useful as part of a battery of tests in assessing responses and attitudes of children with cancer to their disease and their family. They suggest the use of children's drawings in a research or measurement context subjects interpretations and conclusions to empirical verification and justification. Their work shows that drawings offer another means of communication, particularly relevant to seriously-ill children. More recently Forrest & Thomas (1991) studied the drawings of bereaved children using the scoring system of Koppitz, and found no significant difference between their drawings of a person and those of non-bereaved children. Interestingly, they suggest aspects of bereavement could influence children's drawings and a freely chosen topic rather than instructed drawings may yield more information, although they could cite no clear rationale. This observation supports Furth's view (1988) that free drawings may be a more useful source of information than instructed drawings, and that a series of children's drawings should be evaluated rather than one single example (Van Krevelen, 1974).

McGrath & Unruh (1990) evaluated the measurement and assessment of pain in children by a variety of self report measures, including non-verbal methods requiring some understanding of metaphor and animation, such as asking children to describe the colour of their pain or to draw pictures of their pain (citing Scott, 1978; Eland, 1987; Jeans, 1983; Unruh et al, 1983 and Kurylyszyn et al, 1987, amongst others). Research work by Unruh et al 1983, demonstrated that drawings can be reliably classified by raters and provide a useful clinical tool for assessment, and for communicating with children about their pain as well as their emotions.

While all of these interpretive techniques have been developed and widely used particularly when researching maladaptive behaviour and psychopathology, Spinetta (1981) cautions against the tendency towards overinterpretation, notably by clinicians from a psychoanalytic perspective, in a manner that makes controlled replication

difficult. The need for well-controlled studies is essential for clinicians and researchers alike. This is an important point since subjective elements in the interpretation of children's drawings have, in the past, been difficult to evaluate objectively. A major criticism has always been that such interpretations introduce an unverifiable and therefore unreliable element into research and clinical practice.

In summary, research on the conceptual, intellectual and cognitive abilities of children have used their drawings to broadly assess their developmental maturity and intelligence. Sensory feedback may also be important. There is a long tradition underpinning research into children's drawings, which is that children draw what they know rather than what they see. Further, that children may know far more than adults realise (Thomas & Silk, 1990), and emotional influences may be important (Di Leo, 1973).

2.3 The influence of other factors

2.3.1 Anxiety

Anxiety is a feature of normal human development. It is generally regarded as a multidimensional construct and is differentiated between a child's anxiety in specific situations (state anxiety) or the characteristic level of anxiety (trait anxiety) (Cattell & Scheier, 1961, Spielberger 1966). Koppitz's Human Figure Drawing (HFD) Test is a 30-item index of trait anxiety, defined as emotional indicators (eg absence of certain parts from the body or very short or long arms), which takes account of the child's development. Koppitz (1968) compared the HFDs of one group of 76 children in ordinary schools with another group of 76 children attending a child guidance clinic. Whereas the well-adjusted children, as judged by their teachers, produced 22 emotional indicators, the clinic children produced 166. The degree of adjustment is assessed according to the total number of emotional indicators in a child's drawing. A strong criticism of this approach when assessing a child's anxiety has been that it is not

meaningful to make a diagnosis on the basis of one single indicator simply because anxiety may be expressed in different ways by different children and in different ways by the same child on different occasions. For example to diagnose a child as anxious simply because the figure they draw has no arms is clearly unacceptable and evaluation is needed together with other available data.

More recently, Thomas & Silk (1990) tested the theory that anxiety may affect the size of children's figure drawings (Sechrest and Wallace, 1964 & Craddick 1963). Their results were consistent with the notion that anxiety-eliciting topics are reduced in size relative to the drawing of non-threatening topics. However it could be that size difference may also reflect planning problems when the child attempts to organise their work on a page.

To date, there have been few, if any, consistent findings to link children's anxiety and its influence on their drawings.

2.3.2 Sex

Thomas & Silk (1990) from a survey of the literature on children's drawings, found that the only sex differences noted are that girls tend to include more detail than boys. This may reflect the fact that the maturation rate for the sexes differs - in favour of girls (Scott, 1981) This is a potential field of further study and evaluation.

2.3.3. Cross-cultural comparisons

Cross-cultural comparisons have been made by Deregowski (1984) who suggests that the drawings of children reared free from Western influences may develop in quite different ways, and children in different cultures may differ not only in details of drawing style but also in the basic strategies used to construct their drawings. In an early study Paget (1931) collected over 60,000 drawings from children living in remote areas of Africa and Asia and compared them with the drawings of European and American children. Paget noted that 'drawings in which the body parts have a boundary line were quite common worldwide, although the shapes of the segments

varied, ie arms, legs and noses, might show variations. Paget suggests that children are influenced by other children's drawings, that these become the accepted tradition among the children of a particular locality and that the style is picked up by succeeding generations of children. This suggestion however, goes beyond what may be inferred by the data. In a different study, Wilson & Wilson (1985) studied drawings made over the past century by children from different countries and found some features were unique to particular groups of children, eg back-mounted arms were drawn by a third of the boys in a school in Los Angeles. The Wilsons also noted this characteristic was evident in the drawings of Italian children collected by Ricci (in the 1880's). They found this particular school in Los Angeles had a large influx of Italian immigrant children, so that this style of drawing arms may well have migrated with the Italian children and then been passed on to the other children in the school. While this is speculative it may be that from time to time children invent a new way of depicting an item, or like the Italian children, introduce their style to a new population. Despite these studies, support persists for a universal pattern of development in children's drawings (Kellogg, 1970, Lowenfeld & Brittain, 1987). To date there are no consistent findings on anxiety, sex differences and cross-cultural studies and their possible influence on children's drawings.

2.4 Colour and its use in children's drawings

The study of colours in relation to the polarity of light and darkness has been taught by da Vinci (1452-1519) Newton (1643-1727) and subsequently redefined by Goethe (1749-1832) who developed a scientific theory of colour (cited in *Deutsche National-Literatur*, 1897, Ed. Steiner, R.). Historically, colour has always been an important component of drawing and painting. It is a universal phenomenon. Colour facilitates a deeper appreciation and interpretation of the world than a simple visual cue, particularly in the developing child. (Bornstein, 1978). The distinguishing

of colour and aesthetic reactions is a function of the cortex; these abilities are said to be the result of development and education (Scott, 1978), but colour may not be solely developmentally determined. Further, Kane (1982) suggests that colours influence physical and mental health and that health professionals, including psychologists, ought to know more about them. However this observation is speculative since research is lacking to support this view.

Common experience testifies to the fact that colour influences mood and feeling, but the psychological basis of this influence is little understood (Katz, 1955, Lamb & Bourriau, 1995).

The psychological link between subjective responses and colour has a long history (Birren, 1961 and Lamb & Bourriau, 1995). No matter how contradictory subjective responses to colour are, they cannot be easily disregarded. In the 1930s Goldstein performed experiments with coloured illumination and concluded that in red light, time is overestimated and objects seem longer, bigger or heavier; while in green or blue light, time is underestimated and objects seem shorter, smaller and lighter. While Goldstein attempted to quantify the unaccountable effects of colour, it has proved difficult to replicate his results (cited by Birren, 1961).

Based on the general theory that colour is usually associated with affect (Birren, 1961 and Lamb & Bourriau, 1995), the emotional as opposed to the intellectual side of life, projective tests were developed, attempting to shed light on the complexity of the human personality. Two early tests were Rorschach's series of ten inkblots (1942) though only one of the ink blots is fully coloured. Rorschach claimed that a person's response to colour reflected his typical method of dealing with affect. It may be that failure to remark on colour in the inkblot may be just as significant as detailed comments.

The second test is Lowenfeld's mosaic test (cited in *The Lowenfeld Mosaic Test*, Ruskowski 1992), now rarely used. It was said patients, especially children, readily

gave some indication of the level of their psychological disturbance by their choice of colour and design. Anthropologists have also used the test to help gauge the imaginative capacity of their participants, which verbal tests neglect.

Published reports of systematic evaluation regarding the use of colour in children's drawings, apart from the clinical work of Bach, are sparse. (Psych Lit 1969-1997).

The few relevant studies were all published prior to 1970 (Alschuler & Hattwick, 1947, 1969; Lawler & Lawler, 1965; Corcoran, 1954, and Salome 1967)).

Alschuler and Hattwick (1947,1969) attempted to relate colour and form to the personality of 150 nursery school children and suggested children who consistently painted in 'warm' colours (eg red and orange) manifested free emotional behaviour in warm, affectionate relations; children who preferred blue tended to be more controlled in their behaviour and children who used black tended as a group to show a dearth of emotional behaviour. However there is some evidence (Corcoran, 1954) that for young children painting and drawing may be more of an exploratory and mechanical activity rather than an emotional one, and they are concerned with the direct application of colour and then react to it when it is placed on the paper.

Lawler & Lawler (1965) found nursery school children aged about 4 selected yellow crayons to colour a happy picture whereas the same picture was apt to be coloured brown if the children were told a sad story about it. Whether this was exploratory behaviour or emotional appeal is not known.

Children aged from 4 - 12, who have normal colour vision, are able to discriminate and select and name colours. It is not known whether their responses to colour are innate, culturally-conditioned, or the result of a more complex interaction. Mood and state of health may affect colour preference, but the psychological basis of this preference is not understood. Nevertheless, the stubborn fact remains that no matter how contradictory subjective responses to colour are, they cannot be easily disregarded (Frenkel & Adesserman 1970; Nelson, Allan & Nelson, 1977). In an early study by

Wallen (1942) colour reflexly aroused affective responses, with red producing intense and unpleasant reactions in those suffering from stress. As Fleming et al (1988) suggest, a child's state of health might be a key factor in preferences for colour because states of illness may be indicators of psychological and physiological stress.

2.5 Art work of seriously-ill children

Bach (1966,1975,1980 & 1985), a student of Jung, extended research into drawings by evaluating the spontaneous art work of seriously-ill children. Bach suggests the healthy child will draw from a state of well-being, rather than of illness or pain. Similarly, the child when feeling well does not need to call attention to a particular part of the body, and therefore this may not be reflected in a picture. Accordingly, from Bach's ideas, one might say that the healthier the painter the more balanced the picture is, the richer in colour, shades, objects and movement. A 'normal' child will use almost all the colours one offers. Bach further suggests an ill child, at a critical moment in life, given the same selection, seems to choose one or very few colours, precisely those relevant to the type of illness he or she suffers from and to the stage of life he or she has reached. For example, Bach found that leukaemic children, during the anaemic phase of their disease, consistently demonstrated a striking lack of colour in their drawings. Leukaemia is a disease where there is a proliferation of white blood cells.¹ Bach also studied the art work of children with tumours and other acute and chronic conditions, and suggests that free drawings may reflect the progression or regression of specific illnesses in children. Bach's clinical work has drawn attention to these findings, but scientific evaluation is needed.

Kiepenheuer (1980) suggests that organic as well as psychological information is shown in the drawings of the leukaemic child. Further support comes also from Furth

¹ Although white is technically an amalgamation of all colours, Bach's assumption here is that the child associates it with absence of colour

(1986) who contends that somatic factors having an important effect on the individual's life will be manifested in drawings, either by use of colour or via another focal point.

Harrison et al (1990), interested in the use of free drawings as an instrument in the assessment of children with chronic illness, studied the drawings produced by 48 children with asthma and those of 52 controls. These were studied independently by three raters. One rater used a scoring method, the second used direct assessment, based on experience of children with chronic disease. The third based the assessment on knowledge and the use of drawings in clinical practice. The latter observer was superior in detecting those with asthma; the other two observers' ability was no better than chance. Harrison et al's controlled study lends some support to Bach's hypothesis that children's free drawings may be associated with their state of health, but that knowledge of drawings rather than experience with children may be a relevant assessment factor. However, there is little literature to support the assumptions made in this analysis.

The potential importance of Bach's findings warrants empirical investigation as it opens a wider perspective on the evaluation of children's drawings. Empirical support is crucial since the major criticism of Bach's work is that hypotheses were based on subjective clinical evaluation rather than objective comparisons between ill and healthy children.

A study (Stephens-Parker 1990) was undertaken with the intention of objectively testing one of Bach's main hypotheses, namely, that seriously-ill children would use significantly fewer colours in their free drawings when compared with children who were not seriously-ill, and to a healthy group of controls. 36 children between the ages of 4-12 (mean of 7.4 years) took part. Results showed a clear, statistically significant relationship between the number of colours very sick children used in a free drawing situation, compared with the number used by less sick and healthy children. Post hoc

testing on the children's use of space on drawing paper also gave statistically significant results. The seriously-ill children demonstrated a low use of space compared with the non-seriously ill and healthy comparison group of children. The possibility that the colour content in the children's drawing varied in respect to their physical as well as psychological state was raised.

Before support can be claimed however, more longitudinal investigation with different paediatric populations is important.

In conclusion, the review mentioned above demonstrates that colour use in children's drawings has been largely excluded from scientific evaluation (Cox, 1990; Thomas & Silk 1990).²

Since the early studies of Luquet, Goodenough amongst others, children's drawings have lost a central position in child psychology and, for example, by the 1970s, drawings were not mentioned in many textbooks on child psychology and child development. The reasons suggested for the omission from these textbooks probably lay in the relative lack of significance of drawings in some developmental theories, although a recent upsurge of interest has been noted. This 'renaissance' could benefit child psychology in two major ways a) by studying drawings from the child's rather than the adult's point of view. (Freeman, 1980) and b) by the objective investigation of the use of colour in children's drawings. Lowenfeld & Brittain (1987) confirm these areas have only been touched on in very general terms.

Given these conclusions, there remains the fundamental question relative to using children's drawings as research tools. Are they valid and reliable instruments of measurement?

² In a personal communication (see Appendix A), Thomas supports the view that this research needs to be carried out.

2.6 Validity and reliability of using children's drawings as research tools

Briefly, the points relevant to this research project are cited below.

The question of validity

When children's drawings (CDs) have been used to assess intellectual maturity, they have shown significant correlations with standardised tests such as the Stanford-Binet and Wechsler Intelligence Scale for Children (cited in a review by Harris, 1963).

However, when CDs have been used to assess emotional content, for instance in personality testing and clinical situations, the same degree of agreement has not been achieved. This was probably due to subjective elements in the interpretation of CDs introducing a practically uncontrollable variable.

By using the CDs as a research tool rather than a psychological test, and by evaluating the variable of colour rather than content, ie by scoring each colour, the potential extent of error variance is limited.

Researchers (Machover, 1949, Hammer, 1958, Spinetta, 1981) point out that children's free drawings add to variability and may well be different on each occasion. However, as stated above, it is suggested that the scoring of each colour used as distinct from the content of the children's free drawings overcomes any variability, and by limiting the research in this specific manner the validity of CDs is increased, and will form an evaluative scale for future research.

The question of reliability involves two aspects:

1. Inter-rater reliability.

The study by Stephens-Parker (1990) demonstrated statistically significant consistency of inter-rater reliability on the number of colours children use in their drawings.

2. Consistent ratings of drawings over time.

In early studies Goodenough (1950) reported a correlation of 0.937 between scores of 194 CDs on two successive days. Harris (1963) in an extensive study of 4 groups of young children on each of 10 consecutive days reported similar findings.

Relevant to this research, the rating of colour use in two or more CDs, drawn at different times, aids control of situational variables and thus increases reliability.

Further, by objectively scoring each subjectively administered colour, the reliability of the evaluation of the CDs is also increased.

Since this study is the first systematic attempt to investigate the use of colour in children's drawings and a possible link with their state of health, it is considered that by limiting the investigation to the use of basic measures, this will increase the validity and reliability of the research and make replication with other paediatric and/or adult populations possible.

Finally, the most challenging of Bach's inferences is that of children's awareness of their own health status, and that they may convey this awareness through their use of colour or lack of it in their free drawings. Although the objectives of this research are intentionally limited to specific variables, a brief discussion is relevant.

2.7 Children's understanding of their illness

Children, as well as adults, with life-threatening and chronic illness, have a need to express themselves and to have their needs met. According to Kendrick et al (1986) there had been a lack of background knowledge about individual children's understanding of their own illness. More recently, Landsdown (1993) has shown that research based on children's understanding of health and illness is increasing. This helps clinicians, particularly within the field of paediatric oncology, to communicate more effectively with their patients.

Kendrick & colleagues were interested to note that some children showed an understanding of their illness which greatly exceeded their cognitive capacities in other

respects. They would often develop a more mature understanding of the world as a result of their illness. But it is generally accepted that children of different ages understand at rather different levels about their illness and treatment. Until relatively recently, professionals, in general, did not comprehend that children, particularly young children at critical moments in their lives, understand what is happening to them. Yet Kubler-Ross (1974, 1989) who has worked with seriously-ill children and adults for over three decades, maintains even young children not only comprehend what is happening to them but they may use any of three different languages to communicate their knowledge. These are to quote “plain English, symbolic language and symbolic non-verbal language such as drawing and play”.

In turn Kendrick et al suggest, particularly when a potentially life-threatening diagnosis is made, the strongest argument in favour of discussing it with the child is that 'actions speak louder than words' i.e. the child will in any case gather the true situation from the non-verbal cues given by those people around them.

However, Bird and Podmore (1989) state that children's beliefs about health and illness are often described in terms of progression through a series of stages. This implies that children's concepts of illness are qualitatively different from those of adults, and these differences need to be taken into account in explanations of hospitalization and illness. Alternatively, a more cognitive approach (Eiser, 1989) suggests that it is important to focus on what children know, in contrast to stage models which more typically are concerned with what children do not know.

Regarding medical procedures, in a study by Sourkes (1980), children with leukaemia rated medical procedures, followed by school problems, restrictions on peer and play activities, hair loss, nausea and a 'general sense of worry' as aspects they most disliked. And while younger children frequently saw treatment as a punishment, children over 6 years appear aware of the real purpose of medical treatment. This work is valuable in that it emphasises that children attempt to order their own

experiences and interpret them within their own developmental level. Of paramount importance is proper communication with the paediatric patient so that distortions or misconceptions are discussed and, if possible, resolved.

Drawings and play may be ways of aiding this communication, particularly with younger children, often revealing the extent of their knowledge. They are also a basis for stimulating communication with the family, and sharing this information may help them understand the child's awareness and needs (Adams, 1976, Bach 1975, Geist, 1979, Heffron 1975, Thomas 1980 & 1991). Bach (1980) argued that a person trained to 'read' ill children's drawings gains information for helping the whole child. The investigation of colour in children's drawings may further aid this communication. Although the work is exploratory, from the initial study (Stephens-Parker, 1990) it would seem that colour use is associated with illness and health and therefore it appears that children are incorporating some aspects of their understanding into the number of colours they use in their drawings.

The intention in the next chapter is to outline and discuss the development of a methodology, including the procedural problems encountered, and necessary adjustments that occurred.

3.

DEVELOPMENT OF A METHODOLOGY

I often say that when you can measure what you are speaking about and express it in numbers, you know something about it, but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science whatever the matter may be (Lord Kelvin, quoted in Thomas, 1983, pp 143-144).

3.1 AIM

As was noted above, Bach's hypothesis (1966,1975,1985) that colour use in children's drawings may be associated with their physical condition has important implications.

Unfortunately systematic research has been lacking, possibly because the clinical orientation of Bach's work made it difficult to replicate in an experimentally-controlled manner. However, Stephens-Parker (1990) isolated the number of colours used in a free drawing, and showed statistically significant differences between the colour use of seriously-ill children, non-seriously ill children and a healthy comparison group of schoolchildren.

The challenge of these results has been to test their replicability under more diverse conditions.

The specific aims of this present study are therefore:

- 1) to replicate the Stephens-Parker (1990) study.
- 2) to investigate longitudinally whether the number of colours used by sick children in their free drawings varies with the state of their health.

- 3) to examine other variables that may affect the colour use in children's drawings specifically:
 - a) intellectual level.
 - b) assessment of the child's illness status:
 - i) from parent/carer rating each time the child draws a picture.
 - ii) from an independent retrospective rating by a research nurse.
 - c) age and gender of each child.
 - d) anxiety (emotional response).

The data was subjected to statistical analysis (SPSS-PC) (see Appendix J for data).

3.2 MEASURES

3.2.1 Standardisation of Colours

To investigate Bach's hypothesis, the colours of the pencils used for drawing have been standardised (ie 12 colours and a pencil) (see Fig. 1 below). This will allow for evaluation of the number of colours in each child's drawing and comparisons between ill and healthy children to be made.



Fig. 1. Standardised set of colours

3.2.2 Intellectual Level

Intelligent behaviour involves a variety of skills, including drawing ability and the creative use of colour. In the context of this research it is important to assess whether the intellectual ability of the children participating this study may be a confounding variable.

Following a search for a suitable test, the short form of the British Picture Vocabulary Scale (BPVS) was found to have excellent measurement characteristics to screen for

children's general intelligence ability (age range 3-16). The child is asked to point to one of four pictures in response to a word. The BPVS tests one facet of general intelligence - vocabulary - but this is considered one of the most important contributors to measures of intelligence (Elliott, 1982). It is also a test of children's receptive language abilities. Support also comes from Wechsler (1974, Wechsler Intelligence Scale for Children-revised), who reported the vocabulary subtest scores correlated more highly with Full Scale IQ scores than any other subtest.

The BPVS is standardised on a British population covers the age range of children in this study, and is concise (Dunn & Dunn 1981). It is suitable for one-off administration to seriously-ill, non-seriously ill as well as healthy children. Children whose intellectual ability fall outside the standard score equivalent to $<70 - >130$ (± 2 SDs from the mean) were excluded from this research because a grossly above average or below average score may be a further confounding variable.

3.2.3 Illness Severity

The inclusion of a rating scale of illness severity to assess whether the number of colours a child uses in a drawing can be attributed to their physical condition was discussed with hospital staff. Several scales were examined (see Appendix B), and sensitivity to parents' feelings was stressed. Parents have reasonable access to hospital records on their child, and to rate seriously-ill children prospectively would be difficult if, for example, they do better than predicted or alternatively suddenly deteriorate. It was decided therefore to use two scales to provide basic measures, as follows:

a) a scale that could be used each time a child draws a picture

A search for an objective measure of the seriously-ill children's functional status in response to disease, treatment, relapse or remission was undertaken.

The Lansky Play Performance Scale (Lansky 1985,1987) was suggested by a paediatric oncologist since it has been designed to provide a standardized measure of the performance status of the child with cancer. Performance status is a measure of the child's ability to perform day-to-day base-level play activities. Level of activity is described in terms of active play, quiet play, degree of physical limitation, and degree of independence. These distinctions are combined to form a hierarchy ranging from fully active, normal (score 100) to moderately restricted (score 50-60), to completely disabled (score 10 or less). This continuum is rated in deciles. The Scale is shown below (Fig. 2). The strength of the scale is said to be its simplicity based upon play-activity ratings, yet with the ability to provide meaningful data with the parent or carer as rater. It is suitable for repeated use, ie each time a child draws a picture, with seriously-ill, non-seriously-ill and healthy participants.

Parent Form	
Child's name	
Date of birth/...../.....
	mo day yr
Your name	
Relationship	Mother
	Father
	Other
Today's date	
Directions for parents. On this form are a series of descriptions. Each description has a number beside it. Think about your child's play activity over the past week. Think about both good days and bad days. Average out this period. Now read the descriptions and pick the one that best describes your child's play during the past week. Circle the number beside that <i>one</i> description.	
100	fully active, normal
90	minor restrictions in physically strenuous activity
80	active, but tires more quickly
70	both greater restriction of and less time spent in active play
60	up and around, but minimal active play; keeps busy with quieter activities
50	gets dressed, but lies around much of the day; no active play but able to participate in all quiet play and activities
40	mostly in bed; participates in quiet activities
30	in bed; needs assistance even for quiet play
20	often sleeping; play entirely limited to very passive activities
10	no play; does not get out of bed
0	unresponsive

Figure 2 Lansky Play Performance Scale for Children

b) a retrospective rating scale for use by a Research Sister who has clinical contact with the children, and is able to refer to their hospital records.

This incorporated the following points:

- a) the scale should be a 10-point assessment of the children's clinical status on the date they draw each picture.³ (See Fig 3 below).
- b) children are identified by name and hospital number then allocated a participant number.

Excellent	Very Good	Good	Fairly Good	Reasonably Good	Stable	Fair	Labile	Poor	Extremely Poor
1	2	3	4	5	6	7	8	9	10

Fig. 3. Professional Rating Scale of Child's Illness Severity

3.2.4 Anxiety (emotional response)

It was also decided to examine the possibility that the results reported by Stephens-Parker (1990) may be explained by ill children's anxiety, defined by their emotional response rather than their physical condition.

There is some evidence that anxiety may affect the size of children's drawings (Fox & Thomas, 1990), but it is not known whether anxiety may affect the use of colour in their drawings.

A suitable scale to assess anxiety was sought. The investigation and measurement of this particular variable absorbed most of the preparation for this research.⁴

³ Practically, it would be difficult, given the demands of working in a busy paediatric oncology unit, for the Research Sister to rate each child strictly within one week of their hospital visit, therefore it was decided the children's hospital records could be combined with the impressions of the research sister and each group of children would be rated every 3-4 months retrospectively.

⁴ The challenge of identifying and overcoming difficulties involving the assessment and re-assessment of different measurement devices is detailed in the following pages. The aim throughout was to find a device suitable for children under 6, and for use each time a child draws a picture.

Anxiety has been widely reported in the paediatric patient, particularly among children attending haematology and oncology clinics, and is often related to procedures such as taking blood, injections and lumbar punctures as well as pain and discomfort. Such anxiety reactions can be followed by a period of emotional depression and listlessness, but only rarely is the distress of such an extent that it is diagnosed as a psychiatric disorder (See Kellerman, 1979 & Inman 1991, for a review).

Reactions to anxiety occur throughout the normal developmental process, eg in infants it manifests as startle responses, elicited by sudden, loud noises or a sudden drop. In the toddler, separation anxiety, (Bowlby, 1973, Rutter 1984) shown as upset or distress, is seen when the child is parted from its mother or primary carer. With cognitive development, the reactions to anxieties of childhood are displaced by more realistic perception of anxiety-provoking stimuli (Bauer, 1976). The occurrence of these anxieties do not require a complex psychological process to account for them. (Gittelman Klein & Burrows 1990).

Against this background there is increasing evidence (Cox 1978) that anxiety can be linked with variations in the perception and emotional state of the child, and thus affects subjective response areas that can be expressed, for example, in drawing.

The previous findings and the proposed present research were presented by the author at Great Ormond Street Hospital (1991), The Tavistock Clinic (1991) and at The Institute of Child Health, London (1991). The consensus of expert opinion at these centres was:

a) children's anxiety, manifesting as an emotional response to illness, was consistently cited as the important aspect upon which to focus⁵

⁵ Childhood anxiety is often associated with physical symptoms such as tummy aches and/or headaches, but gastro-intestinal upsets and headaches are common side effects of medication in seriously ill and non-seriously ill children. They may also be disease-related factors. It was therefore felt more appropriate to measure children's emotional symptoms such as fears or worries, the responses that are cited most frequently in studies of children's anxiety (see Gittelman Klein & Burrows, 1990, for a comprehensive review of the subject).

b) anecdotal evidence is widespread regarding the effects of anxiety on children's colour use in their drawings, and that a measurement device would be needed to assess this as a possibly confounding variable. This device should also be suitable for a wide age range (eg, children as young as 4 years and up to 12 years).

Following these recommendations, a comprehensive range of published scales was investigated (see Appendix C) and finally 2 scales (The Achenbach Behaviour Checklist; the Ollendick Fear Survey Schedule) were selected as potentially suitable and compared for strengths and weaknesses (see details on following page).

Initially, the Achenbach Behaviour Checklist (ABC) was considered to be suitable for this research, but according to Gittelman Klein & Burrows (1990) there are problems with the ABC and the assessment of anxiety. Also it was found that considerable asymmetry has been shown with regard to age and sex, precluding comparisons between boys and girls. Further, the ABC was also inappropriate for repeated use, ie rated each time a child draws a picture. At most it can be used once every 4 months. Thirdly, there are no UK norms for the ABC. Thus it is of limited usefulness in the context of this research.

The Ollendick Fear Survey Schedule for Children (OFSSC) was also carefully considered. The OFSSC was shown to be validated for certain age groups (7-12), and only moderate correlation with generalized anxiety has been shown in published studies. Importantly, many of the words are overcomprehensive such as fear, bats and ghosts and therefore would be inappropriate for use with very sick children, having been designed primarily for school-phobic children.

**ACHENBACH BEHAVIOUR CHECKLIST (ABC)
Parental Rating Scale**

POINTS AGAINST USE OF SCALE:

1. May be inappropriate for use with the most seriously-ill children.
2. Over-comprehensive for use in this research.
3. Anxiety subscale cannot be validly extracted since they are different for boys and girls. According to Gittelman-Klein & Burrows (1990) the ABC has problems with the assessment of anxiety, and shows considerable asymmetry with regard to age and sex, precluding comparisons between boys and girls. Thus it is of limited usefulness in the assessment of anxiety in children. At best it may be seen as able to identify major areas of difficulty, and as signals for further clinical assessment.
4. Cannot be used with comparison group of schoolchildren.
5. It is an adult (parental/teacher) rating scale only.
6. Inappropriate for repeated use, ie every 2 months.
7. Not cost effective (N=108 x 6).
8. No UK norms for ACB.

POINTS TO SUPPORT USE IN RESEARCH:

1. Sophisticated, ie based on 138+ items.
2. Validated.
3. It is in use at Great Ormond Street Hospital (Dept of Psychological Medicine). Has been used with chronically-ill children, and repeated every 4 months.
4. Can be used by parents of children in 4-12 age range.

**OLLENDICK FEAR SURVEY SCHEDULE FOR CHILDREN
Children's rating scale**

POINTS AGAINST USE OF SCALE:

1. FEAR schedule, eg inappropriate terms for already sick children.
2. Overcomprehensive, eg bats, ghosts etc.
3. Filling in the Scale may have a contaminating effect on the child. This is a very IMPORTANT point if Scale were to be given prior to the child drawing.
4. Not validated with younger age group (Validated with children in 7-12 age range).
5. Primarily used with school-phobic children.
6. 80 items - therefore time-consuming for children.
7. Standardised on US sample so may be inappropriate for use with UK sample.

POINTS IN SUPPORT OF USE OF SCALE IN RESEARCH:

1. Validated for certain age groups.
2. Moderate correlation with generalized anxiety,
3. Based on a comprehensive sample of items.

Fig 4. Two potential rating scales of children's anxiety

It was therefore decided that a suitable measure would have to be devised and pilot studies undertaken.

Meanwhile, following the seminars and in response to the recommendations, two attempts were made to study the drawings of a clinically-anxious group of children compared to two different clinical child psychiatric populations. The aim was to investigate whether anxiety is associated with variations in the colour use of the children's free drawings. A senior staff psychologist at the Tavistock Clinic was approached by the author for permission to undertake a study of the free drawings of 30 children attending the centre for assessment, as follows:

Equal Mix of Boys and Girls Age group 4-12		
Depressed n=10	Anxious n=10	Conduct disordered n=10

All children would be asked to draw 2 free drawings each, at intervals of 1-2 or 1-4 weeks, using standardised set of colours. A similar approach was made to a Professor of Child Psychiatry at The Institute of Psychiatry (see letters in Appendix D).

Permission to undertake these studies was not granted for the following reasons:

- a) difficulties in seeking parental permission.
- b) the complexity of cases meant not enough children could be recruited from these distinct categories.
- c) the centre and the hospital conduct wide ranges of in-house research thus excluding outside involvement.

In order to proceed, the author undertook a further investigation of the most appropriate methodology for measuring children's assessment of the level of their own anxiety (Psychological abstracts 1967-1995). Consideration was also given as to whether the parent/carer could independently rate the child using the same device.

Since this research approach is exploratory, and the scales investigated so far were found to be over-comprehensive, Visual Analogue Self Rating Scales (VAS) as a response format was assessed. Theoretically, this was regarded as the ideal response key because it maximises the specificity of the subject's discrimination, and gives interval level data suitable for parametric statistical testing, but comprehensive literature searches via Psychlit and Medline (1967-1997) failed to reveal any reports of VAS scales suitable to this research. Young children under the age of five are frequently reported in the literature (McGrath, 1990) to present problems of measurement compared with older children. This finding is particularly relevant to self-report scales. Development alters children's understanding and the way in which that understanding is expressed (Piaget, 1969). Therefore, the primary aim when designing and assessing the appropriateness of a VAS was to place minimum cognitive demands upon the children. It is also important to bear in mind McGrath's observation (1990) that a major problem with all self-report measures is this method is open to bias because of the demand characteristics of the specific situation. In other words, the way the child perceives the task will influence the response.

The criteria for designing and developing a VAS were that it should be relevant to this study, be easily administered to children between 4 and 12 years, be of use to seriously and non-seriously ill children, and that it can also be used independently by parents/adults to obtain their estimate of the child's anxiety manifesting as an emotional response.

3.2.4.1 Development of a Self-Rating Scale (VAS)

Studies at a state primary school and a clinical psychodynamic research centre

The method used to develop and test the researcher's design of a VAS scale was as follows:

1. Discussion with colleagues suggested:

i) a single scale to rate emotional response of anxiety should be included within 3-4 other scales rating more neutral items

ii) a horizontal rather than vertical scale would be appropriate

iii) investigation of the most suitable verbal/visual 'tags' should be carried out.

2. In order to find the words a young child would most generally use to describe different emotional responses, simple line drawings were created by the researcher (Illustrations shown below) - one set was designed for girls and one set for boys and an assessment study was undertaken at a Primary School in Essex.

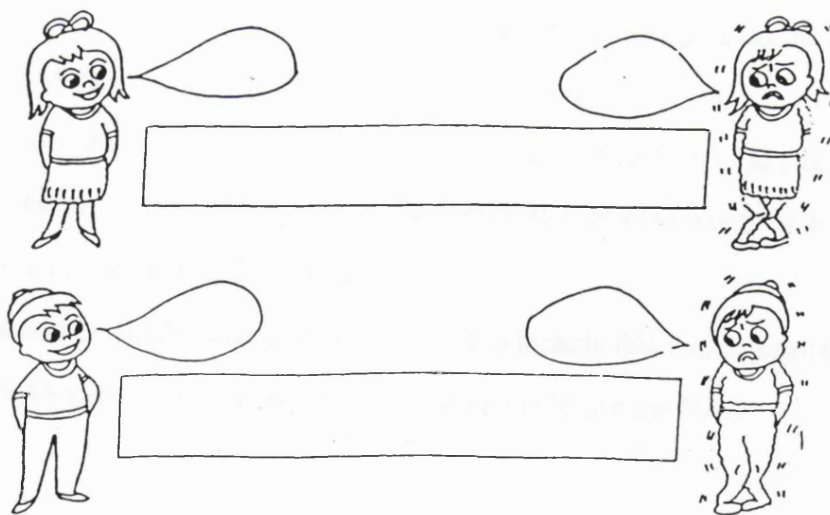


Fig 5. VAS Anxiety Scale

3.2.4.2 Study I

Twenty children, 10 boys and 10 girls, aged between 4 - 7 (mean age 5.7) were randomly selected. Each child was asked individually 'What do you think that little boy/girl is feeling?' as the researcher pointed to each line drawing in turn. Two responses per child were recorded. Results are shown below in Table.....

	Happy	Worried	Other
Boys n=10	9	8	3 (1 smiling 2 angry)
Girls n=10	9	9	2 (1 smiling 1 upset)

Table 1. VAS Scale responses

Seventeen out of 20 children used the word 'worried' rather than the word 'sad' to describe the figure on the right-hand side of the VAS. In a study (Bieri, 1989) cites the word 'worried' as being associated with anxiety, and the word 'sadness' to be associated with depression.

Eighteen out of 20 children used the word 'happy' to describe the figure on the left-hand side of the VAS. Two children used the word 'smiling'.

All recorded responses were consistently reported as 'I am worried' or 'I am happy'. Based on the majority of the children's response scores, the selected words added to the VAS were 'I am worried' and 'I am happy'.

Given that this was one global rating, it was decided to include this with 3 neutral scales for the VAS and to test whether young children could use the VAS appropriately.

Three neutral scales, following the pattern of the child-orientated anxiety scales were devised and added giving one set for boys and one for girls (one illustration is shown below):

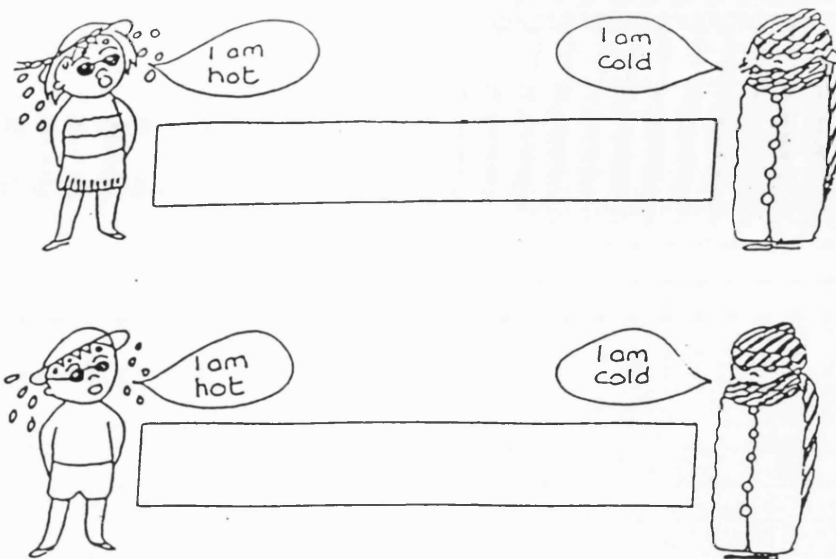


Fig 6. Example of neutral rating scale for VAS

NOTE: Also neutral scales for Fair-haired.....Dark-haired & Big.....Small.

3.2.4.3 Study II

The aim of this study was to evaluate whether children under 6 years could provide discriminative self-ratings. Discrimination is defined as the children's ability to use the VAS as a dimension with more than 2 values.

Fifty-seven healthy children in a primary school in Essex, without any known medical condition, were recruited. Although children's reading abilities varied across the age range, their cognitive abilities were assessed by their class teachers to be good, and that the VAS would be well understood. The random selection of the children was undertaken by the head teacher, who insisted on running this experiment, during the morning teaching session.

Procedure

Each group of children were shown a set of the four scales (stapled together for convenience) and it was carefully explained that 'this is a game just to see how much you know about yourself.' and 'I want you to mark if you feel a lot like this, or a

little or somewhere in between' (pointing to one drawing then running her index finger along the 5 inch midline to the other drawing and giving the same explanation) so you will show me how you feel today. There are no right or wrong answers'.

All children individually marked each scale with a pencil.⁶

During the afternoon school session, all the selected children were then told 'you did so well this morning that I am going to ask you to do this once more,' and they were given a second set of the four scales to complete individually.

The teacher in charge of each class was also asked to complete a rating on a 5 point scale to assess each child's general frequency of anxious behaviour together with their identification number and age. (See Fig. 7 below)

CHILD'S NUMBER: BOY/GIRL	DOB/AGE:
Circle which one is most appropriate in your opinion:	
1.	IS ANXIOUS VERY OFTEN (The child is very often like this. It is very characteristic of him/her).
2.	IS ANXIOUS FAIRLY OFTEN (The child is frequently like this. It is fairly characteristic of him/her).
3.	IS ANXIOUS SOMETIMES (The child is sometimes like this, but not often. It is somewhat characteristic of him/her).
4.	IS ANXIOUS OCCASIONALLY (The child is like this once in a while. It is only slightly characteristic of him/her).
5.	IS ANXIOUS ALMOST NEVER

Fig. 7. Teachers' Ratings of Child's Anxiety

⁶ The use of pencils instead of pens for the youngest children in the school was in accordance with school policy

Thus Pilot Study II involved collecting two completed sets of scales from each of 57 children and 1 rating scale per child from 3 class teachers.

Results

Results were scored as to whether each child marked the scales in the first or last inch (extremity only) or in a discriminative way (marked in the centre 3 inches of the scale), shown in Table 2 below. Further, if on the VAS, morning and afternoon, a child makes a ‘discriminative’ rating then it is categorised as ‘Discriminative Use’. If on either morning or afternoon rating a child makes an ‘extremity’ rating, then it is categorised as ‘Extremity Use’.

Results also defined the children’s ratings on the VAS, ie happy/worried scale (H-W), and the data on the H-W scale were split using the midpoint of the VAS into categories ‘Happy’ or ‘Worried’. Afternoon and morning ratings are shown in Table 3 below.

The results of the teachers’ ratings (TRS) for each age group are set out in Table 4 below.

	Use of Extremity Only	Discriminative Use
Group 1 (4-5 years)		
Girls n=10	7	3
Boys n=10	6	4
Group 2 (5-6 years)		
Girls n=7	5	2
Boys n=10	6	4
Group 3 (6-7 years)		
Girls n=10	4	6
Boys n=10	6	4

Table 2. Children’s use of extremities only or discriminative use

	AM		PM	
	Happy	Worried	Happy	Worried
Group 1 (4-5 years)				
Girls n=10	7	3	10	0
Boys n=10	9	1	6	4
Group 2 (5-6 years)				
Girls n=7	7	0	7	0
Boys n=10	9	1	10	0
Group 3 (6-7 years)				
Girls n=10	10	0	10	0
Boys n=10	10	0	10	0

Table 3 Children's ratings on VAS Happy/Worried scale

Teachers' Rating scale					
	1	2	3	4	5
Group 1 (4-5 years)					
Girls n=10				5	4
Boys n=10			3	1	6
Group 2 (5-6 years)					
Girls n=7				2	5
Boys n=10		1		3	6
Group 3 (6-7 years)					
Girls n=10			2	6	2
Boys n=10			4	3	3

Table 4 Teachers' rating of children's anxiety

Note: Following the study in a general discussion, teachers expressed reluctance to score further assessments due to potential difficulties with parental permission. For example, a child might be anxious but the parent could find it unacceptable for the child to be labelled as anxious.

Discussion

There were no refusals to participate in any of the 3 groups of children.

Regarding children's ability to discriminate, ie make more use of the scale rather than just using the extremities. inspection of the results in Table 2 show that the tendency to discriminate increased with age. Thirteen children in group 1 used the extremities only while 7 discriminated. In Group 2, 11 used the extremities only and 6 discriminated. In Group 3, 10 used the extremities only and 10 discriminated.

Further, all the children that were rated as discriminating used their ability to discriminate on the emotional response scale and the neutral scales; showing good use of all 4 scales. These results suggest that there is a trend for children's ratings of extremities only on the VAS to decrease with age and for their discriminative use of the VAS to increase with age.

Regarding children's ratings on the VAS happy/worried scale. The results shown in Table 3) show that although the majority of children tended to rate themselves as happy rather than worried, 5 children in the 4-5 age group in the morning and 4 in the afternoon rated themselves as worried. Of the 7 children, 3 girls and 4 boys in Group 1 who used the VAS in a discriminative way, 3 boys and 1 girl rated themselves as worried. In Group 2 the one child who self-rated as worried also discriminated on the VAS. This finding was not supported by the discriminative ratings of Group 3.

It may be that these children may have been worried on that particular day or possibly as a result of having recently started school they were not so settled into the school routine.

Teacher's ratings of the children in Group 1 by and large tended to support the children's self-rating results.

However, the teacher's ratings of children in Group 2 and 3 tended to show more variability than the children's ratings, although this may be due to the fact that teachers were asked to rate children's general anxiety levels, whereas children were asked to rate how they felt at that particular time. (Full results of all the children and teachers ratings, summarised in Tables 2, 3 & 4, are available on request).

These results suggest that discrimination in younger children may be associated with worry. Whether young children who are worried found the VAS a useful tool upon which to express their emotional response and thus made them more discriminating is speculative, and it may be that some of the younger children learn to discriminate more quickly than others. Further investigation on this point is outside the context of this current research.

Overall, of the 57 children who took part in the study, 23 out of 57 showed a consistently discriminative use of the H-W VAS scale. Therefore, the data from this study did not demonstrate a clear reason to utilise the VAS nor a clear reason to reject it.

Opinion at a presentation and discussion of these results at an Academic Seminar at The Institute of Child Health, London (1992), was that validation of the VAS would constitute "an entire PhD research study". The main concern expressed at the Seminar was that although it is a global rating scale only one dimension (worried versus happy) comprised the global rating⁷.

With some reluctance a further re-examination of rating scales was undertaken. The Achenbach Behaviour Checklist, the Rutter B Scale and the Rorschach Test were re-evaluated, but they were still felt to be too comprehensive for this research. Practically, the first two could be scored once, possibly twice, but not each time a child draws a picture, and the latter would be difficult to evaluate by statistical

⁷ Their professional unease was derived from their clinical experience.

analysis, as the design of this study requires. Adaptation of these rating scales was also considered but was inappropriate. The aim still being to search for a simple, screening assessment tool to measure children's emotional responses of anxiety, it was decided to investigate a face scale devised by Kellerman (1984) (illustrated below) as an affective 5 point rating scale for use with seriously-ill children.⁸ Face scales were originally devised as a Likert scale response key, and have been used as brief screening tools. Izard (1977), Charlesworth & Kreutzer (1973), Ekman & Friesen (1971), Ekman & Oster (1971), Felleman et al (1983) and McGrath (1990) amongst others, found that specific emotions can be reliably identified from facial expressions by young children.

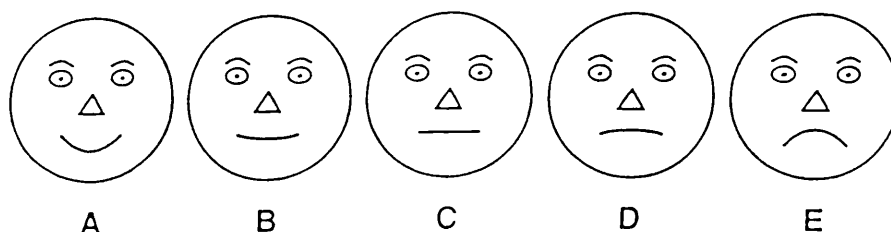


Fig. 8 Face Scale

(Adapted from Kellerman 1984)

In support of the face scale, it is relatively gender-free, culture free and medical-condition free. (eg, it is particularly useful for seriously-ill children undergoing chemotherapy who lose their hair). Potentially, the face scale has empathic value for the children.

⁸ There was a reluctance to drop the VAS Scale because interval data could be derived from it, but the decision was taken to investigate the face scale further even though, theoretically, ordinal data only are derived from it.

Face scales are easily understood by children and have measurement characteristics for ordinal data (McGrath & Unruh 1990). By the age of 4 and 5 children have the ability to distinguish between and respond to facial features and facial patterns exhibiting various basic emotions (summarised by Bieri et al, 1989).

A scale of faces should present little cognitive complexity and metaphoric difficulty and should be relatively free of adult influences of explanation and interpretation. Use of this scale would also allow objective measurement of a subjectively scored instrument. Also child/adult correlations could be taken each time a child draws a picture.

To investigate the potential use of the Face Scale in this research further studies are needed.

3.2.4.4 Study III

Various researchers including Izard (1971); Mulliner & Laird (1971) and Kuttner & LePage (1989) suggest that young children have the ability to reliably identify basic emotions from facial expressions and learn to do so from a very young age. However, as previously stated, young children are frequently reported to present problems of measurement. Given that this approach is exploratory, it was decided to undertake a study of very young children aged from 3 to 4. The aim of this study was to assess whether these children could use the face scale as a self-report measure of their own emotional response.

Participants

Twenty two children, 11 boys and 11 girls, were randomly selected from a nursery school in Essex during the morning session. One child had a tantrum and so was excluded, and it was too late to randomly select another child to participate.

Therefore twenty one children were included in the study. The children were aged

between 3½ and 4 (mean age 3.6 years). The play leaders reported that the children came from a middle-class socio-economic group.

Procedure

The children were divided into two groups. One group of 10 children, called the Informed Group, were shown the sequence of 5 faces on the Face Scale by their play leader, and they had a brief discussion about the Face Scale and emotional expressions. The second group of 11 children, the Uninformed Group, were simply shown the face scale without any brief discussion..

Each child was given a Face Scale and pencil and asked to look at the 5 different facial expressions on the Face Scale and “to mark which one is like you today”. All remarks made by the children were recorded. Their play leaders were also asked, independently, to rate each child’s emotional response that particular morning using the Face Scale.

Results

The results (see Table 5 below) show that of the Uninformed Group, 5 out of 11 children without instruction are capable of making fuller use of the Face Scale (by using B C & D rather than just rating A and/or E). By comparison, only 1 out of 10 children in the Informed Group made fuller use of the Face Scale. Feldman and Feldman (1982) suggested young children sort emotional expressions into larger categories of positive and negative before assigning more specific labels. However, the results from the children in the Uninformed Group in this study suggest if young children are given a task without verbal instruction they tend to assign more specific labels than children who are given instruction. One explanation may be that in the Feldman study there were more cognitive demands made of the children than in this present study.

Further, the results of the children in the Uninformed Group showed slightly more consistency when their scores were compared to the play leaders ratings than the

children from the Informed Group, although the numbers were not significant.

Overall, of 21 very young children who took part in this study 6 were found to make full use of the Face Scale. Only 1 child used Face E (the most negative emotional expression), but neither play leader rated any child by using Face E. However, the majority of very young children (14 out of 21) rated themselves as happy. In comparison, the play leaders rated only 4 children as happy .

It may be that very young children view themselves positively (Long, Henderson & Ziller 1968; Katz & Zigler 1976; Hoffner & Badzinski, 1989), and that self-evaluation in early developmental periods tends to be positive and global (Mullender & Laird, 1971). Interestingly, children generally described Face C as ‘normal’ and they may see ‘normal’ as a neutral state, and therefore less positive and global. It may also be that Face E (the most negative emotional expression) is regarded by the majority of children as deviating more from the neutral state than Face A (the more positive emotional expression).

Nursery School Age 3½-4 years	A	B	C	D	E
Informed Group					
Child	9	0	0	1	0
Play Leader	3	2	3	2	0
Uninformed Group					
Child	5	2	2	1	1
Play Leader	1	4	5	1	0

Table 5 Nursery school children’s face scale ratings

3.2.4.5 Study IV

The next stage was to initiate a further study of a group of slightly older children aged from 4-5. The aim of this study was to assess a) whether these children could use the

face scale as a self-report measure of their own emotional response, and b) whether they would rate themselves differently on a first and second presentation.

Participants

Twenty-five children, 11 boys and 14 girls, were randomly selected from a primary school in North Yorkshire. The children had been at the school since the age of 3+, when they attended during the morning school session only.

Procedure

All the children aged from 4-5 (mean age 4.6 years) were shown the Face Scale.

During the morning session, each child was individually given a Face Scale by the head teacher as well as a pencil, followed by instructions to “look at the 5 different faces” and “tick which one is like you today”. The procedure was repeated during the afternoon session. (There was no prior discussion about the Face Scale and emotional expressions). All remarks made by the children were recorded. Following this, the head teacher’s assessment of each child’s Face Scale response was also recorded. Thus, each child scored 2 Face Scales, and the head teacher assessed each child’s responses.

Results

The results are shown for AM and PM presentations in Table 6 below, and the results are also given for boys and girls (see Table 7 below). There were no refusals and all the children completed the two face scales without any difficulty. (Full results are available on request). Generally, the majority of children rated themselves as happy and it may be that most children do see themselves as basically happy. Only one child self-rated by marking Face E (the most negative emotional expression on the Scale)

both in the morning and afternoon sessions, but overall 2 children in the morning session and 1 in the afternoon rated Face E as like them, showing a variation between morning and afternoon. Again this change was confirmed by the head teacher. Only 2 children, on both morning and afternoon sessions, made fuller use of the Face Scale (using B C & D rather than just rating A and/or E), but 4 children varied their ratings by using B C & D, between morning and afternoon sessions. The head teacher confirmed the children's ratings with one exception that she disagreed with.

Generally, most children 20 morning and 17 afternoon rated themselves as being like Face A ("happy") and as previously suggested, given the findings in Study III, very young children and young children may well view themselves positively and that self-evaluation in early developmental periods tends to be positive and global. However, out of 25 children who took part in the study 11 showed variation in their use of the Face Scale from morning to afternoon. This finding was supported in all but 1 child by the head teacher. Therefore, although only 14 children made fuller use (B, C & D) of the Face Scale, 11 out of 25 (44 %) supported by the Head Teacher showed good discrimination in their ratings.

An important point needs clarification here. This is, that in the studies on the development and use of the Visual Analogue Scale and subsequently the Face Scale, children's scores were said to be discriminating if they showed they could use the full scale rather than just the extremities. However, it is possible that by changing their ratings from one emotional expression to a different one, for example from A to E ('happy' to 'worried') or A to D, children could also be said to show discrimination. Although the majority of children used Face A ('happy') for their self ratings, studies

(Walden & Field, 1982) suggest that young children also recognise ‘worry’ as part of their emotional experience. In order to support this hypothesis, and given the results from this and the preceding study, it was decided to undertake one further investigation.

Junior School Children Age 4-5	A	B	C	D	E
AM	20	1	1	0	3
PM	17	4	1	1	2

Table 6 Junior school children’s AM & PM Face Scale ratings

Junior School	A	B	C	D	E
Girls					
AM	9	2	1	0	2
PM	10	3	1	0	0
Boys					
AM	10	0	0	0	1
PM	8	0	0	1	2

Table 7 Boys & girls Face Scale ratings

3.2.4.6 Study V

The aim was to find out whether very young children are able to discriminate by matching an anxiety-provoking situation and a happy ending (the emotional content) of a short story, to corresponding faces on the Face Scale.

Method/Design

10 children aged between 3 and 4 (with a mean age of 3.6) were randomly selected, but providing an equal mix of boys and girls. They were all full-time attenders at a central London playgroup. The children were of a mixed cultural but integrated group, and English was spoken as their main language. All the children were said to come from a middle-class socio-economic group.

Apparatus & Materials

A search was undertaken⁹ for a suitable children's book¹⁰. Eventually one was located in a secondhand bookshop, and adapted to a two page story of 10 minutes duration, to retain an episode that was anxiety- provoking (corresponding to Faces E or D on the Face Scale) and a happy ending (corresponding to Faces A or B on the Face Scale). (See Appendix E for story adaptation, marked * and * at pauses in story).

A copy of the Face Scale was given to each child together with a pencil for matching a face to the anxiety-provoking/happy episodes in the short story.

Procedure

The open story book was placed on a table in front of all the children taking part in the study so they could look at the pictures, and that the researcher would read a short story from the book to them.

The researcher then told them "I will read you this story and when I stop reading, I am going to ask you to show me which face is the same as the one in the story." The researcher then showed the children the Face Scale and pointed to the different faces in turn from A to E.

⁹ The search took 6 weeks and far longer than expected. Two librarians whose assistance was sought, confirmed that books with emotional content that provoke fear and worries are difficult to find on library shelves nowadays. The major reason being parents censor their children's reading books with such emotive contents.

¹⁰ LITTLE DOG LOST by Inga Moore, Anderson Press, London ISBN 0-86264-322-0

The children were then asked if they understood what they were being asked to do, and if not sure, the instructions were repeated to them. The adaptation of 'LITTLE DOG LOST' was then read to them, either individually or in groups of two children at a time. When grouped together, the children did not see each other's responses.

Results

The results are shown in Table 8.set out below.

Eight out of 10 children correctly identified Face E appropriate to the anxiety-provoking content of the story. One child identified Face D, which is slightly less smiling but still considered appropriate to the anxiety-provoking content of the story. Only one girl refused to complete the Face Scale due to overwhelming emotional problems she was experiencing at the time, and as a result had to be excluded from the study.

One boy, who had difficulties with concentration, would not sit still but he correctly identified Face E as corresponding to the anxiety-provoking situation in the story and identified Face C on the Face Scale as 'normal' but the one he associated with the happy ending to the story.

The third child, a boy who was very nervous got muddled about the different facial emotions. He was pleased with his response on the second attempt, but it was his first attempt that was counted.

Seven out of 10 children also correctly identified Face A appropriate to the happy ending. One child identified Face B which was also considered appropriate to the happy ending of the story.

Participant	Anxiety-Provoking Condition (1)	Happy Condition (2)
1	0	0
2	E	A
3	E	A
4	E	A
5	D	A
6	E	A
7	E	A
8	E	B
9	E	C
10	E	D

Table 8 Playgroup children’s Face Scale ratings

These results support the hypothesis that very young children were able to identify the face/s associated with the anxiety-provoking situation in the story (8 chose Face E and 1 chose Face D). The results further support the children being able to identify the face/s associated with the happy ending of the story (6 chose Face A and 1 chose Face B). However, these were the faces at either end of the face scale, (ie the extremities) so it could be argued that they were simply being asked to sort emotional expression into basic categories (positive and negative), though it has to be said that the children were very young with mean age of 3.6.

In conclusion, these studies were initiated to investigate whether very young children are able to use a self-rating scale to measure their general anxiety (emotional response). This was necessary as very young children are often reported in the literature as presenting problems of measurement. However, when the results of these studies are examined, they show:

- a) In Study II results showed children’s discriminative use of the Face Scale tended to increase with age. There was also a tendency for some the youngest

children to rate themselves as worried, possibly because they were fairly new to the school routine. Teachers supported the youngest children's discriminative ratings, but varied somewhat with the older children.

b) In Study III 6 out of 11 children aged from 3½-4 years showed discriminative use of the Face Scale. They did better without instruction from the play leader than children who were instructed.

c) In Study IV children aged from 4-5 did less well in that 2 out of 23 in the morning and 6 out of 19 in the afternoon showed discriminative use of the Face Scale. However 11 out of 25 of the children showed a variation in their ratings between morning and afternoon, and all but 1 of these was confirmed by the teacher.

d) In Study V 8 out of 10 very young children aged from 3-4, gave discriminative responses to an anxiety provoking situation and 6 out of 10 did so to a happy ending, shown by their use of the Face Scale.

While it is questionable whether the Face Scale can be used sensitively as a 5 point rating scale by very young children, it is suggested that their clear use of the scale does allow comparisons to be made. For example, assuming the majority of very young children are inclined to use the Face Scale as a 3 point rating scale, this is an initial step in measuring their general level of anxiety and would allow statistical analysis to be undertaken. Further an independent rating by parent or carer would be taken each time a child draws a picture. Thus an independent measure will be entered into the final analysis.

There is a need in this research to establish basic measures. More sophisticated psychometric analysis is not justified, and given these circumstances, the use of the Face Scale to measure anxiety (emotional response) is supported and the decision was taken to proceed with its use.

DESIGN AND PROCEDURE OF MAIN STUDY

In the process of scientific discovery everything should be made as simple as possible but not simpler

Albert Einstein

4.1 HOSPITAL RESEARCH PROTOCOL

An important consideration when recruiting seriously-ill children to this research project was the potential strain on the children and their families. The stress of waiting in an outpatient haematology/oncology paediatric department and the strain of undergoing painful medical procedures has been widely reported (Inman, 1991). However, the findings from the previous study (Stephens-Parker, 1990) not only supported a longitudinal research project that could be scientifically evaluated but suggest when the method of investigation is straightforward and easy to administer minimal cognitive demands are placed on the children. Further when it is explained to parents that the research is not looking at how well their children draw but what they draw when left to their own devices and what they draw as they get older, they participate willingly.

On this basis, an application was submitted and approved by the Ethics Committee of The Hospital for Sick Children, Great Ormond Street, London, and included in the research protocol of the University of East London.

4.2 EXPERIMENTAL DESIGN

The central question of investigation was:

Is there an association between a child's state of health and the use of colour in their free drawings?

Secondary questions were:

Do variables such as anxiety, age, sex or IQ co-vary with colour usage?

These questions are to be studied through the following investigations:

- a) replication of the previous study (Stephens-Parker, 1990).
- b) longitudinal assessment using a mixed design .
- c) cross-sectional comparison of free drawings between samples of seriously-ill, non-seriously ill and healthy children.
- d) an analysis of correlation between the independent variables, the state of health of the children and the colour use in their drawings.

LONGITUDINAL ASSESSMENT

This was based on the initial random selection of ill children from specific diagnostic groups, as detailed below, at outpatient clinic appointments or at inpatient admission and was designed to include a minimum of 3 drawings and a maximum of 6 drawings from each child over a 12 month period, collected at 1-2 month intervals.

4.3 PARTICIPANTS

SELECTION CRITERIA

In order to select seriously ill and non-seriously ill children for this study a basic questionnaire, shown in Appendix F, was devised for discussion with consultants and staff in various departments of the hospital. Without their cooperation and support it would have been impossible to undertake this study.

Based on the information the following groups of children shown in Fig. 10 below were considered as suitable for this research.

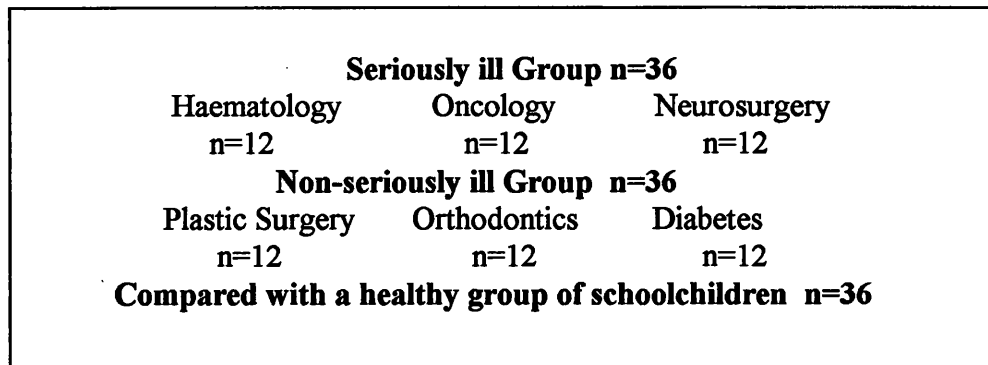


Fig. 9 Selected Group of Participants

EXCLUSION CRITERIA

Children were excluded for the following reasons:

1. Children and/or their parents did not want or were unable to cooperate with the study.
2. The child and/or their parent did not speak English fluently enough to make communication adequate.
3. Children whose IQ scores on the BPVS fell outside the range of +/- 2 SDs from their age-related norm (this would mean standard scores under 70 or over 130 given the BPVS SD is 15 points).

CHANGE TO SELECTION CRITERIA OF PARTICIPANTS

The following problems were experienced, which caused a drastic reduction in sample size:

1. After initial recruitment of 10 children in the seriously-ill group newly diagnosed with lymphoblastic leukaemia, the UKALL XI CNS study was

initiated without the author's or supervisors' prior knowledge (Full details given in Appendix G)

This unfortunately meant that this planned study and the UKALL XI CNS study's target children overlapped. Thus further recruitment had to be abandoned for the following reasons:

- a) the UKALL XI CNS funded by the Medical Research Council study took precedence.
 - b) children and their parents could not ethically be asked to take part in two separate studies as well as follow an intensive treatment protocol to combat their disease.
2. Major building work at the hospital temporarily disrupted recruitment of children from neurosurgery and plastic surgery groups. It proved impossible within the time constraints to recruit the required number of children.
 3. During the 12 month period of the development of the design ongoing changes in the structure of the National Health Service, particularly the decision of The Hospital for Sick Children to apply for trust status, meant that many non-seriously ill children would be treated within their local community. For example, there was a drop in the number of new referrals to the hospital, such as children with diabetes¹¹ and those requiring orthodontic treatment who were within the age range of potential participants for this study. Long-term patients were, in general outside the age range for this study.

¹¹ Reappraisal of the Diabetic group was also found to be necessary because potential mood swings can occur and would not equate with a global anxiety rating but would equate with their blood sugar monitoring. Further the Lansky scale relies on play performance ratings during the previous week whereas for Diabetic children it would need to be a daily, preferably AM/PM rating.

These frustrating difficulties led to massive depletion of potential participants and therefore a radical reappraisal, including the fact that the research was a part-time research project, was undertaken. Rather than risk abandoning the entire project, a search for a homogenous group of non-seriously ill children was undertaken. Eventually it was thought that children with eczema met this criteria. This group of children with chronic, often severe eczema were attending the Dermatology outpatient clinic every 1-2 months, and participating in a long-term clinical trial of Chinese herbal medicine. Despite these children meeting the criteria of this research they were very much an 'unknown quantity' in the sense that there is very little published research on the psychological sequelae of their condition relevant to this research. The few studies found on an in-depth literature search (CD-Rom Psych-Lit and Medline 1967-97) were mainly non-English language so their content had to be assessed from the abstracts. Despite these limitations, these will be included, where appropriate, in the Discussion (Chapter 6). Further, given the time constraints to proceed with this research, and being at risk of having to abandon the study, it was decided to include children with chronic eczema. The change of participants is shown in Figs. 11 and 12 below.

PLANNED NUMBER OF CHILDREN		
SERIOUSLY-ILL GROUP		
Haematology n=12 Acute lymphoid leukaemia	Oncology n=12 Rhabdomyosarcoma Wilms tumour	Neurosurgery n=12 Brain tumours (malignant & benign)
NON SERIOUSLY-ILL GROUP		
Plastic Surgery n=12	Orthodontics n=12	Diabetes = n=12
COMPARISON GROUP OF HEALTHY SCHOOLCHILDREN		
n=36		

Fig. 10 Planned number of children

FINALLY RECRUITED NUMBER OF CHILDREN
SERIOUSLY-ILL GROUP Haematology n=10 Leukaemia & Rhabdomyosarcoma
NON SERIOUSLY-ILL GROUP Eczema n=10
COMPARISON GROUP OF HEALTHY SCHOOLCHILDREN n=10

Fig. 11 Finally recruited number of children

4.4 PROCEDURE

Using a repeated measures design, the following instruments/measures were used each time a child was recruited to the study, with their parents' consent, and followed up during the course of the next 12 months. Sisters of the outpatient clinics and haematology/oncology ward indicated from the scheduled clinic/inpatient lists which children would be suitable for random recruitment to the study.

1. On each occasion of contact with child:
 - i. A free drawing using plain, good quality A4 size white paper.
 - ii. A standardised set of 12 coloured pencils/crayons.
 - iii. Full details of child were attached to each completed drawing.
(See Appendix H).
 - iv. Face Scale to rate anxiety (as shown in Fig 9). One scale to be given to child to complete, and one Scale to be given to adult to complete.

- v. Lansky Play-Performance Scale (as shown in Fig. 2) for parent to rate when child is drawing.
2. A one-off administration of the short form of the British Picture Vocabulary Scale (BPVS) to be given to each child as an estimate of their general intelligence level.
3. A retrospective rating of the health status of seriously-ill children to be given by a Senior Research Nurse of the Haematology/Oncology Clinic and Ward (ie every 2-3 months).

The data were subjected to statistical analysis (SPSS-PC).

It was decided to recruit a seriously ill group of children then follow with recruitment of non-seriously ill group and a healthy group of schoolchildren. The reason for this decision being that the recruitment of children recently diagnosed with leukaemia would potentially take longer than the non-seriously ill and healthy groups of children.¹²

Clinic lists were scrutinised weekly for dates when children would attend outpatient clinics. Ward Sister and Day Care Unit Sister for oncology/haematology patients would be contacted once a week when SI group came for blood test, scan or outpatient appointment. If admitted as inpatient an appointment would be made through Sister/parent.

It had been estimated that up to 6 drawings from each child would be collected, but the number collected varied between 1 and 5, though generally 3 drawings were collected. These 3 drawings from each child were used in the final analysis. When

¹² Although a more rigorous methodology would require testing all groups simultaneously, with hindsight this decision proved correct and enabled the study to continue, recruiting a target group of seriously-ill children before the UKALL XI CNS study overlapped.

only 1 drawing was collected from a child these were not included and thus the number of participants were reduced for the final analysis from 12 to 10.

On completion of all drawings they were collated and laser copies are shown in Appendix I. (Originals available on request).

5

RESULTS

*Be careful that one does not use statistics
as a drunken man uses lamp-posts - for support rather than illumination
Andrew Lang 1844-1912*

5.1 DEMOGRAPHIC VARIABLES

The main demographic variables of the 30 children in the study, and statistical analyses, using SPSS, are summarised below.¹

5.1.1 Age

The mean age of children recruited between 4 and 12 years, was 7.9 (SD 2.5), and by group the mean ages were:

Group 1 Seriously-ill children n=10	Group 2 Non-seriously ill children n=10	Group 3 Healthy children n=10
7.8 (SD 2.2)	8.9 (SD 2.2)	6.9 (SD 2.8)

Table 9. Mean ages of children

Children in the 3 health groups did not differ significantly by age (Anova $F = 1.76$ $df\ 2,27$ $p = .189$).

¹ Whenever the numbers are fewer than 30 for all 3 groups or 10 for each group, it is because missing values are excluded from the analyses

5.1.2. Sex

There were 14 boys and 16 girls in the 3 health groups in this study, as shown below.

Gender	Group 1	Group 2	Group 3
Girls	6	3	7
Boys	4	7	3

Table 10. Numbers of boys and girls in each group

No significant differences were found between the number of boys and girls in all the groups in the study ($X^2 = 3.56$ df 2 $p = .168$).

5.1.3 Intellectual level

The mean intellectual level (BPVS score) of the children was 96.2 (SD 15.7) and group means were:

Group 1 n=10	Group 2 n=10	Group 3 n=10
92.6 (SD 18.4)	95.1 (SD 11.6)	101 (SD 15.3)

Table 11. Mean Intellectual level (BPVS) scores

There was a non-significant trend towards lowered intellectual level for the seriously-ill children (Anova $F = .801$ df 2,27 $p = .459$).

5.2 NUMBER OF COLOURS USED²

5.2.1 Age

The number of colours children used in all 3 drawings was not significantly associated with age (Pearson's correlation $n = 25$ $r = -.041$ $p = NS$).

² In this section the total number of colours used in all 3 drawings was investigated, and the average is referred to as group mean number of colours.

5.2.2 Sex

The mean number of colours used in all 3 drawings for girls was 19.7 (SD 8.47), and for boys it was 12.5 (SD 6.16).

	Girls n=16	Boys n=14
Seriously-ill children	15.83	12.67
Non-seriously ill children	12.33	9.67
Healthy children	26.14	15.00

Table 12. Group means of number of colours used by boys and girls

Girls were shown to use significantly more colours in their free drawings than boys and this was significant for the healthy and also for the ill groups (T-test $t = 2.34$ df 23. $P .03$ 2-tailed). Similarly, Anova showed significant differences between boys and girls and health groups but there was no significant interaction. (Healthgroup $F = 5.96$ DF 1,24 $p = .010$, Gender $F = 4.87$ DF 2,24 $p = .040^2$, Interaction $F = 1.06$ df 2.24 $p = .367$).

5.2.3. Intellectual level

There was a random relationship between each child's BPVS score and the total number of colours each child used in all 3 drawings (Pearson correlation $n=25$ $r = .057$ $p = NS$).

² Due to low numbers in some individual Anova cells (ie less than 5 scores) these statistics should be treated with caution.

5.2.4 Number of colours used in all 3 drawings by health group

The group means for the number of colours used were:

Group 1 n=9	Group 2 n=6	Group 3 n=10
14.8 (SD 5.5)	11 (SD 5.2)	23 (SD 8.8)

Table 13. Group means of number of colours used in all 3 drawings

The healthy group of children used significantly more colours than the ill children across all 3 drawings. (Anova for healthgroup $F = 6.05$ $df = 2,22$ $p = .008$). Tukey HSD supported these results ($p < .05$ level). (See Appendix I for reduced-size colour laser copies of children's drawings).

5.2.5 Variation in the number of colours between health groups for each drawing.

5.2.5.1 Variation in the number of colours between health groups for

Drawing No. 1 was given as:

Group 1 n=10	Group 2 n=10	Group 3 n=10
5.3 (SD 2.7)	4.0 (SD 2.0)	8.1 (SD 3.3)

Table 14. Group mean number of colours used for Drawing No 1.

The healthy group of children used significantly more colours than the non-seriously ill group of children (Anova $F = 5.84$ $df 2,27$ $p = .01$). Tukey HSD supported these results ($p < .05$).

5.2.5.2. Variation in the number of colours used between health groups for

Drawing No. 2 was given as:

Group 1 n=10	Group 2 n=7	Group 3 n=10
4.5 (SD 2.9)	4.0 (SD 1.8)	8.1 (SD 3.9)

Table 15. Group mean number of colours used for Drawing No. 2

The healthy group of children used significantly more colours than the non-seriously ill group of children (Anova $F= 4.70$, $df 2,24$ $p= .02$). Again Tukey HSD identified significance as coming from the number of colours the children in the healthy group used versus the non-seriously ill group ($p < .05$).

5.2.5.3. Variation in the number of colours used between health groups for

Drawing No. 3 was given as:

Group 1 n=9	Group 2 n=7	Group 3 n=10
4.1 (SD 2.4)	3.0 (SD 1.5)	6.6 (SD 3.4)

Table 16. Group mean number of colours used for Drawing No. 3

The healthy group of children similarly used significantly more colours than the non-seriously ill group of children.(Anova $F= 3.98$ $df 2,23$ $p= .03$). Tukey HSD also supported these findings ($p < .05$).

5.2.6 Repeated measures analysis of number of colours used in each drawing.

The interaction between drawings and healthgroup was not significant. However, although not significant, the Multivariate Anova (Manova) identified a pattern of differences shown in the number of colours used by the children in the two ill groups versus the number of colours used by children in the healthy group. This pattern was repeated across all three drawings, and is therefore shown to be reliable. (Manova Health group $F=6.05$ $DF 2,22$ $p = .008$; Drawing $F = 2.56$ $DF 2,44$ $p = .089$, health group x drawing $F = 0.18$ $DF 4,44$ $p = .94$). (There is no Tukey HSD in Manova).

5.3. Post-Hoc Analyses

Tukey HSD is a conservative test when reporting statistical significance. However, since Tukey HSD identified significance as coming from the number of colours the healthy group of children used versus the non-seriously ill group, it was decided to carry out further exploratory post-hoc analyses. T-tests were used to explore further potential differences between the colour use of the different groups of children than those shown in the Tukey HSD results.

5.3.1 Comparison by t-test of number of colours used by healthy group versus combined ill group.

The number of colours the children in the seriously-ill and non-seriously ill groups were combined and compared with the healthy group. The mean number of colours children in the healthy group used was 22.8 (SD 8.8) compared with the combined ill group 13.27 (SD 5.6). The use of colours by children in the healthy group showed

significantly more use of colour than the combined ill group across all 3 drawings

($t = -3.32$ DF28 $p = .003$ 2-tailed).

T-tests comparisons across each drawing showed:

Drawing No 1 healthy group (n=10) versus combined ill group (n = 20)
 $t = -3.24$ DF 28 $p = .003$ 2 tailed

Drawing No 2 healthy group (n= 10) versus combined ill group (n= 17)
 $t = -3.11$ DF 25 $p = .005$ 2 tailed

Drawing No 3 healthy group (n=10) versus combined ill group (n = 16)
 $t = -2.72$ DF 24 $p = .012$ 2 tailed

5.3.2 Comparison by t-test of number of colours used by seriously-ill group versus healthy group

The average number of colours used across all 3 drawings by seriously-ill children was 14.8 (SD 5.59) and for the healthy group of children it was 22.8 (SD 8.8).

Differences were shown between the number of colours used across all 3 drawings seriously-ill children used compared with the healthy group of children ($t = -2.34$ DF 17 $p = .032$ 2 tailed).

T-test comparisons across each drawing showed:

Drawing No 1 healthy group (n=10) versus seriously-ill group (n=10)
 $t = -2.06$ DF 18 $p = < .05$ 2-tailed

Drawing No 2 healthy group (n=10) versus seriously-ill group (n=10)
 $t = -2.33$ DF 18 $p = .032$ 2-tailed

Drawing No 3 healthy group (n=10) versus seriously-ill group (n=9)
 $t = -1.78$ DF 17 $p = .93$ 2-tailed

Drawing No 1 showed significant differences; Drawing No 2 showed less significant differences and Drawing No 3 differences were not significant.

5.3.3. Comparison of number of colours used by seriously-ill group versus non-seriously ill group.

The average number of colours used by the seriously-ill group for all 3 drawings was 14.8 (SD 5.9) compared with the non-seriously ill group 11.0 (SD 5.2).

No significant differences were found ($t = 1.32$ DF 13 $p = .211$ 2-tailed).

T-test comparisons across each drawing showed:

Drawing No 1 seriously-ill group ($n=10$) versus non-seriously ill group ($n=10$) $t = 1.22$ DF 18 $p = .238$

Drawing No 2 seriously-ill group ($n=10$) versus non-seriously ill group ($n=7$) $t = .40$ DF 15 $p = .695$

Drawing No 3 seriously-ill group ($n=9$) versus non-seriously ill group ($n=7$) $t = 1.04$ DF 14 $p = .316$

No significant differences were found.

5.4 ANXIETY

5.4.1 Children's self ratings

A significant relationship was shown between differences in the children's anxiety ratings and differences in the number of colours they used in their first drawing.

However this effect was not found in Drawing No 2 and 3.

Pearson's correlation for:

Drawing No 1 $n=20$ $r = -.54$ $p < .01$ level

Drawing No 2 $n=17$ $r = -.03$ p NS

Drawing No 3 $n=16$ $r = -.16$ p NS

5.4.2 Adult ratings

The children's result on Drawing No 1 were reflected in the adult ratings

Pearson's correlation for:

Drawing No 1 n=20 $r = -.49$ $p < .025$ level

Drawing No 2 n=17 $r = .03$ $p = NS$

Drawing No 3 n=16 $r = .01$ $p = NS$.

5.5 SEVERITY SCALE BY NUMBER OF COLOURS USED

5.5.1 Lansky Scale

There was no correlation found between the number of colours children use and illness status (Lansky Scale) (Pearsons correlation Drawing No 1 n=20 $r = .14$ $p = NS$; Drawing No 2 n=17 $r = .22$ $p = NS$; Drawing No 3 n=16 $r = .26$ $p = NS$).

5.5.2 Severity of Illness Scale - Groups 1 & 2 (Seriously-ill & non-seriously ill children)

No significant relationship was shown between professional/clinical rating of severity and the number of colours children used (Pearsons correlation Drawing No 1 n=20 $r = .06$ $p = NS$; Drawing No 2 n=17 $r = .06$ $p = NS$; Drawing No 3 n=16 $r = .20$ $p = NS$).

5.5.3 Severity of Illness Scale Group 1 (seriously ill children)

No correlation was shown between the number of colours seriously-ill children use in their drawings and the severity of illness scale (professional/clinical rating) (Pearsons correlation Drawing No 1 n=10 $r = .41$ $p = NS$; Drawing No 2 n=10 $r = .26$ $p = NS$; Drawing No 3 n=9 $r = .05$ $p = NS$).

DISCUSSION

Creativity is never finished only abandoned

Paul Valery

The results of this research have shown the feasibility of examining the colour use in children's drawings by a simple count, and linking this with their state of health.

While the general aim has been to investigate Bach's contention that the use of colour or the lack of it in seriously-ill children's drawings may be related to their physical condition¹³, there are several factors to assess in interpreting the results.

6.1 Previous Study and Replication

In a previous study Stephens-Parker (1990) showed significant statistical differences in the number of colours seriously-ill children used in their drawings compared to a group of non-seriously ill and healthy children.

These results were replicated in this current study insofar as it showed significant differences between the number of colours ill children used in their first drawing compared to healthy children. However, the results of the present study faded over time, ie the same level of significance was not reached for the children's second and third drawings.

¹³ Bach 's suggested that the somatic aspects would be consistently associated with a striking lack of colour in the drawings of leukaemic children in the anaemic phase of the disease.

Both studies showed a definite split between the number of colours in the free drawings of ill and well children, but in the first study in 1990 the statistically significant split was between seriously-ill versus non-seriously ill versus healthy children, while in this present study the difference was between seriously-ill, and ill children versus healthy children.

It is possible that there is a 'surprise value' involved in a first drawing, for example, when a child and their parent meet a researcher for the first time they may be more anxious and anxiety may play a part. Alternatively, it may be the child is more focussed when undertaking a new task.¹⁴

6.2 Age

The age of the children was again not found to be significantly associated with the number of colours they used in their drawings. This suggests there is not an age-related trend.

6.3 BPVS Score

When considering BPVS score, the only finding of note was that there was a non-significant trend towards lowered intellectual level for the seriously-ill group of children. This trend is in keeping with previous research suggesting children who receive chemotherapy and/or irradiation at a young age may suffer cognitive impairment (Butler & Copeland, 1993; Jannoun & Chessells, 1987). Whether this may in turn affect their use of colour is not known, but since no significant association was found between BPVS and the number of colours children used in their drawings, this

¹⁴ However, Clinical Psychologist/s at Great Ormond Street Hospital know of no clinical findings to support this hypothesis, and there is no known literature to support this assumption (Psych-Lit Search 1969-1997).

is mentioned as a factor that needs consideration in future research. The test used (British Picture Vocabulary Scale) is based upon vocabulary skills which have often been used in adults as an estimate of pre-morbid IQ since these skills tend to hold up well in cases of cognitive damage. It is therefore possible that the present results indicate an actual rather than an iatrogenic difference in intellectual levels between the groups.

6.4 Sex

Girls were shown to use a greater number of colours than boys in all their drawings (a mean of 19.7 compared to 12.5). However, the reason for this difference is not known and it is possible that this may have been a spurious result. Since there are no published studies on sex differences and the number of different colours used in children's drawings, this finding needs clarification.

6.5 Anxiety

Overall, the concept of anxiety presents difficulties of measurement, particularly with children as young as 4 years. There have been concerns about the accuracy of inferences based on children's self-report scales, and this is a pervasive problem, not confined to clinical assessment and research (Gittelman Klein & Burrows, 1990).

Nevertheless a comprehensive investigation has to start somewhere, and a straightforward screening tool such as the Face Scale used in this research, though not ideal, provided an initial basic measure. It can be criticised in that it was inadequate.

It has been stated that non-verbal communications are often cited to be of greater salience (65%) than words (35%) Kendrick et al (1986), and it may be that the eventual Face Scale used was perceived by children in this study to represent a

happy/sad dimension, rather than the relaxed/worried dimension intended. However, a measurement scale of anxiety that is too comprehensive would be inappropriate for a basic assessment in a study such as this.

Interestingly, the initial face scale ratings from both children and adults suggested anxiety may be a factor associated with a lower number of colours children use in their drawings, but the second and third measurements did not yield similar results. Again, consistent to the finding with the children's first drawing, it may be that the initial response has a 'surprise' value, that children and adults may be more anxious when meeting someone, ie the researcher, for the first time and this in turn affected their ratings on the anxiety scale. But this supposition is speculative. At the very least, results on the first scoring of the Face Scale show anxiety cannot be completely ruled out as a factor affecting children's use of colour in their drawings. Alternatively, it is possible that anxiety may not be 'expressed' by the medium of colour but by the actual drawing content. For example studies have shown variations in the size of a child's drawing of a potentially-anxiety provoking figure (Craddick, 1963, Fox & Thomas, 1990). The reason for this may be that 'generalised emotional states such as anxiety may interfere with the motor activity of producing a drawing, resulting in smaller or cruder drawings than the child would otherwise produce' (see evidence for this effect in adults reported by Lewinsohn, 1964, and cited by Thomas & Jolley (1997). It has to be said that these latter findings are related to instructed rather than free drawings, but they may be important.

6.6 The use of colour and association with children's health

Regarding the children's use of colour, the findings in this study support the hypothesis that illness is associated with a lower use of colours in children's drawings. Similarly, health is associated with the use of a higher number of colours in children's drawings. Therefore the results are consistent with the view that state of health does have an effect on the number of colours children use in their drawings.

However, this study did not completely support the hypothesis, drawn from Bach's contention that seriously-ill children diagnosed with leukaemia, during the anaemic phase of the disease, show 'a striking lack of colour' in their drawings.

Much of Bach's work was carried out in the 1950s to 1970s and to a lesser extent in the 1980s. Until recently leukaemia was considered a fatal condition and children invariably died. Advances in the management of this condition not only prolong life but give many children a long-term survival prognosis, if not cure. Bossert & Martinson (1990) state 'the course of childhood cancer has changed dramatically in recent years from a rapidly fatal disease to a chronic condition with variable outcomes.' This raises the question that maybe children currently diagnosed with leukaemia have an increasing expectation of living with their disease rather than dying of it, and it is possible, though speculative, that if illness is associated with the number of colours children use in their drawings, then a more optimistic prognosis may have an effect.

Of note, is the observation that the one child who had the most serious prognosis and who died shortly after completion of his second drawing was shown, on retrospective analysis, to use only one colour in his drawings (light brown).

Bach's contention that children with different medical diagnoses show a preference for certain colours, and this is distinct from the number of colours they may use in their free drawings, suggests a sustained, non-random preference for colour. Exploratory investigation of this factor between the 3 health groups in this study (using Chi square analysis) showed that seriously-ill children made more use of light brown colour in Drawings 1 and 2 ($X^2 = 6.24$, $df=2$ $p<.05$ and $X^2 = 6.133$, $df=2$ $p<.05$) than the non-seriously ill and healthy children.

Non-seriously ill children used more of the colour black in their first drawing than the seriously-ill and healthy children ($X^2 = 9.300$, $df=2$ $p <.01$), but there were no significant differences shown in Drawings 2 and 3. Similarly non-seriously ill children also used more light green ($X^2 = 7.601$, $df=2$ $p<.05$) and orange ($X^2 = 6.667$, $df=2$ $p<.05$) in their first drawings than the seriously-ill and healthy children but there were no significant differences shown in Drawings 2 and 3.

It was also decided informally to explore whether seriously-ill versus non-seriously ill children differed on their average use of 'dominant' colours (dominant computed as black, dark brown, red, orange, dark green, dark blue and mauve) compared to 'subdued' colours (computed as light brown, pink, yellow, light green and light blue), but no differences were shown. However due to the exploratory nature of this study and the small number of children in each group it is not possible to do more than suggest preferences for colour and dominant versus subdued colour use in drawings are potential indicators of further study even though no consistent pattern was shown. It is unfortunate, that as previously explained, the number of children recruited to this study were drastically reduced as data from the estimated versus selected numbers of

children might have allowed a more comprehensive evaluation. This has been a problem noted by other researchers and will be discussed briefly in the later section on methodological shortcomings.

6.7 Non-seriously ill Children

Results also showed that children in the non-seriously ill group overall used a lower number of colours in their drawings than did the seriously-ill children. These findings need careful consideration, particularly since there is a sex difference, and that girls were shown to use a greater number of colours in their free drawings than boys.

There were more girls in the seriously-ill than the non-seriously ill group and that may have had an effect on the results. Also, as suggested above, the depletion in the number of children recruited to the study was most unfortunate but if, for example, there had been a larger cohort, with an equal number of girls and boys in each of the health groups a clearer pattern of results may have emerged.

Also the non-seriously ill group were children who all had a diagnosis of chronic eczema, the majority at the severest end of the spectrum. Their inclusion in this study was due to imposed changes since the original group of children with diabetes had to be abandoned, as explained. While severe eczema is not life-threatening it was found to be life-disruptive affecting all areas of the children's functioning, often requiring hospitalisation on a number of occasions, and so, in many ways, these children are an 'unknown quantity'. Eczema is not often regarded as a severe condition, but the children recruited to this study were considered to have a severe, chronic condition, and it may be that these children see themselves as seriously-ill, and this in turn affects

the number of colours they use in their drawings. Such a contention is however speculative.

It might therefore be useful in the future to evaluate non seriously-ill children's self-concepts. Further, it may be that children with eczema have difficulty in adapting to their chronic illness. Whether they generally find it more difficult to adapt to their illness than the seriously ill children is not known. Treatment for both these groups can be classified as invasive, in that many procedures involve taking blood and medication for prolonged periods. Unfortunately, there have been few relevant studies of children with severe eczema, and more work needs to be done in this area. However, a study of the abstracts of 3 non-English language studies relate to family functioning (Langfeldt & Luys, 1993 and Ring and Palos, 1986, 1995), 2 of these suggest emotional distance between mothers with infants and toddlers who have eczema. Ring and Palos (1986) from a structured interview with an unspecified number of participants, mothers were said to react less spontaneously and maternal affection often takes place as a hygienic ritual and the capacity to 'enjoy' their children was 'significantly less pronounced in comparison to controls'. Interestingly, evaluation of the children's animal drawings suggested they 'mostly selected unpleasant or dangerous animals to describe their parents and siblings' However, again this finding is highly speculative and no mention was made of a matched comparison group of children. Nor is it known whether the children drew freely, or were instructed, for example, to choose from a variety of animal pictures.

Extensive searches (Psych Lit and Med-Lit CD Rom 1974 -1996) failed to reveal any English language studies relevant to the drawings of children with eczema and

therefore any association between their condition, free drawings and colour use is an unknown factor at the present time.

6.8 Lansky Scale & Professional Rating Scale of Illness Severity

Results from the Lansky Scale and Professional Rating scale were disappointing. The Lansky Scale was developed and validated for use with seriously-ill children and was reported (Lansky 1985, 1987) to reliably differentiate seriously-ill children from their healthy siblings and a comparison group of well children. With hindsight, although it was a validated scale in published literature, it might have been more appropriate to pilot the scale. Quite simply, the Lansky Scale was not found to be useful. One reason could be that the parents of ill children, particularly those who are seriously-ill with a life-threatening diagnosis, are not able or willing to rate their children appropriately. It is not suggested that they do not want to be honest, but perhaps they can't always be so. For example, the one child that had the poorest prognosis of the seriously-ill children and who subsequently died, was rated high by the parent, which highlights this difficult point.¹⁵ Of course it may be the instruments were inadequate. Another example is that the Lansky Scale performed poorly compared to the professional rating scale, despite publications suggesting its robust properties (Lansky 1987), but overall it has to be said these were at best crude measures because staff would not commit themselves, mainly for medicolegal reasons, to anything other than a general rating of children's illness severity. This is understandable, but is an important point if further evaluation is to be undertaken.

¹⁵ There were concerns expressed by staff that the mother had difficulties coming to term's with her child's very poor prognosis. This is understandable. She wanted him to do well and conveyed this in her manner, behaviour and the basic anxiety scale assessment.

6.9 Methodological shortcomings

To reiterate, basic measures were used throughout this study, one reason being that they had to be quick and straightforward to administer given that most children were recruited and followed up in busy paediatric outpatient departments. Clearly, there are limitations to the research design, and it may be that future research should consider using different measures.

First of all, unfortunately, soon after the writing-up process for this research had commenced, statistical power analysis was brought to the attention of the author (Howell, 1997), and therefore post-hoc rather than planned analysis of the colour used in the children's 3 drawings is included here. Results demonstrate that one can be reliably confident that a Type II error has been avoided for Drawing No 1 .85, for Drawing No. 2 0.74 and for Drawing No 3 0.64 . Therefore the cautious confidence diminishes over time. (see Appendix K for hand-written data).

Regarding the various technical difficulties of estimated versus selected numbers of children in this research. Apparently, Spinetta et al (1981) for a variety of reasons found that, despite a long research project involving a full back-up team, they were unable to collect the number of drawings originally formulated. The suggestion is that future research may have to continue to rely on smaller numbers of children.

Finally, following Bach's recommendations, coloured pencils rather than felt tip pens which have more vivid hues, have been used throughout this study and previous work (Stephens-Parker, 1990). Bach suggested caution regarding felt-tip pens/pencils because these usually produce markings and strokes too thick and undifferentiated to allow for accurate evaluation.

If a child used a number of light colours and consequently obtained a fairly high score in the present study, Bach would comment on this being significant.¹⁶ In this respect it could be argued that this study is inadequate because it does not take into account this aspect of colour.

6.10 Conclusion

All the results from this research and the previous study support the view that illness does have a significant effect on the number of colours children use in their drawings but anxiety may also have an effect. Whether anxiety affects colour use or the content, ie a decrease in the size of children's drawings, is not yet known. More objective investigation needs to be undertaken before anything approaching a strong and enduring correlational relationship between illness and colour use in children's drawings can be established. At the very least, the basic measures used throughout this investigation have placed the study of the number of colours children use in their free drawings and their state of health on a strong research foundation.

Currently, psychosomatic medicine recognises the mind and body functions as a unit, while in the child this partnership is developing and in the adult is possibly more stable, nevertheless it may be that in everyday life many ill children may be creatively far more in touch with their physical condition than many adults realise.

Despite the limitations discussed above, this investigation supports the view that colour may be a common factor that reliably differentiates a healthy from an ill child and indeed one child from another.

¹⁶ Every colour can have a double significance according to Bach (1990) ' which can be understood as positive or negative. Similarly even the same colour, more strongly or more faintly applied, or alternatively a lighter or darker shade of the same colour, may reflect different states of mind or body.'

6.11 Suggestions for future research

The foregoing results suggest there are several ways in which this research could be extended.

The number of colours children use in free drawings versus instructed drawing may yield more information. Similarly, a freely chosen topic rather than instructions on what a child should draw may generate hypotheses for further study.

Forrest & Thomas (1991) in their study on the drawings of bereaved and non-bereaved children support this viewpoint, although could cite no clear rationale.

Further, Van Krevelen (1974), Kelly (1984) and Furth (1988) suggest free drawings may be a more useful source of information than instructed drawings, and a series of drawings should be evaluated rather than one single example.

Recruiting an adequate number of children would seem to be an ongoing problem

One way forward might be to study and compare the number of colours individual children with different and quite distinct diagnoses, use in a series of free drawings.

Age was found not to be a factor in this study. While it is useful when undertaking an exploratory study to include young children, it might be useful to include a self-

concept scale for children such as the Piers-Harris Scale. This is used for children

over 6 years of age and might show whether children with these diagnoses differ in any way. The Piers-Harris Self-Concept Scale also has a built-in anxiety component..

Further exploratory studies of sex differences may yield more information, and the results of this present study have highlighted the potential for future research.

potential area for future work.

Anxiety as a factor is important. Methodological concerns do not support the use

of self-rating scales, but neither do they exclude them, particularly in relation to the younger child of 3-5 years.

The use of standardised coloured pencils or crayons rather than felt tips is recommended, for reasons already discussed.

Finally, it might be feasible to reinstate the original design, for example non-seriously ill children could be recruited in a school medical room or health centre, or in a setting that is more sociological rather than a medical setting such as their own home.

In conclusion, despite all the procedural problems with the design and selection of participants for this exploratory study, the results support the view that if children are allowed to respond without formal rules of right and wrong, and are free to select colours, allowing for variability in response, then future studies may broaden the field of enquiry into children's drawings.. The potential for a wide range of studies has yet to be explored.

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APPENDICES

- A Letter from G. Thomas**
- B Illness Severity Scales**
- C. Range of published anxiety related scales**
- D. Letters to Institute of Psychiatry & Tavistock Clinic**
- E. Story adaptation for playgroup children**
- F. Questionnaire for selection of participants**
- G. UXALL XI CNS Study details**
- H. Information sheet giving child details**
- I. Colour laser copies of children's spontaneous drawings**

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2 March 1992



Dr S. Stephens-Parker,
Department of Neurology,
(Old Building),
The Hospitals for Sick Children,
Great Ormond Street,
London, WC1 3JH

Dear Dr Stephens-Parker,

Thank you for your letter about children's use of colour. I fear that I cannot help you much, because there has been so little good work on this question. As I'm sure you are aware, correct use of colour is of little interest to young children. They see colour much more in terms of decoration and mood. Nevertheless, while a 5-y-old child might well use a bright colour deliberately for a picture of a happy person, I'm less sure that they would use bright or dark colours unconsciously to match their own feelings. Clearly, the research needs to be done. It is always salutary, however, to be reminded that the principal influence over toddlers' choice of colours appears to be the distance between the paint pot and the easel -- nearer colours are chosen more frequently!

The enclosed short list of references is fairly old and reflects how little work has been done. You may well have carried out a much more thorough search than I was able to do. I enclose also a copy of the bereavement paper as you requested. The drawings in our study were all made with pencils only. The paper does not include reproductions of the drawings, but I could let you have copies of selected examples if you could let me know which categories of drawing were of interest. At present I have no opportunities to undertake further work with bereaved children, but would be most interested to hear more about your researches into children's use of colour. Please do feel free to 'phone me on the number above if you think that a discussion could be useful.

Yours sincerely,

Glyn Thomas

Glyn Thomas, PhD.
Senior Lecturer in Psychology

email: THOMASGV AT UK.AC.BHAM.

APPENDIX A

INTENSITY OF ILLNESS SCALE

DISEASE SPECIFIC CHARACTERISTICS

DATE OF DIAGNOSIS:

VISIBILITY:

SEVERITY:

COURSE:

PROGNOSIS OF ILLNESS:

SEVERITY OF ILLNESS SCALE

(TO BE RATED BY CONSULTANT/PRIMARY PHYSICIAN)

AGE OF ONSET:

DURATION OF ILLNESS:

TOTAL NO. OF HOSPITALIZATIONS:

PROPORTION OF DAYS ABSENT FROM SCHOOL:

LEVEL OF MEDICAL INTERVENTION REQUIRED:

(TYPES & FREQUENCY OF MEDICATION RECEIVED)

LIMITATIONS OF CHILD'S ACTIVITIES BELIEVED TO RESULT
FROM ILLNESS:

INDEX OF SEVERITY OF ILLNESS

CONSULTANTS CLINICAL JUDGMENT

PARTICIPANT NO:

DIAGNOSIS:

PROGRESSIVE

LIFE DISRUPTIVE

LIFE-THREATENING.....

QUALITY OF LIFE YEARS:

General Health State:

Symptoms:

Activity Level:

Physical Mobility:

Pain:

Sleep:

Energy:

Social Isolation:

NUMBER OF TIMES HOSPITALIZED:

LENGTH OF STAY IN HOSPITAL:

Adapted from C E Perrin et al (Competency)

THE RORCHACH TEST

This consists of 10-12 plates of inkblots, equal mix of black and white and colour plates.

1. Can be used by children
2. Suitable for repeated measures design
3. Cost effective and easy to administer
4. Measurement of this scale would be difficult to interpret as it is not a standardised test.
5. It is considered more of a psychodynamic test and there is no evidence that this test has any value other than for clinical practice (Gittelman, 1990)
6. Not validated for use as an anxiety scale.

Children's behaviour questionnaire - Rutter Scale B (1971)

Adult rating scale, usually teacher or parents

Designed for children aged 7-13

26-item questionnaire with neuroticism (anxiety subscore) and covers a wide variety of behavioural problems

Aggressiveness, hyperactivity and anxiety-fearfulness are the 3 main factors assessed

Has also been used for absenteeism and truancy as well as classroom behaviour rating scale

Overcomprehensive and can be used once possibly twice in this research

STAIT-TRAIT ANXIETY INVENTORY (STAI)

Designed to distinguish between the two types of anxiety (Spielberger 1973).

Child rates as he/she feels right now (state) and in general (trait).

Provides self-ratings of general levels of anxiety.

Unsuitable for children under 6.

HOSPITAL FEARS RATING SCALE (HFRS)

(Malamed & Siegel, 1975)

A self-report inventory in which children rate on a 5 point scale faces depicting a continuum ranging from not afraid at all to very, very afraid) their fear to 16 medically related situations and to 9 filler items.

A medical fears score is derived by summing the ratings of those items relating specifically to medical stimuli and situations.

Can also be used by mothers to rate their perception of their children's fear levels on the HFRS items.

CHILDREN'S MANIFEST ANXIETY SCALE

Revision of Taylor Manifest Anxiety Scale (1956)

by Reynolds & Richmond 1978, 1984).

Three rating factors of a) physiological signs of anxiety;
2) worry and oversensitivity and 3) Fear/Concentration..

Scale is used to measure different forms of anxiety

Overcomprehensive for this study.

FEAR SCALE

(Miller et al, 1971) revised the 11 item anxiety factor

of their earlier Louisville Behavior Checklist to tap specific fears

(trains, loud noises), as well as general anxiety and separation anxiety.

Also Miller et al developed a parent-rated fear questionnaire for children.

THE PERSONALITY INVENTORY FOR CHILDREN (PIC)

Includes 600 items rated true/false.

Originally a parent-rated scale but more recently used

with teachers. The scale provides general population norms for children of preschool age to adolescence (Wirt et al 1977; Lachar 1982).

Over-comprehensive but potentially useful for one-off administration.

THE CONNORS TEACHERS RATING SCALES

(Goyette et al 1978)

Used primarily for tracking hyperactive children.

The parent, but not the teacher scale provides an anxiety factor.

Kiddie-SADS (or K-SADS) (Chambers et al 1985)

The Schedule for Affective Disorders is over-comprehensive and primarily used for children with anxiety disorders.

Piers-Harris Self Concept Scale

Self-rating scales with anxiety being one of the dimensions.

Not suitable for children under 6

The Junior Eysenck Personality Inventory (JEPI)

Measures neuroticism (emotionality) and extraversion-introversion (E).

For use with children aged between 7 and 16 years.

The scale is made up of 60 items selected on the basis of factor analytic studies, 24 to measure the N factor and 24 to measure the E factor and 12 items making up the lie scale. It has been suggested as showing distinctions between the constructs of anxiety and neuroticism while accepting that the two are highly correlated. A test that has been used to estimate the anxiety or emotionality level of children. Separate norms are available for boys and girls and is said to have good reliability.

It seems overcomprehensive for this research and cannot be used by children under 7 years of age. Potentially it might be useful for a one-off assessment but not for repeated use.

The Schedule for Affective Disorders is over-comprehensive and primarily used

for children with anxiety disorders.

CHILD DEVELOPMENT QUESTIONNAIRE

Zabin & Melamed, 1980) describes 14 hypothetical situations in which a child might be fearful or avoidant, eg during thunder and lightning, a visit to the doctor's officet. The parent is asked to score each of five response options, each reflecting a particular behavioural stragegy; (positive reionforcement; force; threat of punishment, reinforcement of dependency; modeling and reassurance. The frequency with which each strategy is chosen by the parent is computed, yielding a profile of parental management of the child's fearful/avoidant behaviour.



The Hospitals for Sick Children Special Health Authority

GREAT ORMOND STREET, LONDON WC1N 3JH

Telephone: 071-405 9200 Ext. *5594 or Answerphone*

Telegrams: GREAT LONDON WC1

PATRON: HER MAJESTY THE QUEEN

CHAIRMAN: MRS. C. BOND, S.R.N., S.St.J.

GENERAL MANAGER: SIR ANTHONY TIPPET, K.C.B., C.B.I.

C/O DEPARTMENT OF NEUROLOGY
OLD BUILDING

Mrs Amelia Dowling
Clinical Psychologist
The Tavistock Clinic
120 Belsize Lane
London NW3 5BA

Dear Mrs Dowling

I am undertaking PhD research here at GOS and Richard Lansdown is one of my Supervisors. It was he who suggested I write to you. As briefly as possible I will try to explain the reasons for this letter.

Firstly, my research is about children's use of colour in their drawings and that this use of colour may be associated with their clinical condition, or severity of illness.

Secondly, it may be that depression or anxiety which has been widely reported in seriously ill children may be a variable that affects their use of colour. A comprehensive literature search has revealed no relevant studies.

Thirdly the framework of my current research is that I plan to collect a series of at least 6 drawings from children between the ages of 4-12. There will be six different groups, all with different clinical conditions.

It has however been suggested that initially it would be useful to undertake a project with perhaps 30 children aged from 4-12 with an equal mix of boys and girls, as follows:

DEPRESSED
n=10

ANXIOUS
n=10

CONDUCT DISORDERED
n=10

All children will have the standardised set of colours used throughout my research and draw two pictures each, at say intervals of 1-2 weeks or a month between each.

On both occasions when each child is asked to draw a picture the parent or primary caregiver is asked to complete the Achenbach Child Behaviour Checklist.

The use of colour and comparisons between groups as well as

APPENDIX P

PHONE CALL WITH RL 12.3.92

Explained Mrs Amelia Dowling couldnt help with research due to enormous difficulties and amount of work involved in asking for parental permission and also the complexity of their cases means that children seen there wouldnt fall into such distinct diagnostic categories.

RL suggested I write to Professor Bill Yule at The Maudsley, and then if unable to find anyone else to help with this part of the research IT IS IMPORTANT TO STRESS THIS IN THE PHD THESIS.



The Hospitals for Sick Children *Special Health Authority*

GREAT ORMOND STREET. LONDON WC1N 3JH

Telephone: 071-405 9200 Ext.

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PATRON: HER MAJESTY THE QUEEN

CHAIRMAN: MRS. C. BOND, S.R.N., S.St.J.

GENERAL MANAGER: SIR ANTHONY TIPPET, K.C.B., C.B.I.A.

Department of Neurology
(Old Building) or
c/o Dr. R.Lansdown
Chief Psychologist, Department of Psychological Medicine

12th March 1992

Professor William Yule
Professor of Applied Child Psychology
Department of Psychology
Institute of Psychiatry
De Crespigny Park
London SE5 8AF

Dear Professor Yule

I am undertaking PhD research here at GOS and Richard Lansdown is one of my supervisors. It was he who suggested I write to you, and as briefly as possible I will try to explain the reasons for this letter.

Firstly, my research is about children's use of colour in their drawings, and that this use of colour may be associated with their clinical condition or severity of illness.

Secondly, it may be that depression or anxiety, which has been widely reported in seriously ill children, may be a variable that affects their use of colour. A comprehensive literature search has revealed no relevant studies.

Thirdly, the framework of my current research is that I plan to collect a series of at least 6 drawings from each child, between the ages of 4 and 12. There will be six groups of children, all with different clinical conditions.

It has however been suggested that initially it would be useful to undertake a study with perhaps 30 children, aged from 4-12, with an equal mix of boys and girls as follows:

DEPRESSED
n=10

ANXIOUS
n=10

CONDUCT DISORDERED
n=10

All children will have the standardised set of coloured pencils/crayons as used throughout my research, and be asked to draw two pictures each, at say intervals of 1-2 weeks or possibly a month between each.

The parent or primary caregiver of each child will be asked to complete the Achenbach Child Behaviour Checklist.

APPENDIX D

Page 2.

Professor W Yule

The children's use of colour in their drawings and comparisons between groups as well as parental ratings could then be statistically analysed to test for differences.

As far as I am aware there has been no published, systematic research in this area, and my main question is to ask if you would be prepared to consider whether I could approach the parents of children attending the Maudsley, and also whether a joint study would be feasible i.e. a study that I could incorporate into my own research here at GOS, and one that could be used by yourself or your Department. Naturally my main interest is in my research, but I am also interested simply because there has so far, to my knowledge, been no published systematic research in this area, and this would be very useful.

I do realise how busy you must be, but perhaps when you have had a chance to consider my request, you will let me know your feelings on this.

With many thanks, and I shall look forward to hearing from you.

Yours sincerely

Sonya Stephens-Parker

cc: Dr Richard Lansdown

APPENDIX D

LITTLE DOG LOST

Story adapted from Little Dog Lost by Inga Moore

When Dad got a new job in the country my brother Tom and I were so excited we could hardly wait to help pack and move to our new house.

As we drove along to our new home I had to hold on to Pip, our dog, because he kept looking out of the window. Dad said we would need a proper dog in the country.

"But we have a proper dog," I said. And Pip barked at him as if to say you bet!

At first I didnt really like living in the country. It's so lonely and I miss all my friends in town. The only friend, apart from my brother Tom, I had was Pip.

Pip is ever so funny. He still sleeps in Grandpa's slipper and sometimes rides home in my bicycle basket. But you will never guess what. Mum bought an old piano for Grandpa to play and whenever we have a sing-song Pip joins in. He doesn't always sing in tune, but he really seems to enjoy himself.

It was my birthday in the late autumn and Grandpa said perhaps Pip could sing at my party.

"Oh Grandpa," I said. "How can I have a party. I have no one to invite. I don't think I'll ever make new friends.*"

"You will," he said. "You'll see."

But autumn came and still we had no-one to play with. Tom and I just stayed at home on our own. Grandpa said we should be more like Pip who loved living in the country and was always scampering off to explore.

Then the night before my birthday Pip disappeared. I couldn't find him anywhere.

Mum told me to try not to worry and Tom said Pip had only scampered off somewhere by himself to explore.

But autumn was turning to winter and I kept imagining Pip wandering all alone in the cold and dark. Then it began to snow

Poor Grandpa didnt play his piano at all that night. He just sat by the fire not saying a word. "We'll find him," I said to Grandpa and Tom. I had forgotten all about my birthday. As I watched the snow fall all I could think of was Pip.

Page 2.

We went from house to house asking the children who lived round about if they had seen Pip. None of them had but they all came to help us look for him.

As we walked along I told them about the funny things Pip did. I don't think they believed me when I said he could sing.

We looked everywhere - in rabbit-holes, fox-holes, in all the hollow logs. We searched the woods, and tramped the fields for hours. But there was no sign of him.

By now it was getting late so we went back to the village. We were tired and we had all had enough, and now the snow was falling heavily.

I couldn't go home without Pip. Then as we stood quietly, I heard a piano playing in the distance and voices singing...

I thought I heard a sound I knew. I ran towards it and pushed open a door.

And there was Pip singing at the top of his voice. He was at the village choir practice! I explained that Pip had disappeared and that we had been searching for him all day. Then in came Tom, my brother, and told everyone it was my birthday and the next thing I knew I was having a party.

It was the best party I had ever had. Pip joined in singing Happy Birthday and everyone clapped and cheered. *

QUESTIONNAIRE

1. Is there a homogenous group of children (ie those suffering from the same diagnosed condition) aged between 4 and 10 years (ie 6 and 12 years by the time research is complete)?
2. Does this group have an equal mix of boys and girls?.
3. Most common clinical diagnosis?
4. What time intervals generally do children attend clinic for review?
Monthly/bi-monthly or longer?
5. If recently diagnosed, how long are they followed up at this hospital for, before being discharged back to care of local community services?
6. What days of the week and times (AM/PM) are clinics held?
7. What procedure to follow if inpatients (relevant to seriously-ill children)
8. Live within 25 mile radius of London or home counties?

INSTITUTE OF CHILD HEALTH

University of London

The Children's Hospital for Sick Children, Great Ormond Street, London W1N 8JH



NEUROSCIENCES UNIT

The Wolfson Centre, Mecklenburgh Square, London WC1N 2AP

Telephone: 071-837 7618 / 071-278 0902 Fax: 071-833 9169

Head of Unit: Professor B.G.R. Neville

Dear MRC

TREATMENT OF CHILDREN WITH LYMPHOBLASTIC LEUKAEMIA UKALL XI TRIAL

You are already aware that one of the objectives of this trial is to minimise possible late effects of treatment in particular with respect to school and learning problems.

You know that children in the trial are receiving different forms of central nervous system directed therapy and our aim is to monitor this treatment by serial assessment of the children. The purpose of this letter is to explain what these assessments entail.

We would like to test as many children as possible who are receiving various forms of central nervous system treatment to ascertain whether there are any problems with memory and learning. In order to do this we would like to investigate children five months from diagnosis, when they are in remission and have completed their first type of therapy and are attending outpatients regularly and subsequently at 3 years and 5 years.

For the first time in this kind of study, we are aiming to test a control group which will include for each child a sibling or cousin of similar age, and if possible sex. A healthy control group with comparable background and experience to the patient group is especially valuable because it will allow us to assess the effects of the treatment or of the disease independently from any other factor. The children from the control group will be tested in exactly the same way and at the same time as those of the patient group.

The tests will cover various aspects of intelligence, memory, motor behaviour, language and learning. The results may provide guidance for those young people who may be having educational problems, and for their tutors. The approximate time for testing will be 1 to 4 hours and this can be arranged in two sessions at mutually convenient times.

We would be very grateful if you would consent to your child being tested as any information we obtain from this study will help determine which form of treatment is the least detrimental

for children undergoing therapy for acute leukaemia. However, if at any time you feel that you wish to remove your child from the study, you are totally free to do so.

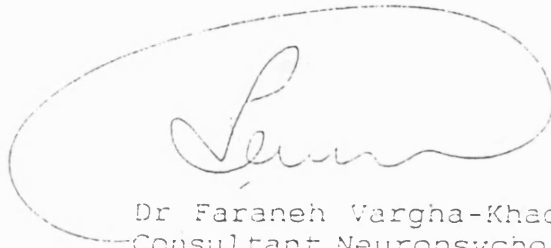
If you have any questions about the tests involved, we will be pleased to answer them.

A consent form is enclosed with this letter. If you agree that your child should take part in this study, could you please complete it and return it to us at your earliest convenience.

Yours sincerely,



Professor Judith Chessells
Haematology Consultant



Dr Faraneh Vargha-Khadem
Consultant Neuropsychologist



Dr Ian Hann
Haematology Consultant



Marie-Claude Jones
Assistant Psychologist

UKALL XI PSYCHOMETRIC STUDY

Brief summary of study

Aim

In the past 15 to 20 years the outlook for children with acute leukaemia has considerably improved, with increased chance of long-term survival. This has raised the issue of the qualitative nature of this survival as some children have shown psychological and behavioural problems following treatment.

In the UKALL XI CNS study, three methods of treatment have been chosen:

- Cranial irradiation
- Intravenous methotrexate and continuing intrathecal methotrexate
- Continuing intrathecal methotrexate alone

The aim of the psychometric study is to find out which treatment has the least deleterious effects on the child's intellectual abilities. It may also be possible to identify selective areas of deficit (i.e. visuo-spatial problems, memory difficulties, etc.)

Duration of study

This is a longitudinal study which will last for 6 years. Testing will first take place at 5 months post diagnosis, before the intensification programme. This will provide a baseline for further testing. The tests will be repeated at intervals of 3 years and 5 years.

We are also aiming to test a control group which will include for each leukaemic child a sibling or cousin of similar age and if possible sex.

Psychometric testing

The tests will cover various aspects of intelligence, memory, motor function, language and learning. The testing will take approximately 3 to 4 hours, depending on the age of the child and this can be arranged in two sessions to avoid fatigue.

Tests will include:

- basic intelligence scale
- tests of visual and verbal memory
- tests of attention and vigilance
- tests of frontal lobe function
- vocabulary, reading, spelling and maths
- fine motor coordination
- visuo-spatial skills

Referral system

Meetings were held with haematologists at GOS and at Marsden to discuss the patient referral system.

The following points were agreed:

- Sue Richards of the Clinical Trials Service Unit at Oxford will provide lists of patients on a monthly basis.
- The haematologists will introduce the study to the parents when the patients come to the clinics. This should be done at the 3rd or 4th month clinic post-diagnosis. The haematologists will obtain consent from the parents (form to be returned to the psychologist) and will inform them that they will be contacted by the psychologist at a later date.
- A tape will be produced by the psychologist describing the study to the parents. The psychologist will write to the parents who have agreed to take part to arrange an appointment for the first testing session to take place before the intensification programme at 5 month post-diagnosis.
- The liaison between the psychologist and the leukaemia data manager is essential to the success of this study. The psychologist will check with the data manager the dates of the clinics for individual patients. It would also be helpful if the data manager could remind the haematologists to introduce the study to the patients when they come to the clinics. Maybe this could be written in on the computer as a matter of fact.
- The haematologists will be kept informed as to which of their patients have been seen by the psychologist, and when. Every four weeks, a list of these patients will be sent to the haematology department so that 'missing' patients can be identified and referred to the psychologist.
- A summary report of the psychometric testing will be produced for each patient. This will be filed in the medical notes.

One of the questionnaires to be completed by the parents is the Somnolence Checklist. As this is to be filled in six weeks after beginning of ~~radiotherapy~~^{therapy}, it would be helpful if the haematologist could hand these out to the parents at the appropriate time. A supply of these checklists will be provided to the haematology department by the psychologist.

NAME OF CHILD:

DATE OF BIRTH:

BOY/GIRL

**DEPARTMENT/WARD
(Outpatient/Inpatient)**

HOSPITAL NO:

DATE:

AM/PM

TIME SPENT DRAWING:

THE CHILD DREW ALONE:

FOLLOWING A SUGGESTION:

NAME OF ADULT/S PRESENT:

THE CHILD MADE THE FOLLOWING REMARKS WHILE DRAWING:

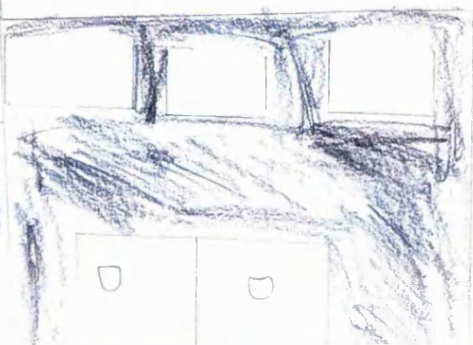
THE CHILD EXPLAINED HIS/HER PICTURE AFTER COMPLETION:

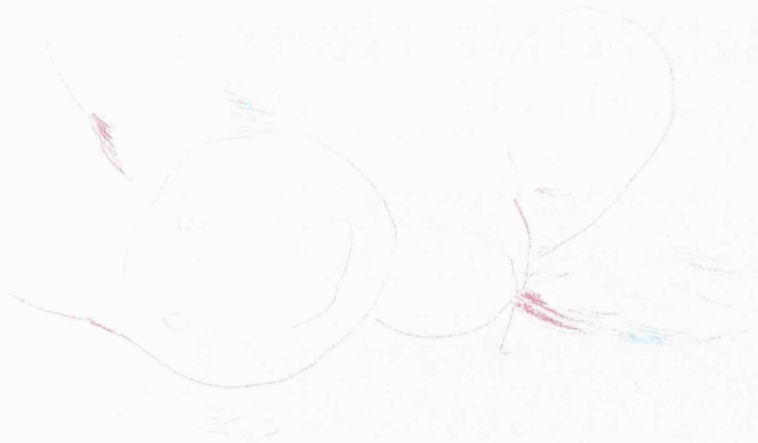
OTHER REMARKS:

APPENDIX I
COLOUR LASER COPIES OF
CHILDREN'S SPONTANEOUS DRAWINGS



PICTURE

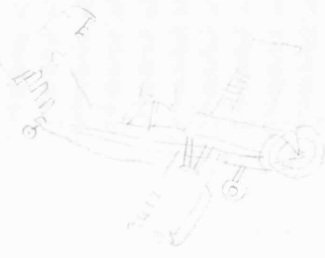


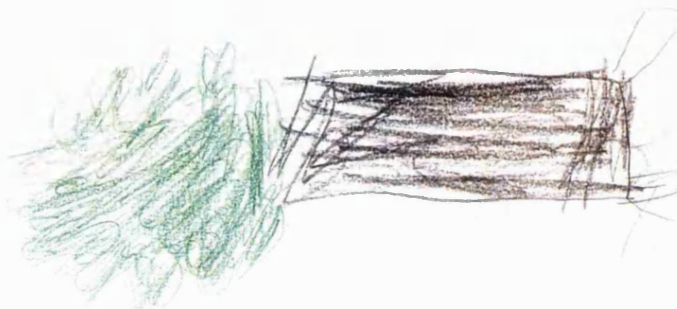


CHI-SAN

CHI-SAN









GOLDILOCKS
and The Three
BEARS



Participant 6 - Group 1



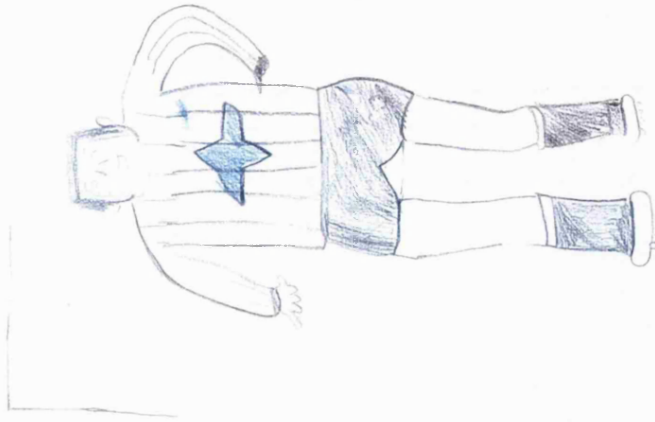




by John

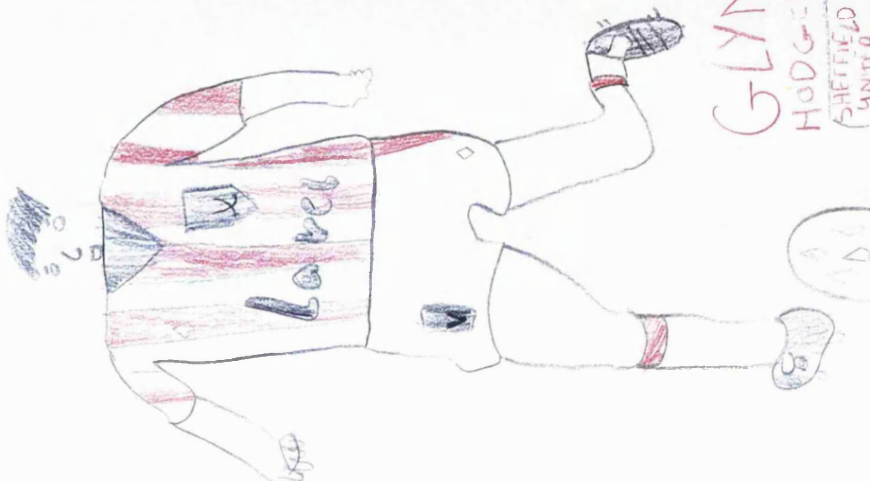






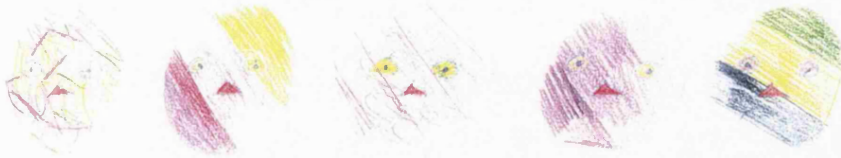
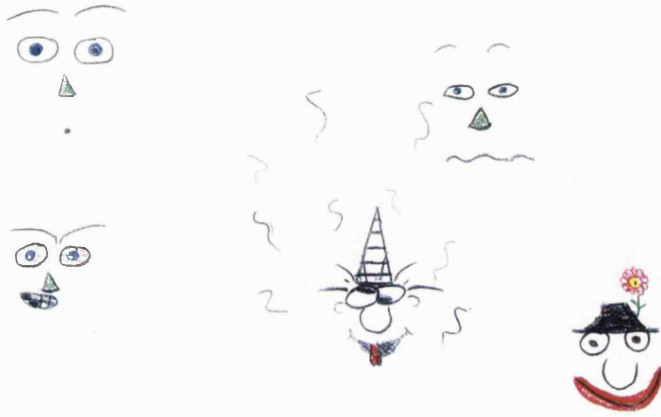
Bontcho
Guentchev

IPSWICH



GLYN
HODGES
SHEFFIELD
UNITED

Participant 13 - Group 2





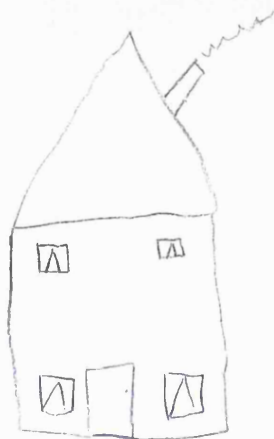
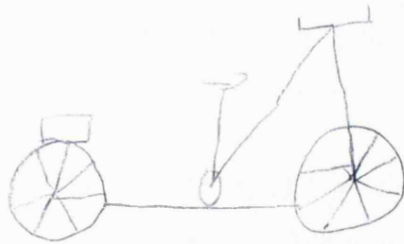
Star man



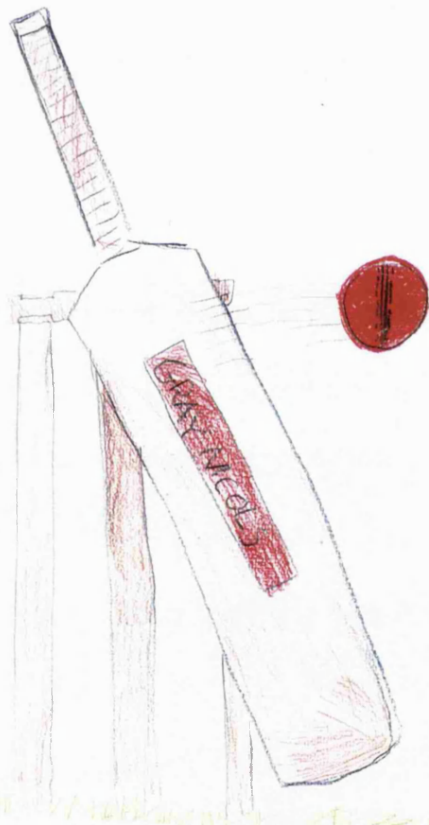
any old top any
trousers cling film
pump bag car head
gold paper.

Hork man



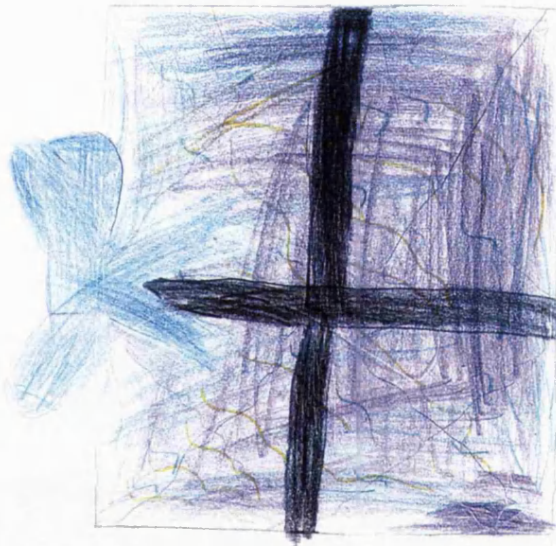
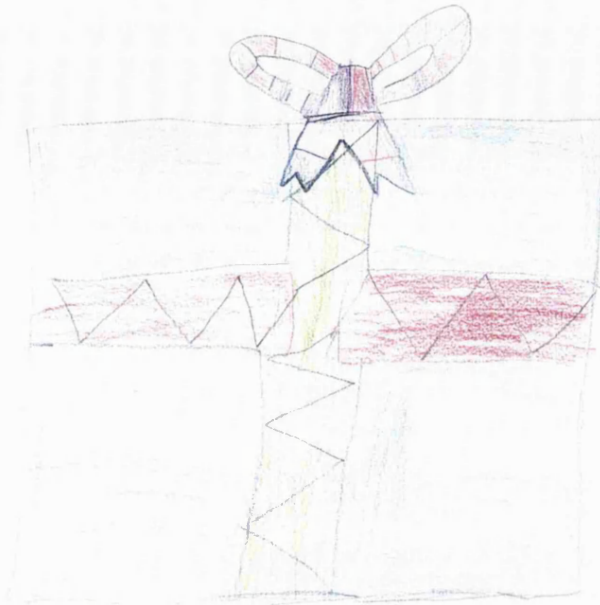


Participant 18 - Group 2

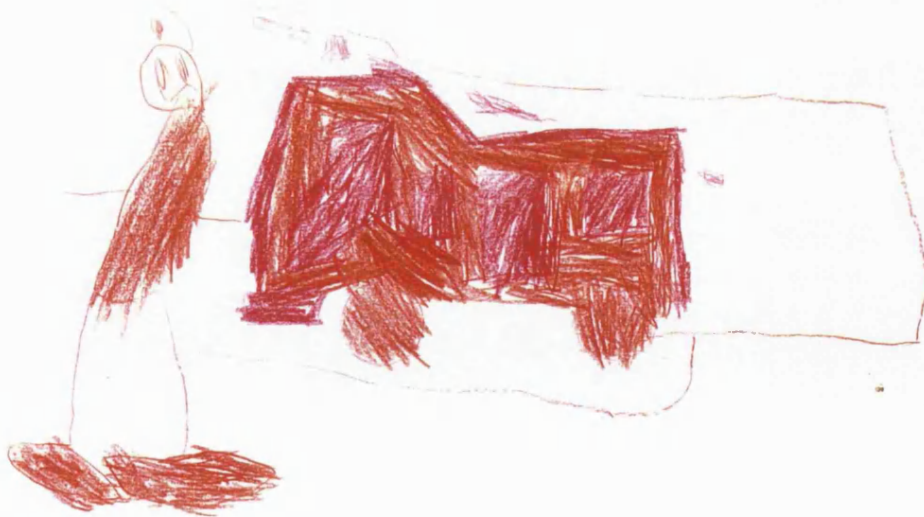


Participant 19 - Group 2



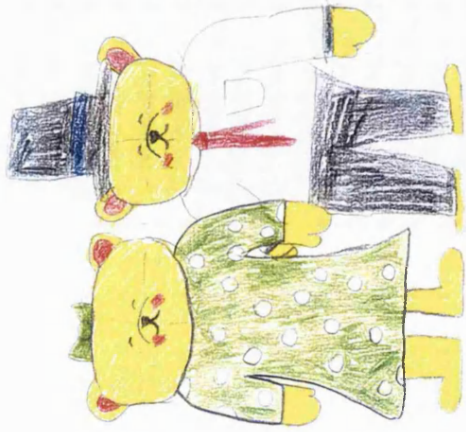


Participant 21 - Group 2





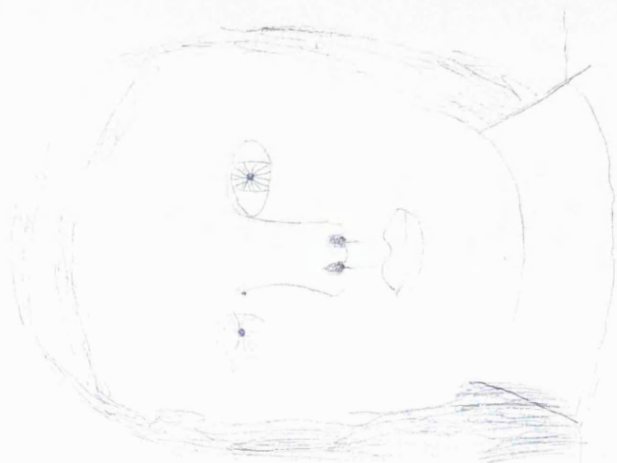


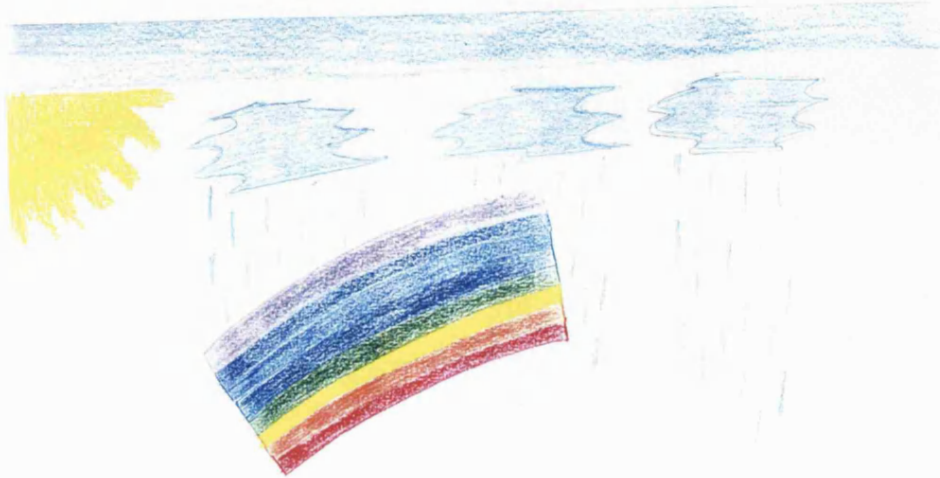
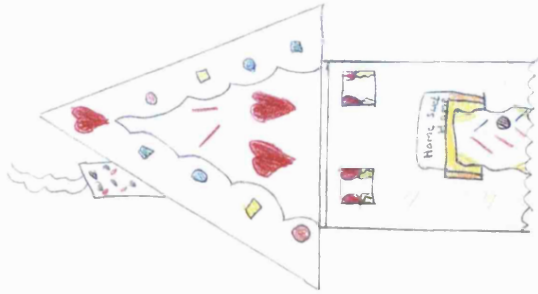


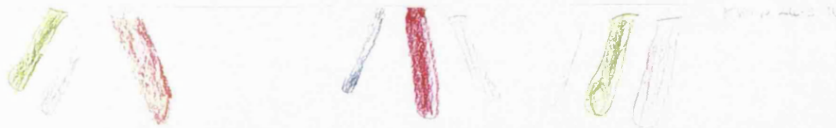
Laura



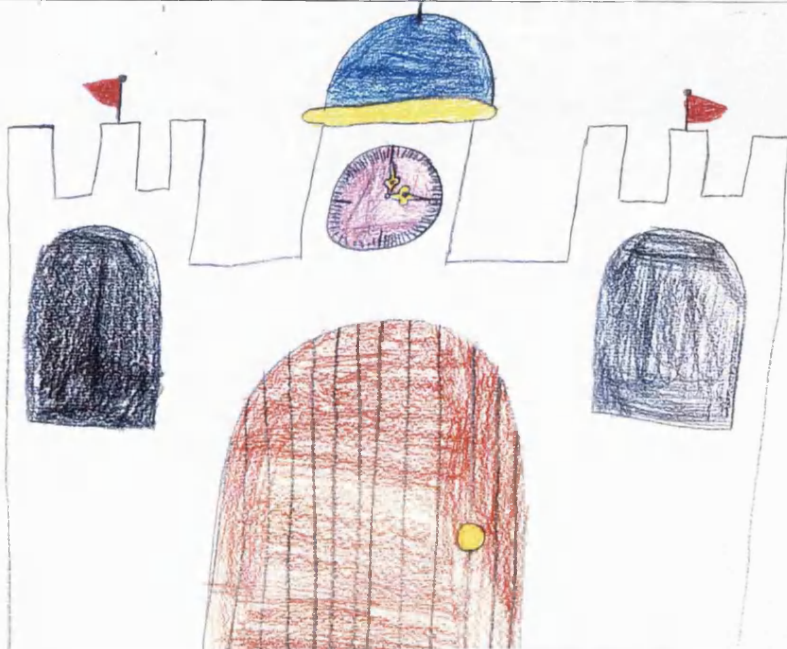
you know you're SO flurigt when
you're sitting around rockin' and
you realize you don't have a
rockin' chair!



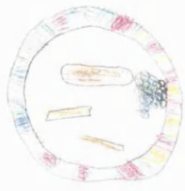












Phillyac





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