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ABSTRACT
                A total of 128 middle- and upper-working class
children in four age groups, ranging in 2-year intervals from 4 to 10
years of age and equally divided by sex, viewed 28 photographs of
adults and children expressing seven emotions in order to explore
developmental changes in children's ability to differentiate
emotions. Emotions modeled were happiness, sadness, fear, anger,
disgust, surprise, and shame. Four tasks were posed; results of
matching, labelling and comprehension tasks are reported. Whereas
children in this sample showed a much greater deceleration of the
curve of success than did Izard's (1971) sample, results from these
London children are in some ways very similar to those obtained in
his study of American and French children. The steep rise in
successful recognition and labelling he obtained in those children
between 2 and 5 years is also shown in the steep rise found between
the 4- and 6-year-olds of this sample. These subjects also displayed
the marked difference between labelling and comprehension which may
be indicative of their relative unfamiliarity with emotional terms
and emotion as a field of discourse. Subjects frequently confused
shame and sadness, fear and surprise, and anger and disgust. Happy,
sad, frightened, and surprised expressions were those most easily
discriminated, with happiness by far the best distinguished. (RH)

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Introduction

The work reported here is part of a project planned to elucidate
further some findings of a previous investigation into The
Young Child's Representation of Persons and the Social
World (ESRC grant HR C00/23/0027) undertaken by Shields and
Duveen in 1982/3. The brief section on Emotion in this
project appeared to show that a substantial minority of three
and four year old children who were asked to label angry and
sad expressions in a drawn representation confused the two
emotions though children asked to select a cross or sad face
did so accurately to a label supplied. Both groups of children
when questioned about what would make them , their mothers
or their teachers cross or sad provided similar answers for
both emotions, distinctions emerging only at age five.
This suggested that children of the ages tested($3\frac{1}{2}, 4\frac{1}{2}, 5\frac{1}{2}$.)
were emerging from a two phase scheme of emotional representation
where happiness was distinguished from upset states, but
upset states were less clearly differentiated. It appeared
that a developmental gradient in the emergence of differentiation
would be worth exploring over a more extended list of emotions
and a more extended age range.

A project * was therefore planned around two main groups of
tasks, the first replicating work based on the recognition

of faces in photographs, which is reported here, and the second
on the understanding of story episodes which might arouse emotion
together with a conversational discussion on the child's
personal and observed experience of such emotions, which
is in preparation.

Emotion and Facial Expression

The literature on emotion is vaste and confusing. It is
dogged by lack of agreement as to what is encompassed by
the term 'emotion' and it is beset by many different theories
and a welter of discursive metaphors. Emotion is not a field
that lends itself easily to laboratory investigation except
in very limited ways. Non-clinical studies of emotion have
been steered by this difficulty towards the use of subject
judgement on contrived stimulus material, either facial
displays, situational representations or combinations of
these. Those theoreticians who hold views of emotion which
link it closely to specific,heritable endogenous mechanisms
are propelled by their theoretical stance towards research
in the CNS, hormonal and visceral changes and changes in
the skeleto-muscular systems, in particular facial expressions
as these afford material for fairly clear cut experimental
design and to some extent bridge the gap between common
sense understanding of emotion and less accesible bodily
changes. This approach has been fruitful in some ways, but
its natural concentration on within organism factors has
resulted in neglect of those emotions wich arise from
between-person relationships e.g. love, sympathy and compassion
or even hatred, jealousy and vengefulness. These are emotions
which imply complex social networks, can endure over time, and
have no necessary connection with particular facial displays.

The multitude of delicately nuanced emotional discriminators
embodied in a socially evolved language have no place in
this line of study except as purported 'cocktail mixes' of a
small set of 'basic' ingredients, i.e. those emotions which
produce specifiable facial change.

It is possible, however that facial expressions are part of
the alphabet of social signals which, suitably modified by
cultural and subcultural norms, inform human beings about
the feelings of others. A reasonably socially competent
member of a social group should have, and probably does have an
understanding of a far wider and more subtle system than
that provided by the so called 'basic' set.

Nevertheless. the development of more complex social represent-
-ations is likely to be related to the ability to encode and
decode more elementary social signals, and it is,thherefore,
likely to be worthwhile to include the identification of
the facial expresssion of the so called 'basic' emotions in an
investigation of the development of representation by children
of these along with more socially derived emotions.

(see Ekman et al 1982, Izard 1971,1877, 1978, and Plutchik
and Kellerman 1983 for reviews of theory and research)

Methodology

(a) Materials.

A set of 28 photographs posed by four models of seven emotions, viz: happiness, sadness, fear, anger, disgust, surprise, and shame were selected from 288 taken by machine driven camera. The models were two adults and two nine year old children of either sex. The models were not actors or Ekman-trained face pullers, and were responding to verbal requests or prompts. The 'best' exponents of each expression were agreed by the two investigators and then shown to a group of 18 adults asked to label the expressions from a list of thirteen terms. Expressions of contempt, pride boredom, interest, jealousy and neutrality were discarded at this stage either because agreed identification was low or because sets were incomplete. Additional photographs were taken of each model and the final set of 28 photographs were rated by thirty adults selecting terms from a list of seven. Interview techniques were piloted with a group of 4-year-old children

(b) Subjects

The subjects were 128 London children drawn from four schools, and whose parents' occupations fell within the Registrar General's classes 111 & IV, i.e. upper and middle working class. There were 32 children in each of four age groups, 4,6,8,and 10 equally divided between boys and girls. All children were from English -speaking homes. A further group of 12 year olds will be interviewed later.

(c) Procedure

The children were interviewed individually. They were asked for help in finding out what children of their age knew about feelings and emotions. Each child was initially presented with a set of seven photographs posed by a same sex or opposite sex child, or a same sex or opposite sex adult. The model was named. All seven photographs were

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presented simultanously. There were four tasks.

(1) Matching: The child was presented one by one with a
     second set of identical photographs and asked to match
     them to the original set. This was a warm-up task and
     the great majority of the children were 100% successful.

(2) Production task (Labelling). The child was asked to label
     each photograph pointed to in random order in response
     to the question: 'what do you think Laura, Hilary, Gerard
     or Darren is feeling when he/she looks like that?' or a
     close paraphrase

(3) Cross matching: The child was asked either to match the set
     already tabled with another set of different sex or age,
     or to cross-match two different sets across age or sex.

(4) Comprehension task: The seven photographs first presented
     were isolated and the child asked to point to the appropriate
     photograph in reply to the question 'Which photograph shows
     Gerard....etc. feeling happy, cross, disgusted...etc?

Scoring

Each response was was noted as (a) correct (b) identification of
another emotion (c) inapropriate or(d) other. Most difficulty
came in task (2) where decisions had to be made on the basis of
a paraphrase or situational definition. Following Izard(1971)
these were accepted where appropriate,e.g. 'a bit down' and
'something dead' were accepted for the sad expression, but'thinking'
was not. The most numerous paraphrases were offered in the
labelling of shame. Some of the near misses captured some of the
emotional quality such as 'worried' 'wondering' 'trying to answer
a difficult question', but 'sneaky' and 'bored' were classified
as inappropriate.

RESULTS ARE GIVEN FOR TASKS (1), (2) AND (4)

Figure 1. Percentage of correct responses by task and age.
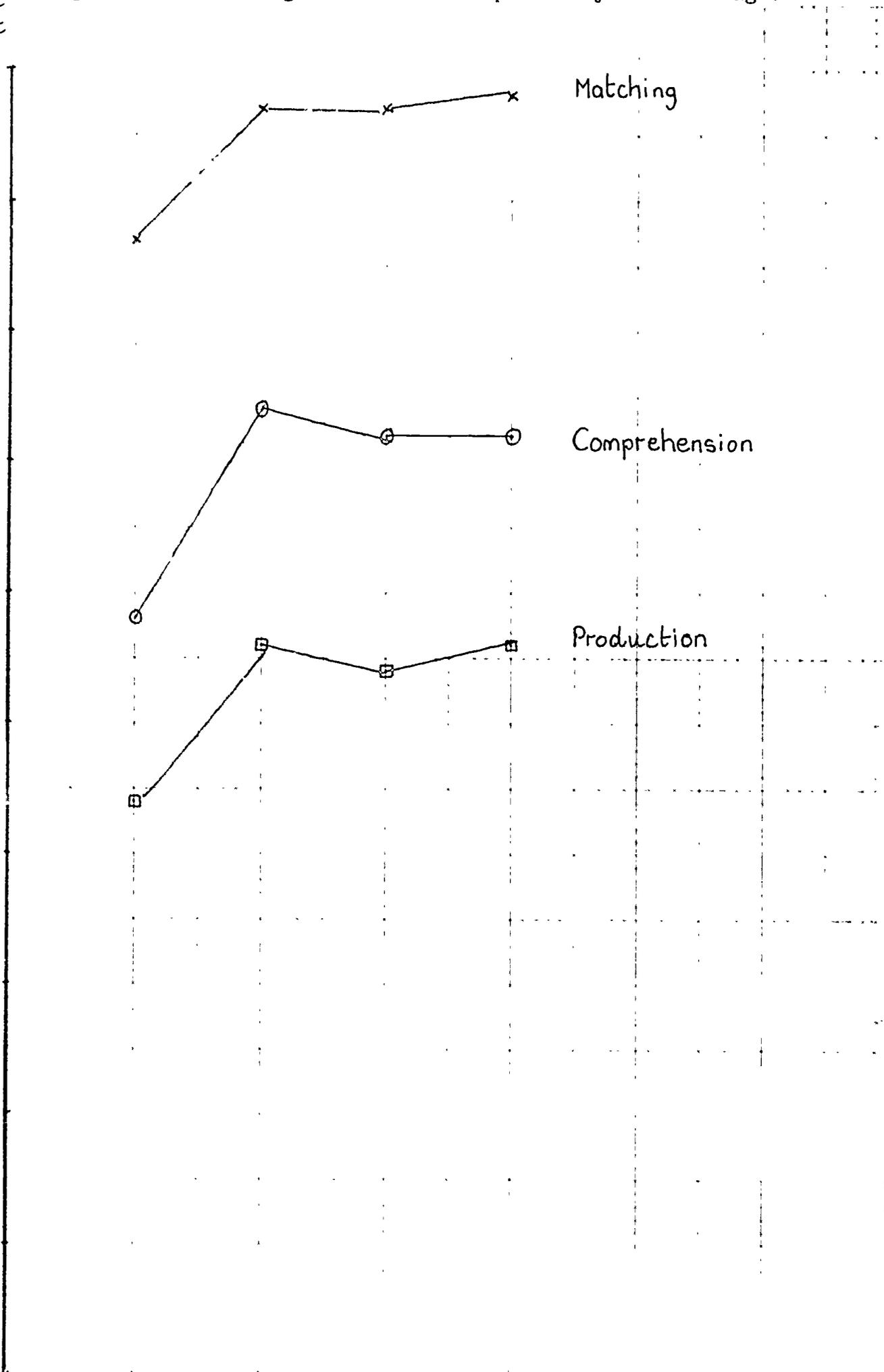
Figure 2. Percentage of correct responses of 4-year olds,
6-year olds and adults in the comprehension task
to each expression.
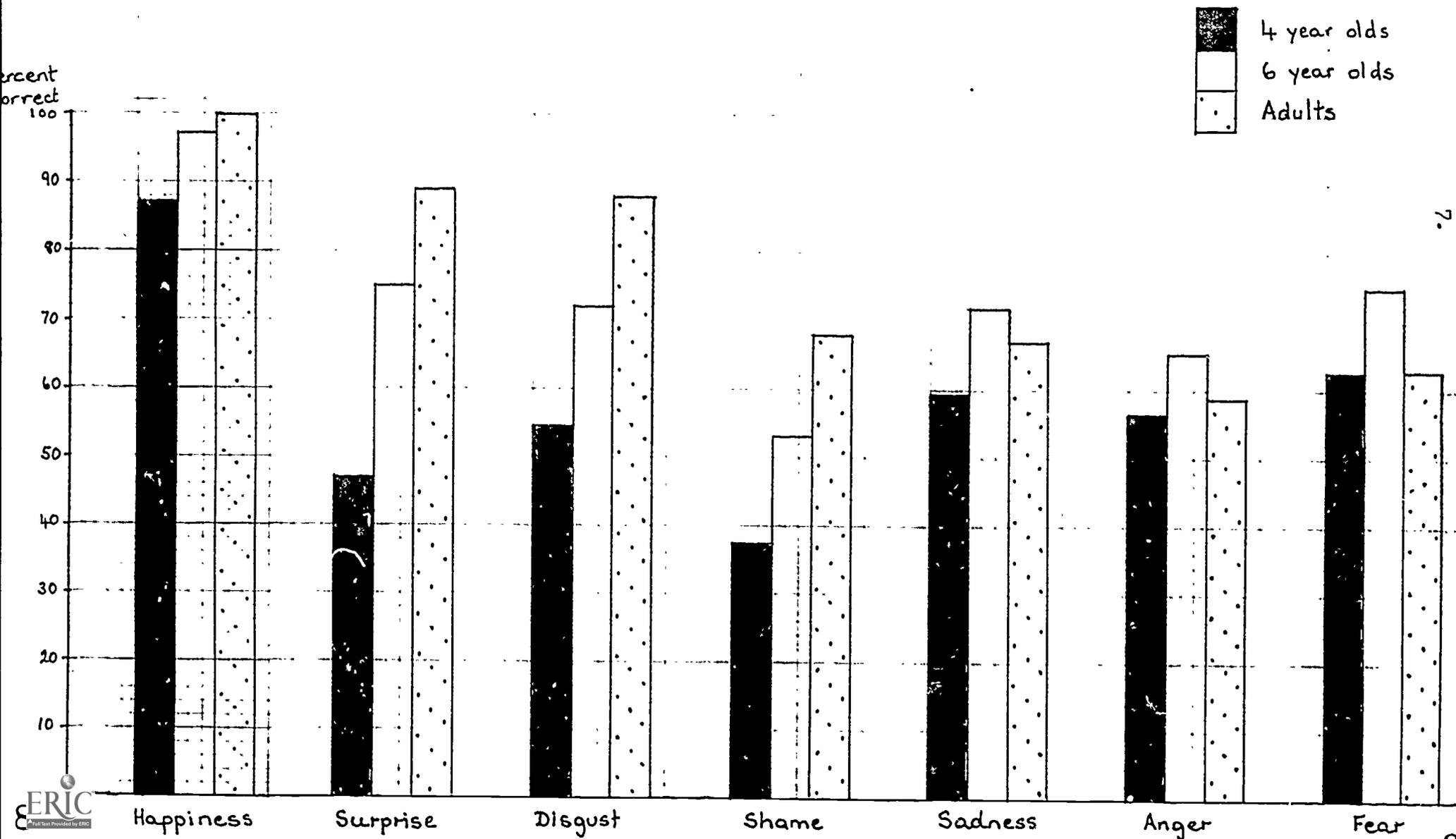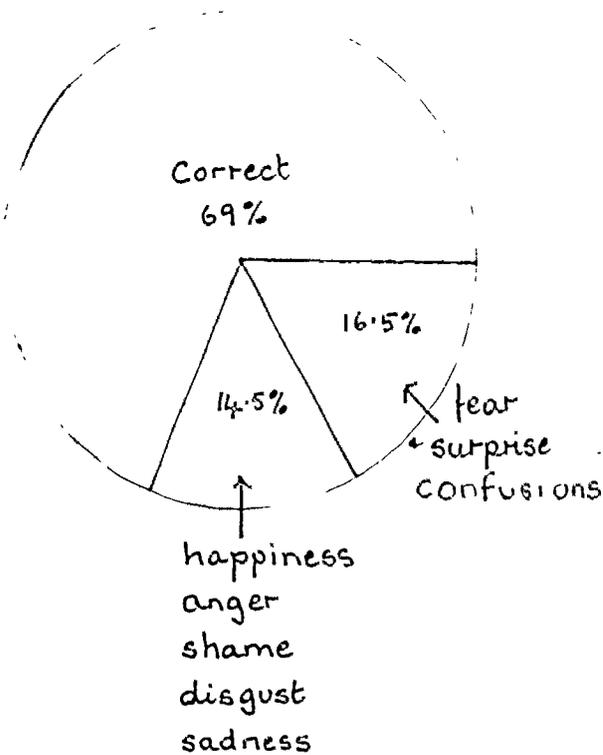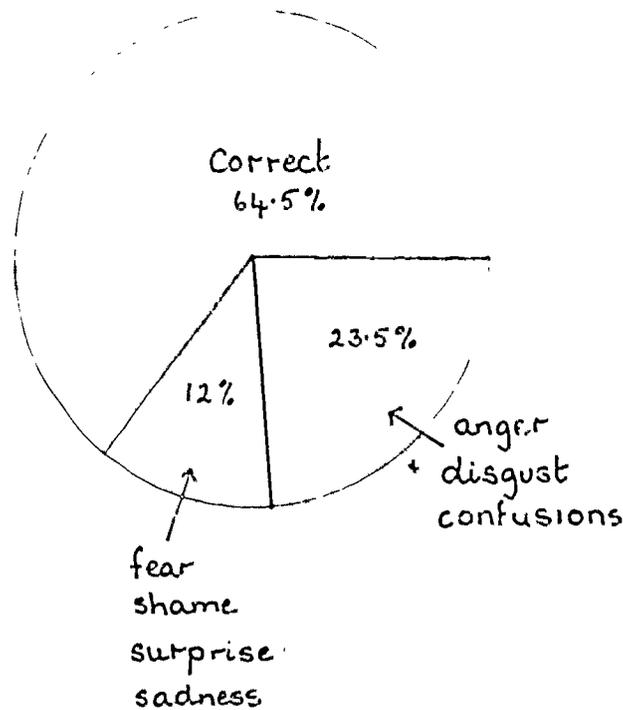
Figure 3.

This shows the percentage of correct selections for each of the
pairs of common confusions: sadness/shame, fear/surprise
anger/disgust. together with the percentage of occasions
on which the other member of the pair was chosen, and also
the percentage of occasions on which one of the other
emotions was chosen.

Fear / Surprise

Correct
69%

16·5%

14·5%

fear
+ surprise
confusions

happiness
anger
shame
disgust
sadness

Anger / Disgust

Correct
64·5%

23·5%

12%

anger
+ disgust
confusions

fear
shame
surprise
sadness
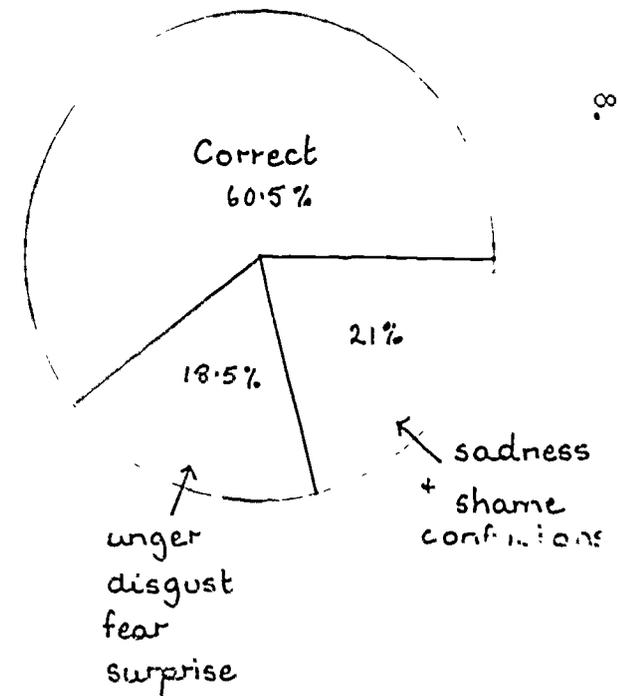
Sadness / Shame

Correct
60·5%

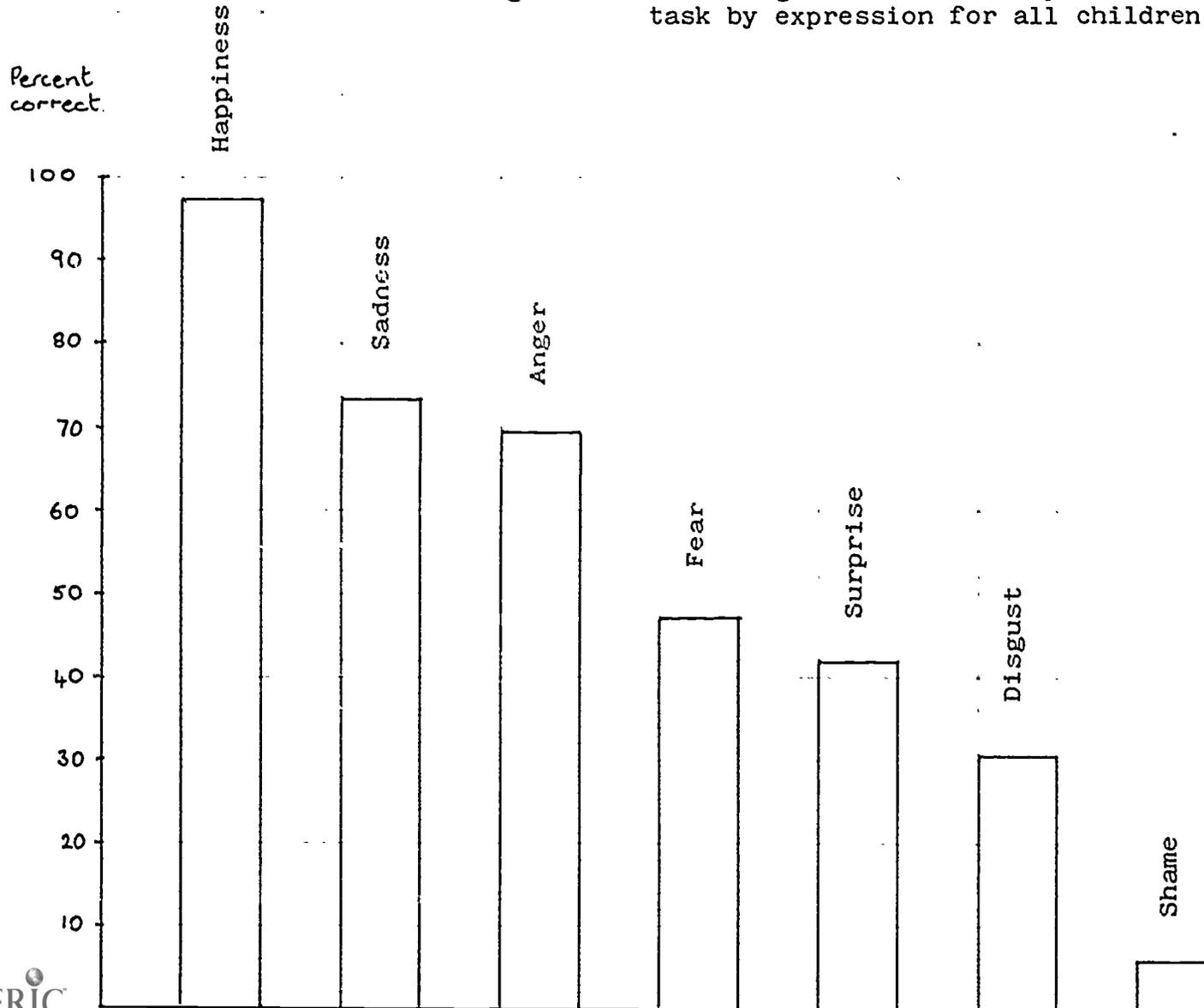21%

18·5%

sadness
+ shame
confusions

anger
disgust
fear
surprise

PRODUCTION

Figure 4. Percentage of correct responses in the production task by expression for all children.

Discussion

The results obtained from these London children are in some
ways very similar to those obtained by Izard in his study
of American and French children (Izard 1971) The steep
rise in successful recognition and labelling he obtained
between 2 &5 is also shown in the steep rise between our
four and six year olds. This may be due to task difficulty
for the younger children. We also obtained the marked
difference between labelling and comprehension which may
be indicative of the childrens relative unfamiliarity with
emotional terms and emotion as a field of discourse. Such
differences are commonly noted in cognitive research

On the other hand, the children in this sample showed a
much greater deceleration of the curve of success than did
Izard's sample.. This may, of course be the result of
different methodology. It may also be the result of difference
in the stimulus material which may have lacked sufficient
differentiation. On the other hand the natural environment
of children from which they have to learn their skill in
emotional identification is unlikely to include Ekman trained
face-pullers or professional actors, and the naive models
we used may be more representative of the expressive abilities
of those from which the child has to acquire her representations.
A more likely answer may be that the so called basic emotions
are relatively infrequently displayed in the children's environ-
-ment except in dramatic representations in the media. Socialised
emotions are more varied, more complex, more muted in display,
and more likely to be expressed at a verbal level than in
the face. The growth in more mature abilities in representing
emotion may de-emphasise the face in favour of other clues.

Support for this interpretation may be drawn from the
differences between the labelling and comprehension tasks
(See figure 1).   It appears from this that a verbal
label is of more help in disambiguating a facial expression
than an expression is in calling up a d scription.   If
facial expression appears to lose saliency in relation
to other powerful indices such as situation and language,
there is no reason to give it increasing cognitive attention.

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Common Confusions in the identification of facial expression

One of the most interesting results is the presence of standard
confusions between emotions.   Mistakes in identification were
not on the whole random.   The most frequent confusions were
between shame and sadness, fear and surprise, and anger and
disgust (see figure 3).   These identical confusions
were also found by Tc .kins and McCarter (1964) in their
study of 24 naive urban firemen. They laid some of the blame on
model deficiencies where a predominant mood shone through.

> 'A predominantly friendly model does not have a
> completely pure sneer of contempt'

Ekman and his colleagues who are committed to the specificity
of basic emotions suggest that such confusions are due to
blends of two separate emotions, and that the confusions
disappear when raters are allowed to name both components.
Children in a normal environment will have to sharpen
their skills on mild non-sneerers and placid non snarlers
and committed maintainers of a stiff upper lip, as well as
many idiosyncratic forms of expression.   It may be that a more
economical deployment of their cognitive ability would
direct them to more general characteristics of human expression
in conjunction with other clues.

For example a dimensional approach, or one based on distinctive features might provide sufficient information to be used in conjunction with other clues, given the redundancy in most situations in which a child or adult is called upon to judge emotional states.   Excluding happiness as expressed in smiling which was rarely confused with any other state, the use of three dimensions pleasant/unpleasant, active/passive, and startle, all available to young children might illustrate how these confusions arise due to the sharing of common dimensions:

	Pleasant /unpleasant	Active /passive	Startle
Sadness	–	–	–
Shame	–	–	–
Anger	–	+	–
Disgust	–	+	+/–
Fear	–	–	+
Surprise	–/+	–	+

There are, of course objections to a dimensional approach, one being that apart from pleasant/unpleasant none of the theorists who use dimensions agree on which to use. Even using facial categories, however, sadness and shame would share a drooped head and downcast eyes, anger and disgust would share a frown and lip tension, and fear and surprise share dramatically widened

eyes and an opened mouth.   These physical descriptions are not nearly as detailed as those supplied by Ekman and Izard, but could indicate the more general character of the clues on which the children rely for extracting information from faces.

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Differences in discriminability between facial expressions

Happy, sad frightened and surprised expressions were those
most easily discriminated, with happiness by far the best
distinguished. Disgust and shame were least well discriminated
It may be that expressions of disgust are discouraged by
social norms, and the expression of contempt which, in
the literature appears allied with it, may be considered out
of place in a society more closely geared to non-
discrimination between persons.   Shame is closely linked
with the grasp of complex social/behavioural rules and their
violation and may therefore be more dependent on verbal
reproaches, excuses and justifications and less closely
linked to endogenous expressive modes. It is expressively
linked to sadness by the drop in muscle tone and downcasting
of the eyes.   Shame proved to be the emotion most
difficult for the children to elucidate in the subsequent
interview and may develop late.

Conclusion

The children in this sample were competent raters of four of the
'basic ' emotional expressions, in fact nearly as good
as the adults who piloted the sample.   Disgust taxed their
linguistic capacity, and so did shame, and they were less
able to handle them discursively. It appears unlikely
that advances in the complexity of emotional representation
are closely linked to fine discriminations of facial
expression, and developmental growth should be sought
in a grasp of social relations and the refinement of
the more nuanced distinctions in discourse.

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