THE ATTRIBUTION OF INTENTION TO THE BEHAVIOUR

OF INFANTS AND YOUNG CHILDREN, BY NAÏVE

OBSERVERS

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A C K N O W L E D G E M E N T S

"Reasons and actions must in principle be physically describable, but this means only that each particular mental event which causes an action is identical with some particular physical event which causes a bodily movement; it does not mean that rationalizing explanation is reducible to physical explanation, since mental events may be identical with diverse kinds of physical events in the brain."

Neil Bolton, 1979.

A B S T R A C T

This thesis addresses itself to the problem of observing,
interpreting and explaining ongoing behaviour in the natural
environment. It maintains that the intention of the actor
is the primary characteristic of behaviour and is concerned
with how observers attribute intentions to the actions of others.

Naïve observers were asked to segment the behaviour of in-
fants exhibited to them on a video tape and having done so to
describe that behaviour in their own terms.

The behaviour sequences selected for observation were rela-
tively "simple", i.e. the behaviour of infants and young children,
in order to gain some possible guidelines for a study of more
"complex" adult behaviour.

The sequences were interpreted on two levels, at the percep-
tual level and at the level of meaning. It was assumed that by
instructing subjects to divide the observed behaviour into per-
ceived segments and subsequently to describe those segments, that
some guidelines as to how to proceed with a study of action would
emerge.

The findings suggest that naïve observers do identify mean-
ingful segments in the ongoing stream of behaviour but that inter-
observer agreement about the precise timing of the changes was
not high, a finding which differs from studies on adult behaviour.

Attributed meanings were also individual, suggesting that the
actions observed are not tied specifically to the physical move-
ments of the child but are subject to a range of meaning depending
on the observer's individual interpretation. General trends in
meaning were, however, observed for the children of different ages.
These trends were identified by categorizing the attributions into
"functional" categories, developed from a study of early utterances
and are assumed to be continuous with later "uses" that language
serves.

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SECTION 1

INTRODUCTION

1.1 The area of concern

This thesis is concerned with the attribution of intention, by naïve observers, to the perceived behaviour of infants and young children and the implications for human perceptual, cognitive and communication processes.

The question of intention is central to a study of human action for it provides the basic distinction between movements and actions. If actions are not identified human beings would be seen going about their daily lives making many movements and uttering many sounds in the form of acoustic strings emitted from their mouths. Precisely what they were doing and saying would remain unintelligible.

1.2 Definitions of actions and movements.

Before proceeding to the main purpose of this thesis a few definitions of actions and movements are in order.

1.2.1 Movements.

"Movement" as defined by English and English (1958) is "The change in position of a bodily part as the result of organic functioning." Usually there is no necessary reference to environment.

Reflex responses are movements of this nature. The Babinski response observed in the neonate can be described purely in terms of movement, it is possible to see the way in which it happend if shown diagrams of how the muscles operate in such an instance.

1.2.2 Actions.

The most widely accepted definitions of actions are "behaviour with volition or intent," "organismic movements correlated with conscious process," "a unified sequence or complex of acts or behaviours." (English and English, 1958).

Many problems arise in distinguishing between "movements" and "actions" because of the difficulty of the conscious involvement, or otherwise, of the behaviour being perceived.

English and English (1958) distinguish between the two on the

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basis of the relationship between the organism and the environment.

"Movement" is viewed as a change in position of a bodily part as the result of organic functioning without there necessarily being any reference to the environment, whereas an "act" always implies a changed relationship between organism and environment and the act is usually named for its consequences outside the organism.

Hampshire (1970: 154) cites the essential features of action as being:-

    (i) "That it is something done at will.

   (ii) "... at some particular time."

 (iii) "That it constitutes some recognizable change in the world."

Several pertinent points have been made about the essential nature of actions, the most outstanding property of an action being that it results in a meaningful change in behaviour.

For behaviour to be perceived as being meaningful is to assume rationality on the part of the actor. The actor is viewed as having an intention to do something or to achieve some goal.

The main point made, at this stage, is that to find meaning in human behaviour, it has to be interpreted and explained in terms of actions. The psychologist cannot be content with simply recording the movements of other people, for no matter how accurately he does this, he has missed the whole point of what behaviour means.

The preceding definitions indicate that the most basic way in which actions may be identified is to mark their boundaries by indicating when a meaningful change occurs in the ongoing stream of behaviour.

1.3 The attribution of intention.

Since the primary characterization of an action is intention, an important point that emerges from a study of this kind is whether the intention the actor has is the same as the intention the observer perceives him to have.

The attribution of intention requires an inferential leap involving the attribution of mental states and mental predicates and, in particular, focusses on the context in which the action takes place.

The crux of the problem is, therefore, identifying the correct mental state from the observable outward state.

This difficulty is apparent because there is hardly ever a one-to-one

relationship between the two. For example:-

(i) Two different actions may be performed with the same intention on the part of the actor.

e.g. a traffic constable raising his hand to stop a motorist and a traffic constable catching the motorist's eye and pointing simultaneously to a red robot, will mean only one thing to the motorist, "stop".

(ii) The same action may be performed as a result of different intentions, e.g. a person may rub his eye to remove a piece of dirt, or he may do so to indicate that he is tired.

(iii) A person anxious to conceal his true intentions may disguise or adjust his behaviour temporally to mislead anyone observing him.

Further, a person may have an intention formed in his mind but suddenly decide not to carry out the intended behaviour, or he may accidentally carry out the wrong actions and thereby mislead an observer.

The impossibility of devising a simple set of rules to explain human action is evident.

1.4 The purpose of this study.

The purpose of this study is to investigate whether an untrained observer, a naïve observer, attributes intention to the behaviour of infants and young children and, if so, how does he do this? and do the kinds of attributions made about the behaviour of the children vary with the age of the child?

The particular concern of this thesis is whether the infants behaviour is seen mainly in terms of movements or actions and whether as the child's age increases more actions than movements are perceived and whether actions of a different nature are perceived in the behaviour of the older children.

1.5 Implications of this study.

In the Literature Review reference is made to evidence which shows that:

(i) Human communication begins very early in life.

(ii)   That communication involves a reciprocal exchange between
         the interactants and involves, essentially, the communication
         of intentions.

(iii) In the case of mother-infant studies, the communication takes
         place between an autonomous individual and a highly dependent
         individual and that these social exchanges are essential for
         the proper development of the human communication and sociali-
         zation processes.

Several studies on mother-infant interactions report the adultomorphic
attributions made by mothers about the behaviour of their infants. It
was decided, therefore, to investigate whether an untrained observer
presented with the task of having to make sense of an ongoing action
sequence of the behaviour of an infant or a young child who was completely
unknown to the observer, attributed intentions to the child's behaviour.
Whether or not the infant or young child has an intention is not at
issue here but whether they are seen as having intentions is the essen-
tial point of this investigation.

It is logical to assume that naïve observers who, in everyday life
form part of the social world of the infant/child, will react to record-
ings of the behaviour of the infants/children as they would react to
their behaviour in normal everyday situations, with the added assump-
tion that this subjective process can be externalized by setting up an
appropriate experimental situation.

If we accept a continuity hypothesis they should do this in a way
compatible with the way in which human action is observed with adult
behaviour.

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R E V I E W   O F   T H E   L I T E R A T U R E

2.1 FUNDAMENTAL OBSERVATIONS ABOUT A STUDY OF HUMAN ACTION.

Two fundamental observations about a study of human behaviour form
the basis of this thesis:

- (i) Behaviour is produced in time and a study of human action
       must, therefore, be concerned with the organization of
       behaviour along its temporal axis.
- (ii) A study of human behaviour must concentrate on actions rather
       than movements.

2.1.1 Synchronic versus diachronic analyses.

The diachronic nature of behaviour, which is both produced in time
and made sense of within a temporal dimension determines the most
appropriate analysis for it's contents.

A diachronic study examines the actions of people as they are
constituted over time and responded to.

A synchronic study is concerned with the relationship between a
set of elements at a particular point in time.

Sassure's (1916) analogy of the difference between the two analyses
is appropriate.

"He compares the two types of operation to the ways in which one
might examine a plant stem, thereby exposing the configuration of the
cells. The second, the diachronic, would involve slicing along the
length of the stem in order to see how the various strands alter their
relation to each other. For Sassure the length of the stem represented
time. Just as we can fully understand the constitution of the stem by
cutting it both ways, so too it is necessary to scrutinise behaviour,
not only in terms of it's structure at any point in time, but also in
terms of the ways in which it unfolds, is produced and comprehended
in time." (Collett, 1980: 4)

2.1.2 The two main strategies in Psychology.

Synchronic and diachronic analyses point to the two main research
strategies in Psychology:

(i) Studies which focus on variables and derive their model from the physical sciences.

(ii) Studies which concentrate on units and take their inspiration from ethology or linguistics.

"The distinction is a little like that between the conception of light as a wave and light as a particle, or, say, the difference between parametric and non-parametric statistics. In the former case an underlying parameter or continuum is inferred, while, in the latter, it is assumed that actions are discontinuous and discrete."

(Collett, 1980: 2)

Collett (1980) argues that for any study concerned with social transactions, emphasis must be placed on units because meanings inhere in units and units in combination. He adds:

"... anyone who doubts this need only consider the parody that would arise from an attempt to treat language parametrically.
... I am not saying that parametric analyses have no place in Psychology only that they cannot hope to play a role in any understanding of the way in which people interact with each other."

(Collett, 1980: 3)

2.1.2.1 Fundamental distinctions between the two main research strategies.

The most fundamental distinction between the two research strategies is that studies that derive their model from the physical sciences assume that behaviour is law-governed and explain behaviour in terms of causes. Studies that model themselves on ethology or linguistics assume that behaviour is rule-governed and provide rational explanations for behaviour.

2.1.2.1.1 Causal vs rational explanations of behaviour.

Beck (1975) argues that causal or mechanistic explanations of behaviour depend on empirically establishing a contingent but universal or probable connection between two independently recognizable events or features of the event.

The meaning of the behaviour, therefore, depends on the values for variables in the context of scientific law, with the particular objective of being able to predict and control behaviour.

Rational explanations of behaviour refer to rules that are embedded in the context of everyday verbal and non-verbal behaviour. The meaning of the behaviour, therefore, depends on values inherent in the language and the social institutions which form the context within which we operate.

2.1.2.1.2 Are reasons causes?

There has been much debate among philosophers as to whether reasons are causes.

Beck (1975) notes that recently philosophers have preferred to use cause in giving explanations of changes in physical objects, including behavioural events in living bodies, and to use reasons in the explanations of actions of persons.

Pettit (1979) adopts the view that reasons are causes in the sense that the mental event causes the behavioural one, i.e. to have an intention to do something will produce the relevant behaviour for the realization of that goal.

While Pettit's argument is philosophically sensible it does not provide the finer details that clearly separate laws of causation and rules of reason.

A law implies that to make an event intelligible to the observer, he must see the event as a cause that results as part of the order of nature.

Beck (1975) aptly points out that the laws of nature are not rules which the planets obey. For example, if a planet does not appear at a predicted time it is not breaking Kepler's Law but refuting it. Law-governed behaviour is, therefore, pre-determined and discovered, while rule-governed behaviour is the result of decisions.

2.1.2.1.2.1 Properties of rules.

Beck (1975) outlines several pertinent points about rules:

(i) Rules are general, just as the concepts they correspond to are general. A command to shut a door, for example, is not a rule if it applies on the one occasion on which it is delivered.

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(ii)   A rule can be broken or followed. Action may result from obedience to a rule which is known to the actor and which can also be broken by him if he fails to act in obedience to that rule. It is possible to act in conformity to a rule even if the actor does not know about the rule.

(iii)   Rules can be appropriate or inappropriate, legetimate or illegitimate, but not true or false.

(iv)   Rules are not things like sensations, feelings or causes. They are universals in that they can be known in exactly the same way by many people even though one applies to them some things and others to other things.

(v)   Rules can be openly formulated and communicated in the way that things (even feelings and diseases) cannot.

Further, it is by following the same rules and knowing that we are doing so that we can communicate with each other about what are not rules.

2.1.2.1.2.2 Regulative and counting rules:

Beck (1975) makes the further useful distinction between regulative and counting rules:

(i)   A regulative rule is one that can be conformed to or obeyed in action, e.g. a rule that in chess a knight must always be moved to a square of opposite colour. Regulative rules are rules for agents.

(ii)   A counting rule is one that can be followed or obeyed in one kind of action only, normally in specifying what is to count as, for instance, a legal move in chess. Counting rules are rules for observers.

2.1.2.1.3 Causal laws and rules.

Though causes are not rules, causal laws may be rules, not as regulative rules but as counting rules for the things that instantiate them by conforming to them.

Kepler's Laws can be obeyed as counting rules by astronomers in their decision whether to call something a planet or not, and in the astronomer's predicting positions they serve as regulative rules. (Beck 1975).

Causal laws, not causes, may thus be reasons and rules for actions of observers. By knowing a causal law and by using it as a rule, people can act with intention, i.e. by using the knowledge of causal laws to make rational decisions.

2.1.2.1.4 Reasons.

The need to find reasons for actions is essential to an understanding of how action is organized by both the actor and the observer.

2.1.2.1.4.1 Range of reasons.

Beck (1975) provides for a spectrum of reasons by distinguishing between public or private reasons and objective or subjective reasons. This spectrum ranges from a common world where the reasons are the same for all, through the actors unique life world, or through the specific public conditions of practice, to the inner dynamics of the actors own personality.

2.1.2.1.4.2 Locus of reasons.

Beck's (1975) distinction between:

(i) Subjective reasons, i.e. those specifically individual reasons for behaving in a particular way, and

(ii) Idiosyncratic reasons, referred to as "specific public conditions of practice."

has important implications for the understanding of human action, since they provide different contextual frameworks within which action may be understood.

Beck argues that when specific public conditions of practice are broken down, interpretation of the behaviour of others then shifts to an interpretation in terms of subjective reasons, or some uncommon situational reason.

Subjective reasons refer to the actor's "lebenswelt" the world as he experiences and interprets it. Emphasis is placed on the constructions the actor makes about the objective world and his reasons for acting in the way that he does.

Shotter (1978) emphasizes the need to find reasons for actions within the framework of a tradition or culture, arguing that social institutions have intentional structures built into them which were present before our birth and that we as practitioners of institutional forms may have no awareness at all of the reasons for their structure,

it is just "the-way-things-are-done."

(Shotter, 1978:   70)

This view has important implications for what it is to act with
intention. On the one hand, we as human beings know what it is to
have an intention because of our special insider's knowledge about
what it is to have an intention. However, the view that social
institutions have intentional structures built into them means that
humans may act according to the recognized way-to-do-things, without
being aware of the intentional behaviour that is being exhibited.

Shotter (1978) therefore, views development as a process of
realizing more and more autonomy by being able to realise what it is
to have intentions and to commit oneself to the realization of inten-
tions by carrying out projects which commit one for longer and longer
periods of time.

Each and every act in this longer sequence of activity is seen
to be hierarchically related to each and every other act by an
hierarchical structure of implications. Man gains the ability to do
this by constructing explicit accounts of already established practi-
ces and uses them to construct plans of action. (Shotter, 1978).

This approach abandons the search for objective knowledge in the
sense that "understandings from within a frame of reference; a
tradition or a culture are what are required." (Shotter, 1978: 51).
The central activity becomes a seeking, in the course of something
like "dialogues" with them, interpretations of the meaning of people's
actions. (Shotter, 1978: 50).

2.1.2.1.4.3 Kinds of reasons attributed to others in ordinary explana-
            tions of actions.

Pettit (1979) cites four rough categories of reasons given for
actions in everyday life.

  (i)   Reasons which refer to the character traits of actors.
 (ii)   Reasons which refer to the motivating states of agents,
            i.e. their emotions or impulses.
(iii)   Reasons which refer to concerns, desires or priorities.
 (iv)   Reasons which refer to the agent's intentions.

These categories support both subjective reasons for behaviour and

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specific public conditions of practice as being reasons for action.

2.2. A STARTING POINT FOR A STUDY OF HUMAN ACTION.

In search of a discipline of action explanation, Pettit (1979) argues that the student of human behaviour must take his starting point from the common, or ordinary scheme of explanation because it is that scheme which sets apart among human responses those events we describe as actions.

There is the danger of changing the subject matter if the point of departure is taken from elsewhere.

Studies which have concentrated on the scientific measurement of patterns of movement have, according to Trevarthen (1980) begun to reveal principles of co-ordinative function. Rigorous physical descriptions of natural movements, even quite simple ones like walking, lead to the conclusion that the muscle contractions in them are controlled by cerebrally generated images of an ideal form of the resultant effect or goal. He adds that Psychologists have been able to interpret, as Psychologists, only a minute part of the meanings transmitted in human movements.

It is doubtful whether rigorous physical descriptions of natural movements can provide a proper description of human actions without reference to meanings embodied in the social and linguistic environments. The two main reasons for this are:

(i) There is no standard meaning to actions, unless the act is a ritual or symbolic performance.

(ii) From the repertoire of movements that a human being makes, only particular aspects of those movements have psychological significance for both the actor himself and those who perceive his behaviour.

Two important points made by Trevarthen, however, are that, firstly, it is important to concentrate on the goal-directed nature of movements and, secondly, the meanings transmitted in human movements have to be more fully understood for a proper account of human action.

2.2.1 Goal-directed behaviour.

The goal-directed nature of behaviour is fundamental to the

explanation of actions. Hampshire argues that:

> "A conscious mind is always envisaging possibilities of action,
> of finding means towards ends, as a body is always and necessarily
> occupying a certain position."

<div align="right">(Hampshire, 1970: 119)</div>

In the course of interpreting the meaning of people's actions it is always possible to obtain answers to "what are you doing now?" as there is always the answer to the question "where are you now?"
(Hampshire 1970: 119)

Beck (1975: 107) argues that it is this goal-seeking, not memory that is:

> "... the first stand of the universal in experience and goal-seeking
> by alternative behavioural routes that is the first mark of
> agency."

2.2.2 The importance of studying actions rather than movements.

It is an assumption of this thesis that it is essential to concentrate on "actions" rather than mere "movements" if meaning is to be extracted from the ongoing stream of behaviour, for the following reasons:

> (i) The concept of agency depends on man being viewed as an intentional being, capable of exercising some control of events in his world and not just a passive receiver of environmental stimulii.
>
> (ii) Achievement of a goal results from the agent performing a variety of movements which may be different from the movements performed by another person intent on achieving the same goal.

Emphasis is, therefore, placed on intention as the primary characteristic of human action.

2.2.2.1 Kinds of stances that can be taken towards systems.

Dennett (1973) recognizes three 'stances' which can be taken towards systems. He argues that failure to distinguish these three stances, each of which is relevant in different situations, has led to confusion

among some philosophers.

These stances are not reducible to each other and none is a priori more fundamental than the other. The stance depends on the object requiring explanation.

2.2.2.1.1 The Design Stance.

This stance depends on a complete knowledge about .the design of the. system which enables prediction of response in any situation. It is consequently most often taken in making predictions about natural objects.

2.2.2.1.2 The Physical Stance.

Predictions are based on the state of the system and are worked out according to the laws of nature. It is usually reserved for instances in which prediction fails.

2.2.2.1.3 The Intentional Stance.

The predominant feature of this stance is rationality and consequently it is essential to adopt this stance for explanation of most human interaction. This assumption might fail in instances such as interaction with mentally disturbed individuals where the quality of interaction changes.

The intentional stance is not exclusive to human interaction since the behaviour of some computer systems can best be predicted by adopting this stance towards them.

There is, therefore, a sub-division within this third category, that of the personal stance, which presupposes intentionality of the system but requires as well a moral commitment to the system. Very different moral issues are entailed in destroying a computer and destroying a human.

Communication is an interaction with the intentional stance. Thus implicit in the notion of communication is intentionality or rationality albeit of a unique nature in that underlying the communicative act is the intention of the actor A to produce a response in the recipient B and to intend B to recognize his (A's) intention and to respond on the basis of this recognition.

There must be a shared meaning between the interactors about the form of expression (inter-subjectivity). If it is A'S intention to influence B to give him an object and he asks for it in a language unintelligible to B, he will not communicate his intention.

> "... Individuals who are interacting can do so successfully only if they have comparable understandings of what is signified by a set of verbal and/or non-verbal acts at a given point in a given situation, and more important perhaps, comparable under-standing of what can be meaningfully signified at a given point in a given situation."

(Sanders 1973: 6 & 7)

2.2.2.2 Linguistic studies and meaning.

Linguists have studied the nature of meaning with reference to language and their findings suggest useful guide-lines for a study of non-verbal as well as verbal behaviour.

Earlier linguistic studies concentrated on the structure of language and failed to provide adequate theories of language since the meaning of a word, or sentence, is not the function of the physical properties of the word, or sentence, and since a given pattern of sounds can have different meanings in different language communities or in the same language communities at different times (Alston, 1978).

These considerations have shifted the emphasis in linguistic studies from those which concentrated on the structure of language to those which emphasize the use to which language is put.

2.2.2.2.1 Speech act theory.

The speech act theory of Searle (1969) has particular relevance for a study of human action since it emphasizes the close connection between intention and meaning, i.e. meaning has to be formulated to make it clear that one's "meaning something" is more than just contin-gently related to what the sentence means in the language one is speaking.

> "To say that A meant something by X is to say that A intended the utterance of X to produce some effect in an audience by means of recognition of this intention."   (Searle, 1965: 228)

This account of meaning captures something essential to speaking a language, i.e. an attempt to communicate things to a hearer by means of getting him to recognize the speakers intention to convey just those things.

Searle distinguishes the following kinds of speech-acts:

(i) Utterance acts.

These consist of uttering words (morphemes or sentences) in the performance of the act.

(ii) Propositional acts.

Propositional content, in which subject and predicate are always present, consists of referring and predicating which is included in the performing of propositional acts.

(iii) Illocutionary acts.

These are complete speech acts which consist of stating, questioning, commanding, promising etc. To perform these acts is to engage in rule-governed behaviour. (Searle, 1965).

(iv) Perlocutionary acts.

These are acts which are aimed at achieving certain effects in the hearer, e.g. by arguing I may pursuade or convince someone; by warning I may startle or alarm.

The perlocutionary effect may be different from the effect the speaker intended it to achieve.

The main value of this theory is the importance it places on how messages are exchanged and not simply what is exchanged.

2.2.3 The attribution of intention.

Speech act theory emphasizes the interactive aspect of communication and in particular the crucial role played by intention in the interpretation and explanation of action.

For an accurate interpretation of the behaviour of an actor it is essential that there is a correspondence between the actor's purpose or intention and the observer's pre-disposition to receive the message transmitted by the actor.

2.2.3.1 Basic components of a message.

Apart from the necessity of there being a purpose or intention on the part of the actor in the performance of an act, it is also essential that if the message contained in the action is to be counted as such, the actor intending to send the message must gain the attention of the observer. This requires a language, if the message is to be transmitted verbally, or other medium if other sensory channels are to be employed. It is not satisfactory to make some arbitrary sound or gesture, it must be structured according to some particular code or language. (Pratt. 1977).

There are, therefore, three components of a message, all controlled by the actor: intention, medium and/or language. (Pratt. 1977).

2.2.3.2 Minimal conditions for receipt of a message.

The following minimal conditions are required for the receipt of a message by an observer:

(i) The message can only be received through some sensory channel or medium.

(ii) The message, usually a sound or gesture, must be structured according to some particular code, or language, rather than being some randon variation in the sensory environment.

(iii) There must be correspondence between the sender's intention and the observer's pre-disposition to receive the message. (Pratt. 1977).

Failure to receive a message will result if any of these conditions are not met. There is no point in gesturing to the blind or talking to the deaf, or giving an instruction in a foreign language to the observer.

The most difficult area of interpretation, however, is the area which involves the correspondence between the actor's intention and the observer's pre-dispositions or biases, which bear directly on the point of view of the observer.

The following diagram illustrates the necessary lines of corres-
pondence that must exist between the actor and the observer for the
communication to be successful.

Source (actor)

Language   Medium

Purpose
Predisposition

Observer
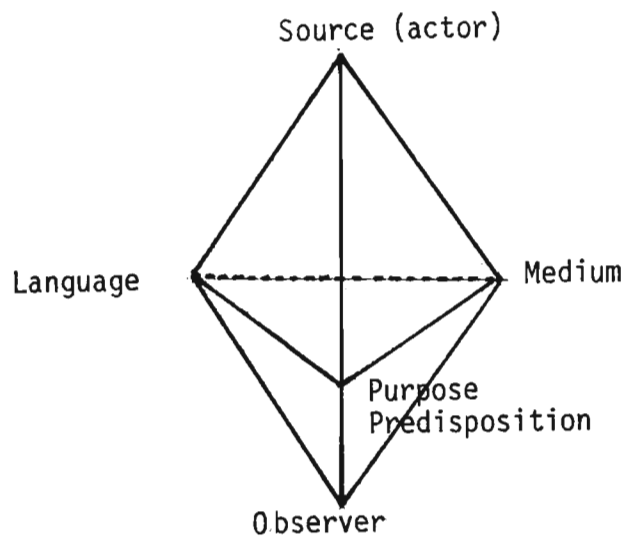
2.2.3.3   The question of bias.

The process of attribution has been defined by Heider (1958) as the
organization into meaningful units of a continuous stream of informa-
tion from the behaviour of another.   (Cited in Newtson, 1973).

Subsequent theories treated attribution as an inference process
following the perception of behaviour units. These theories assume
that the unit of perception of ongoing behaviour is constant (Jones &
Davis, 1965; Kelley, 1967).

According to Newtson (1973) current research views the observer
as passively observing others and making attributions when information
is revealed in the choices of other persons. Newtson's research
focusses on the implications for attribution processes of variation in
the unit of perception. The perceiver is an active participant in the
organization of observed behaviour into meaningful actions and thus
actively controls his information from that behaviour.

The perception of the observer is, therefore, guided by and insepa-
rable from cognitive activity. He may have options in the mode of pro-
cessing that information so that perceptual input is initially selec-
tive and may be highly variable.

The attribution of intention is, therefore, also a process of inference which may be highly influenced by the biases and pre-dispositions of the observer. Collett (1980) points to the necessity of considering the status of the observer in relation to the actor in studies of this nature, thus emphasizing the necessity of a shared code of understanding in making sense of the behaviour of others.

To illustrate this point and to indicate other relevant features concerning a study of action, a segment of behaviour interpreted by the actor, a common-sense observer and a mechanistic or causal observer is provided.

2.2.4 Illustration of the interpretations of a short segment of behaviour by the actor and two different kinds of observer.

Beck (1975) casts three characters into roles; a child, who is the actor; an observer who gives a common-sense description of the child's behaviour (Observer 1) and an observer whose description and explanation of the child's behaviour conforms to the categories that he would apply in describing and explaining the behaviour of a rat or a machine in his laboratory i.e. the mechanistic or causal observer, (Observer 2).

Upon being asked "What is going on here?" each of the three makes his own answer.

The child responds: "I am doing my homework, which must be handed in tomorrow, but I can't seem to get this problem right."

The common-sense observer responds: "The child is doing his homework, which must be handed in tomorrow, and is angry because he cannot work a problem."

The mechanistic or causal observer responds: "From 9:01 - 9:02 the child sat at a table, holding a pen in his right hand. He made marks on the paper four times. He scratched his head with his left hand at 9:01:26.

The main difference lies in the description given by the mechanistic observer and Beck (1975) makes the point that he is saying something different from the common-sense observer, whose description is most like that of the actor's own description, he is not saying the same thing in a different way.

The common-sense description "The child is writing" cannot be translated by any rule into a suitable mechanical description which would require a description in terms of one set of muscles

being employed in describing "the child is writing" at one point in time and in terms of another set of muscles at another time.

> "If this were a translation of what the first spectator says, there would be a rule for it's production from what the first spectator says, and this rule could be followed again and again. But it cannot be; the next time the one says "the child is writing," the other cannot just look up this rule of translation; he must look at the child again, and he may find that a different set of muscles is involved this time."
>
> (Beck 1975: 39 - 40).

The following table summarizes the main differences between the three descriptions:

	THE ACTOR'S DESCRIPTIONS	OBSERVER 1's DESCRIPTIONS	OBSERVER 2's DESCRIPTIONS
The purpose of the action.	·The actor knows what his purpose is. He knows what he is doing in the sense of what he means to accomplish by his action, even if not explicitly conscious of it, he can when asked give an answer.	·The actor's purpose is <u>inferred</u> in terms of what he thinks the actor means to accomplish by his action.	·No reference is made to what the actor means to accomplish by his action. A purpose for the action can only be established by first considering what behavioural events are taking place and then finding a hypothesis about the actor's motive or intention which explains them.
Back-ground Inform-ation.	·Only the actor has access to information which re-fers to his <u>real</u> inten-tion in performing an ac-tion e.g. he may be doing his homework to impress his parents. The actor is, therefore, the best judge of the actions that he performs.	·Observer 1 may be in possess-ion of background information which could provide added in-ferences that the actor is un-likely to give because he is ig-norant or unaware of it, e.g. "The child is studious" or "ambitious." This suggests a higher-order classification of the child's actions, based on his habits, traits, dis-positions or motives.	

	THE ACTOR'S DESCRIP-TIONS OBSERVER 1's DESCRIP-TIONS	OBSERVER 2's DESCRIPTIONS
Conceptual context.	·The concepts employed by both the actor and observer 1 are embedded in the context of the normal everyday language of the actor and observer 1.	·The concepts are embedded in a causal context and whatever meaning they have is provided in terms of values in causal laws.
Criteria of relevance and functional equivalence.	·The actor and the common-sense observer employ criteria of relevance and functional equivalence in describing actions. Behaviours may have no functional equivalence, either because there is only one way of performing the act in question or because there is no known function that the specific behaviour has in the performance of the act.	·Observer 2 has no use for functionally equivalent behaviours since behavioural events are functionally equivalent only for the action as reported by the actor and the common-sense observer. "At best only an immensely long conjunction of disjunctions of behavioural equivalents, most of which cannot be observed, ... could say the same thing as "the child is preparing his homework."

	THE ACTOR'S DESCRIP- TIONS	OBSERVER 1's DESCRIP- TIONS	OBSERVER 2's DESCRIPTIONS
THEMATIC CONSIDER- ATIONS.	·By reporting the behaviour in terms of actions rather than behavioural events, a theme that ties the items in the behaviour is provided. It is this theme that ties the writing and the headscratching and the angry gesture into a story that makes sense.		·Observer 2 records only one movement after the other without linking them together into a theme. He refers to items in the behaviour as reflexes, hand movements and muscular contractions which are of a different logical type from, for e.g., the actions performed in "doing homework."
TERMINOL- OGY AND RULES OF REFERENCE	·The actor and observer 1 use teleological terms ("doing" something) and make reference to a rule (Homework must be correct and handed in on time). Behaviour is rule-governed.		·Observer 2 uses words that refer to actions done with a purpose e.g. "scratch" and "hold" are used minimally and could be used in describing the workings of a machine. There is also a lack of rules of reference to which the behaviour of the child can be judged successful or not. Behaviour is law-governed.

	THE ACTOR'S DESCRIPTIONS	OBSERVER 1's DESCRIPTIONS	OBSERVER 2's DESCRIPTIONS
VOCABUL-ARY AND GRAMMAR.	·The vocabulary and grammar used is that of everyday life and determined by the language community to which they belong.		
SOCIAL CONTEXT.	·The explanations of the actor and observer 1 are not con-ceptually neutral with regard to social institutions and rules.		·The explanation provided by observer 2 do-es not require knowledge of institutions like schools and rules of doing home-work, or words which contain values that have social significance e.g. "ambi-tion", "studiousness".
STATUS OF THE OBSERVER.		·Observer 1 has knowledge of social rules of observation. He, therefore, has a social structure imposed on him and interprets what he sees from the standpoint of his individ-ual role according to those social rules. ·Observer 1 is naïve, he is often unaware of the	·Observer 2 adopts a socially neutral role in his observation of behaviour. He interprets what he sees according to a theoretical or hypothetical framework. ·Observer 2 is trained to interpret what he optically sees, within the

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THE ACTOR'S DESCRIPTIONS	OBSERVER 1's DESCRIPTIONS	OBSERVER 2's DESCRIPTIONS
STATUS OF OBSERVER cont.	constraints upon him in describing actions. He "has not learned (or does not remember learning) how to make common-sense observations and to give common-sense answers, he may not even be aware of what he brings to bear on what he optically sees or that in interpreting what he optically sees he is following rules that have social sanctions. He thinks he sees people as they really are." (Beck, 1975: 55)	constraints of a theory based on laws of causality. Technically and practically he describes what he sees in a very different way from the actor and observer 1.
STANCE OF THE OBSERVER	˙Personal. ˙Personal	˙Design or physical.

The illustration provided shows the close connection between the actor's own description and that of the common-sense observer. This supports Pettit's argument for taking common-sense observations as a starting point for a theory of action explanation.

Pettit's ideas as to how the common-sense scheme can be sharpened up into a theory will now be enlarged upon.

2.2.5 In search of a discipline of action explanation.

Knowledge of intention gives the primary characterization of the action, it is to know the description or aspect under which the actor represents the action to himself.

The explanation of actions described by reference to the intentions they embody is provided in terms of concerns, states and traits.

2.2.5.1 Concerns.

These comprise the most basic of the three types of explanation in view of the fact that we hold to a background model of human desire which motivates people, i.e. the actor was concerned with/desired the intended action because it was attractive to him. Therefore, to know his concerns in acting is to know the description or aspects under which the action appealed to him as the thing to be done. (Pettit, 1979)

When a supposed pattern of concerns is found surprising for some reason then feelings or habits are referred to in the explanation of actions.

2.2.5.2 Beliefs and concerns.

There is a close link between beliefs and concerns.
"It is in view of his beliefs, where this is a catch-all category for his perceptions, judgements, inferences and standing commitments, that an agent sees that he has such and such options, with such and such possible outcomes, and that he views those outcomes as each being relatively more or less attractive, on the basis of his concerns, than the others."

(Pettit, 1979 :7)

For a full explanation in this form of explanation then, action is occasioned by a state of mind involving a complex of such beliefs, apart from concerns.

2.2.5.3 What explanation by concerns involves.

The question arises as to how we determine which beliefs and desires to invoke in accounting for behaviour.

This question has to be answered by referring to two further questions:

(i) How do we know which action a given array of beliefs and concerns will produce? How do we project from the mental state to the behaviour?

(ii) How do we know which beliefs and concerns to ascribe to someone, independently of seeing the action they produce? How are effect-independent indices of the mental state found? (Pettit, 1979)

2.2.5.3.1 The assumption of rationality.

The assumption of rationality is the key to answering the first question:

"Roughly, we can say that the action must be represented by the agent in the mental state as a way of realising something which, granted the state he is in, finds more attractive than anything which he thinks can be realized by the available alternatives. In order to work out which of a set of options has this priority for the agent we need to know ..."   (Pettit, 1979: 9)

(i) The concerns which determine what the actor finds attractive.

(ii) The relative weights which he attaches to these concerns, and

(iii) The decision principles which guide him in his attitude to actions that may give any of a number of outcomes.

Decision theory is an attempt to sharpen up the ordinary scheme of action explanation by spelling it out in detail. (Pettit, 1979).

2.2.5.3.2 The assumption of humanity.

The identification of effect-independent indices of belief
and concern requires the basic assumption of humanity.

Pettit (1979) argues that in the formation of beliefs and concerns
people are much the same. Perceptions display the same rough patterns
of figure on ground, generalizations are made on similar inductive
canons, deductions follow roughly the same rules of logic. Inductive
and deductive logic provides the means, as far as beliefs are concer-
ned, for providing us with effect-independent indices of the mental
state which we take to produce the actions of others.

2.2.5.3.3 The question of a predictive science in explaining action.

Is it possible to sharpen up the common-sense scheme of action
explanation sufficiently to have a predictive science of action
explanation?

Pettit (1979) argues that this is not possible for the simple
reason that the assumption of rationality is not compatible with the
fixing of exact indices for states of belief and concern. If it was
possible:

> "... it is hard to see why these indices should not already have
> been located during the long history of application of the ordin-
> ary scheme."

(Pettit, 1979: 14)

Rather, Pettit argues that there should be a professional skill in
the business of action explanation. The point of entry for this pro-
fessional skill being where discretion is used at the point when a
person, applying the common-sense theory, makes his choice of best
explanation.

The problem in selecting the mental state, is one of optimization
from a number of competing constraints that derive from the twin assum-
ptions of rationality and humanity, which explains the behaviour in
question. (Pettit, 1979)

2.2.5.3.4 Constraints upon optimization in accounts given of action.

Pressures that might result in a less than optimal account arises
from:

(i) Constraints in relationships which enter explanations e.g.
I may be too kind or too unrealistic in making excuses for
someone.   23

(ii) Pressures against imputing reflexive concerns in any wide-spread way to human beings. A reflexive concern is a desire to appear to oneself as well as to others, as having a straightforward desire to get something, as money, power or fellowship, when in fact one has no such desire.

In accounting for behaviour by application of the common-sense method, these considerations cannot be systematically applied.

A style of explanation is required which would resist non-reflexive pressure and the pressure of existing relationships in construing people's behaviour. An impartial retionalization could be obtained by optimizing over the demands of humanity and rationality. (Pettit, 1979).

2.2.5.3.5 Practices in Psychology and Sociology.

Pointing to practices in psychology and sociology, e.g. psycho-therapy, Pettit concludes that the art of rationalization is not new to psychology since practitioners of human behaviour have already proceeded in that direction.

2.3. THE FOUNDATIONS AND DEVELOPMENT OF HUMAN ACTION.

The question as to whether infants exhibit intentional movements is the subject of some controversy. Studies on the development of communication and language in the human infant are important in revealing features about the foundations of human action and it's organization. They also have implications for the perception of human action within the whole process of communication.

2.3.1 The question of innate capacity.

At birth the human infant is capable of making many movements and sounds. Assessment sheets of the neonate's behaviour, e.g. The Brazelton, list many movements which can be observed objectively.

The Babinski response, for example, involves the contraction of a certain set of muscles, producing a particular kind of response, which can be agreed upon by all observers no matter what culture they come from. (Albino, 1979). A reflex response does not, however, involve volition and other evidence is required to substantiate an argument for intentional movement.

Chomsky, (1968) and Trevarthen (1975, 1977) among others, have advoc-
ated innate capacities for the acquisition of language. Bruner (1975:65)
also suggests the innate capacity to acquire language:

> "What may be innate about language acquisition is not <u>linguistic</u>
> innateness, but some special features of human action that permit
> language to be decoded by the uses to which it is put."

Emphasis is here on the <u>use</u> to which language is put. This point
is supported by numerous researchers concerned with language develop-
ment. Halliday (1975) for example, adopts the view that language
development is a matter of learning how to mean and also refutes the
concept that at birth the infant is merely an organism responding to
external stimulii.

2.3.2 <u>The concept of person.</u>

Shotter (1978: 64) argues that the infant lives:

"... as one term in a personal relationship," which assumes that
the baby is born capable of receiving personal ministrations. He
quotes Mac Farlane (1974) who discusses the behaviour mothers show
towards their newborn infants.

She

> "... verbalizes her inspection of the child ... imitates the child
> and puts her own interpretations on the child's behaviour."

So that

> "... from the moment of birth the child does things capable of bear-
> ing personal attributions."

Emphasis on a personal relationship between mother and infant from
birth implies that a concept of person exists between mother and child.

Miller (1976) accepts Strawson's argument that a "person's concept"
is a psychologically primitive, unanalysable concept and that intention-
al predicates must take persons for their first argument.

He states that for obvious biological reasons, every species has
some mechanism for recognising members of it's own kind. The interest
displayed by infants in the appearance of the human face and the sound
of the human voice indicates that humans have not been neglected in
this respect.

So primitive a concept of what human beings are and what they do is
probably given to every normal person very early in life, the "person's
concept" like the "self-concept" is a cultural universal. (Miller , 1976).

2.3.2.1 Implications of a concept of person.

Miller advocates that we should accept the logical primitiveness of the concept of person and with this the unique, logical character of certain predicates.

The use of such predicates, of which intention is one, is not the result of some intellectual decision made in the history of Western thought, or achieved by children reflecting on their experience with certain animate beings, but is inherent in the human perceptual process.

2.3.3 The concept of self.

Shotter (1978) argues for the realization that a concept of "self" is fundamental to the issue of human action. The neonate is not viewed as an organism merely responding to external stimulii but is seen as an agent that causes at least some of it's own motions. Human action is, therefore, referred not to an organism but to a self

"... a peculiar bi-furcated thing that is both agent and patient in action and subject and object in thought and the development of the self is quite different from the development of the organism proper."

(Shotter, 1978: 48)

2.3.4 The structural approach to language.

Structuralism in linguistics follows a suggestion by Bloomfield (1933) in which solutions to all grammatical questions were sought without appeal to meaning. (Mac Namara, 1972).

Structural linguists regard language as a commodity of some kind that the child has to gain possession of in the course of maturation, their interest being purely in terms of sound and form. (Halliday, 1975)

However, as Halliday points out the adult language system is now generally recognised as being basically tri-stratal in nature, consisting of sound, form and meaning. (Halliday, 1975)

If the utterances of an infant or young child are analysed purely in terms of structure there is a clear distinction between the structure of a child's language and that of the adult. This begs the question as to why the child learns one set of structures in favour of another if language development is primarily the acquisition of structure? Halliday argues that the fundamental question is rather

"How does the child learn language?" i.e. How does he master the adult linguistic system - in which grammar is just part and structure is just on part of grammar? How does he build up a multiple coding system consisting of content, form and expression: a system of meaning relations, together with their realisations as configurations of words and structures and the realisation of these, in turn, as phonological patterns?

2.3.5 The functional approach to language.

A swing in the direction to seek a basis for language learning in infants among non-linguistic cognitive principles became evident about 1970, as shown in several books and articles e.g. Bloom, 1970; Brown, 1970; Ervin-Tripp, 1970: Keenan, 1969; McNeill, 1970 and Slobin, 1971. (Cited in MacNamara, 1972).

Consideration of the development of the semantic system has led theorists to view the development of language in the context of the function that language serves since:

"Some specification of the total set of functions of language, some kind of functional hypothesis, which is not just a list of the uses of language but a system of developmental functions from each of which a range of meanings or "meaning potential" is derived,"

is required. (Halliday, 1975: 4)

2.3.5.1 Halliday's categories.

Halliday's view of language as meaning potential provides for an open-ended and theoretically infinite range of options in meaning. These options are grouped into a very small number of sets which are subject to strong internal constraints. These sets of options constitute the functional components of the semantic system.

The categories may be summarized thus:

(i) Instrumental

This function serves to satisfy the childs material needs, of enabling him to obtain the goods and services he wants.

(ii) Regulatory

Controls the behaviour of others. They are utterances directed at a particular individual, and it is the behaviour of that individual that is to be influenced.

(iii) Interactional

The interactional function refers to language used to interact

with others, this includes generalized greetings and responses to calls. It also includes the focussing of attention on particular objects in the environments i.e. objects used as channels for interacting with those around them.

(iv) Personal function

This function is used to express the child's own uniqueness, his awareness of himself in contradistinction to his environment; and then to mould that self. It includes, expressions of personal feelings, of participation, of withdrawal, of interest, pleasure, disgust etc.

(v) Heuristic

This function emphasizes the boundary between the child himself and his environment that he begins to recognize and it is because of this distinction that the child can begin to explore his environment meaningfully. In it's earliest form heuristic utterances consist of the demand for a name, which is the child's way of categorizing the objects of the physical world; but it soon expands into a variety of more specific meanings.

(vi) Imaginative

The imaginative function is one in which the child creates an environment of his own.

(vii) Informative

This function is dominant in adult language, it is the "I've got something to tell you " function. The idea that language can be used as a means of communicating information to someone who does not already possess that information is very sophisticated, it depends on the internalization of a whole complex set of linguistic concepts. It is the only function that is definable solely by reference to language.

2.3.6 Findings from mother-child interaction studies.

Attention has been focussed on the interactions between mothers and their infants since, if these interactions involve co-ordinated joint activity, they must "for their proper performance, involve communication between mother and infant." (Krige & Albino, 1977: 1)

The essential points that emerge from mother-child interaction studies are:

(i)   Interactions between a mother and her infant, or in the absence of the mother a caretaker, lay the foundations for the process of communication.

(ii) This, in turn, supports a continuity hypothesis by means of which language is regarded, not as an independent system of communication, but as a development from the pre-linguistic acts of the infant.

(iii) A pre-verbal communicative act is not seen as distinct from, and independent of social and cognitive actions.
(Krige & Albino, 1977).

2.3.6.1   The continuity hypothesis.

Support for the continuity hypothesis is available in the features used in both verbal and pre-verbal communication,

"... intonation, gesture, even particular sounds and also the aims of communication are the same - to enable integrated interaction to occur."

(Krige & Albino, 1977: 1)

2.3.6.2   Interaction between pre-verbal communicative acts and social and cognitive actions.

Support for the interaction between pre-verbal communicative acts and social and cognitive actions is available from certain of Piaget's observations on cognitive development of symbolic function, in that symbolic thought develops from actions that have become internalized.

Further support is found in the work of Krige (1977) who has extended the speech act theory of Searle (1969), which emphasizes not only the communication of propositional content, but also the transmission of information concerned with the intended effect with which the speaker influences the hearer, to include pre-speech acts.

This view, that the non-verbal behaviour of the infant consists of acts which have all the basic elements for later dialogue laid down, is an important finding for communication as a whole.

2.3.6.2.1 Cognitive determinism and linguistic input.

Schlesinger (1977) discusses two extreme point of view with reference to a study of the development of language:

(i) That linguistic development is completely determined by cognitive development, i.e. a cognitive determinism approach.

(ii) That the child's linguistic development is determined by his experience with language, i.e. a linguistic-input hypothesis.

An important point which emerges from the arguments presented is that cognitive development itself cannot be sufficient for the formation of a concept which underlies language. (Schlesinger, 1977)

A child learning a concept has to deal with two problems:

(i) The problem of interpretation.
(ii) The categorization problem.

The world is not presented to us in neatly arranged discrete categories and the solution as to where to draw the boundaries must be determined by the child when he learns the concepts underlying words.

Schlesinger's argument is that the process of categorization, the drawing up of boundaries between and grouping into concepts, cannot take place without the aid of language. For example, the boundaries of the concept "uncle" depend on the kinship terminology employed by the language in question. This would also account for the way in which the tense systems of different languages carve up temporal concepts in different ways. Similarly with grammatical relationships. There is no inherently "correct" or "natural" way to group objects into concepts, so there is no such way to group grammatical relations. This may also be the reason why languages differ in the distinctions they observe.

This view conflicts to a certain extent with the views of those who do advocate some innate capacities for language acquisition.

Schlesinger concludes (1979) that it is necessary to view the two hypotheses as being compatible. Extralinguistic experience may be responsible for the emergence of one relation and linguistic experience for another.

A modicum of cognitive determinism must precede any language learning because language remains meaningless unless referring to some

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already interpreted aspect of the environment. However, once some structuring of the environment has occurred and some primitive utterances can be understood in accordance with this structure, there is room for an influence on the form of these utterances on the child's cognitive determinism. They may direct him towards further interpreting events and states referred to.

Children may even vary in the way they acquire a given distinction, some using cognitive determinism and some using linguistic input.

The two processes may operate even within a single child acquiring one particular dimension.

The relative contribution of extralinguistic and linguistic experience may thus differ from language to language and may even differ for different children learning the same language.

The interpretation of the environment by linguistic input must be prepared by cognitive determinism, since a certain level of maturity is a pre-requisite for such interpretation to occur. Linguistic input in its turn may, as we have seen, prime the perception of cognitive distinctions. Alternatively, cognitive determinism may facilitate the operation of linguistic input. (Schlesinger, 1979)

A reformulation of the cognitive-determinism hypothesis therefore, asserts that the concepts and relations which underlie language and constitute the meaning of what is expressed by it are formed by cognitive determinism. The manner of expressing these notions and the rate at which the child learns to express them are determined in part by linguistic factors such as complexity of the linguistic constructions.

The initial proposal was that the function of linguistic input is to deal with the categorization problem. After he has constructed a map of the world through his extralinguistic experience, the child utilizes linguistic input to draw in the borders between adjoining categories. Now it is suggested that linguistic input may also be responsible for constructing certain parts of the map itself.

While I agree with Schlesinger that the ability to gain from linguistic experience may make the process of categorization of concepts more efficient, it is difficult to believe that before the child has acquired language he does not categorize concepts. Visual comparisons, for example, must surely make the child think?

2.3.6.2.2 Early social exchanges and the development of communication.

Lock (1978) and Shotter (1978), among others, provide substantial evidence for the relevance of early social exchanges necessary for the development of the human communication process.

Lock illustrates his argument drawing from the work of Vygotsky. Vygotsky proposed that initially meanings exist at an "inter-mental level", that meanings initially exist between the interactants, and later at the "intra-mental level", as symbols develop they are internalised and simultaneously given explicit form.

2.3.6.2.2.1 The circle of reciprocal exchange.

Shotter's argument that a baby lives "as one term in a personal relationship" suggests that the baby has certain competence for entering into early social exchanges. The mother's/caretake-'s role becomes incorporated into a circle of reciprocal exchange, whereby the child learns to act, both in expressing himself and in manipulating the things about him. (Shotter, 1978)

> "He does this in a way that at least makes sense to her - the child not understanding till later the nature of what it is he is actually doing, it being enough at first that he understands how to do it. The child is "helped" by his mother to retrospectively evaluate his states of feeling and the consequences of his actions and thereby learns meanings or socially significant uses for feelings that he may have, or movements that he might make at any time."
>
> (Shotter, 1978: 69)

2.3.6.2.2.2 Hierarchic and rythmic nature of early interactions.

Shotter (1978) also provides evidence from the work of Condon and Sander (1974) as to the hierarchic and rythmic nature of these interactions. First in self-synchrony and then in interactional-synchrony, turn-taking is viewed not so much as a matter of the mother imposing such a structure upon her baby's activities as finding it within it. She is paced by her baby's activity (Shotter, 1978). The relevance of "timing" or "phasing" of the mother's actions are emphasized also by Kaye and Brazelton (1971). Actions, therefore, show a rythmic, temporal development. (Cited in Shotter, 1978).

2.3.6.2.2.3 Discovery of social institutions.

Another important point made by Shotter (1978) is the wider view
that he adopts concerning social exchanges. Each human act unfolds or
develops within an implicational field of possible subsequent acts and
Shotter argues that rather than there being precise innate foundaticns
for the structure of human exchanges, there are precise foundations to
be discovered in the institutions we establish between ourselves and
others. These institutions existed before our birth and although we
practice institutional forms we may have no awareness at all of the
reasons for their structure. (Shotter, 1978).

2.3.6.2.2.4 The development of autonomy.

As mentioned previously, development is seen to be a process
of realising more autonomy as the individual is able to incorporate
already established practices into his behaviour in order to achieve
his goals. (Shotter 1978)

It is interesting to note the hierarchical structure of implications
in which each and every act is meaningfully related to each and every
other act, and the way in which man uses them to construct plans of
action. This has particular relevance in the light of research done
on the stream of behaviour which is reported on in the next section.

2.3.6.2.2.5 Negotiating meanings of actions.

An important point which results from these findings is the emphasis
that is placed on negotiating a meaning for an action. The search
for objective knowledge is abandoned in favour of understandings from
within a frame of reference, (Shotter, 1978). The central activity
becomes a seeking, in the course of something like "dialogues" with
them, interpretations of the meaning of people's actions. (Shotter, 1978)

2.4. SEGMENTING THE ONGOING STREAM OF BEHAVIOUR.

Actions are not studied in isolation but are seen as positions
occupied in a sequence. The problem for researchers studying the
ongoing stream of behaviour is to find out how actions are made sense
of within a temporal dimension.

2.4.1 The unit approach.

Many researchers have concerned themselves with such "action slots" in time and have addressed themselves to a study of these units by attempting to discover their nature and how they relate to each other over time.

English and English (1958) define an "act" as a "psychological unit," while other names given to these extracts from the behaviour stream are: "behaviouremes" (Pike, 1967); "kinemes" and "kinemorphic construc- tions" (Birdwhistle, 1971); "actions" (Harris, 1964); "agons" (Bjerg, 1968); and "point and position" (Scheflen, 1973).

As Collett (1980) points out, it is extremely difficult to see whether these various authors are talking about the same or related things. They all, however, refer to the isolation of acts from the ongoing stream of behaviour and subsequent analysis of their relations within the context of a temporal structure, a strategy which attempts:

"... to study communication as a tightly organized and self-
  contained social system, like language."

(Collett, 1980: 2)

2.4.1.1 The division of the stream into discrete categories.

Evidence for the existence of behaviour units is based on studies which have found significant replication of "break-points", or boundaries that are agreed upon by subjects viewing a continuous action sequence.

Newtson (1973) proposed that the subjective units of perceived action could be identified by providing subjects with a button opera- ting a continuous event recorder and by instructing them to press the button whenever, in their judgement, one meaningful action ends and a different one begins.

Subjects perform this task without any difficulty, indicating that the task involves a form of behaviour compatible with their thinking. This is in agreement with Dickman's findings, reported as follows:

"The relative ease with which most of the subjects understood
  and completed the task set for them indicates that the idea
  of behaviour occurring in units was familiar to them."

(Dickman, 1969: 27)

2.4.1.2 The categorical nature of thinking.

The categorical nature of people's thinking is illustrated in an
experiment by Liberman et al (1967). (Cited in Collett, 1980).

A series of sounds between two adjacent phonemes were synthesized,
/b/ and /d/. When presented to subjects, who were asked to identify
the sounds, they responded categorically, i.e. they judged the sound
to be /b/ or /d/, never something between or a combination of the two.

2.4.1.3 Behaviour units and perceived units of behaviour.

An important observation is whether these units are inherent in
the behaviour stream of the actor or whether they are constructions
placed on activity within the stream.

Collett (1980) argues that the stream of behaviour is for all prac-
tical purposes, homogeneous in time.

> "It is seamless, and it is only by virtue of the segmentations that
> I impose on it, and the way in which these segments are seen as
> relating to each other, that it can have any meaning or signifi-
> cance for me."

$$(Collett, 1980: 2)$$

He illustrates this with an example of moving his hand through the
air. An objective description of the separate actions performed
would prove impossible because:

> "Any attempt to identify the constituents, let alone the boundaries
> of the actual movement itself, would necessarily arise out of a
> set of assumptions the I entertain about the nature of such an
> action."

$$(Collett, 1980: 2)$$

While <u>inference</u> plays a crucial role in the study of actions, work
by Barker (1969) points to the importance of <u>input</u> information.
He refers to records of behaviour stream research and argues that the
findings may be replicated, the only method to show that behaviour
units do exist and are self-generated, inherent divisions of the be-
haviour stream.

Barker (1963) distinguishes two types of constituents which make
up the behaviour continuum, "behaviour units" and "behaviour tesserae."

"Behaviour units" consist of inherent segments of the behaviour stream
and enter psychology when the investigator functions as a transducer,

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observing and recording behaviour with techniques that do not influence
its course. "Behaviour tesserae"*are regarded as fragments of behaviour
that the investigator creates or selects in accordance with his scien-
tific aims.

The essential difference is, therefore, seen to relate to the opera-
tions of the investigator. A unit will consist of a segment of the
behaviour stream which is marked off at naturally occuring boundaries,
i.e. when changes occur independently of the investigator's opera-
tions.

2.4.1.3.1 <u>Main differences between behaviour units and behaviour</u>
           <u>tesserae</u>.

The main differences between units and tesserae may be summarised
thus: (Cited in Barker, 1969).

BEHAVIOUR UNITS   BEHAVIOUR TESSERAE

i Behaviour units are natural   i Behaviour tesserae are imposed
   units in that they are self-   elements in that they are alien
   generating parts of the   parts of the stream.
   stream.

                                     They occur when an investigator,
   They occur in the behaviour   ignoring or dismantling the
   stream without the inter-   existing stream of behaviour
   vention of the investiga-   chooses parts of it according
   tor.   to his own preconceptions and
                                     intentions.

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*"Tesserae are the pieces of glass, or marble, used in mosaic work;
 they are created or selected by the mosaic maker to fulfill his
 artistic aims."

                                        (Barker, 1969: 1)

BEHAVIOUR UNITS	BEHAVIOUR TESSERAE
ii The beginning and end points of the selected parts of the stream are naturally defined.	ii The beginning and end points of the selected parts of the behaviour stream are established by the technical requirements of the investigator and coincide only by chance with the inherent units of the behaviour continuum.
iii Techniques employed for the study of behaviour units are tender, sensitive and non-destructive, e.g. X-ray analysis, electrical, magnetic and resonance techniques and photographic recording.	iii The research methods are standard techniques which, when employed ignore or destroy the existing structure and select or create new ones, e.g. Chemists, biologists and geologists grind and macerate, compound, synthesize and re-arrange their substances in order to make important analyses.
iv Behaviour units are identified and described within their relevant contexts or environments and are incorporated into a unified system of concepts forming an intact system.	iv Behaviour tesserae are constructs with greater or less conceptual elaboration, defined within the context of a theory. They are divorced from the natural units of the intact system.

4.1.3.2   Interaction between behaviour units and behaviour tesserae.

Although a clear distinction is made between these two kinds of
parts of the behaviour stream, Barker (1969) points to the interaction
that takes place between natural and contrived systems of units.

"The intact system provides the raw material and context with which
the operations of creating and maintaining the tesserae must
contend, and with which the dynamic processes of the tesserae,
themselves, must come to terms."

(Barker, 1969: 3)

2.4.1.3.3   The structure of the stream.

Thefollowing fundamental structural features have been identified:

(i)   Behaviour units occur as discrete behaviour entities.
(Barker, 1969: 11)
(ii)   Behaviour units may be combined into chains of interlinked
units.
(iii)   Behaviour units show evidence of hierarchical structuring,
referred to by Barker (1969) as enclosing-enclosed struc-
tures.

Newtson (1976) and Collett (1980) also refer to this hierarchi-
cal structure. Certain junctures are identified more frequently than
others and that irrespective of the fineness of their discriminations
people locate the boundaries of supra-segmental units in roughly the
same place in the sequence.

Barker (1969) also refers to the complex structure of the stream.
It is not a single current upon which behaviour units pass single
file, either separately, on in chains, or in enclosing-enclosed
structures but a very complex organization. He adds that

(i)   Only a small portion of the total complexity of the behaviour
stream is revealed from figures from behaviour stream records.
(ii)   Structural dynamic units of other sizes are not revealed.
(iii)   Units defined in terms of the material content criteria
are not revealed in such records.

2.4.1.3.4   Dynamics of the behaviour stream.

The inter-dependent nature of units of the stream of behaviour is
yet another feature of the stream which, according to Barker (1969)

requires further research to establish the degree and nature of this independence.

2.4.1.3.5 Boundary problems along the stream of behaviour.

2.4.1.3.5.1 The trans-boundary paradox, the inside-outside problem.

The concepts and theories appropriate for entities of one inclusiveness level must inevitably differ from those that are apposite for entities of other levels, yet the different levels are linked with the same structures.

2.4.1.3.5.2 The boundary where behaviour ceases and the non-behavioural boundary begins.

This refers to the context within which the behaviour occurs and begs the problem of couplings between incommensurate systems.

2.4.1.3.6 Problems of design and research methodology.

2.4.1.3.6.1 The problem of interference.

Application of inappropriate methods may distort the subject matter. Collett, (1980) argues that the very fact that the investigator interferes with the process in an attempt to make sense of the behaviour of others may alter the natural process.

2.4.1.3.6.2 The problem of verification.

Control and selectivity which is emphasized in scientific method is inappropriate for this kind of research. No similar external criteria is available for research upon behaviour units. The behaviour stream itself decrees the boundaries and the properties of it's own parts.

To highlight some of the problems and findings of behaviour stream research some of the methods employed will be discussed.

2.4.2 Methods employed to investigate segmentation of the behaviour stream.

2.4.2.1 Types of studies employed.

Studies aimed at investigating how subjects divide up the ongoing stream of behaviour into units, and agreement as to what constitutes a unit have employed the following methods: (Collett, 1980)

(i)   The post-hoc method.

(ii)   The ad-hoc method.

(iii)   Role-playing procedures.

(iv)   Film-making techniques.

2.4.2.1.1 The post-hoc method.

This method involves selection of the units, by the subject, after observation of the action sequence takes place.

An experiment of this nature is reported by Dickman (In: Barker 1969).

(i)   Action sequences are presented to subjects who are initially instructed simply to watch the sequence.

(ii)   Following the viewing of the sequence, 3" x 5" cards, each with a written description of "a minimal molar unit", or phase* is presented to the subjects.

(iii)   The cards are numbered and arranged so that the sequence correponds to the sequence of the movie. They are laid out so that the whole sequence is clearly visible and provide a systematically segmented, written description of the behaviour observed in the movie.

(iv)   Subjects are then instructed to divide the cards into groups so as to represent a "happening" in the movie.

2.4.2.1.1.1 Criticisms of the post-hoc method.

(i)   The task of grouping units after viewing the sequence relies on recall as to where breakpoints were observed during the viewing of the actual sequence. (Collett, 1980). This could distort the findings to the extent that reconstruction after the event could occur.

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*"A phase is the smallest behaviour segment in an action hierarchy. As such it is a minimal unit of action in the sense that descriptive sub-division of it would break into actones."

"Actones are used here in the sense that they constitute muscular movements or adjustments which would not necessarily imply behaviour of a goal-directed type. "

(Dickman 1969: 25)

(ii) The units are selected in advance, by the investigator and
a real-time base-line is provided (Collett, 1980: 11).
"The method may, therefore, interfere with the selective
attention to certain aspects, which the subject may
employ while perceiving an ongoing action sequence."

2.4.2.1.2 The ad-hoc method.

This method involves selecting the units as observation takes place.

Newtson (1976) proposed that the subjective units of perceived
action could be identified by providing subjects with a button opera-
ting an event recorder.

(i) Action sequences are presented to subjects who are instructed
to press the button whenever, in their judgement, one mean-
ingful action ends and a different one begins.

(ii) Further instructions to divide the sequence into fine,
natural or gross units were given in an attempt to control
the hierarchical structure of units within the sequence.

Collett (1980) argues that the kind of method used by Newtson
et al:

(i) Cannot control variable response latencies within and
between subjects.

(ii) Loses track of the material to which they have addressed
themselves.

McPhail and Collett (1978) devised a method of segmenting the
behaviour stream in which the formation of units is made problematic.
The button, when pressed, places marks on the sound-track of the
video-recording.

(i) The subject is instructed to press the button whenever he
sees the slightest change in action.

(ii) Once the subject has viewed the sequence and has placed
his marks he is instructed that the sequence will be re-
played and that when he hears his button-presses he is
to provide a description of the unit which he has identi-
fied on the first viewing.

(iii) This procedure provides a list of "action glosses" which
are recorded by the investigator.

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(iv) The subject is then asked to group the glosses, preferably
       into pairs and to work up through the groupings until all
       the glosses are subtended under a single node.

In this way the investigator is able to derive a record of the
judgements identified, the subject's labels for each of the units and
the way in which the subject sees the units forming higher order units.
(Collett, 1980).

2.4.2.1.2.1 <u>Advantages of the method</u>.

(i)   Instead of selecting the segments in advance, each subject
       is allowed to nominate his own junctures and units.
(ii) The problem of analysing subject's marks in real-time is
       avoided since units are compared via their glosses. A
       common <u>emic</u> base-line is provided for a group of subjects,
       i.e. a base-line formed from the observations of the
       ordinary group of people who made up the sample, not based
       on the observations of the investigator. This allows for
       an analysis of the marks provided to be recorded against
       a baseline defined by himself and others.

2.4.2.1.3 <u>Role-playing procedures</u>.

The subject is required to watch the investigator carry out an
action and is then required to repeat the sequence. (Kendon, 1976).
This technique was devised to overcome the problem of removing
the observer from the interactive context in which natural observa-
tions take place. The observer interprets behaviour, not for it's
own sake but to guide his own actions in response.
Kendon's findings show that the subjects impose definite limits on
what they take to be the action. For example, when the experimenter
performs a finger exercise and completes the sequence by placing his
hands on his knees, most subjects repeat the exercise but not the
terminal posture of the hands. This demonstrates that we have quite
set opinions about the bounded character of actions. Some are seen
to be bracketed together, others as being outside the sequence. (Cited in
Collett, 1980)

2.4.2.1.3.1 <u>Main disadvantages of the method</u>.

    (i)   The hierarchical process of segmentation within a sequence of acts being mimed is not revealed.

    (ii) The final response of the observer, when he responds to the action may include discrepancies which result from an inability to de-code complex sequences which cannot be distinguished from an inability to encode these sequences correctly.

2.4.2.1.4 <u>Film-making techniques</u>.

Subjects are instructed in the use of a movie-camera and the editing facilities and are required to make a short film of a subject chosen by themselves.

Worth and Adair (1972) report an experiment they conducted among the Navaho using the above-mentioned technique, in an attempt to investigate cultural differences in imposing structure on ongoing action sequences.

Lidstone and Mc Intosh (1970) conducted a similar experiment on children. (Cited in Collett, 1980).

2.4.2.1.4.1 <u>Findings and criticisms of the method</u>.

The findings from Worth and Adair's study (1972), are particularly interesting in the context of cross-cultural studies since:

> "It emerged that the narrative style of the Navaho films, and the
> way they composed and juxtaposed their shots, were quite different
> from conventional cinematography. They found, for example, that
> the films were more concerned with movements, especially walking,
> and that there were very few close-ups of the face. The former,
> it was suggested, reflects a cultural pre-occupation with the
> sheer time it takes to get around. the latter a tacit understanding
> regarding an invasion of privacy."

(Collett, 1980: 13)

The Navaho also revealed unique ideas as to how one action leads to another. Rather than splicing together sequences which depict the same action sequence "in parallel" as is normally done with established film technique, the Navaho use "jump-cuts" which were explained in terms of their concept of time but gave the impression of discontinuity to Western eyes.

Collett (1980) argues that although the investigators discussed their findings in the context of the Navaho inability to use the medium, the important question of whether artistic creations, even including film, actually reflect the constructions of the artist or simply conventional ways of viewing the world.

The authors might conclude that the Navaho use of jump-cuts is intentional but they are not that convincing in their suggestions that this is the way the Navaho think when they are not making films. (Collett, 1980)

2.4.2.2 Findings from Dickman's and the Newtson et al studies.

The work of these researchers indicates the main findings that result from attempts to identify and explain the objective basis of behaviour units.

2.4.2.2.1 Findings from Dickman's studies.

Findings from Dickman's (1963) studies indicate that:

(i)   There was statistically significant agreement on the all over patterning of sequence of break and continuity.

(ii) A large number (one-half of the possible division points) were significantly agreed upon as being either points of break or continuity.

(iii) Agreement on simultaneous beginning and ending points of units showed that approximately three-quarters to four-fifths were units designated by only one subject. This indicated high disagreement in the designation of identical units. (Dickman, 1969)

Dickman regards the contradictory findings as being only apparent for the following reasons:

(i)   There is agreement among subjects as regards the basic components of units, i.e. that of imputing intent or goals to the actor. He, therefore, regards the perception of a meaningful unit of behaviour and the imputation of goals as being functionally independent. (Dickman, 1969)

(ii) While all subjects used this concept of imputing goals to the actor, they still diverged in concluding what the actor was trying to do.

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The amount of apparent disagreement can be reduced by pointing out that if subject A sees two units where subject B sees one, there is not necessarily disagreement on what is happening. This was borne out by an inspection of the labels attached to actions which were similar except for one feature which indicates how inclusive or delimiting the definition of the goal is.

2.4.2.2.1.1 <u>Behaviour perspective and order of abstraction.</u>

Barker and Wright (1955) have termed the dimension of imputing broad or delimited goals to the behaviour as "behaviour perspective" which is the main point on which differences between subject's ratings were reported to hinge.

The arguments for differences in behaviour perspective among subjects was substantiated by a further analysis of the results of Dickman's experiment.

The variability of sub-divisions of modal units among subjects who agree basically on the division at modal areas was tabulated.

> "Within every modal unit there were varying amount of fractioning
> of that unit. In every instance some subjects saw the unit as
> a single and complete one: others saw it as having one, two
> or even six parts."

> (Dickman, 1969: 38)

This indicates that while these units retain the same content and meaning, they constitute a somewhat different order of abstraction.

2.4.2.2.1.2 <u>Stability of behaviour perspective.</u>

Correlations between numbers of units discriminated by the same subject on both the original test and a second test carried out approximately three weeks later provide evidence that when taken as an individual characteristic, behaviour perspective remain quite stable over at least a few weeks time. (Dickman, 1969).

This tendency to maintain a stable behaviour perspective may be evidence for the relative ease or difficulty with which individuals perceive social events and may influence their ability to communicate.

It may also indicate relationships to other personality variables and perhaps make up meaningful dimensions in describing personalities.

2.4.2.2.1.3 Characteristics of the stimulus and the designation of
goals.

Stimulus cues are inherent in the stimulus which may determine the
clarity by which the goal is designated and the consistency with which
it is pursued.

These cues aid the observer and may account for ageement or lack of
agreement, particularly at choice points.

2.4.2.2.1.4 Analysis of cues used by trained observers to mark the
boundaries of units.

Dickman (1969) cites the findings of Barker and Wright (1955)
in their analysis of cues used by trained observers to mark the
beginning and end points of units:

(i)   Change in the "sphere" of the behaviour from verbal to
      physical to social to intellectual, or from any one of
      these to any other.

(ii) Change in the part of the body predominantly involved in
      the physical action as from hands to mouth to feet.

(iii) Change in the physical direction of the behaviour. Now
      a child is walking north to the sandpile; next, he is
      going up a tree; later he climbs down the tree.

(iv) Change in the behaviour object "commerced with", as from
      knife to a watch to a dog to a person.

(v)   Change in the present behaviour setting. A storm comes up,
      a fire whistle blows, teacher says "pass", and the child
      goes from one action to another.

(vi) Change in the tempo of activity, as when a child shifts
      from walking leisurely to running toward a friend.
      (Dickman 1969)

Dickman adds that these factors may operate singly or in combina-
tion.

Dickman (1969) concludes that it is the extent to which goals
and motives are imputed to behaviour that the stream of behaviour
attains orderliness in the eyes of other humans. Independent
observers showed significant agreement on general patterning of
sequences, specifically on points at which units began and ended.
Agreement on identical incidence was very poor despite their agree-
ment on general meaning. Dickman interprets this paradox in terms

of the differences in the inclusiveness of the goal or behaviour
perspective.

2.4.2.2.2 Main findings from the Newtson et al studies.

A main difference between Dickman's work and the Newtson studies,
apart from the post-hoc/ ad-hoc methods used, is that Newtson con-
trolled for the size of the unit perceived by giving subjects instruc-
tions to divide up the action sequence into fine, natural or gross
units in an attempt to control the hierarchical structure within
units.

The Newtson studies (Newtson 1973, 1976, 1977) concentrate on
segmenting action sequences involving the behaviour of a single adult
actor and have indicated, as did Dickman's study, that actions are
experienced as cognitively discrete units. High reliability of sub-
ject's judgements over a 5-week test/re-test period was found both in
terms of the number of actions used by a subject for a given action
sequence, as well as in terms of the probability of particular stimulus
intervals used to segment the stream of ongoing activity.

2.4.2.2.2.1 The objective basis of behaviour units.

High agreement points, which Newtson Engquist & Bois (1977)
terms "breakpoints" have higher information bearing properties
than other points in the behaviour stream.

This has been shown to relate significantly to the point when
subjects perceived a "meaningful change" to take place, rather than
when they perceived the actor to be in a "meaningful state," i.e.
that distinctive changes relative to the previously used action unit
boundaries form the objective basis of behaviour units, rather than
those units consisting of distinctive action defining states.
(Newtson, Engquist & Bois, 1977).

The assumption that actions are perceived as cognitively discrete
units was borne out in these studies for the following reasons:

(i) Boundaries were shown to have distinctive properties which
     differentiate them from other parts of the behaviour stream.

     (a) When deletions were made in ongoing films, these were
          detected more accurately at breakpoints than at non-
          breakpoints.

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(b) The timing of the deletions were also relevant. The longer the deletion at breakpoints, the more accurate the detection. Non-breakpoints however, produced only 35 % accuracy in their detection, regardless of the length of the detection. (Newtson, Engquist & Bois, 1978)

(ii) Variations in the level of analysis.

Level of analysis is indicated by the size of the unit, with regard to both the length of the average interval between unit marks, or the total number of units employed by a perceiver for a given segment.

Factors influencing unit size were found to be:

(a) Controlling instructions.
   Newtson (1976) reports that this range of analysis in individuals can be controlled by instructions given to subjects to analyse behaviour sequences into fine units, natural units or large units. A natural unit being "... at least one level between the two."

(b) The organization of particular action sequences.
   The point on the continuum where the level of analysis falls is very much a function of the particular sequence. In general, natural-unit analysis for sequences portraying highly organized, step-by-step action, with a clear hierarchy of sub-ordinate and super-ordinate goals, will tend to be closer to large-unit levels. Irregular, loosely organized action sequences will tend to produce natural sizes closer to fine-unit analysis. (Newtson, 1976)

(c) Predictibility of the stimulus.
   Insertion of an unpredictible action in a regular sequence of action showed that subjects employed significantly more units per minute than controls. (Newtson, 1976).

   An additional finding was that unitization of the control sequence declined over time whereas the unexpected action in the experimental situation prevented this decline in that condition.

Newtson argues that the finding is a reasonable one in that as the observer gains understanding and predictive control of a sequence, particularly a sequence that is highly structured, he should be able to organize it over longer intervals. (Newtson, 1976).

Wilder (1974) has produced further evidence to support Newtson's finding that a change in behaviour per se may prevent the transition to higher levels of analysis. Thus demonstrating the powerful effect of unpredictability on the way in which behaviour is organized. (Cited in Newtson, 1976).

Wilder (1974) suggests that overall persons begin at fine-unit levels of analysis and work up to higher levels.

If behaviour changes at the level of analysis the perceiver is employing he tends to remain at that level.

If the behaviour changes to unpredictable actions it appears that the perceiver beings again at the finest level (the jump in unitization in Wilder's predictable to unpredictable condition).

The subsequent decline in unitization rate observed in Wilder's predictable to unpredictable condition to a unitization rate lower than that in the unpredictable to predictable suggests that once a perceiver reaches a higher level of analysis, he may return to it quite readily. (Newtson, 1976).

(d) Social power and predictability

Social power and predictability have been investigated by Frey & Newtson (1973, cited in Newston, 1976).

They found that a high-power person in an unequal power dyad has predictability of the low-power person's actions by virtue of his position. This situation is reversed for the low-power person, who has less predictability over the actions of the high-power person.

This kind of research points to the influence that the status of the observer has in judgments made about the actions of others.

The conditions which account for this variation in the level of analysis are, as yet, not well understood.

Overall, Newtson found the following:

(i)   Large-unit analysis yields neutral attribution on the personal-
      situational dimension.

(ii) Fine-unit analysis, depending on the sequence, produces a dis-
      placement toward either the personal or situational end of the
      scale, i.e. attributions were more differentiated as to cause.
      (Newtson, 1976)

2.4.2.2.2.2 The importance of input in attribution studies.

Newtson (1976) refers to two findings which point to the fact that
input and not only inference is shown to be of importance in a study
of the perception of ongoing behaviour.

(i)   The units identified by the procedure do contain reliable
      evidence for causal judgement.

(ii) That variation in level of analysis may, under conditions
      not well understood, alter the output of the attribution
      process.

2.4.2.2.3 Implications of the findings.

2.4.2.2.3.1 The perceiver as an active information seeker.

The view that the perceiver is an active information seeker contrasts
with the views that actions are perceived by the processing of chunks of
movement which assumes the perceiver to be a passive receiver of environ-
mental stimulii. (Newtson, Engquist & Bois, 1977).

The Newtson studies show that variation in levels of stimulus infor-
mation is actively carried out and the perceiver even has options in
the mode of processing information.

Newtson's views are consistent with current analyses of cognition
and perception, such as those of Garner (1974), Miller and Johnson-
Laird (1976) and Neisser (1976). (Cited in Newtson et al, 1977).

Sharratt (1980) also argues that people show considerable flexibility
in the way that they attend to objects and events, indicating that rules
rather than laws should be sought in attempts to understand the proces-
ses involved.

This selective view has one important consequence, namely, that per-
ceived action may be separated from perceived movement. The distinction

does not rule out the possibility that some actions may be specified
in terms of movements (e.g. wiggling one's ears) and thus be perceived
in this manner, but this type of perceived action is rejected as the
prototye for all perceived action. (Newtson, Engquist & Bois, 1977).

Newtson, Engquist & Bois (1977) discuss Neisser's perceptual cycle
which they regard as being compatible with their proposal that there
exists a higher order stimulus dimension which governs our perception
of actions.

Neisser (1976) identified three points of view that are taken towards
perceptual processes in Psychology and argues that they can be unified
by treating them as part of a perceptual cycle.

1. Information search (monitoring of stimulii for certain kinds of action defining information.)

3. Hypothesis testing

2. Processing (breakpoint modification)
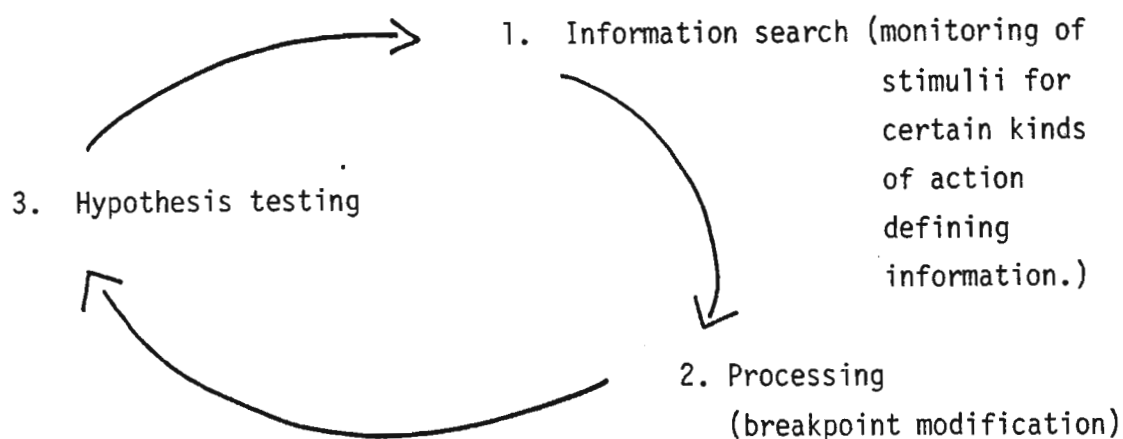
The direction of the process is governed by an anticipatory schemata,
according to Neisser. This is compatible with Newtson's finding that
triads of breakpoints contain more information than component pairs,
in that sets of such information are selected to yield higher order
information. (Cited in Newtson, Engquist & Bois, 1977).

2.4.2.2.3.2 A feature monitoring mechanism.

The mechanisms by which the selected information is accepted is of
central importance to the perceptual cycle view.

Newtson (1976) proposed a feature-monitoring mechanism and this would
indicate that the anticipatory schemata is realised through the mechanism
of perceptual feature composition.

Viewed as an ongoing process the anticipatory schema (perceptual
plan of action) could function to compose a limited set of features for
monitoring. When one of the features changes, defining the action, the
feature is up-dated and the monitoring continues, if the information is
consistent with ongoing interpretation it is accepted, if not further

searching and modification of the plan ensues. (Newtson, Engquist & Bois, 1977).

Neisser points out that there is a constant tension between the requirements that:

(i) Some pre-existing structure must exist for the perceiver to gain information at all.

(ii) The perceiver must not only see what is anticipated, expectation is involved in behaviour perception and shown by findings whereby an unexpected action prompts perceivers to shift to finer units of perception.

This is consistent with a plan-modifying process but 'magic tricks' can fool people and it is necessary that an error-detection process be found to counter-act this effect. (Newtson, Engquist & Bois, 1977).

2.4.2.2.3.3 Analysis of feature changes.

For the feature monitoring model to function as a testable theory, the specification of perceptual features that may define action when the change is critical.

In one study, Newtson, Engquist & Bois (1977), individual patterns of coding features changes were factor analysed to obtain further information about the empirical descriptions of perceptual features, i.e. natural unit, breakpoint to breakpoint transitions were factor analysed and a clear-cut factor structure was found at each sequence, indicating that these factors have a real basis in the data.

It was also noted that the perceptual elements used from the different sequences produced quite different coding features, indicating that the perceiver may have considerable flexibility in his composition of monitored stimulus features. (Newtson, Engquist & Bois, 1977).

A more direct test of the feature-change model of behaviour perception was carried out. A factor change index was derived by treating each factor in the analysis as a single feature. If one coding changed this was counted as a change of "one". The range of this index was from zero to the number of factors in a given sequence.

Results were consistent with previous findings that the greatest amount of change is perceived at breakpoints.

Newtson, Engquist & Bois (1977) conclude that:

"If actions are perceptually defined at breakpoints then the set of breakpoints should contain the perceptual structure of the ongoing behaviour sequence. Such summary of action would be

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analogous to a written typescript of a conversation, omitting
some information that could modify its interpretation but
preserving what was actually said."

<div align="right">(Newtson, Engquist & Bois, 1977: 860)</div>

2.4.2.2.3.4 <u>Limitations and strengths of the analyses</u>.

The nature of the behaviour sequences used in the Newtson <u>et al</u>
studies all had a constant theme or task which might have affected
reliability favourably. They note, however, that the most repetitive
of the sequences, dancing, was least reliable, but that the lack of
purpose may have given rise to that alone.

The effect of repetition possibly affected the factor analysis
study the most. Given apparent differences across behaviour sequences
in these factor structures, it is possible that shifts in monitored
features will occur when episode contents shift markedly.
(Newtson, Engquist & Bois, 1977).

The mundane character of the behaviour analysed may have eliminated
certain sources of unreliability. They refer to a study by Deaux and
Majors (1977) who demonstrated that marked effects on level of analysis
can occur as a result of interaction of perceiver characteristics, for
example, sex role attitudes. (Newtson, Engquist & Bois, 1977).

2.4.2.2.3.5 <u>Summary</u>.

Newtson, Engquist and Bois (1977) conclude that from their findings evidence
is provided to show that we actively construct actions, based on, but
not completely determined by, movement. The process of behaviour per-
ception is active and selective with regard to stimulus information and
many questions about the nature and content of this interaction remain
to be answered still.

Evidence suggests that the interaction between the perceiver and
the behaviour stream proceeds by selection of successive points of
definition in the behaviour stream,.according to a criterion of rela-
tive change in the stimulus between selected points. Such points seem
to be selected by an ongoing perceptual plan of interpretation. It
would appear that a feature selection and monitoring mechanism, whereby
the perceiver selects certain stimulus configurations or elements and
defines actions according to changes in these elements, controls the
perception of actions.

<div align="right">53</div>

Collett (1980) draws attention to one important point that must be raised before concluding, namely, that all action is multi-channel. The relatively simple action sequences used to investigate action sequences have already been mentioned. It follows that the perception of action sequences is also a complex process, involving more than just the visual and auditory senses. If we are to understand more about the perception of the behaviour of others and how we make sense of it, clearly there is still much more investigation needed, particularly in the open, natural environment.

Collett (1980) indicates that some of the problems might be intractable because of the very fact that the investigator interferes with the material he is trying to make sense of.

While difficult methodological and theoretical problems are likely to be encountered the pursuit is a worthwhile one and indispensible if we are to gain a deeper understanding of how people act and interact with one another.

ooOoo

S E C T I O N   3

T H E   E X P E R I M E N T

3.1 AIM OF EXPERIMENT.

The experiment sets out to answer four questions:

(i)   Do naïve observers segment the ongoing stream of behaviour when viewing the behaviour of infants and young children?

(ii)   Whether naïve observers attribute intention to the behaviour of infants and young children?

(iii) If so, how do they do this?

(iv)   Do the kinds of attributions made vary with the age of the child being observed?

3.2 Method.

3.2.1 The sample.

56 subjects (28 male and 28 female) who volunteered to take part in "an experiment concerned with the observation of children's behaviour" were recruited from first year University courses, from all faculties at the University of Natal, Durban.

The subjects were naïve in the sense that they had no training in the observation of behaviour.

3.2.2 Apparatus.

The observation room was equipped with the following apparatus:

(a) A video-recorder and video-screen.

(b) A tape-recorder.

3.2.3 LAY-OUT OF EXPERIMENTAL ROOM

DOOR

VIDEO-SCREEN

SEAT FOR S.

LINE OF VISION

SEAT FOR E.

TAPE-RECORDER

TELEGRAPH KEY

VIDEO-RECORDING APPARATUS

POLYGRAPH APPARATUS
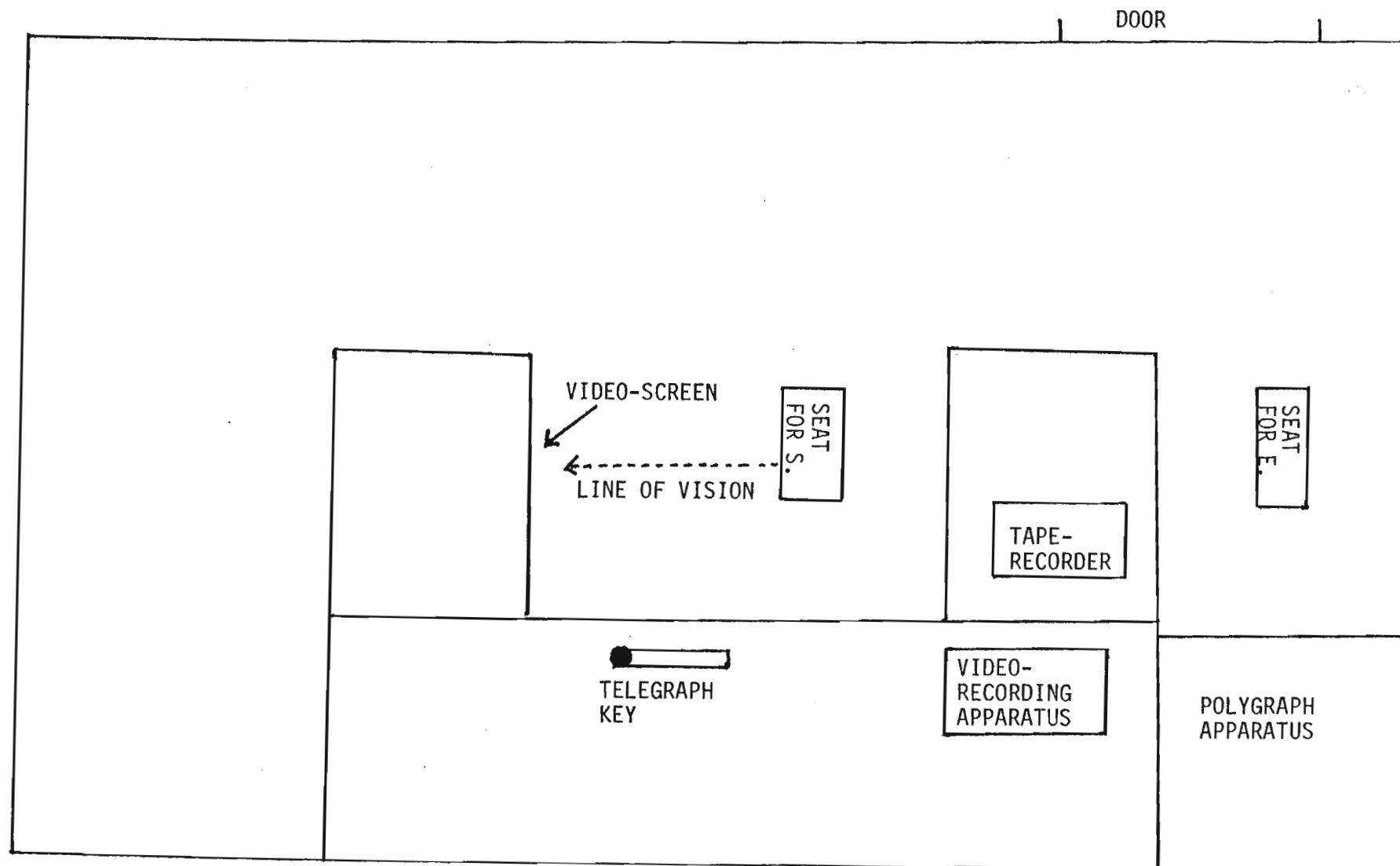
(c)   A Grass 2 channel polygraph;   only one channel was used.
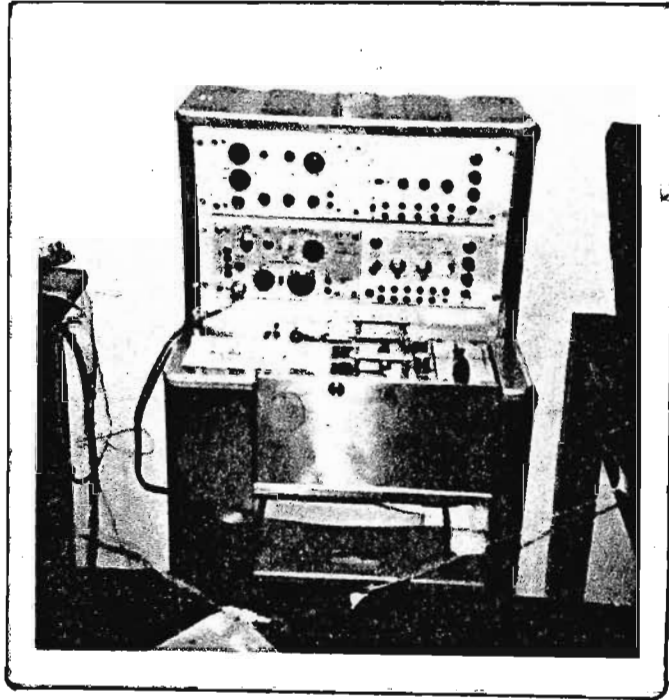
THE GRASS 2
CHANNEL POLYGRAPH

(d)   A telegraph key was connected to the polygraph so that when
      tapped the signal was recorded on the polygraph record.
(e)   Video-recordings of 4, 120 sec. action sequences.
(f)   A copy of written instructions for the experimenter to give
      to subjects.

3.2.4 The experimental method.

3.2.4.1 Selection of the action sequences to be viewed.

The video-recordings were selected from a series of video-tapes
collected by the Department of Psychology, University of Natal,
Durban.

Recording sessions were carried out in a playroom in the Department
of Psychology. The playroom is soundproofed and isolated from the
observation room.

The recording sessions of the mother and child playing freely
originally lasted 10 minutes and for the purposes of this experiment
only 120 sec. segments of each child's behaviour was selected.

Selection was based on the age of the child and each sequence was
a sample of the child's behaviour when in it's normal waking state.

The notation for the exact ages of the children is as follows:

00:	00:	00:
years	months	days

However, for ease of discussion their approximate ages are referred to as
the 6 month old child, the 9 month old child, the 14 month old child
and the 2 year 4 month old child.

The children comprised a "normal" sample, being "normal" infants
with "normal" mothers. "Normal" here means not deviating markedly
from the mode of the population. The sample was not, therefore,
representative of any section of any population in the stricter
sense of the word.

The four action sequences were as follows:

(i) <u>Sarah</u>   Age: 00:27:05 ($^\pm$6 months)

Sarah was an infant unable to talk or even crawl. Throughout the sequence she sat in her mother's lap with her back to her mother and attended mainly to a doll which her mother held up in front of her.

(ii) <u>Paula</u>   Age: 00:39:03 ($\pm$9 months)
Paula was able to crawl but did not talk. She was placed
on the floor of the play-room with a selection of toys.

(iii) <u>Chris</u>   Age: 01:13:04 ($\pm$14 months)
Chris was able to walk, run and was beginning to talk. He
was allowed to play freely with the toys in the play-room.

(iv) <u>Joanna</u>   Age: 02:20:03 ($\pm$2 years 4 months)
Joanna was both walking and talking in complete sentences.
She was allowed to play freely in the play-room.

The basis for selection of the children's ages was to provide
a range of behaviour from infancy to young childhood. The lower
age-limit was placed at $\pm$6 months to provide an indication of how
observers perceive and describe the behaviour of an infant not yet
crawling, nor making sounds intelligible to the average observer.
While the upper age-limit, placed at $\pm$2 years 4 months, shows a child
both walking and talking.

3.2.4.2 The experimental conditions.

Previous experiments, referred to in the Literature Review, i.e.
Newtson et al and Collett, show the necessity of controlling the level at
which subjects segment recordings of adult behaviour.

For the purpose of this experiment it was decided to control for
this possible effect by instructing half the subjects viewing an action
sequence within each age group to observe and record either "natural" or
"fine" behaviour changes.

There were 8 experimental conditions, with 7 subjects assigned to
one condition only.

The experimental conditions may be summarised thus:

Table showing assignment of subjects to experimental tasks.

Age of child viewed	"Natural" condition instruction	"Fine" condition instruction	No. of subjects per task
. 00:27:05	Natural		7
. 00:27:05		Fine	7
. 00:39:03	Natural		7
. 00:39:03		Fine	7
. 01:13:04	Natural		7
. 01:13:04		Fine	7
. 02:20:03	Natural		7
. 02:20:03		Fine	7

N = 56

3.2.4.3 Assignment of subjects to experimental tasks.

Subjects were randomly assigned to the particular experimental task they were to perform.

A table showing the assignment of subjects to their tasks is shown in appendix i.

3.2.4.4 Outline of procedure to be followed during experimental sessions.

The experiment consisted of three main stages:

(i) The subject was required to watch the 120 sec. sequence.

(ii) The subject was then required to segment the sequence by lifting the finger from a telegraph key linked to the polygraph, each time a "meaningful change" was perceived in the child's behaviour.

(iii) The recording was re-played for the third time and the subject was required to describe into a tape-recorder, the behaviour he observed when the child changed it's behaviour in a meaningful way.

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STAGE 1

This was required to:
(i)   Allow the subject time to become familiar with the action
      sequence. This was done because previous studies have shown
      that reaction times of subject's varies widely, possibly due
      to the ongoing behaviour of the actor being unfamiliar to
      the subject.
(ii) It was also assumed that a "warm-up" observation would
      relax the subject before the tasks of segmenting and
      describing the behaviour began.
(iii) The following tasks i.e. segmenting and then describing
      added an extra task to that of simply observing, thus in-
      volving the subject in the performance of two tasks at the
      same time.

      For these reasons it was decided to allow the subject at
      least one viewing when he could concentrate on observing
      only. Subjects were all given the choice of further
      "observing only" sessions if they required it.

STAGE 2

This was required for the subject to perform the task of segmenting
the action sequence according to when a "meaningful change" was per-
ceived to take place in the observed behaviour; and to obtain records of
these perceived changes on the polygraph record.
(see appendix ii, for a collated version of these recordings).

STAGE 3

This was required to obtain verbal descriptions of the perceived
changes in the child's behaviour and to record these for permanent
record. These were later transcribed for each subject's responses.
(see appendix i v).

3.3 Procedure.

On arrival at the experimental room the subject was seated in front
of the video-screen.

SUBJECT SEATED
IN FRONT OF THE
VIDEO-SCREEN

On a table to the left of the subject was a telegraph key. The experi-
menter pointed out that during the course of the experiment the subject
would be required to respond by releasing the key as quickly as possible
to enable a mark to be recorded on the polygraph record. To assist
the subject in making the response as quickly as possible the experimen-
ter demonstrated how this was to be done and suggested that the sub-
ject rest the arm along the table with the finger positioned, ready for
action on the telegraph key. When the subject had mastered the action

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the instructions were given.

3.3.1 The instructions given to subjects.

3.3.1.1 Instructions for observing the sequence.

"You will see on the screen in front of you a film of a child. I
would like you to watch it - it will last about two minutes. What
I want you to do is this:

When one watches people doing things, one divides up what they do
into parts. For example, somebody sitting at the far side of the room
may get up and open the door which is at the other side of the room.
This could be described by saying,

"He opened the door."
But one could describe this behaviour rather more fully by saying,

"He got up from his chair, moved across the room and opened the door."
One might even describe it more fully still be saying,

"He raised himself from his chair, walked slowly towards the door,
lifted his hand and turned the knob and opened the door towards himself,
stepping backwards as he did so."
Some people might describe the behaviour in even greater detail.

What I want you to do as you watch the film is to attempt to identify
all the separate behaviours which are occurring. I want you to:

(a) Natural condition instruction only.
     Identify not the largest and not the smallest items of

behaviour but items of behaviour which you notice as being natural and meaningful to you, as in the example above.

(b) Fine condition instruction only.

Identify the smallest items of behaviour which you notice as being meaningful to you, as in the last example I mentioned.

"Do you understand what I want you to do?"

(IF THE SUBJECT DOES NOT UNDERSTAND, REPEAT THE INSTRUCTIONS USING THE EXAMPLE ALL THE TIME UNTIL THE SUBJECT IS ABSOLUTELY CLEAR.)

"Do you understand what you have to do?"

(IF THE SUBJECT SAYS "YES", SAY:)

"That is the first task - there will be another task following it which I will explain to you after you have done this. This is not a test of how clever you are, nor is it an attempt to find out anything about your personality. I merely want to know how you describe people when you see them behaving. I am interested in how people describe each other. What you are being asked to do will not tell me anything more about you than how you undertake this sort of task. Remember it's only the child you have to watch."

(AFTER THE SUBJECT HAS OBSERVED THE ACTION SEQUENCE ASK:)

"Do you understand what you have to do, or would you like to see the film again?"

(IF, THE SUBJECT IS HAPPY TO PROCEED CONTINUE AS FOLLOWS:)

3.3.1.2 Instructions for marking off the tape.

"The tape will be shown to you again and I would like you to raise your finger from the key as I explained before (E. TO DEMONSTRATE BY RAISING FINGER FROM THE KEY), at the beginning of every new item that you can see on the film. Again, mark the items as you were told to do before, that is, mark the most natural, meaningful items/ the smallest, meaningful items* you see. Remember to concentrate only on the child's behaviour. Are you ready?"

---

*Choose appropriate instruction depending on whether subject is viewing according to "natural" or "fine" instructions.

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(IF THE SUBJECT SAYS "YES" SAY:) "start now."

3.3.1.3 Instructions for description of the tape.

"You have now marked off the items of behaviour that the child has
exhibited. I am now going to show you the tape again and I want you
to describe those items of the tape again, into the recorder. You
may use any words you like and it does not matter if you don't identify
exactly the same items as you marked with the key. Just give a descrip-
tion as best you can of what you see."

<div align="center">ooOoo</div>

S E C T I O N 4

A N A L Y S I S O F R E S U L T S

4.1 Types of results obtained.

Results obtained from the experimental situations are of two main
types:

(i) Judgements obtained from subjects about perceived changes in
the action sequences observed.

These judgements are recorded as events on polygraph paper.
Compiled versions of all marks made by the 7 subjects who
viewed a sequence, within one condition of instruction are
provided in appendix ii.

(ii) Verbal reports obtained from subjects about the behaviour of
the infant or young child.

These reports were initially transcribed for each subject
individually but as space will not permit inclusion of the
separate transcriptions, a compiled version of the reports
made by the 7 subjects who viewed one sequence within one
condition of instruction is provided in appendix iv.

4.2 Definition of the term "experimental task."

The term "experimental task" is used to refer to only one of the
experimental situations.

In the experiment, four action sequences were selected for viewing.
Each sequence showing the behaviour of a child of a different age group.
Subjects were required to view only one of the sequences.

Subjects were required to segment and describe the ongoing behaviour
according to either a "natural" or "fine" condition of instruction.

This resulted in 8 different experimental situations with both
perceptual changes and verbal reports obtained from subjects.

An "experimental task" is, therefore, the segmentation or descrip-
tion of one of the action sequences, within one of the conditions of
instruction.   68

4.3 Analysis of perceived changes.

4.3.1 Procedure of analysis.

4.3.1.1 Collation of data.

Event marks recorded for each subject viewing an action sequence within each age group and for each condition of instruction were compiled. (see appendix ii).

4.3.1.2 Selection of interval size.

In the Newtson studies the selection of interval size for the analysis of the action sequences was mainly arbitrary, varying from 1 - 5 seconds.

Newtson (1976) reports that usually an interval size is selected "such that less than 1 % of unit markings from individuals yield multiple markings with that size interval." This criterion seems vague and for the purpose of this analysis a computer analysis of results was run to see what kinds of patterns emerged when intervals of 1 second, 2 seconds, 3 seconds, 4 seconds and 5 seconds were taken as respective bases for analysis.

Inspection of the event marks and the 1 second interval size, showed that no subject marked more than one change within any 1 second interval and the distribution showed a scatter around certain 1 second intervals, this pattern is evident in the compiled polygraph recordings shown in appendix ii.

The 2 second interval combination (see appendix iii) brought together numerous adjacent marks that could reasonably be seen to refer to the same change, taking into account the varying reaction time among subjects. There was a very low incidence of a single subject having more than one mark in any 2 second interval, indicating that they perceived more than one change in that time period.

The 3 second to 5 second interval data showed considerable evidence of multiple marks from individual subjects within the respective time intervals and were consequently rejected for the analysis.

The 2 second interval size was chosen as the best size interval to select as the basis for this analysis since it brought together adjacent marks that appeared to belong together in a single interval, without there being more than one mark from each subject, (with the exception of a few cases where adjustments were made by counting only one event

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instead of two for that time interval).

4.3.1.3 Selection of breakpoints.

In the Newtson studies, the total number of marks recorded for each
sequence for all subjects was first divided by the number of intervals,
yielding a mean number of marks per interval. The standard deviation
of the number of marks per interval was then calculated for each
sequence.

Intervals with total marks at least one standard deviation above
the mean were selected as breakpoints.

This procedure was followed in this analysis for each sequence and
for each experimental condition.

4.3.1.4 Calculation of amount of agreement among subjects.

The degree to which subjects agreed in polygraph marked events was
calculated for each sequence as follows:-
- (i)   The total number of marks from all subjects that fell into
        each 2 second interval were summed. (see appendix iii).
- (ii) If a single subject marked more than one event per 2 second
        interval, only one mark was counted.
- (iii) For each sequence and each condition of instruction, all
        intervals that yielded marks were ranked according to the
        number of marks they contained. For example, the table at
        4.3.2.2.1 indicates that for the 6 month (00:27:05), natural
        sequence, 0 intervals had agreement scores of 6, 4 intervals
        had agreement scores of 5, etc.
- (iv) The mean agreement score and standard deviation was estima-
        ted for each sequence and each experimental condition.
        (see 4.3.2.2.2). For example, the mean agreement score for
        the 6 month (00:27:05), natural condition was 2.35, with
        a standard deviation of .95.
- (v)   A t test for a difference between means was carried out on
        the fine and natural condition means for each age group.
        (see 4.3.2.2.3 for a summary of the t scores for each age
        group and each condition of instruction).
- (vi) A t test for a difference between means was carried out

between means of the different age groups and for each
condition of instruction. (see 4.3.2.2.4).

(vii) The t scores were tested for significance. Those scores
which showed a significant difference between means were
marked with an asterisk* on 4.3.2.2.3 and 4.3.2.2.4.

4.3.2 Results obtained from analysis of perceived changes.

4.3.2.1 Breakpoints identified.

The computer analysis showing the results obtained by pairing intervals
into 2 sec. intervals is provided in appendix iii.

The breakpoint criterion for each sequence, within each condition of
instruction, was determined by adding together the mean and standard
deviation of marked events for each distribution. (see appendix iii.)
A 2 sec. interval which had a score equal to or more than the breakpoint
criterion was counted as a "breakpoint".

The breakpoints identified for each sequence and each condition of
instruction are as follows:-

4.3.2.1.1 Breakpoints identified for the 00:27:05 action sequence and for each condition of instruction.

00:27:05 (6 months)	Natural	00:27:05	Fine
2 sec. intervals	No. of Agreements	2 sec. intervals	No. of Agreements
11 - 12	4.	13 - 14	4
17 - 18	4.	15 - 16	4
*25 - 26	5.	19 - 20	4
27 - 28	4.	*25 - 26	5
33 - 34	4.	37 - 38	5
51 - 52	4.	47 - 48	4
*57 - 58	5.	*57 - 58	7
*59 - 60	4.	*59 - 60	4
*65 - 66	5.	*65 - 66	6
77 - 78	4.	71 - 72	4
89 - 90	5.	75 - 76	4
		87 - 88	4
Σ =	48	93 - 94	4
			Σ = 59

*Indicates the intervals are "breakpoints" for both conditions of instruction.

A point to be noted is the low agreement of breakpoints that are the same for both conditions of instruction, this will be discussed later after the results for the other age groups have been given.

Appendix ii,   page 2 provides   an illustration of the intervals that count as breakpoints , marked off in red, for the action sequence of the 6 month old child (00:27:05).

It is clear from this illustration that many marks fall outside breakpoint intervals, this was not expected as the Newtson studies referred to breakpoints as high agreement points and paid no attention to marks falling outside those intervals.

The following table indicates the relative percentages of marks falling either inside or outside breakpoint intervals, for the activity sequence of the 6 month old child. (00:27:05).

00:27:05 (6 months)
Percentages of marks within breakpoint intervals.

Natural	Fine
48/124 = 38.70 %	59/148 = 39.86 %

Percentages of marks outside breakpoint intervals.

Natural	Fine
3 agreements = 26.61 %	3 agreements = 28.38 %
2 agreements = 20.97 %	2 agreements = 24.32 %
1 mark = 13.71%	1 mark = 8.87 %

There is little difference between the percentage of marks that comprise breakpoints with both the fine and natural condition of instruction, so that the higher scores obtained by adding marks within each breakpoint interval for the fine condition sequence should not be interpreted as indicating that the more detailed, or finer, analysis produces higher agreement at breakpoint intervals.

The implications of this finding that a relatively low percentage of total marks falls within a breakpoint interval will be discussed after results from the action sequences of the other three age-groups have been given.

4.3.2.1.2 Breakpoints identified for the 00:39:03 action sequence and for each condition of instruction.

00:39:03 (9 months) Natural		00:39:03 Fine	
2 sec intervals	No. of agreements	2 sec. intervals	No. of agreements
1 - 2	3	13 - 14	5
9 - 10	4	17 - 18	3
15 - 16	6	35 - 36	4
29 - 30	3	53 - 54	4
65 - 66	4	61 - 62	3
73 - 74	4	67 - 68	3
*99 - 100	3	69 - 70	5
¡09 - 110	3	*99 - 100	6
115 - 116	3		33
	33		

*Indicates the intervals are breakpoints for both conditions of instruc- tion.

There is a particularly low agreement between breakpoints identified for each condition of instruction.

Appendix ii, page 3 provides an illustration of the intervals that count as breakpoints , marked off in red, for the action sequence of the 9 month old child (00:39:03).

The following table indicates the relative percentages of marks falling either inside or outside breakpoint intervals for the activity sequence of the 9 month old child. (00:39:03).

00:39:03 (9 months)

Percentage of marks within breakpoint intervals.

Natural	Fine
33/71 = 46,48 %	33/66 = 50 %

Percentages of marks outside breakpoint intervals.

Natural	Fine
2 agreements = 22.54 %	2 agreements = 30.30 %
1 mark = 30.98 %	1 mark = 19.70 %

Although higher percentages of marks fall within the breakpoint intervals for this activity sequence, a high percentage still falls outside breakpoint intervals.

It was found that the natural and fine condition breakpoint intervals also differ considerably and taken together with the percentages of marks falling into breakpoint intervals, is further evidence that breakpoints are not precisely determined.

4.3.2.1.3 <u>Breakpoints identified for the 01:13:04 action sequence and for each condition of instruction.</u>

01:13:04 (14 months) Natural		01:13:04 Fine	
2 sec. intervals	No of agreements	2 sec. intervals	No of agreements
*11 - 12	5	5 - 6	6
*23 - 24	4	*11 - 12	6
*35 - 36	4	*23 - 24	5
*53 - 54	4	29 - 30	6
59 - 60	3	*35 - 36	5
*87 - 88	4	43 - 44	5
97 - 98	5	47 - 48	5
107 - 108	4	*53 - 54	5
	33	57 - 58	5
		63 - 64	5
		73 - 74	5
		75 - 76	5
		*87 - 88	5
		93 - 94	6
		105 - 106	5
			79

<u>*Indicates the intervals are "breakpoints" for both conditions of instruction.</u>

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There is a higher agreement between breakpoints for each condition of instruction, only 3 of the breakpoints identified in the natural condition are not identified in the fine condition.

Appendix ii, page 4 provides an illustration of the intervals that count as breakpoints, marked off in red, for the action sequence of the 14 month old child. (01:13:04).

The following table indicates the relative percentages of marks falling either inside or outside breakpoint intervals for the action sequence of the 14 month old child. (01:13:04).

01:13:04 (14 months)

Percentages of marks within breakpoint intervals.

Natural	Fine
33/76 = 43.42 %	79/188 = 42.02%

Percentages of marks outside breakpoint intervals.

2 agreements = 26.31 %	4 agreements = 14,89%
1 mark = 32.47 %	3 agreements = 28.72%
	2 agreements = 9.57 %
	1 mark = 4.26 %

Again the percentage of total marks falling within a breakpoint interval is relatively low.

continued overpage

4.3.2.1.4 Breakpoints identified for the 2:20:03 action sequence and for each condition of instruction.

02:20:03 (2 years 4 months) Natural		02:20:03 Fine	
2 sec. intervals	No. of agreements	2 sec. intervals	No. of agreements
*21 - 22	6	1 - 2	3
43 - 44	3	17 - 18	3
*45 - 46	3	*21 - 22	4
57 - 58	3	*45 - 46	5
*63 - 64	5	*63 - 64	4
75 - 76	4	81 - 82	4
*91 - 92	4	87 - 88	4
	28	*91 - 92	4
		101 - 102	3
		103 - 104	4
		105 - 106	3
			41

*Indicates the intervals are breakpoints for both conditions of instruction.

Of the 7 breakpoint intervals identified in the natural condition, only 4 are the same as for the fine condition instructions, again falling below the expectation that all breakpoints identified in the natural condition would be identified in the fine condition.

Appendix ii, page 4 provides an illustration of the intervals that count as breakpoints, marked off in red, for the action sequence of the 2 year 4 month old child (02:20:03)

As with the previous sequences a large number of marks are seen to be outside the breakpoint intervals and the following table provides

a breakdown of the relative percentages of marks within and outside breakpoint intervals.

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0 2:20:03 (2 years 4 months)

Percentages of marks within breakpoint intervals

Natural	Fine
28/60 = 46.67 %	41/94 = 43.62 %

Percentages of marks outside breakpoint intervals.

Natural

Fine

2 agreements = 20 %

2 agreements = 34.04 %

1 mark = 33.33 %

1 mark = 22.34 %

4.3.2.1.5 Discussion of breakpoint results.

Overall the age groups, the following main trends are found with respect to the identification of breakpoints:-

(i) Ratios of natural to fine breakpoints are generally in the expected direction of there being more fine breakpoints identified than natural breakpoints. The ratio's are as follows: (natural:fine)

Tables showing ratios of natural to fine breakpoints per age group.

00:27:05	00:39:03	01:13:04	02:20:03
11:13	9:8	8:16	7:11

With the exception of the 00:39:03 action sequence, the ratios are in the expected direction. This result demonstrates the effect of individual differences in response rate which is particularly marked in the fine condition, 00:39:03 sequence. Appendix iii, page 9 , fine condition, subject 6, only responded 5 times throughout the whole sequence, consequently lowering the overall scores. Total

marks for the natural condition sequence were 71 and only 67 for the fine condition. (See appendix ii pages 8 and 9).

(ii) Breakpoints identified from the natural unit condition of instruction do not always agree with breakpoints identified when the fine unit instruction is given.

This is an unexpected result since the Newtson studies indicate a hierarchical arrangement and it would be expected that the boundaries of natural units would also be boundaries identified when a fine analysis is carried out, the more detailed, or fine analysis, would simply identify more sub-goals.

(iii) The percentage of marks that fall within breakpoint intervals are more than one third but less than half of the total marks recorded in all the sequences.

These results have been disappointing considering the reports from Newtson that breakpoints were clearly distinguishable from other parts of the stream, in their studies.

At this point no further discussion about the results and their implications will be given as all the relevant points will be referred to in the final overall discussion.

So far the analysis of the marked events recorded on the polygraph records has followed the lines of the Newtson studies in that breakpoints have been identified. The analysis has proved not entirely satisfactory and it was decided to try and obtain further information about the distribution of the marked events, with particular emphasis on the activity sequences of the four different age groups.

4.3.2.2 Amount of agreement between subjects for the action sequences of the different age groups and for both conditions of instruction.

It may be assumed that if action sequences become more meaningful to subjects as the age of the child increases, that there would be more agreement among subjects as to what constitutes a meaningful change in the perceived behaviour.

The procedure for calculating amount of agreement among subjects, for each activity sequence and both conditions of instruction is outline in 4.3.1.4.

If the assumption that action sequences become more meaningful to subjects as the age of the child increases is correct then it would be expected that more intervals would yield higher agreement scores as the age of the child increases and that this trend would be found with both conditions of instruction, i.e. more intervals that yield marks from subjects would include higher frequency of scores from subjects as the age of the child increases, in the following table for example, higher agreement scores (scores of 5, 6 and 7) should increase in frequency for the older children.

4.3.2.2.1 Table indicating frequency of agreement scores for the intervals that yielded marks, for all age groups and both conditions of instruction.

	00:27:05		00:39:03		01:13:04		02:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
No. of intervals →								
Agreement scores ↓								
7	0	1	0	0	0	0	0	0
6	0	1	1	1	0	4	1	0
5	4	2	0	2	1	9	1	0
4	6	8	3	2	6	9	2	7
3	12	15	5	3	1	19	3	4
2	12	16	8	8	10	9	6	16
1	18	13	22	11	25	8	20	20
N =	52	56	39	27	43	58	33	47

N = Total no. of intervals that yielded marks from subjects.
   (Total no. of intervals per action sequence = 60.)

The results obtained do not follow the expectation that higher
agreement scores will increase in frequency as the age of the child
increases.

An estimate of the mean agreement score and standard deviation
of agreement score for each age group and both conditions of instruction
was calculated to obtain a measure of the average number of agreements
per interval, from the intervals that yielded marks at all. The results
are as follows:

4.3.2.2.2 Mean agreement scores and standard deviation of agreement
           scores.

	00:27:05		00:39:03		01:13:04		02:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
x̄	2.35	2.59	1.82	2.22	1.79	*3.24	1.82	1.96
S.D.	.95	.865	1.25	1.36	1.20	.750	1.38	1.102

*Significantly larger than natural condition mean score at 99.5 %
level of significance.

These results show that on average, out of a possible 7 agreements
per interval, agreement among subjects ranged between 1.79 - 3.24
agreements per interval and the standard deviations were not large.

As expected means were slightly higher for the fine condition of
instruction. A t test to establish significant differences between
means between fine and natural conditions for each age group showed
that only one activity sequence (01:13:04) produced a significantly
larger mean result in the fine condition of instruction than for the
natural condition.

4.3.2.2.3 <u>t scores for mean differences between fine and natural condition for each age group.</u>

00:27:05	00:39:03	01:13:04	02:20:03
t = 1.36 not significant	t = -0.37 not significant	*t=7.44 significant at 99.5 % level.	t = -0.495 not significant

t tests were also computed to establish significant differences between the means of the different age groups for each condition of instruction, the results are as follows:-

4.3.2.2.4 <u>t scores for mean differences between age groups for each condition of instruction.</u>

age group	Natural condition	Fine condition
00:27:05 + 00:39:03	2.27*	1.43
00:27:05 + 01:13:04	2.59*	-4.28*
00:27:05 + 02:20:03	2.06*	3.21 *
00:39:03 + 01:13:04	.11	-4.41 *
00:39:03 + 02:20:03	0	.88
01:13:04 + 02:20:03	-0.01	6.96*

The main significant differences occur between the mean scores for the 6 month (00:27:05) child's action sequence and the other age groups for both the natural and fine condition, since the mean scores were higher in all instances for the 6 month old child. Only the difference between the 6 month old mean score and 9 month old mean score for the fine condition, did not prove to be significantly greater, although the 6 month old mean score was higher than those of the 9 month old mean score.

The only other significant differences were for the fine condition mean scores between the 14 month old child and both the 9 month and 2 year 4 month old child, where the 14 month old child's mean agreement score was significantly higher than the mean scores for the other two activity sequences.

4.3.2.2.5 Discussion of agreement scores.

Mean agreement scores were highest for the action sequence of the 6 month old child, except for the sequence of the 14 month old child analysed in the fine condition.

This was not expected as it was assumed that as the age of the child increased the meaning of it's behaviour would be more easily understood and subjects would, therefore, tend to agree more about the changes that they perceived.

An inspection of the polygraph recordings (appendix ii) shows that subjects responded more frequently to the action sequence of the 6 month old child, again, with the exception of the 14 month old child and the fine condition of instruction.

The total perceived changes for each 120 second sequence were as follows:

Total no. of perceived changes for each 120 sec sequence.

00:27:05 6 months		00:39:03 9 months		01:13:04 14 months		02:20:03 2 yrs 4 months	
Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
124	145	71	67	79	188	60	94

Two possible explanations could account for these results:

(i) The subjects did perceive more meaningful changes in the activity sequence of the 6 month old child's behaviour and that the age of the child has no connection with the meaningful behaviour that was perceived, it is purely a function of the particular activity sequence viewed regardless of the age of the child.

(ii) The subjects were less certain of the meaning of the child's behaviour and consequently responded more randomly. This resulted in a larger number of marks recorded and the higher agreement scores are due simply to the higher frequency at which the subjects responded.

Strong support for the first assumption comes from the verbal analysis. The number of segments identified also being higher for the 6 month old child's behaviour.

Total no. of segments identified within each 120 sec. sequence.

00:27:05 6 months		00:39:03 9 months		01:13:04 14 months		02:20:03 2 yrs 4 months	
Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
120	137	106	82	111	228	80	111

It will be seen in the verbal analysis that although the number of perceived changes was high for the 6 month old child's behaviour, the analysis does show that some of the segments identified were less meaningful than segments identified for the older children. The indication is that it is not that meaning is not found by the subjects in the activity sequence of the 6 month old child but that the degree of perceived meaning is influenced by the child's age.

4.4 VERBAL ANALYSIS.

4.4.1 Transcriptions of the verbal descriptions.

(i) The verbal reports given by each subject were transcribed from the tape-recordings.

(ii) Each time the subject started to speak and each time he paused in his speech, indicating that he had momentarily finished what he had to say, the timings were noted.

(iii) The transcriptions for each subject within each experimental task were then plotted against time, in parallel running order

(see appendix iv for these tables, i.e. Tables 1 - 8, pages 14 - 45)

4.4.2 Procedure for analysis.

4.4.2.1 Identification of supra-segments.

(i) Tables 1 - 8 were each studied, reading across the descriptions of the 7 subjects.

(ii) Main change-points were identified and the descriptions encompassed between main change-points, across all subjects were blocked off.

The blocks may be seen drawn off in red lines on Tables 1 - 8.

Each block is concerned with the child performing a particular kind of behaviour, e.g. the child is seen to be playing with a doll, then with a train, then with a block etc.

4.4.2.2 Identification of segments.

Within each supra-segement identified, segments were identified from the subject's descriptions.

The subject's own pauses between the descriptions were initially taken as the boundaries of the segments, e.g. "He crawls towards the pull-along toy"/"changes it's attention towards another toy"/"and throws it away."

However, some subjects referred to the same behaviour in subsequent descriptions and it was considered necessary to include these subsequent descriptions together in the segment, e.g. "the sound affects him"/"he reacts to it"/"moves back when he reacts, moves his whole body in actual fact." These descriptions all refer to the child's response to the sound of the doll.

4.4.2.3 Identification of sub-segments.

Within each segment, subjects sometimes referred to more than one kind of action, these form the sub-segments within the segment, e.g. "It's been attracted to the doll and laughing"/"and now she's looking at the doll again and touching it."
Operative words, usually verbs, assist in identifying the sub-segments. Adjectives and adverbs are also indicators of sub-segments, particularly where personal attributions are made, e.g. "picks up the block excitedly."

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4.4.2.4 Linking together segments across subjects.

Segments which showed similarity of content when they occurred together in close temporal relationships to one another, were linked as shown in Tables 9 - 16 and a single action "gloss" was provided by the investigator, in agreement with an independent judge, for the segments identified. (See appendix v).

Sub-segments assisted in the linking of segments identified across subjects since subjects varied in their behaviour perspective as to the nature of the main action.

e.g.   Subject A. "Now she's staring at the doll with enjoyment."
                        Sub-segments: "staring" and "enjoyment"
         Subject B. "Smile again, smile dies."
                        Sub-segments: "smile" and "smile dies"
         Subject C. "Laughing, enjoyment"
                        Sub-segments: "laughter" and "enjoyment"
              GLOSS: "Shows enjoyment."

4.4.2.4.1 Illustration of how the segments were linked.

Appendix iv, Tables 1 - 8, show similar segments from subjects, occurring at slightly different points in time, as in the example below:-

Subjects →	1	2	3	4	5	6	7
Time ↓ in secs.	**A**		**A**				
1.00	kicks the ball		kicks it				
1.01		**A** kicks ball	**B** and runs	**B** runs after ball	**A** kick the ball		**B** runs after ball
1.02	**B** runs after it				**B** runs	**A** kicks	
1.03				**C** fetch-es it			
1.04		**C** grabs ball			**C** takes hold of ball again		**C** grabs ball

(The red A, B, C, marks show how the segments from the different subjects can be linked).

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For the purpose of analysing similar segments between subjects, appendix v, tables 9 - 16 have been compiled.

The timings have been removed but the SEQUENTIAL ORDER of each subject's segment is strictly adhered to. B segments must follow A segments (or a void) where A segments are nearly related or synonymous The same rule applies to B segments, C segments etc.

The resulting table appears as in the following example:-

Subjects →						
1	2	3	4	5	6	7
A kicks the ball	**A** kicks ball	**A** kicks it		**A** kicks the ball	**A** kicks	
B runs after it		**B** and runs	**B** runs after ball	**B** runs		**B** runs after ball
	C grabs ball		**C** fetches it	**C** takes hold of ball again		**C** grabs ball

4.4.2.5 <u>Identification of functions.</u>

Once the supra-segments, segments and sub-segments were identified and agreed upon by an independent judge, the <u>functions</u> served by each segment, as provided by each subject, were identified according to Halliday's categories. (Halliday, 1975: 37).(Literature Review p 27)

i.e. Instrumental   "I want." (including the negative "I don't want".)
      Regulatory   "do as I tell you."
      Interactional   "me and you."
      Personal   "here I come." (also indicates child's moods).
      Heuristic   "tell me why."
      Imaginative   "let's pretend."
      Informative   "I've got something to tell you."

It was found necessary to add five categories; three because certain
segments conveyed little meaning in functional terms i.e. movement,
locomotory and vocal; one to indicate behaviour that was seen to be
essentially passive in nature in that the child did not appear to be
in complete control of it's response i.e. reactive; and one to
accommodate a more elementary form of behaviour than specified in
Halliday's "heuristic" category, i.e. exploratory. These are as follows:

Movement	Body movements where meaning was not clearly implied, e.g. "blink eyes".
Locomotory	Body motion that did not clearly specify goal-direction, e.g. the "child crawls" rather than "child crawls towards doll."
Vocal	Sounds made by the child where no linguistic meaning was attributed, e.g. "the child makes vocal sounds."
Reactive	The child is seen essentially as a passive receiver of stimulii. e.g. "she is suprised".
Exploratory	This is an elementary heuristic function, e.g. "The child's attention is on the doll."

The assignment of functions was based on the following guide-lines:

(i) Only one function was assigned to a segment, as far as
possible. Where both the investigator and the independent
judge agreed to a mixed categorization, based on the impli-
cations of sub-segments, this was permitted.

(ii) Assignment of functions had to be agreed upon by both the
investigator and an independent judge. If disagreement
between the two arose then the meaning was discussed until
agreement was reached.

4.4.2.6 Underline Enumeration of functions.

The functions assigned to each segment were enumerated for all sub-
jects within each experimental task.

A percentage score for each category was calculated to provide a
quantitative measure which would:

(i) Indicate the % of attributions made for each functional
category.

(ii) Allow for comparisons across experimental tasks in terms of the relative % of behaviour in each functional category across the age-groups of the children viewed and the two conditions of instruction.

4.4.2.7 Range of vocabulary.

To determine the range of vocabulary that was applied to the behaviour of the children, verbs (since they indicate the goal-directed nature of the behaviours) were listed.

Tense of the verb was disregarded to allow for the listing of the verbs used across all subjects in all contexts.

A percentage score was calculated by counting the number of times each verb was used by subjects in one experimental task and then expressing this score as a percentage of the total number of verbs used for the experimental task. (see appendix vi, pages 141 - 153)

4.4.2.8 Length of descriptions.

To determine mean differences in length of descriptions the following data was tabulated.

(i) Length of time spent describing by each subject in each experimental task.

(ii) Number of words used by each subject in each experimental task.

(iii) The mean number of words per second was calculated for each experimental task as follows:

$$\frac{\text{no. of words}}{\text{length of time spent describing}} = \text{X words per second.}$$

4.4.3 RESULTS AND MAIN FINDINGS.

4.4.3.1   Summary tables showing supra-segments identified
          and glosses for combined segments from subjects, for
          each age group and each condition of instruction.

4.4.3.1.1

00:27:05

NATURAL. Supra-segments.	Glosses for combined segments from subjects.	FINE. Supra-segments.	Glosses for combined segments from subjects.
PLAYING WITH DOLL	Child showing interest in doll. Looking at doll. Laughing/smiling. Reacts to cry of doll. Shows enjoyment. Reacts to cry of doll.	PLAYING WITH DOLL	Reaction to the cry of the doll. Pleasurable reaction to the doll. Looking at doll. Laughing/excitement in response to doll. Pleasurable reaction to doll. Shows pleasure. Moves back.
MOVING FROM DOLL AND MOTHER	Disinterested/restless. Looking at/turning to mother.	MOVING TO MOTHER	Moving from doll. Smiling and turning to mother.
APPROACHES DOLL	Returns to handling doll. Affected by sound of doll. Attempts at contacting doll.	APPROACHES DOLL	Handles doll. Suprised/frightened reaction to doll.

4.4.3.1.2

00:27:05

NATURAL. Supra-segments.	Glosses for combined segments from subjects.	FINE. Supra-segments.	Glosses for combined segments from subjects.
RESTLESS AND APPROACHES MOTHER	Moves restlessly between mother and toy.	RESTLESS	Laughing. Moves towards mother. No interest in doll.
REACHES OUT FOR DOLL	Returns to handling doll. Distracted by noise of doll. Cuddles up to mother. Handles doll again.	APPROACHES DOLL	Looks back at doll. Handles doll.
		APPROACHES MOTHER	Attention turns from doll to mother.
		APPROACHES DOLL	Looking at doll. Touches doll.
DISINTERESTED/ RESTLESS PERIOD	Moves. Makes sounds.	RESTLESS/DISINTERES-TED PERIOD	Looking away. Moving away.

00:27:05

| NATURAL. | | FINE. | |
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
ATTENTION ON DOLL	Reaction to cry of doll.	MOMENTARY RETURN TO DOLL	Touching/holding doll.
LOSS OF INTEREST IN DOLL	Disinterested.	LOSS OF INTEREST IN DOLL	Loses interest in doll.
APPROACHES DOLL	Returns to mother. Touches/reaches out for doll again.	MOMENTARY MOVE TOWARDS DOLL	Moves towards doll.
LOSES INTEREST IN DOLL	Loses interest in doll again.	TURNING TO MOTHER	Turns to mother.
PLAYING WITH DOLL	Exploring doll's legs.	MOMENTARY ATTENTION TO DOLL	(Various individual attributions e.g. "touching again")

00:27:05

NATURAL. Supra-segments.	Glosses for combined segments from subjects.	FINE. Supra-segments.	Glosses for combined segments from subjects.
NO INTEREST IN DOLL	Attention off sound of doll.	INDECISIVE PERIOD	(Various individual attributions e.g. "Looking past it").
REACTION TO DOLL'S CRIES	Reacts to sound of doll.	PLAYING WITH DOLL	Looking at doll. Playing with doll's leg. Reacts to sound of doll.
CHANGE TO NEW TOY	Changes attention to feet of new toy.	CHANGES TO NEW TOY	(Various individual attributions e.g. "want's teddy bear").

4.4.3.1.3 00:39:03		4.4.3.1.4	
NATURAL.		FINE.	
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
PLAYING WITH BLOCK	Picks up/plays with block. Drops block.	PLAYING WITH BLOCK	(one subject only - "holding block," "drops block").
APPROACHES DOG	Attention changes to dog. Concentration changes to dog. Crawls towards dog.	ATTENTION ON DUCK	Changes attention to duck. Looking at duck moving. Continues to watch duck moving.
PLAYING WITH RINGS	Attention on ring-toy. Picks up the ring-toy. Drops rings.	PLAYING WITH RING-TOY	Changes attention to ring-toy.
PLAYING WITH DOG	Attention back to dog. Attention on dog continues. Grabs/holds string attached to dog.	PLAYING WITH DUCK	Attention on duck. Momentary approach to duck and then loses interest again.

00:39:03

NATURAL.		FINE.	
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
LOOKING AROUND	Looks around.	SEARCHING PERIOD	Looking around.
		ATTENTION TO MOTHER	Attention on mother. Focussing on noise made by the mother.
PLAYING WITH BLOCK	Plays with block. Puts block in mouth. Drops block. Picks up block. Drops block.	PLAYING WITH BLOCK	Attention on block. Discards block.
PLAYING WITH DUCK	Attention on duck. Plays with duck. Concentrating on duck. Hitting duck (noisily) and vocalizing. Drops duck.	PLAYING WITH DUCK	Attention on duck. Attention on duck. Picks up duck.

00:39:03

NATURAL.		FINE.	
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segements from subjects.
MOVING AWAY	Crawls - moves away.		
PLAYING WITH BLOCK	Plays with block. Knocking/hitting block. Puts block in mouth.	PLAYING WITH BLOCK	Attention on block. Moves after block. Finds block. Puts block in mouth.

4.4.3.1.5

01:13:04

NATURAL.		FINE.	
Surpa-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
PLAYING WITH BALL	Bouncing ball.	PLAYING WITH BALL	Holding the ball.
	Kicks the ball.		Bounces the ball.
	Picks up ball.		Picks up ball.
	Throws the ball.		Bounces ball again.
	Shouts after ball.		Kicks the ball.
	Fetches ball.		Follows/runs after the ball.
	Throws ball over fence.		Picks up the ball.
	Finds ball.		Turns to his mother.
	Picks up ball.		Thinks about throwing ball.
	Speaks/calls.		Throws ball.
	Throws ball to mother.		Points to ball.
			Talking.
			Fetching ball.
			Picks up ball.
			Throws ball over fence.

01:13:04

NATURAL. Supra-segments.	Glosses for combined segments from subjects.	FINE. Supra-segments.	Glosses for combined segments from subjects.
			Follows the ball. Picks up ball. Walking. Holds ball. Throws the ball. Running.
PLAYING WITH DOLL	Loses interest in ball and changes to play with doll. Makes doll cry. Loses interest in doll.	PLAYING WITH DOLL	Picks up doll. Holds doll. Walking around. Looks at doll. Bending doll to make it cry. Shows doll to his mother. Turns doll over.
PLAYING WITH BALL	Changes back to ball. Kicks ball.	PLAYING WITH BOTH BALL AND DOLL	Playing with ball and doll.

01:13:04

NATURAL.		FINE.	
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
	Loses interest in ball.		Kicks ball. Plays with ball again. Kicks ball.
PLAYING WITH TRAIN	Starts playing with train. Loses interest in train.	PLAYING WITH TRAIN	Looks at train. Picks up train. Holds train. Puts down train. Loses interest in train.
PLAYING WITH BLOCK	Starts playing with block.		
CONCERN WITH IDA	Momentarily listens to mother. Thinks about/looks for Ida.	CONCERN FOR IDA	Shouts

01:13:04

NATURAL.		FINE.	
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
		PLAYING WITH TOYS	Moves towards a toy. Picks up block. Handles block.
		CONCERN WITH IDA	Concerned about Ida.
		WALKING	Walking.

4.4.3.1.7
02:20:03

NATURAL. Supra-segments.	Glosses for combined segments from subjects.	FINE. Supra-segments.	Glosses for combined segments from subjects.
PLAYING WITH BLOCKS	Starts playing with blocks. Studying blocks. Puts down blocks. Puts blocks away on rack.	PLAYING WITH BLOCKS	Playing with blocks. Studying blocks. Picks up blocks. Examining blocks. Puts blocks down. Looking for more blocks. Puts blocks in rack. Throws blocks.
PLAYING WITH DOG	Starts to play with dog. Puts dog away on top shelf.	PLAYING WITH DOG	Loses interest. Attention turns to dog. Picks up dog. Shows she likes the dog. Gives dog to mother. Throws dog down. Puts dog on top of rack.

4.4.3.1.8

02:20:03

NATURAL. Supra-segments.	Glosses for combined segments from subjects.	FINE. Supra-segments.	Glosses for combined segments from subjects.
PLAYING WITH BLOCKS	Takes blocks from top to middle shelf.	PLAYING WITH BLOCKS	Puts blocks in rack. Moves block to middle rack. Attention on blocks. Picks up blocks. Moves blocks to middle rack.
PLAYING WITH NEW TOY	Discovers a new toy.		
PLAYING WITH BLOCKS	Puts blocks back on top rack. Throws blocks aggressively. Puts blocks on middle shelf.	PLAYING WITH DOG	Moves dog into middle rack. Ignores mother's request to leave dog in top rack.
PLAYING WITH DOG	Puts dog in middle shelf.	PLAYING WITH BLOCKS	Throws blocks around in middle rack.
REACTION TO MOTOR-BIKE	Reacts to motor-bike.	REACTION TO MOTOR BIKE	Responds to noise of motor-bike.

02:20:03

NATURAL.		FINE.	
Supra-segments.	Glosses for combined segments from subjects.	Supra-segments.	Glosses for combined segments from subjects.
PLAYING WITH TOYS ON FLOOR	Starts playing with toys again. Puts foot in object.	PLAYS WITH VARIOUS TOYS ON FLOOR	Bored. Response to mother talking to her. Puts foot in object on floor.
THROWS BALL AT MOTHER	Throws ball at mother's head.	THROWING BALL AT MOTHER'S HEAD	Throws ball at mother's head.

4.4.3.2 Discussion of supra-segments indentified and glosses for combined segments from subjects.

The following table provides data concerning the supra-segments and segments indentified in the verbal analysis.

	00:27:05 NATURAL	FINE	00:39:03 NATURAL	FINE	01:13:04 NATURAL	FINE	02:20:03 NATURAL	FINE
No. of supra-segments	14	16	9	6	6	8	9	8
No. of segments	121	143	106	83	111	228	0	111
No. of glosses obtained	27	28	22	18	22	39	16	28
No. of linked segments	95 78,51%	90 62.94%	84 79.25%	58 69.88%	92 82.88%	181 79.39%	60 75%	85 76.58%
No. of unlinked segments	26 21.49%	53 37.06%	22 20.75%	25 30.12%	19 17.12%	47 20.61%	20 25	26 23.42%

4.4.3.2.1 Supra-segments.

The supra-segments identified do not vary in number more than one supra-segment between natural and fine conditions of instruction.

An inspection of the summary tables (pages 89 - 102) shows that the meanings assigned to the supra-segmental divisions are similar in content for both conditions of instruction, further supporting the above argument.

4.4.3.2.2 Segments.

With the exception of the action sequence of the 9 month old child, more segments were identified in the fine condition than in the natural condition.

This supports Newtson's findings that the level of instruction does influence the subjects level of analysis. However, the result obtained for the action sequence of the 9 month old child does also indicate the influence of individual differences on the level of analysis despite the instructions given.

4.4.3.2.3 Glosses obtained from linked segments.

A gloss was only assigned when at least 2 subjects provided descriptions that could be linked together (see appendix v, tables 9 - 16). This was done to prevent single descriptions from outweighing the segmental analysis.

The action sequence of the 6 month old and 9 month old children yielded more glosses in the natural than in the fine condition, while the reverse trend was indicated for the older children.

In the natural condition 78,51% of the segments were linked and yielded 27 glosses for the 6 month old child. The remaining 21.49 % of the segments were unlinked.

In the fine   condition only 62,94 % of the segments were linked, yielding 28 glosses, while 37.06 % of the segments were unlinked.

For the 9 month old child this similar trend was observed, 79.25 % of segments were linked, yielding 22 glosses in the natural condition and 20.75 % of the segments were unlinked.

In the fine condition 69.88 % of segments were linked, yielding 18 glosses and 30.12% of the segments were unlinked.

This indicates that segments were more difficult to link in the fine condition for the action sequences of the two younger children, suggesting more varied meanings were attributed when a detailed analysis was required.

The opposite trend was observed with the two older children. Between 75 % and 82.88 % of the segments were linked and more glosses were identified for the fine condition than for the natural condition of instruction. This suggests that the amount of meaning conveyed in the action sequences did not vary, regardless of condition of instruction.

There is still evidence that some subjects described behaviour that could not be linked. (14 months, natural 17.12 % and fine 20.61 %; 2 years 4 months, natural 25 % and fine 23.42% pointing to individual differences in meanings attributed even for the two older children.

4.4.3.4 Functions identified.

Each age-group will be dealt with separately to allow for a more detailed discussion of the segments that were assigned to each functional category.

Before continuing with the discussion Halliday's table of functional utterances in young children (see page 107) is provided for reference. A table showing "percentages of segments assigned to each functional category for the behaviour of the children of different ages and for the natural and fine conditions of instruction," is also provided.

4.4.3.4.1 <u>Table showing percentages of segments assigned to each functional category for the behaviour of the children of different ages and for the natural and fine condition of instruction.</u>

	6 months 00:27:05		9 months 00:39:03		14 months 01:13:04		2 years 4 months 02:20:03	
	NATURAL	FINE	NATURAL	FINE	NATURAL	FINE	NATURAL	FINE
	%	%	%	%	%	%	%	%
REACTIVE	6.15	1.32	2.75	0	0	0	0	.85
MOVEMENTS	9.23	23.68	.92	0	0	.42	0	0
LOCOMOTORY	0	0	4.59	4.49	.87	7.98	0	0
VOCAL	2.31	0	1.83	0	0	3.78	0	0
EXPLORATORY	16.92	22.37	26.61	53.93	14.78	5.46	15.56	11.86
INSTRUMENTAL	10.76	13.82	60.55	31.46	57.39	65.55	54.44	60.17
REGULATORY	0	0	0	0	3.48	.42	1.11	.85
INTERACTIONAL	11.54	8.55	.92	7.87	6.09	7.98	8.89	11.02
PERSONAL	40.77	28.95	.92	2.25	10.43	5.88	13.33	9.32
HEURISTIC	2.31	1.32	.92	0	3.48	1.26	5.56	5.09
IMAGINATIVE	0	0	0	0	2.61	.84	0	0
INFORMATIVE	0	0	0	0	.87	.42	1.11	.85

4.4.3.4.2 <u>Halliday's Table showing the functional behaviour in the speech of the child between 9 months and</u>
<u>18 months.</u>

	Instru-mental	Regu-latory	Inter-actional	Per-sonal	Heuris-tic	Imagin-ative	Inform-ative	TOTAL
*Phase I								
(9 - 10 1/2 mo.)	2	2	3	5	-	-	-	12
(10 1/2 - 12 mo.)	3	2	7	9	-	-	-	21
(12 - 13 1/2 mo.)	5	6	7	9	-	2	-	29
(13 1/2 - 15 mo.)	5	6	7	11	(?)	3	-	32
(15 - 16 1/2 mo.)	10	7	15	16	(?)	4	-	52
*Phase II								
(16 1/2 - 18 mo.)	31	29	16	61	3	5	-	145

*Phase I refers to the language of a very small child before the adult linguistic system begins to develop.

*Phase II refers to the transitional period when the child starts to develop the adult linguistic system.

Halliday (1975 : 147)

4.4.3.4.3 <u>Discussion of the findings for age-group 00:27:05 (6 months)</u>.

<u>00:27:05</u>

NATURAL	%	FINE	%
Personal	40.77	Personal	28.95
Exploratory	16.92	Movements	23.68
Instrumental	10.76	Exploratory	22.37
Interactional	11.54	Instrumental	13.82
Movements	9.23	Interactional	8.55
Reactive	6.15	Heuristic	1.32
Vocal	2.31	Reactive	1.32
Heuristic	2.31	Locomotory	0
Locomotory	0	Vocal	0
Regulatory	0	Regulatory	0
Imaginative	0	Imaginative	0
Informative	0	Informative	0

The highest percentage of attributions made were personal (40.77 % natural; 28.95% fine) and movements (9.23 % natural; 23.68 % fine).

The high percentage of personal behaviour attributed to the 6 month old child is interesting particularly in the light of Piaget's obser- vation that the infant's behaviour is essentially ego-centric, naïve observers clearly identify this trend as well.

Both the judges who categorized the attributions reported greatest difficulty with attributions for the 6 month old child. This difficulty was found particularly for behaviour described as "interested" which tended to refer to the child's state of mind, rather than to the explo- ratory behaviour of the child Categorization of a particular attribute was, therefore, carefully considered within it's context - the behaviour pre-ceding or following the attribution which would indicate either momentary interest on the part of the child, or a more active partici- pation in exploring the object of interest. Consideration of the attributions made by other subjects about the behaviour also helped to determine whether it should be categorized as personal or explo- ratory, although, in general, attributions by other subjects played

little part in determining the function of a single attribution.

The behaviour described as exploratory received second highest percentage scores. This category is one that had to be added to Halliday's categories since the enquiring heuristic category was inappropriate for the 6 month old child's behaviour, in particular. Halliday (1975) points out that the heuristic category grows out of exploratory behaviour and it's addition to this analysis was necessary because of the large amount of non-verbal exploratory behaviour described by subjects.

The third highest set of percentage scored, i.e. for movements required further discussion since it may be seen as being partly due to the fact that the child was not yet locomotory, it could not yet crawl and some movements, even if they appeared to be in the direction of the doll in front of it, could not be clearly determined as being goal-directed.

Another result which appears peculiar to the situation of the child being physically supported by it's mother, is the high percentage of interactional behaviour attributed. The close proximity of the mother to her infant was not present in the other action sequences where the children were able to move on their own.

These attributions may be seen in detail in Tables 9 & 10 consist mainly of the child moving towards the mother after reaching out for the doll in front of her. It is difficult to determine whether the subjects perceived this as an interaction as such, or whether they were merely describing the child returning to a more supportive sitting position. Some attributions do refer specifically to an interaction e.g. "Now it's attention goes back to the mother and she attracts it with a toy." It would be a mistake to conclude that the 6 month old child displayed more interactional behaviour than the older children because of this situational factor.

Another interesting finding is the reactive behaviour attributed more to the 6 month old child than to the other children. The reactive category was also an addition to Halliday's categories since behaviour was attributed that could not easily be assigned to available categories because the child was seen to have little control over the environment at that time, it's behaviour was seen to be essentially reflexive, e.g. "the sound now catches the child." The number of

behaviours described simply with the verb "reacts", rather than an indication of how it reacted is evident from the tables.

Instrumental behaviour was also seen to be relatively low (10.76 % natural; 13.82 % fine), while for the older children it is the predominant form of behaviour reported.

Overall, the attributions made indicate that less functional meaning is attributed to the child of 6 months than for the older children, as indicated by the more personal, affective behaviour; reactive behaviour and movements.

It is important to note, however, that:

(i) The child is not simply viewed as a passive receiver of environmental stimuli - 41. 53 % natural and 46.06% fine attributions fall into exploratory, instrumental, interactional or heuristic categories.

(ii) The relatively large percentage of personal attributions made about the behaviour of the infant emphasizes the need to adopt a personal stance to a study of infant behaviour.

4.4.3.4.4 Discussion of findings for age-group 00:39:03 (9 months).

00:39:03

NATURAL	%	FINE	%
Instrumental	60.55	Exploratory	53.93
Exploratory	26.61	Instrumental	31.36
Locomotory	4.59	Interactional	7.87
Reactive	2.75	Locomotory	4.49
Vocal	1.83	Personal	2.25
Personal	.92	Reactive	0
Interactional	.92	Movements	0
Heuristic	.92	Vocal	0
Movements	.92	Regulatory	0
Regulatory	0	Heuristic	0
Imaginative	0	Imaginative	0
Informative	0	Informative	0

The highest percentage of attributions made were instrumental (60.55 % natural: 30.46 % fine); and exploratory (26.26 % natural; 53.93% fine).

In the natural condition, instrumental attributions were higher than exploratory and vice versa for the 'fine' condition. These differences are difficult to explain but it is clear that both instrumental and exploratory behaviour was seen to be most characteristic of the behaviour of the 9 month old child.

.92 % natural and 0 % fine movements and 4.59 % natural and 4.49 % fine , locomotory were reported. This change to locomotory behaviour is apparent since the child is able to crawl and body movements are seen to be more goal-directed than for the 6 month old child.

Personal attributions are low (2.25 % fine and 2.92 % natural) indicating a marked change from the high personal content found with the 6 month old child.

Reactive, vocal and movement categories were very low, indicating that most attributions could now be seen as having clear functional meaning.

Halliday's analysis of the functions conveyed in the utterances of young children begins it's first phase at nine months. Only heuristic, imaginative and informative. (See table on p. 107 of this thesis).

This trend is also observed from the attributions about the perceived behaviour, both verbal and non-verbal, of the 9 month old in this study,

4.4.3.4.5 Discussion of findings for age-group 01:13:04 (14 months).

01:13:04

NATURAL	%	FINE	%
Instrumental	57.39	Instrumental	65.55
Exploratory	14.78	Locomotory	7.98
Personal	10.43	Interactional	7.98
Interactional	6.09	Personal	5.88
Regulatory	3.48	Exploratory	5.46
Heuristic	3.48	Vocal	3.78
Imaginative	2.61	Heuristic	1.26
Locomotory	.87	Imaginative	.84
Informative	.87	Movements	.42
Reactive	0	Regulatory	.42
Movements	0	Informative	.42
Vocal	0	Reactive	0

Instrumental attributions received the highest score comprising almost two-thirds of the perceived behaviour of the 14 month old child (57.39 % natural and 65.55 % fine .)

Halliday's Table (page 107 of this thesis) indicates that between 15 months and 16 1/2 months there is a rapid increase in instrumental behaviour in the utterances of young children.

A particularly interesting finding is that subjects reported an imaginative incident in the child's behaviour, (See appendix v. p. 100, 115, 116.), " Concern with Ida. " The child imagined his nanny "Ida" to be nearby, he called her, visually searched around for her, and stood silent for a few seconds, some subjects reported him to be thinking about Ida at this point.

Halliday found that between 12 - 13 months the imaginative "let's pretend" function becomes apparent in the speech of the young child.

It is in the attributions about the behaviour of the 14 month old that the regulatory function appears for the first time in this analysis (3.48 % natural; .42 % fine). Halliday reports regulatory functions in the child's verbal behaviour from 9 months. A reason why this kind of behaviour may not have appeared before now in the non-verbal behaviour of the children, is that regulatory behaviour depends largely on verbal behaviour - "do as I tell you" - and is most frequently conveyed by the means of language. The attributions that indicated this function in this sequence, referred to the child "trying to make the doll talk" "wants the doll to talk." (see appendix v. p. 97 & 111   ).

4.4.3.4.6 <u>Discussion of findings for age-group 02:20:03 (2 years 4 months)</u>.

continued overpage

02:20:03

NATURAL	%	FINE	%
Instrumental	54.44	Instrumental	60.17
Exploratory	15.56	Exploratory	11.86
Personal	13.33	Interactional	11.02
Interactional	8.89	Personal	9.32
Heuristic	5.56	Heuristic	5.56
Regulatory	1.11	Reactive	.85
Informative	1.11	Regulatory	.85
Reactive	0	Informative	0
Movements	0	Movements	0
Locomotory	0	Locomotory	0
Vocal	0	Vocal	0
Imaginative	0	Imaginative	0

Instrumental and exploratory attributions comprised the highest percentages of behaviour (Instrumental 54.44 % natural, 60.17 % fine ; and exploratory 15.56 % natural and 11.86 % fine). In both conditions, therefore, between 70 - 72 % of the older child's behaviour was seen to be of this nature.

Halliday does not indicate the expected proportions of behaviour for each functional category beyond 18 months but at 18 months the highest proportion was reported as being instrumental.

As may be expected reactive, movements and vocal behaviour was not observed but all the attributions about the behaviour of the child could be assigned to some functional category.

The imaginative category received no score. On the basis of the finding for the 14 month old child and on Halliday's findings, it can only be assumed that this is because the child showed no such behaviour in the particular action sequence viewed, rather than assume that she was incapable of performing such behaviour.

The higher percentage of interactional behaviour is of particular interest. The mother was essentially passive and consequently the interactive behaviour was initiated by the child. An inspection of Tables 15 & 16 shows that she interacted through the use of language. She followed instructions, for example "put the dog away" (table 7 $^{\pm}$23 secs.) and asked questions of her mother. For example, when she heard a motorbike she was reported to have asked her mother what the noise was. (tables 7 and 8, approximately 1:40 - 1:56 secs.).

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4.4.3.5 <u>Range of vocabulary</u>.

A wide range of vocabulary is evident in the descriptions made
about the behaviour of the infants and young children. The list of
operative words used to identify segments and sub-segments of behaviour
(see appendix vi) is particularly illustrative of this feature.

<u>Number of different operative words identified</u>.

00:27:05 6 months		00:39:03 9 months		01:13:04 14 months		02:20:03 2 yrs 4 months	
<u>Natural</u>	<u>Fine</u>	<u>Natural</u>	<u>Fine</u>	<u>Natural</u>	<u>Fine</u>	<u>Natural</u>	<u>Fine</u>
58	54	39	42	58	66	50	68

4.4.3.5.1 <u>Discussion of operative words used to identify segments</u>
<u>and sub-segments of behaviour</u>.

Appendix **vi** shows that the percentages obtained from an analysis
of the operative words used most frequently by subjects were low across
the experimental tasks, due to the wide range of vocabulary used in all
the experimental situations.

Words used most frequently referred primarily to the physical move-
ment, visual and tactile behaviour of the 6 month old child, for both
the fine and natural conditions of instruction. It is evident that
when given fine unit instructions the subjects were inclined to des-
cribe more behaviour in terms of movements, the word was used 8 % of
the time in the natural condition and 15 % of the time in the fine
condition. This trend was also apparent in the categories assigned to
segments of the behaviour, where 9.30 % of the attributions made in the
natural condition and 24.50 % made in the fine condition were seen
as movements.

A particularly interesting finding is that the word. "attempt" was
used in the fine condition and "try" in both the fine and natural
conditions. "Try" was used in both the sense of the mental concept
"trying to make out" and in the physical sense "trying to grab". Hamp-
shire (1970) points out that two words in the English language which
indicate intention are "try" and "attempt". This finding is a strong

indication that intentions are attributed to infants by naïve observers.

The word "attend" features frequently in the behaviour of all the children but less so with the sequence showing the 14 month old child's behaviour. In this latter case the instrumental and exploratory type of behaviour, so predominant in the behaviour of this child, is shown in the operative words as "throw", "pick-up", "bounce", "play" etc. The 9 month old child and the 2 year 4 month old child also show a high frequency of instrumental and exploratory type responses.

Another interesting finding is the negative behaviour reported mainly for the two older children, i.e. 14 months and 2 years 4 months. Trevarthen (1981) reported that at approximately 40 weeks when the child is developing motives to co-operate by incorporating the mother into his games, there appears a distinct feature in the child's behaviour when the child positively refuses to co-operate with the mother just prior to the onset of mutual co-operation. In the list of operative words the number of "doesn't affect", "doesn't care", "doesn't want to" which describes the behaviour of the two older children at times, is clear evidence that naïve observers see this negative behaviour quite distinctly.

The operative words used in both fine and natural experimental conditions are repeated for both conditions in most cases although the relative percentages vary for each condition. This shows that the same kind of words are applied in both natural and fine accounts of behaviour.

4.4.3.6 Mean length of utterance.

4.4.3.6.1 Table showing mean length of utterances total length of each sequence = 120 seconds.

	00:27:05		00:39:03		01:13:04		02:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	secs	secs	secs	secs	secs	secs	secs	secs
1	51	48	22	32	61	63	50	42
2	52	52	39	21	36	88	77	64
3	36	80	43	73	58	66	26	50
4	68	55	37	21	40	83	16	46
5	52	54	63	51	37	56	14	34
6	54	43	71	22	30	76	31	63
7	33	33	21	22	35	76	50	51

$\bar{x}$ =	49.43	52.14	42.29	34.57	42.43	72.57	37.71	50
SD	10.86	13.37	17.55	16.47	11.17	10.53	20.39	10.58
	$t = -.31$		$t = .858$		$t = 4.81$		$t = -1.29$	

4.4.3.6.2 Discussion of mean length of utterances.

The natural and fine conditions of instruction produced no significant differences in mean length of utterance for descriptions of the behaviour of 6 and 9 month old children.

The descriptions of the behaviour of the 14 month and 2 year 4 month old children yielded significantly longer mean length of utterances in the fine condition. This finding suggests that as the child's age increases, subjects were able to describe their behaviour at greater length when requested to do so.

4.4.3.7 Frequency of words used by subjects.

4.4.3.7.1 <u>TABLE SHOWING FREQUENCY OF WORDS PER SUBJECT WITHIN EACH AGE GROUP AND CONDITION OF INSTRUCTION.</u>

6 MONTHS		9 MONTHS		14 MONTHS		2 YEARS 4 MONTHS	
Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
39	72	50	48	60	102	30	60
70	75	52	48	74	104	33	79
82	96	69	55	76	130	71	104
103	103	75	56	92	166	104	126
118	107	78	70	96	166	115	152
123	123	121	92	117	204	139	168
126	148	159	228	127	238	170	213
TOTAL 661	724	604	597	642	1 110	662	902

$\overline{X}$ 94.43	103.43	86.29	85.29	91.71	158.57	94.57	128.86
S.D. 8.15	6.40	10.48	16.71	6.15	9.86	13.28	11.49
t = -0.57		t = .036		*t = -3.15		t = 1,21	

* <u>Significant at 99% level.</u>

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4.4.3.7.2 <u>Discussion</u>.

The t scores obtained show that differences existed in the mean number of words spoken in both the fine and natural conditions but that this difference was only significant for the description of one child's behaviour, i.e. the 14 month old child. There was also a larger difference for the 2 year 4 month old child but this was not significant. This seems to indicate that the subjects were able to say more about the child's behaviour if requested to do so when the child was older.

The mean scores shown in Table 4.4.3.7.1 for the natural condition of instruction are similar for the children of all ages.

4.4.3.8 <u>Mean number of words spoken per second by subjects</u>.

The mean number of words spoken was divided by the mean length of utterances to obtain a more precise estimate of whether the speed of uttering varied across age groups and both conditions of instruction.

It is reasonable to assume that if the mean length of utterance is long and the mean number of words used by subjects is high that the subjects are in fact saying more about the behaviour of the children than if the mean length of utterance is long but the mean number of words is relatively low, indicating that the subjects were talking more slowly.

4.4.3.8.1 Tables showing mean number of words spoken per second by subjects.

00:27:05 6 months			00:39:03 9 months	
Ss	Natural	Fine	Natural	Fine
1)	2.02	1.56	2.27	2.19
2)	2.37	2.85	1.77	2.29
3)	1.94	1.34	1.74	3.12
4)	1.74	1.87	2.11	2.29
5)	1.58	1.77	1.92	1.80
6)	2.33	2.86	2.24	2.50
7)	1.18	2.18	2.48	2.55

$\bar{x}$	1.88	2.06	2.08	2.39
SD =	.527	.429	.28	.30
	t = -.76		t = -1.91	

01:13:04 14 months			02:20:03 2 years 4 months	
Ss.	Natural	Fine	Natural	Fine
1)	2.08	1.62	3.40	2.48
2)	2.55	1.89	1.49	2.38
3)	2.02	3.09	2.73	2.52
4)	1.85	1.25	1.88	1.30
5)	2.60	2.32	2.36	2.32
6)	2.00	2.18	3.35	3.38
7)	2.17	3.13	2.78	3.29

$\bar{x}$	2.18	2.21	2.57	2.52
SD =	.262	.724	.66	.64
	t = -.96		t = .135	

4.4.3.8.2 Table illustrating t scores obtained for the mean number
of words spoken per second by subjects for all age groups
and both conditions of instruction.

	Natural condition	Fine condition
6 + 9 months	t = -1.02	t = 1.54
6 + 14 months	t = .192	t = -.649
6 + 2 years 4 months	t = -2.20*	t = -2.15*
9 + 14 months	t = -0.64	t = -.74
9 + 2 years 4 months	t = 1.67	t = 1.59
14 + 2 years 4 months	t = -1.34	t = -.159

*Significant at 90 % level.

4.4.3.8.3 Discussion.

Although the mean number of words per second increased for the fine
condition of instruction within each age group, these differences
were not significant. This indicates that although subjects describing
behaviour in the fine condition spoke more quickly than those describ-
ing natural condition sequences, it was not at a significantly greater
speed.

One clear trend that is evident is that as the age of the child
increases, the number of words used by subjects per second, to des-
cribe that behaviour increases. It may be assumed, therefore, that
more was said about the behaviour of the older children than for the
younger children.

The t scores shown in 4.4.3.8.2 show these differences to be
significant between the descriptions for the 6 month old child and
the 2 year 4 month old child.

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S E C T I O N 5

F I N A L   D I S C U S S I O N   A N D   C O N C L U S I O N

5.1 Final discussion.

5.1.1 The aim of the study.

The aim of the study was to answer four questions about the observation of the behaviour of infants and young children, by naïve observers, namely:

1. Do naïve observers consistently segment the ongoing stream of behaviour when viewing the behaviour of infants and young children?

2. Do naïve observers attribute intention to the behaviour of infants and young children? If so,

3. How do they do this?

4. Do the kinds of attributions made about the children vary with the age of the child?

5.1.2 Do naïve observers segment the ongoing stream of behaviour when viewing the behaviour of infants and young children? and do they attribute intention to this behaviour?

The answer to the first two questions is provided from the evidence in the polygraph recordings and the verbal analysis.

5.1.2.1 Meaningful changes perceived.

The most essential point to be made about the markings on the polygraph records is that, regardless of the results obtained concerning agreement between subjects, every subject was able to carry out the instructions to press the button whenever they perceived a "meaningful change" to take place while observing the action sequence.

Further analysis of the results shows that for the behaviour of the children of each age-group, and within each condition of instruction, it was possible to identify breakpoints, or points along the behaviour stream that indicated psychologically significant feature changes often agreed upon by subjects.

This supports Newtson's proposal (1976: 223) "that there are perceptual processes involved in our experience of persons above and beyond the perceptions that others are three-dimensional moving objects with a limited degree of plasticity."

However there are certain findings in this study which are not as clear-cut as findings from studies on adult behaviour would suggest and these require further discussion.

5.1.2.1.1 Are actions perceived as cognitively discrete segments?

The Newtson studies suggest that actions are perceived as cognitively discrete "units" or segments (see page   47   of the Literature Review), contrasting with the viewpoint that actions are perceived by the processing of continuous chunks of movement. (Newtson, Engquist & Bois, 1977). The continuous, undifferentiated stream of physical stimulation that impinges on our senses is, therefore, rendered into discrete, discriminable, describable actions. (Newtson 1976).

The method used by Newtson to tap the ongoing stream of behaviour by asking subjects to press a button leading to an event recorder whenever a "meaningful change" was perceived, has already been described. A finding which emerged from their reliability studies is important in that it indicated that breakpoint judgements are tied to some distinctive feature of the stimulus, i.e. those intervals that elicit high consensus as breakpoints must have some distinctive and important feature that other points do not have. Further inspection of a series of breakpoints, for particular sequences, revealed an almost comic-strip quality, appearing to summarize the sequences very well. By way of contrast, non-breakpoints did not appear to produce the same effect. (Newtson, 1976) Newtson, therefore, concluded that:

> "Logically, at least, it seems reasonable that any sequence of action
> could be summarized by a series of still pictures in correct temporal
> order. It was possible, therefore, that our subjects were discrimina-
> ting the best summary points, or the highest information points, in
> our sequences."   (Newtson, 1976: 227)

Further experiments were carried out to test whether the breakpoints did, in fact, contain more information about the sequence than points of continuity and not only was this found to be the case but also breakpoints

were found to contain a considerable element of order information. Another important finding was that sequences vary considerably with themselves in information value. (Newtson, 1976).

Newtson argued that his evidence not only indicated that subjects are able to identify high-information points in a behavioural sequence but that these points are important processing points, i.e. breakpoints are more than summary points, they are points of perceptual organization themselves. (Newtson, 1976).

Experiments involving recognition of breakpoints and non-breakpoints and to demonstrate that observers are perceptually more sensitive to disruption at breakpoints than at non-breakpoints, provided strong evidence that breakpoints are importantly involved in the perceptual processing of behaviour sequences. (Newtson, 1976).

With regard to the results obtained in this study, the information obtained about breakpoints identified by subjects raises a few pertinent questions about the nature of breakpoints, since they have not proved to be such clearly defined points as reported from the Newtson studies.

Referring to p. 72, 73, 75,+77 of this thesis it may be seen that the percentages of marks that make up breakpoints, show that for all age groups and within both conditions of instruction, less than half, but more than one-third, of the marks were included in breakpoint intervals. This indicates that many events were perceived by individuals that did not link up with judgements.
There are several possible explanations for this.

The Newtson studies were based on observations of adult action sequences and it may be that the particular sequences selected were over-simplified for a proper study of human action. Actions were performed by a single adult actor who may have artificially introduced segmentations into his stream of behaviour.

For example, the eight sequences used in some of the Newtson studies were as follows:-

   (i)   "Depicted a man pacing and intermittently answering the phone."
   (ii) "Showed a man removing stacks of books from a table and shelving them."
 (iii) "Showed a woman performing an interpretative dance."
  (iv) "Showed a woman setting a table with plates and food."
   (v) "Showed a man clearing a table by knocking everything off it onto the floor."
  (vi) "Showed a man systematically building a tower from tinker toys."

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(vii)   "Showed a man taking a test."

(viii) "Showed a woman making a series of identical tinker toy con-
        structions and then placing them on a pattern on the floor."

(Newtson, 1976:   227).

All of these sequences, with the exception of the dancing sequence
which consisted of a woman dancing to rock music and exhibiting rhyth-
mic movement, showed meaningful purposive action. It is interesting to
note that in Newtson's reliability studies the dancing sequence was the
least reliable of the eight sequences investigated. (Newtson, Engquist
& Bois, 1977).

Another finding which shows how analysis may be influenced refers to
the nature of the sequence itself. Newtson (1976) reports that despite
individual differences in "range of analysis", where on a continuum of
natural-unit, fine-unit or gross-unit analysis, a particular sequence
is analysed is very much a function of the particular sequence.

"In general, natural-unit analysis for sequences portraying highly
organized, step-by-step action, with a clear hierarchy of subor-
dinate and superordinate goals, will tend to be closer to gross-
unit levels. Irregular, loosely organized action sequences will
tend to produce natural unit sizes closer to fine unit analysis."

(Newtson, 1976:   231).

The possible explanations suggested with regard to the results in
this study are that:

(i)   The behaviour of infants and young children may show less
      evidence of hierarchically arranged behaviour because it is
      more random and consequently less predictable.

It is particularly interesting to note that the 6 month old be-
haviour sequence yielded the highest number of marked events with both
conditions of instruction, and although the verbal analysis also yiel-
ded a higher content than for the other sequences, the meaning was not
as easy to determine as it was for the other sequences. This does
seem to suggest that the subjects found the sequence more loosely or-
ganized and consequently responded more frequently.

Previous studies on behaviour stream research have shown the hier-
archical arrangement of segments of behaviour in that fine conditions
of instruction yield more detailed information within the boundaries
of natural breakpoints. While certain points in this study are
perceived as breakpoints for both conditions, it was not always the
case. This again seems to indicate that the behaviour sequences
of the infants and young children used in this study

were not as highly organized as it appeared to be for the adult
sequences. Consequently, subjects were unable to follow the fine
and natural condition instructions as easily as they might have done
for adult action sequences.

    (ii) Subjects may have been less certain as to the exact meaning
          of the behaviour of the infants and young children and were
          consequently unable to respond as rapidly as they might do
          in the case of adult behaviour.

Two pieces of information support this:

    (i) a number of subjects reported, after the experiment, that the
         ongoing stream of behaviour had advanced very rapidly for
         them and that they had experienced difficulty responding
         both with the key-pressing task and with the verbal descrip-
         tions.

The addition of a task to carry out, as well as observing the on-
going action sequence may well have influenced the precision, or other-
wise, with which subjects carried out those tasks. However, this was
controlled as far as possible by allowing subjects to watch the
sequence, at least once, before proceeding with the other two tasks.
It was also necessary for the purpose of this experiment, which was
to obtain information about how naïve observers respond to an on-
going sequence of behaviour in as close an approximation to a natural
situation as possible, that subjects carried out the task without
interrupting the sequence by punctuating it with pauses to allow
for "second-looks". For this same reason it was considered unneces-
sary to re-test subjects at a later stage. Information about how
naïve observers, fresh to a situation, extract sense from an ongoing
sequence of behaviour was the main aim of this experiment.

    (ii) The time variation of responses by individuals to dif-
          ferent actions suggests that some subjects are able to
          decide more rapidly than others when a meaningful change
          in behaviour occurs. This variation in "behaviour pers-
          pective" is noted by Dickman (see Literature Review page 45)
However it appears that some reactions are prompted by sudden
or unexpected events which result in most subjects responding

immediately. In appendix ii, page 5 for example, (21 - 22 secs, natural and fine) the child was seen to suddenly start putting away blocks and this was recorded by 6/7 subjects in the natural sequence and by 4/7 subjects in the fine sequence. However, looking at the natural record between 1:28 seconds and 1.32 seconds, it may be seen that 6/7 subjects responded to a meaningful change within that 5 second period. An inspection of the verbal reports for that period shows that the child was moving toys from the top shelf to a middle shelf described variously as:-

"replaces some of the toys below"

"and puts them back into the middle"

"she then takes them out of the top shelf and puts them into the middle shelf."

"starts taking the blocks off the top"

This variation in behaviour perspective makes interpretation of results from groups of subjects an extremely difficult task, especially when dealing with analyses that depend on precise timings.

In the example just cited from appendix ii, page 5   1:28 - 1:32 seconds, another important point relating to the selection of the interval size for the purpose of the statistical analysis is evident and will be returned to shortly for further discussion.

The individual response times may suggest that different subjects respond to slightly different cues in determining the boundaries of action. This would also account for the variable verbal descriptions which tend to link together according to some general meaning but differ in expression. Even with the naming of material objects the variety of names for the same object was considerable in a number of instances.

For example, appendix iv, Table 4, 9 months, Fine, 4 secs - 13 secs., the various objects refer to a duck on wheels as "the trolley", "the moving object, "a doggy-duck idea," "the duck or the dog." Similarly in appendix iv, Tables 7 - 8, 2 years 4 months, the 3-tier toy basket is referred to by various names as: "cage", "shelf", "rack", "basket", "tray". This wide range of vocabulary is particularly evident in the description of naïve observers.

Illustrations of various responses from subjects to a segment of the children's behaviour.

00:27:05 (6 Months)

SARAH

NATURAL CONDITION RESPONSES

* "Touching the lower limbs of the doll".

* It's inspecting the doll, looking at it's legs".

* "Feeling, again touch".

* "The interest doesn't seem to be in the cries as much as in the touch of the doll or the feel of it's mother".

* "Watching".

* "Exploring doll's legs".

(See appendix v. p. 54)

FINE CONDITION RESPONSES

* "It's playing with it's feet, the doll's feet".

* "Now he's investigating the doll's legs quite intently".

* "Holding it. She's playing with the doll".

* "Holds it's mother's hand and the doll's leg".

(See appendix v. p. 68)

.PAULA

NATURAL CONDITION RESPONSES	FINE CONDITION RESPONSES

NATURAL CONDITION RESPONSES

* "(Focus) now on the ring-toy".

* "Grabs object in the foreground here".

* "Changes it's attention towards another toy".

* But it's distracted by something else".

* And now changing it's attention towards the pyramid".

FINE CONDITION RESPONSES

* "Now she's looking at those rings".

* "Now on a pile of toys".

* "Now her attention is moved towards a toy with round rings."

* "Baby shifted attention from dog to another toy".

* "It's seen something else; a pile of rings".

* "Baby now interested in the object in front of him".

(See appendix v. p.73)   (See appendix v. p. 83)

01:13:04 (14 Months)

CHRIS

NATURAL CONDITION RESPONSES

· "Tipping it over the bannister".

· "Now he changes his game to
  throwing the ball over the wall".

· "Throws it over the ledge".

· "Throws it over the fence".

· "Drops it".

· "Throwing the ball over the
  edge of something".

(See appendix v. p. 95)

FINE CONDITION RESPONSES

· "Pushes it over".

· "Dropping it, letting it go".

· "And drops it over the edge of
  the little play-pen wall".

· "Throws it over the fence/gate".

· "And drops it over the railing".

· "Throws it over the wall".

· "And throws it over the railing".

(See appendix v. p. 105)

JOANNA

NATURAL CONDITION RESPONSES	FINE CONDITION RESPONSES

NATURAL CONDITION RESPONSES

- "She decides to pick up a ball and it's a funny action, she throws it at her mother's head, probably just in fun".

- "Chucking the ball up in the air".

- "She picks up the ball and throws it on her mother's head".

FINE CONDITION RESPONSES

- "She picks it up and throws it".

- "Throws a ball that she has picked up towards her mother".

- "She's picked up a ball, lobbed it at her mother".

- "Throws the ball around".

- "Attention attracted her, threw it at her mother".

- "Then picks up a ball and throws it so it hits her mother on the head".

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The possibility that naïve observers respond to slightly different cues in defining the boundaries of action, a feature which is likely to be more highly controlled for trained observers, has important implications for a study of human behaviour. Collett (1980 notes the distinction between emic and etic descriptions of action. Emic referring to the set of distinctions that are made by the subject, and etic to those made by the investigator.

Collett refers to the work of Birdwhistle (1971) who has made extensive descriptions of human features. For example, he identifies four discrete positions of the eyebrow, lifted brow, lowered brow, knit brow and single brow movement. He suggests that whenever one or both brows move, there are four movements that can be executed. Collett argues that one serious question that must be raised about this kind of work is whether the peoples phenomenal distinctions are the same as those of the investigator. The patient investigator will always be able to distinguish more detail in actions than the hurried observer who, like the ordinary observer in most everyday situations, must reach decisions without the benefit of playback facilities.

It may be concluded that there is considerable variation among untrained observers as to their ability to perceive action in greater or lesser detail and in what they identify as a significant cues, pointing tq the fact that not only input but also inference plays an important part in how individuals segment an ongoing stream of action.

It was noted frequently during the verbal analysis that some subjects employed higher order classification for a piece of behaviour that other subjects described in greater detail. This occurred despite the attempt to control the level of analysis by instruction. By way of example, in appendix iv, Table 8, 2 years 4 months fine, 1 sec - $\pm$ 12 secs., subject 5 reports two actions "the child playing with blocks" and "puts the blocks back", all other subjects give more detailed turnover.

descriptions in between the timings of the two responses given by subject 5, e.g. "putting blocks on top of each other and looking at them .... picking up blocks"; "child's playing, picking up blocks ... puts them down and then picks them up on her mother's direction"; "she's examining the bricks ... and trying to put them together the two ends together" etc.

From the descriptions it may be seen that subjects do segment the ongoing stream of behaviour and do attribute intentions to the child's behaviour but that the exact boundaries drawn between actions and the interpretations . of the actions are subject to individual variation between the different subjects.

This leads to a discussion of observer status which will be discussed more fully in the section dealing with methodological problems and suggestions for further studies of this nature.

Although sample sizes were small within each experimental task it was assumed that a larger sample would not be necessary to ask the fundamental question as to whether or not naïve observers perceive meaningful changes. Provided that subjects produced certain evidence that they do perceive meaningful changes there is sufficient evidence to conclude that they perceive the behaviour of infants and young children as being intentional.

5.1.2.2 Verbal descriptions of the behaviour.

While the polygraph markings, produced according to the specific instructions given, do provide evidence for the perception of meaningful changes, the verbal analysis based on assigning segments identified in the descriptions to functional categories, provides evidence in terms of meaning and, therefore, with reference to intentions.

5.1.3 How do naïve observers attribute intention to the behaviour of infants and young children?

Question three is linked directly to the answer provided in questions one and two.

5.1.3.1 The perception of psychologically significant features.

Subjects attribute intentions to the behaviour of infants and young children by perceiving certain psychologically significant features

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of the behaviour stream which they are able to identify on the basis of a meaningful change being perceived and to communicate this to others, primarily via the medium of a language.

An interesting question that could be investigated further is whether observers from different language communities perceive the same kinds of features as being psychologically significant.

The gaps between both markings on the polygraph records and between the verbal descriptions is indicative of the fact that not all input is regarded by subjects to be of equal significance and points to a process of inference which is selective with regard to incoming stimuli.

The disappointingly low agreement as to breakpoints and also the lack of agreement between the timings on the polygraph recordings and in the verbal analyses has posed problems about the method used to record meaningful changes but despite the timings many changes were perceived and described by all subjects, this indicates that they do attribute intentions by attending to the feature changes in the behaviour stream but little is known about how this process actually operates.

5.1.3.2 The question of a feature monitoring mechanism.

Newtson's proposal that a feature monitoring mechanism selects information at high processing points, breakpoints, assumes not only that there exists a higher order stimulus dimension within the behaviour stream but also that the observer has some hypothesis about the behaviour he perceives and against which he accepts or rejects incoming sensory information. Newtson does not suggest the representational form of this "back of the mind" information but the multi-sensory nature of perception suggests that Newtson may be simplifying a complex process by basing his arguments on predominantly visual features.

This thesis has dealt mainly with incoming visual information but it must be borne in mind that in the natural environment incoming information is multi-sensory and selection, organization and integration of this data must precede any response to it on the part of the observer.

The central question is, how do we make sense of this information? The suggestion that incoming information is matched with an internal image, as part of the meaning extraction process, points to a close connection between perceptual and cognitive, especially memory processes. Once again this places importance, not only on input information but also on the inferences that the observer brings to the task of observing

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the behaviour of others. These inferences are particularly evident in higher order classifications. For example taking the illustration of the child "doing homework", cited in the literature review, if an observer watched the child do his homework everyday for a week and recorded all the meaningful actions that he perceived during each session, at no time would he press the button to indicate when he saw "the child is a studious child". This attribution is abstracted from all the actions he has seen the child perform while doing his homework over a long period.

This indicates that while the event recording is a useful method for observing and recording changes in behaviour for an ongoing action sequence, there is clearly a limit to the information that can be collected purely by observing directly observable events. Certain higher order abstractions depend on mental events that are unique to the observer taking place and the access to them is usually only via further questioning of the observer.

5.1.3.3 Contributions from linguistic studies.

It is suggested in this thesis that non-verbal information provides meaning according to processes similar to those evident in linguistic behaviour.

Linguistic studies based on the transformational, or generative approach of Chomsky, emphasize that rules are not fixed but creative, Chomsky's surface and underlying structures of language which suggest that meaning is contained in an underlying structure while the surface structure, which may assume variable forms, contains that part of the actual sentence that can be segmented and labelled by conventional parsing, has important implications for the way in which non-verbal behaviour might be understood and explained.

Referring to Tables 9 - 16, the tables of linked segments, it may be seen that attempts to combine the varied individual segments had to be based on an underlying assumption about the meaning of segments, labelled as "glosses".

Chomsky's approach has contributed mainly to showing the considerable flexibility that the structure of language may assume. More recently, the functional approach to language, emphasizing the use which language serves has contributed even further to an understanding of the actual meaning of langauge. The speech act theory of Searle, and for the purposes of studying the development of language, Halliday's work have

added to a more complete knowledge of the nature of meaning.

A valuable contribution of these approaches to a study of early human behaviour is that they emphasize the necessity of adopting a personal approach and also support the continuity hypothesis that meaning develops out of earlier pre-speech acts.

In this study subjects readily adopted a personal stance towards the infants and young children, the child is seen as an active information seeker and not as a passive receiver of environmental stimulii. It was possible to assign segments of behaviour identified into functional categories whether or not the child had developed language.

5.1.4 Do the kinds of attributions made about the behaviour of infants and young children vary with the age of the child.

The fourth question to be answered has to refer mainly to the evidence provided from the verbal analysis.

The perceptual changes identified have indicated that the amount of agreement does not increase as the age of the child increases. The results obtained could have been influenced by other factors as the particular activity sequence observed, or to individual differences in observation on the part of the subjects.

The verbal analysis has, however, produced some interesting findings, particularly with regard to the functions identified.

The behaviour of the 6 month old child was shown to be qualitatively different from that of the three older children. More personal attributions were made and categories had to be added to accommodate descriptions that were so low in meaning content that they could not be categorized with the functional categories, i.e. movements, reactive and vocal.

Developmental changes observed by Halliday in verbal utterances of a young child were observed in the non-verbal behaviour of the children in this study, generally preceding its appearance in the verbal behaviour but later categories, e.g. imaginative and informative appeared at approximately the same time that Halliday reported it to be present in the verbal behaviour of the young children.

Two main points emerge from these findings.

1. The continuity hypothesis which assumes that pre-verbal cognitive behaviour precedes verbal behaviour is supported and
2. Naïve observers identify the same kinds of behaviour in infants and young children that more highly trained observers attend to. This

supports theories which emphasize the interactive approach to a study of human action and also arguments that a starting point for a study of human action should begin with common-sense observations.

5.2 Methodological problems.

The methods employed in this study attempted to tap the ongoing process of behaviour perception with as little interference as possible. This resulted in data that was difficult to analyse because of the wide discrepancies between the timing of perceived changes and between verbal and perceptual response times.

While this does indicate how imprecise the timing of individual is in more "natural" situations it did make analysis difficult with regard to linking descriptions with a reasonable degree of confidence that the subject had been referring to the action the investigator assumed him to be referring to.

Collett (1980) has attempted to overcome this problem by having the event recorder linked directly to the sound system of the videorecording, so that on replay the subject is prompted by a noise as to when to start describing an action he had previously perceived to constitute a meaningful change in behaviour.

5.2.1 Sample size.

The sample size for each experimental task was small, consisting of only 7 subjects. This was considered sufficient to answer the fundamental question of whether subjects do segment an ongoing stream of behaviour when viewing the behaviour of infants and young children but the wide individual differences in response that have been found suggest that much further research is needed with regard to samples of particular kinds.

The question of the observer's status requires a great deal more research with larger samples of trained and untrained observers, and observers of different status - age, sex, personality type, social role (e.g. mothers), occupational type and I.Q., for example, may produce findings which could account for these apparently individual differences

Although subjects in these experiments were drawn from different university faculties, analysis along the lines of arts, social science,

science, law and architecture would not have indicated any conclusive trend because of the small size of each sample within each experimental task.

5.2.2 Re-test Reliability Studies.

It must be pointed out that no re-test reliability studies were carried out because they were not considered necessary for the kind of information required. All that was required was information about how naïve observers, fresh to a situation, make sense of an ongoing stream of behaviour; whether they would be consistent in what they made of such a stream from time to time did not concern this study.

5.2.3 Selection of the age sequences viewed.

The main objective, to establish whether there were differences in how observers react to the behaviour of the children of different ages resulted in only 4 sequence being used, 1 for each age group under study. This has proved a weakness of the experiment since to draw more conclusive evidence for each age group further sequences within each age group (randomly selected) would be required for comparison with other age groups to establish whether the findings have more general applicability.

5.2.4 The problem of interval size.

The breakpoints identified were based on agreements over 2 second intervals, for the reasons given previously. There is a problem in determining the interval size, however, since some actions appear to be responded to immediately, while in other instances the subjects have a longer period in which to respond. They are able to predict what is going to happen and some respond at the onset of a change while others wait until a change has been completed or a goal point reached. This was mentioned by Dickman (1963) and is also evident in the verbal analysis of this thesis. (see example, Table 8, 33 secs onwards some subjects refer to the interest shown in the dog but the timings noted as to when the dog is picked up vary within a few seconds of each other).

For this analysis the 2 second interval was the most appropriate for an analysis of the agreements but a fixed interval cannot be fully representative of the responses from all subjects for one particular action if subjects are responding to slightly different cues in determining the boundaries of a perceived action. The verbal analysis is

particularly important in illustrating this discrepancy. The fact
that clear red lines could not be drawn straight across the time inter-
vals in Tables 1 - 8 (appendix iv) is evidence of this aspect.

5.3 Conclusion.

There is substantial evidence in this study that naïve observers
do attribute intention to the behaviour of infants and young children.
Whether or not the child has an intention does not matter, it is impor-
tant for studies of human interaction and social learning that their
behaviour is described as intentional.

The results have indicated that the information gain from the
verbal descriptions was much higher than from the perceptual data where
relatively few breakpoints were identified. Doubt has been cast on
whether precise boundaries of perceived segments of behaviour in a
situation other than those involving a single adult actor, can be as
clearly identified from an ongoing stream of behaviour as Newtson has
suggested.

The value of these studies lies in the emphasis placed on adopting
a personal stance to the study of human action and, in particular, of
taking a starting point from common-sense observations.

Cazden (1977) points out that many new questions about child language
require the determination of communicative intent.

The first set of questions concerns the development of communicative
intentions themselves. In what order do they develop?, for example,
Halliday's work is of value here, hypothesizing an order of development
from the earlier instrumental and regulatory to the later informative .

The second set of questions concerns developmental changes in the
relationship between intentions and their realizations. Do communica-
tive intents constitute an underlying continuity between prespeech and
speech development? Does the differentiation of intent stimulate growth
in the structural repertoire of children as it stimulates historical
change from pidgins to creoles?

The third set of questions concerns differential influences on the
child's development of utterances spoken with different intentions. Do
utterances of the child itself, or its dialogue partner, spoken with
some intentions have special saliency in influencing the acquisition
of langauge structure because of the degree of child attention that
they express or elicit?

All these questions, suggested by Cazden, and more require further research and attention.

This thesis has been primarily concerned with the <u>attribution</u> of intention and has not dealt with intention per se. However, from what has been discussed, a few general points about a study of human action warrant further discussion.

One general observation about a study of human action that emerges is that attempts to understand more about actions by requiring more detailed and rigorous physical descriptions seem doomed to frustration.

Evidence from the adult studies and this present study does suggest that informational input from the ongoing stream of behaviour does play an important part in how we make sense of the behaviour of others, but that in itself it is not sufficient for a complete interpretation of human action. For example, Newtson, Engquist & Bois (1977) set out to establish more precisely the nature of breakpoints by hypothesizing that they consisted either of meaningful states (i.e. goal states reached which would result in a marked difference in position on a feature change index relative to preceding non-breakpoints) or of meaningful changes (i.e. that the breakpoint would differ markedly on a feature change index relative to preceding breakpoints). Although the meaningful change hypothesis was supported, Newtson, Engquist & Bois (1977) remained guarded in their interpretation, concluding that discrimination of action units could be based on a combination of the two; or it could be that for certain sequences or contexts, distinctive states are relatively more important than distinctive changes. Further, the particular feature change index could have been differentially sensitive to the two hypotheses.

"For example, it could be that some meaningful states exist but that they are defined not by absolute positions of body features but by distinctive configurations of positions that would not be picked up by individual feature-by-feature- comparisons. This same possibility, however, also exists for meaningful changes; such transformations in the stimulus could consist of distinctive configurations of change, and thus a simple number-of-feature-changes index would be relatively insensitive to this hypothesis."

(Newtson, Engquist & Bois, 1977: 854).

Further evidence that relative changes between successive configurations are sufficient for action perception is available from Johansson (1975). He placed lights on limbs of persons and then filmed them walking

and dancing in the dark. Subjects were unable to identify the static configurations of light as human but readily recognized them when they moved. (Newtson, Engquist & Bois, 1977).

These findings are important in indicating the role played by goal states and changes for the perception of action but it seems that further analysis of the features themselves will prove worthless unless reference is made to what the behaviour means.

As McGinn (1979) points out, a behavioural event qualifies as an action if and only if it satisfies (or is believed by the agent to satisfy) some description relative to which it was intentional, i.e. actions are intentional or otherwise only under a given description. e.g. I may empty the contents of a glass believing it to contain water and actually pour a glass of vodka down the sink. "Pouring away the vodka" and "emptying the glass" are descriptions of the very same action. However, substituting "pouring away vodka" into an intensional sentence as "it was intentional of A that e occurred" (where e is an action), leads to a false statement, whereas substituting "emptying the glass" into the intensional sentence leads to a true statement.

The same description for an action e.g. "the child is writing", may involve completely different physical movements even from the same actor at different points in time. (This argument was raised in the Literature Review page 14 and 15).

In conclusion, it is evident that there can never be a simple classification of human action. Action has to be interpreted by negotiating its meaning, taking into account not only input features but also inferential and contextual aspects of each event.

ooOoo

A P P E N D I X

C O N T E N T S

APPENDIX i

Assignment of subjects to tasks.

ASSIGNMENT OF SUBJECTS TO TASKS

Random tables were used to assign subjects to their tasks.

00:27:05

6 MONTHS	NATURAL	FINE
1.	1	3
2.	8	11
3.	13	25
4.	15	29
5.	32	43
6.	33	45
7.	47	54

00:30:03

9 MONTHS	NATURAL	FINE
1.	5	35
2.	7	44
3.	30	46
4.	38	48
5.	40	50
6.	41	51
7.	42	55

01:13:04

14 MONTHS	NATURAL	FINE
1.	2	6
2.	4	14
3.	12	17
4.	26	18
5.	27	19
6.	31	21
7.	36	23

02:20:03

2YRS 4 MONTHS	NATURAL	FINE
1.	16	9
2.	22	10
3.	24	20
4.	34	28
5.	37	39
6.	52	49
7.	56	53

APPENDIX ii

Collated versions of polygraph recordings.

Computer print-out of marked events within 2 second
intervals for all age groups and within both the
"fine" and "natural" condition of instruction.

SUB HAP. BORING : TONE
GROUP II

subjects..	①	②	③	④	⑤	⑥	⑦ TOTALS.	
	0	1	0	0	0	0	0 1	
	0	0	0	0	0	0	0 0	
	0	1	0	0	0	0	0 1	
	1	0	1	0	0	1	0 3	
9-10	0	1	0	0	1	0	0 2	
	1	0	0	1	0	1	1 4	← 4
	0	1	1	0	1	0	0 3	
	1	0	0	1	0	0	0 2	
	0	1	1	0	1	1	0	← 4
19-20	0	0	0	1	0	0	0 1	
	0	1	1	0	1	0	0 3	
	0	0	0	0	0	0	0 0	
	0	1	1	1	1	1	0	← 5
	0	1	1	0	1	0	1	← 4
29-30	0	0	0	0	0	0	0 0	
	0	1	0	0	0	0	0 1	
	1	0	1	0	1	0	0 3	
	0	1	0	1	0	0	0 2	
	0	0	0	0	1	1	1 3	
39-40	1	0	0	0	0	0	0 1	
	0	1	1	1	0	0	0 3	
	0	0	0	0	1	1	1 3	
	0	0	0	0	0	0	0 0	
	0	1	0	0	1	0	0 2	
49-50	0	0	1	0	0	0	0 1	
	0	1	1	1	1	0	0	← 4
	1	0	0	1	0	0	0 2	
	0	1	1	0	0	0	1 3	
	1	0	1	1	1	1	0	← 5
59-60	0	1	1	1	1	0	0	← 4
	0	0	0	0	0	0	0 0	
	1	0	1	0	0	0	0 2	
	0	1	1	1	1	0	1	← 5
	0	1	0	0	0	1	0 2	
69-70	1	0	1	0	0	0	0 2	
	0	0	0	0	1	0	0 1	
	0	1	0	0	0	0	0 1	
	1	0	1	0	0	0	0 2	
	1	1	1	0	1	0	0	← 4
79-80	0	0	0	1	0	1	1 3	
	0	0	0	0	1	0	0 1	
	0	0	0	0	0	0	0 0	
	1	0	1	0	0	0	0 2	
	0	0	0	0	1	0	0 1	
89-90	0	1	1	1	0	1	1	← 5
	0	0	0	0	1	0	0 1	
	1	0	0	1	1	0	0 3	
	0	1	1	0	0	0	0 2	
	1	0	0	0	0	0	0 1	
99-100	0	0	1	0	0	0	1 2	
	0	0	0	0	0	1	0 1	
	0	1	0	0	0	0	0 1	
	0	0	0	0	0	0	0 0	
	1	0	0	0	0	0	0 1	
109-110	0	0	0	0	0	0	0 0	
	0	0	0	0	1	0	0 1	
	1	0	0	0	0	0	0 1	
	0	0	1	1	0	0	1 3	
	0	1	1	0	1	0	0 3	
119-120	0	0	0	0	1	0	0 1	

6

(6 MONTHS)   FINE.

Subjects	①	②	③	④	⑤	⑥	⑦ TOTALS
	0	0	1	0	0	0	01
	1	0	0	0	0	0	01
	0	0	1	0	0	0	01
	0	0	1	1	0	0	02
9-10	1	0	1	0	0	0	13
	0	0	0	1	1	1	03
	1	1	1	0	0	0	03
	0	0	1	1	1	0	1 ← 4
	1	0	1	1	0	0	03
19-20	0	1	1	0	1	1	04 ← 4
	0	0	1	1	0	0	13
	0	0	1	1	0	0	12
	1	1	1	1	1	0	04 ← 5
	0	0	1	1	0	0	02
29-30	0	0	1	1	0	0	13
	1	0	1	0	1	0	03
	0	0	0	1	1	0	02
	0	0	1	1	0	0	02
	1	1	0	0	1	1	1 ← 6
39-40	0	0	1	0	0	0	01
	0	0	1	1	1	0	03
	1	0	1	0	0	1	03
	0	1	0	0	0	0	12
	1	0	1	1	1	0	0 ← 4
49-50	0	0	0	0	0	0	00
	0	0	1	0	0	0	01
	0	0	1	0	1	0	13
	1	0	1	0	0	0	02
	1	1	1	1	1	1	1 ← 7
59-60	1	0	1	1	0	0	1 ← 4
	0	0	1	0	0	0	01
	0	0	1	0	0	1	02
	1	1	1	1	1	0	1 ← 6
	0	0	0	0	0	1	01
69-70	0	0	1	0	0	0	01
	1	1	0	1	1	0	0 ← 4
	0	0	1	0	0	0	12
	1	0	1	1	0	1	04 ← 4
	0	1	0	0	1	0	02
79-80	0	0	1	0	0	0	01
	1	0	0	0	1	0	02
	0	0	0	1	0	0	01
	0	0	1	0	0	0	01
	1	1	0	1	0	0	1 ← 4
89-90	0	0	1	0	1	1	03
	0	0	1	0	0	0	12
	1	1	0	0	1	0	1 ← 4
	0	0	1	0	1	0	02
	1	0	1	0	0	1	03
99-100	0	1	0	0	0	0	01
	0	0	1	0	0	0	12
	0	0	0	0	0	0	00
	1	0	1	0	0	0	02
	0	0	1	0	1	0	02
109-110	0	0	1	0	0	0	01
	0	0	0	0	0	0	00
	0	0	0	0	0	0	00
	1	0	1	1	0	0	03
	0	1	0	0	1	0	13
119-120	1	0	1	0	0	0	02

00:39:03   (9 MONTHS)   NATURAL.

Subjects	①	②	③	④	⑤	⑥	⑦	TOTALS	
	0	0	1	1	0	0	1	3	
	0	0	0	0	0	1	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0		1	←———— 4
9-10	0	0	1	1	1	0		1	
	0	0	0	0	0	0	0	0	
	0	1	0	0	0	0	0	1	
	1	0	1	1	1	1		1	←———— 6
	0	0	1	0	0	0	0	1	
19-20	0	0	0	0	1	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	1	0	1	0	2	
	0	1	0	0	0	0	0	1	
29-30	0	0	1	1	0	0		1	←———— 3
	0	0	0	0	1	0	0	1	
	0	0	0	0	0	0	0	0	
	1	0	1	0	0	0	0	2	
	0	0	0	0	0	0	0	0	
39-40	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	1	0	0	0	1	
49-50	0	0	0	0	0	0	0	0	
	0	0	0	0	0	1	0	1	
	0	0	0	0	0	0	0	0	
	1	0	0	0	1	0	0	2	
	0	0	0	0	0	0	1	1	
59-60	0	0	1	0	0	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	1	1	0	2	
	0	0	1	1	1	0		1	←———— 4
	0	0	1	0	0	0	0	1	
69-70	0	0	1	1	0	0	0	2	
	0	0	0	0	0	0	0	0	
	0	0	1	0	1	1		1	←———— 4
	0	0	0	1	0	0	0	1	
	0	0	1	0	0	0	0	1	
79-80	0	1	0	0	0	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	1	0	0	1	
	0	0	1	0	0	1	0	2	
89-90	0	0	1	0	0	0	0	1	
	0	0	0	1	0	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
99-100	0	0	1	0	1	0		1	←———— 3
	1	0	0	0	0	1	0	2	
	0	1	1	0	0	0	0	2	
	0	0	0	0	0	0	0	0	
	0	0	0	1	0	0	0	1	
109-110	0	0	1	0	1	0		1	←———— 3
	0	0	0	0	0	1	0	1	
	0	0	1	0	0	0	0	1	
	0	0	1	0	1	1	0		←———— 3
	0	0	0	1	0	0	0	1	
119-120	1	0	0	0	0	0	0	1	

Σ.71

8

subjects	①	②	③	④	⑤	⑥	⑦	TOTALS	
	0	0	1	0	0	0	0	1	
	0	0	0	0	1	0	0	1	
	0	0	0	0	0	0	0	0	
	0	1	0	0	0	0	0	1	
9-10	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	1	1	1	1	0	0	1		← 4
	0	0	0	0	1	1	0	2	
	1	1	0	0	0	1	0		← 3
19-20	0	0	1	0	1	0	0	2	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	1	1	0	0	0	2	
	0	0	0	0	0	0	0	0	
29-30	0	0	1	0	0	0	0	1	
	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	1	
	0	0	1	1	1	0	1		← 4
	0	0	0	0	0	0	0	0	
39-40	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	1	0	0	1	
	0	0	0	0	0	0	0	0	
49-50	0	1	1	0	0	0	0	2	
	0	0	0	0	0	0	0	0	
	0	0	1	0	1	1	1		← 4
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
59-60	0	0	0	1	0	0	0	1	
	1	0	0	0	1	0	1		← 3
	0	1	1	0	0	0	0	2	
	0	0	0	0	1	0	0	1	
	1	1	1	0	0	0	0		← 3
69-70	0	1	1	1	1	0	1		← 5
	0	0	0	0	0	0	0	0	
	1	1	0	0	0	0	0	2	
	0	0	1	0	1	0	0	2	
	0	0	0	1	0	0	0	1	
79-80	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	1	1	0	2	
89-90	0	0	1	0	0	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
99-100	1	1	1	1	1	0	1		← 6
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
109-110	0	0	1	0	0	0	1	2	
	0	0	0	0	1	0	0	1	
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	1	0	0	1	0	2	
119-120	0	0	0	0	1	0	0	1	

SDEV 1.45   2.67

9

SUBJECTS	①	②	③	④	⑤	⑥	⑦ TOTALS	
	1	0	0	0	0	0	1 2	
	0	0	0	0	0	0	0 0	
	1	0	0	0	0	0	0 1	
	1	0	0	0	0	0	0 1	
9-10	0	1	0	0	0	0	0 1	
	1	0	1	1	0	0	1 4	← 4
	0	0	0	0	1	0	0 1	
	0	1	0	0	0	0	0 1	
	0	0	0	0	0	0	0 0	
19-20	0	0	0	0	0	0	0 0	
	0	0	0	0	0	0	0 0	
	1	1	0	1	0	0	1 4	← 4
	0	0	0	0	1	1	0 2	
	0	0	0	1	0	0	0 1	
29-30	1	0	0	0	0	0	0 1	
	0	0	0	0	1	1	0 2	
	0	0	0	0	0	0	0 0	
	1	0	1	1	0	0	1 4	← 4
	0	1	0	0	0	0	0 1	
39-40	0	0	0	0	0	0	0 0	
	1	0	0	0	0	0	0 1	
	0	0	0	0	0	0	0 0	
	0	0	0	0	0	1	0 1	
	1	0	0	0	0	0	0 1	
49-50	0	0	0	0	0	0	0 0	
	0	0	0	0	0	0	0 0	
	1	0	1	1	0	0	1 4	← 4
	0	0	0	0	1	0	0 1	
	0	0	0	1	0	0	1 2	
59-60	0	0	1	0	1	1	0 4	← 3
	0	0	0	0	0	0	0 0	
	0	0	0	0	0	0	1 1	
	1	0	0	0	0	0	0 1	
	0	1	0	0	0	0	0 1	
69-70	0	0	0	0	0	0	0 0	
	1	0	0	0	0	0	0 1	
	0	0	0	1	0	0	1 2	
	0	1	0	0	0	0	0 1	
	1	0	0	0	0	0	0 1	
79-80	0	0	0	0	1	0	0 1	
	0	0	0	0	0	0	0 0	
	1	0	0	0	0	0	0 1	
	0	0	0	0	0	0	0 0	
	0	1	1	1	0	0	1 4	← 4
89-90	1	0	0	0	1	0	0 2	
	0	0	0	0	0	0	0 0	
	0	0	0	0	0	0	0 0	
	0	0	0	0	0	1	1 2	
	1	1	1	1	0	0	0 4	← 4
99-100	0	0	0	0	1	1	0 2	
	0	0	0	0	0	0	0 0	
	1	0	0	0	0	0	0 1	
	0	0	0	0	1	0	1 2	
	1	1	1	0	0	1	0 4	← 4
109-110	0	0	0	1	0	0	1 2	
	0	0	0	0	1	0	0 1	
	0	0	0	0	0	0	0 0	
	0	0	0	0	1	0	0 1	
	0	1	0	0	0	0	0 1	
119-120	0	0	0	1	0	0	0 1	

MEAN= 1 20   S.DEV= 1 32   5.70

GROUP

SUBJECTS.	①	②	③	④	⑤	⑥	⑦ TOTALS.	
	1	0	0	1	0	0	0 2	
	0	0	1	1	0	1	1 4	
	1	1	1	1	0	1	04 ⟵——— 6	
	1	0	1	0	0	0	1 3	
9-10	1	0	0	0	0	1	0 2	
	0	1	1	1	1	1	1 ⟵——— 6	
	1	1	0	0	0	1	1 4	
	1	0	0	1	0	1	1 4	
	0	1	1	0	0	1	0 3	
19-20	1	0	0	1	1	1	0 4	
	0	0	1	0	0	0	0 1	
	1	0	1	1	0	1	1 ⟵——— 5	
	1	0	0	0	0	1	1 ⟵——— 3	
	1	1	0	1	0	0	0 3	
29-30	1	0	1	1	1	1	1 ⟵——— 6	
	0	0	0	0	0	0	0 0	
	0	1	1	1	0	1	0 4	
	1	0	1	1	0	1	1 ⟵——— 5	
	1	0	0	0	1	0	1 3	
39-40	0	1	1	0	0	0	0 2	
	0	0	0	0	0	0	1 1	
	1	1	0	1	0	1	1 ⟵——— 5	
	1	0	1	0	0	1	0 3	
	0	1	0	1	0	1	1 ⟵——— 4	
49-50	1	1	0	0	0	0	0 2	
	0	0	1	0	0	0	0 1	
	1	1	0	1	0	1	1 ⟵——— 5	
	1	1	1	0	0	0	0 3	
	1	0	0	1	1	1	1 ⟵——— 5	
59-60	0	1	1	0	0	0	1 3	
	1	1	0	0	0	0	0 2	
	0	1	1	1	1	0	1 ⟵——— 5	
	1	1	0	1	0	0	0 3	
	1	1	0	0	0	1	0 3	
69-70	0	0	1	0	0	0	0 1	
	0	0	0	0	0	0	0 0	
	1	1	0	1	0	1	1 ⟵——— 5	
	1	1	1	0	1	0	0 ⟵——— 4	
	0	1	0	0	0	1	1 3	
79-80	1	0	1	1	0	0	0 3	
	0	1	0	0	0	0	0 1	
	1	1	0	0	0	0	0 2	
	0	0	0	1	0	1	1 3	
	1	1	1	0	1	1	0 ⟵——— 5	
89-90	1	0	0	1	0	0	1 3	
	0	1	0	0	0	0	0 1	
	1	1	1	1	0	1	1 ⟵——— 6	
	0	1	0	1	1	0	0 3	
	1	0	0	0	0	1	1 3	
99-100	0	0	1	0	0	0	0 1	
	0	1	1	1	0	0	0 3	
	1	1	0	0	1	1	0 4	
	1	1	0	1	0	1	1 ⟵——— 5	
	1	0	0	1	0	0	1 3	
109-110	0	1	1	0	0	0	0 2	
	1	1	0	0	0	1	0 3	
	0	1	1	0	0	1	1 4	
	0	0	1	0	0	0	0 1	
	0	1	0	1	0	0	0 2	
119-120	1	0	0	0	0	1	0 2	

MEAN = 3.25   SDEV= 1.65   Σ188

02:20:03   (2 YRS 4 MONTHS)   NATURAL.

SUBJECTS	①	②	③	④	⑤	⑥	⑦	TOTALS
	0	0	0	0	0	1	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	1	0	1	0	0	0	0	2
9-10	0	1	0	0	0	1	0	2
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	1
	0	0	1	0	0	0	0	1
19-20	0	0	0	0	0	0	0	0
	1	1	0	1	1	1	1	← 6
	0	0	0	1	0	0	0	1
	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	1
29-30	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
39-40	0	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	1
	1	1	0	0	0	0	1	← 3
	0	0	0	1	1	1	1	← 3
	0	0	0	0	0	0	0	0
49-50	1	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	1	1	0	0	0	0	1	← 3
57-60	0	0	1	0	0	0	0	1
	0	0	0	0	0	0	0	0
	1	0	1	1	0	1	1	← 5
	0	0	0	0	1	0	0	1
	0	0	0	0	0	0	0	0
69-70	0	0	0	0	0	1	0	1
	1	0	0	0	0	0	0	1
	0	1	0	0	0	0	0	1
	1	1	1	0	0	0	1	← 4
	0	0	0	0	0	0	0	0
79-80	0	0	0	1	0	1	0	2
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	1	1
	0	0	0	0	1	0	0	1
	0	0	1	0	0	0	0	1
89-90	0	1	0	0	0	0	0	1
	1	0	1	0	0	1	1	← 4
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	1	0	1
99-100	0	0	0	0	0	0	0	0
	1	1	0	0	0	0	0	2
	0	0	1	0	0	0	1	2
	0	0	0	0	0	0	0	0
	0	0	0	1	0	0	1	2
109-110	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	1
	1	0	0	0	0	0	0	1
119-120	0	0	0	0	0	0	1	1

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02:20:03   (2 YRS 4 MONTHS)   FINE.

SUBJECTS.	①	②	③	④	⑤	⑥	⑦	TOTALS.	
	0	1	0	0	1	0	1		← 3
	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	1	2	
	0	0	1	0	0	0	0	1	
9-10	0	0	0	1	0	0	0	1	
	1	0	0	0	0	0	1	2	
	0	0	0	0	0	0	1	1	
	0	0	0	0	0	1	0	1	
	0	1	1	1	0	0	0		← 3
19-20	0	0	0	0	0	0	1	1	
	1	0	0	1	1	0	1		← 4
	0	0	1	1	0	0	0	2	
	0	0	0	1	0	0	0	1	
	0	0	0	0	0	0	0	0	
29-30	0	0	0	0	0	0	0	0	
	0	0	0	1	0	0	0	1	
	0	0	0	1	0	0	1	2	
	0	0	0	1	0	0	0	1	
	0	0	0	1	0	0	0	1	
39-40	0	0	1	1	0	0	0	2	
	1	1	0	0	0	0	0	2	
	0	0	1	1	0	0	0	2	
	0	0	1	0	1	1	1		← 4
	0	1	0	0	0	0	0	1	
49-50	0	0	0	1	0	0	1	2	
	0	0	0	0	0	0	0	0	
	0	0	1	0	0	0	1	2	
	0	0	0	1	0	0	0	1	
	0	0	0	0	0	0	0	0	
59-60	1	1	0	0	0	0	0	2	
	0	0	0	0	0	0	1	1	
	0	0	1	1	1	0	1		← 4
	1	0	0	0	0	0	0	1	
	0	0	0	0	0	0	0	0	
69-70	0	0	0	0	0	0	1	1	
	0	1	1	0	0	0	0	2	
	1	0	0	0	0	0	0	1	
	0	0	0	1	0	0	1	2	
	0	0	0	1	0	0	0	1	
79-80	0	0	1	0	0	1	0	2	
	0	1	0	1	1	0	1		← 4
	0	0	1	0	0	0	0	1	
	0	0	0	1	0	0	1	2	
	0	1	1	1	1	0	0		← 4
89-90	0	0	0	0	0	0	0	0	
	1	0	0	1	1	0	1		← 4
	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	
	0	0	0	1	0	0	0	1	
99-100	0	0	0	0	0	0	0	0	
	1	1	1	0	0	0	0		← 3
	0	0	1	1	1	0	1		← 4
	0	0	0	0	1	1	1		← 3
	0	0	0	0	0	0	0	0	
109-110	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	1	
	0	0	0	0	0	1	0	1	
	0	0	0	0	0	0	0	0	
	0	1	0	1	0	0	0	2	
119-120	1	0	0	0	0	0	1	2	

Table 1

6 MONTHS.   NATURAL

Time in Secs.	1 Subject 1	2 Subject 8	3 Subject 13	4 Subject 15	5 Subject 32	6 Subject 33	7 Subject 47
1					interest		child looking
2						the baby seems to show inter- in the doll crying, it opens it's eyes wide	
3	Child's not interested in it's mother, some thing else has his at- tention	the baby's staring at the doll		the child's fairly in- terested in what he's seeing			hands mov- ing
4							
5							
6							
7							
8			baby laughs				
9	reacts to noise	she's making vocal sounds and smiling		so he gives a smile	he's happy	starting to laugh	laughing
10							
11	it's mother gets it's attention for a min- ute						moving
12							
13						seems very interested in the doll	
14							
15		she's react- ing to the sound of the doll			a little bit fright- ened about the whole thing		
16							
17							frightened
18				smile again	laughter		
19			becoming playful				moves head back
20				smile dies			
21					enjoyment, enjoyment most espe- cially at ? ?		blinks eyes
22							
23						the baby al- ways blinks when the doll comes near it and it's always sort of sur- prised at the cry of the doll	
24		now she's staring at the doll with enjoy- ment					mouth open
25				surprise, change there			
26							
27							
28							
29							
30							

Time in Secs	1	2	3	4	5	6	7
31		now she's become dis-tracted	baby is be-coming rest-less	surprise again	changed now saw some-thing in background		
32							
33							
34		she's turn-ing her head towards her mother		and again			
35						it's show-ing disin-terest in the doll now	
36							
37					looking at the mother now		child look-ing
38							
39				childs distracted	looking back again at the doll		
40							
41							
42		she's now looking at the doll again and touching it					
43			reaches out for the doll	he reaches out			child grasp-ing doll
44						it's start-ing to touch the doll and use it's hands	
45				the sound affects him	trying to discover what the noise is		
46		startled by it's cry					
47	enjoys the toy			he reacts to it			
48							
49							
50							
51							
52							moving rest-lessly
53							
54				moves back when he re-acts, moves his whole body in ac-tual fact	a little scared as to whether or not to try and feel it		
55		she's turn-ing toward her mother again	it's trying to reach for the doll				
56							
57							
58		touching the doll				the baby seems to be becoming restless	
59			it's hold-ing the doll				
1.00							

15

Time in Secs	1	2	3	4	5	6	7
1.01	now it's attention goes back to the mother and she attracts it with a toy			reaches for the toy	looks very scared about that, it's appearance	the attention shifts from the mother to the doll	
1.02							
1.03							
1.04			it's jumping				looking away
1.05	it's attracted by the noise	now she's looking over her mother's shoulder, putting her face into her mother's		he's distracted			
1.06							restless
1.07			it snuggles up to it's mother	goes to the mother		it's moving away from the doll now	
1.08							
1.09							
1.10							
1.11		reaching out for the doll again					
1.12				he's not really interested in the toy now			grasping doll again
1.13							
1.14	attention back to it's mother	looking in front of her			uncomfortable		
1.15		looking around					
1.16				moves away			
1.17							moving
1.18		making vocal sounds	it's becoming playful again	makes a sound	trying to make out the noise		
1.19							
1.20						the doll's cries aren't nearly as interesting to the baby anymore	
1.21							
1.22	it's mother wants the baby to play with the toy		it's a bit scared of the noise				
1.23							
1.24	it's not very interested	she's smiling again		the sound catches the child now			
1.25							
1.26							moving hands and feet
1.27	and goes back to its mother		it's trying to reach for the doll	now the child's not interested again			
1.28							
1.29						it's touching the doll again	
1.30							

16

Time in Secs	1	2	3	4	5	6	7
1.31				goes to the mother	uncomfort- able lost interest again		
1.32		she's now turned to- wards her mother,					
1.33	attention back to the toy						
1.34		reaching out in front of her		generally he's not in- terested in the toy			
1.35			it wants to play with the doll				
1.36							
1.37							
1.38	it's not very inter- ested				feeling - again touch		
1.39							
1.40							watching
1.41						the interest doesn't seem to be in the cries as much as in the touch of the doll or the feel of it's mother	
1.42		touching the lower limbs of the doll	it's inspe- cting the doll, look- ing at it's leg				
1.43	it's attract ed by the noise						moving clos- er to doll
1.44							
1.45							
1.46							
1.47				the sound doesn't af- fect him at all, he's not looking			
1.48	something else has at- tracted it's attention						
1.49							
1.50				just look- ing down			
1.51							
1.52							
1.53				he's not interested			
1.54			it's sur- prised at the sound		interested again		moving head
1.55		she's start- led again by the baby's cry		that sound caught him			
1.56							
1.57							
1.58					pleased		
1.59	mother's again attr- acted it's attention with the feet of the toy	Her atten- tion is ag- ain becom- ing distrac- ted		moves back wriggling	found some- thing else now		
2.00							

17

Table 2

6 MONTHS.   FINE.

Time in Secs.	1 Subject 3.	2 Subject 11.	3 Subject 25.	4 Subject 29.	5 Subject 43.	6 Subject 45.	7 Subject 54.
1							
2		Baby is just look-ing at the doll		At the mo-ment it's just trying to figure out what's happening		She's not very much interested in it, she's kind of scar-ed of the doll	
3							
4		Everytime the doll squeaks it takes not-ice	Closes it's hand				
5							
6				it's aware of something being pre-sent			
7			blinks it's eyes				
8							It's been attracted to the doll and laughing
9			moves back		There's definitely fascination there		
10	Baby's now looking at doll			and now it's smiling and moving		now she's starting to smile	
11							
12		and it's laughing at the moment	leans back				
13					there's a bit of sur-prise and happiness at discov-ering some-thing		
14							
15		still look-ing at the doll	blinks it's eyes and laughs				
16							
17			moves back				
18			laughs				it's laugh-ing again
19				now laugh-ing		now she's getting very excit-ed about the doll	
20		It's laugh-ing again	leans back				
21							
22		Seems to laugh as it comes clos-er					
23	Smiling		opens it's mouth				
24				now shows surprise			
25					again he's showing more kind of pleasure		surprised
26			laughs				
27			opens it's hands				
28		and smiling					and moving back
29							
30	It's laugh-ing		laughs and moves back				

18

Time in Secs	1	2	3	4	5	6	7
31							
32		It's just looking at the doll's face					
33					fascination as well		
34			moves it's head			she's not so scared of it anymore	
35	It's moving away from it						
36							
37		Now it's lost interest					moves towards it's mother
38			moves it's head back	now it seems to turn towards it's mother	he's going into a despondency but seems to be aroused by it	she turns to look at her mother	
39	smiling and moving at the same time						
40		Now it's looking at the doll again					
41			puts it's hand forward				
42						now she's holding the doll	holds it's hands out to the doll
43				it actually feels the doll			
44	looks surprised	Now it's wanting to touch the doll	gets a fright				
45							
46							
47		But when it squeaked it stopped		now it's looking round a bit			
48			laughs				
49							
50							
51			moves back	it laughs			
52							
53		Just looking at the doll again	moves back				
54							
55			turns around			she looks at her mother again	moves towards it's mother
56							
57		Now it's looked away, it's lost interest again	touches it			looks back at the doll	
58	not interested in the doll			now starts feeling again	again he's just attemp-		holds the doll
59							
1.00	it's touching the doll	now it's gone back	touches it				

Time in Secs	1	2	3	4	5	6	7
1.01		to the doll			ting to touch the doll	she touches the doll	
1.02		now it's trying to hold the doll	moves back				
1.03							
1.04			looks away				moves away from the doll towards it's mother
1.05				turns towards it's mother	and then he goes back toward the comfort of his mother	looks away from the doll	
1.06		now it's lost interest again	looks away				
1.07							
1.08	looking at it's head						cuddles up to his mother
1.09			touches it again				
1.10						touches the doll again	
1.11							
1.12							puts out it's hand towards the doll again
1.13	moving away	it's looking at the doll again	looks away				
1.14							
1.15			moves back				
1.16	looking at his mother					now she looks away from it	becomes disinterested
1.17							
1.18					struggling too, probably boredom		
1.19			blinks it's eyes				
.20	touching the doll						
.21							
.22		still looking	closes it's fingers				
.23							
.24	moving away from it						
.25	turning his head away			now it's stiffening up	and again his attention is aroused		
.26			opens it's hands			now she's not interested in it any more, she's looking at the teddy bear	
.27		now it's lost interest again					
.28							
.29			moves back				moves toward the doll
.30			forward	using it's hands			

20

Time in Secs	1	2	3	4	5	6	7
1.31		it's get-ting rest-less as well	turns away		and with-drawing into his mother		
1.32							moves toward his mother
1.33	touching it again			she looks pleasantly surprised at the action			
1.34			moves it's hand for-wards				
1.35	looking past it						
1.36						she looks back at the doll, she's playing with the doll	
1.37							
1.38							
1.39			moves it's hand				
1.40					now he's in-vestigating the doll's legs quite intently		
1.41	looking at the doll again	now it's getting in-terested again, it's playing with it's feet - the doll's feet					holds it's mother's hand and the doll's leg
1.42							
1.43						holding it	
1.44			moves it's head for-ward				
1.45	smiling			I think it's a very in-teresting aspect the way he feels to try and be aware ex-actly if the doll is there and it's what he's find-ing so con-fusing			
1.46			moves back				
1.47							
1.48							
1.49	touching it		moves it's hand				
1.50		it's just looking at the doll again					
1.51							
1.52	looking at his mother						
1.53			lifts it's head				
1.54							
1.55	touching the doll's feet	everytime it squeaks it looked up then	opens it's mouth		but again he's get-ting dis-tracted by the other noise of the doll	she's losing interest in the doll, she looks away from it more often	
1.56							
1.57							
1.58							
1.59			moves back			she wants the teddy bear	
2.00							

Table 3

9 MONTHS.   NATURAL

Time in Secs.	1 Subject 5	2 Subject 7	3 Subject 30	4 Subject 38	5 Subject 40	6 Subject 41	7 Subject 42
1				baby puts down the toy it's holding, changes it's attention	child's just dropped a block	it's playing with the brick	child picks up the brick and drops it
2			picks up the block				
3							
4			drops it		attention is now on another toy	changing it's attention to the dog on the cart	
5							
6							
7		Well, at the moment the baby is just looking around					
8							
9							
10				he crawls towards the pull-along toy			
11		now it's focussed on a little trolley				concentrating on the cart	
12							
13			gets onto it's knees		started crawling towards it but is distracted by something else		
14						and now changing it's attention to the pyramid	
15				changes it's attention towards another toy and throws it away			
16		and now on to the (ring toy)	grabs object in the foreground here				child picks up the rings and throws them out of the way
17					picks it up and drops it		
18							
19			drops it			and now attention goes back to the dog on the cart	
20							
21							
22							
23							
24				now tries to grab for the toy			
25		still concentrating on the trolley			it's again attracted by the duck		
26							
27							
28							
29				and now for the string		attention is still on the dog on	directs his attention to
30					he holds the pulling cord		

22

Time in Secs	1	2	3	4	5	6	7
31					but is again dis-tracted	the cart	the string attached to the dog
32			grabs for the rope				
33							
34		just gener-ally look-ing around, nothing specific					
35	now the baby 's not looking at the toys any-more, but looking at the general surroundings		looking around	looks around			
36							
37							
38							
39						seems to be changing it's atten-tion to-ward the block on it's right	
40							
41							
42							
43							
44							
45							
46							
47						now seems to be feel-ing for the block	
48							
49							goes back to playing with original block
50					picks up the block next to him		
51				still looks but now at the mother			
52							
53							
54							
55							
56						and grabs the block	
57		just look-ing around					
58	now the in-terest is being brought back to the toys again						
59							
1.00							

23

Time in Secs	1	2	3	4	5	6	7
1.01					puts it to his mouth		
1.02			puts an object in the mouth			moves the block to its mouth	
1.03					and drops it		
1.04				throws away the block			
1.05							
1.06			drops it		picks it up again and drops it		
1.07			picks it up again			she has the attention on the block	
1.08							
1.09			and drops it				throws brick aside and pursues duck
1.10					again takes hold of the cord and then (holds) another toy		
1.11							
1.12				picks up another toy			
1.13							
1.14		now it's directed it's attention towards the duck	grabs the duck			the attention now moves towards a plastic duck which it picks up	
1.15							
1.16							
1.17			drops it				
1.18							
1.19		concentrating on that at the moment				and is studying it	
1.20					holds it in its hands and puts it to its mouth		
1.21							
1.22			picks it up again				
1.23							
1.24							
1.25							
1.26			starts making a noise		puts it down	starts talking and hitting the duck	
1.27							
1.28							
1.29							
1.30							

24

Time in Secs	1	2	3	4	5	6	7
1.31					picks it up		
1.32							
1.33				seems to have got ex-cited now		the atten-tion is still fixed on the duck	
1.34							
1.35					drops it		
1.36							
1.37							
1.38							throws duck aside and crawls
1.39	now the baby is moving away from the toys to go and look at something else	seems to have spot-ted some-thing else	drops the duck		crawls off	now the at-tention changes and it moves over toward the right of the screen to-wards some other ob-ject	
1.40							
1.41		thing else		crawls right over to the edge of the room			
1.42		starts crawling				
1.43		it's making its way to-ward it					
1.44							
1.45					picks up something else and puts it to his mouth	and it picks up some ob-ject which seems to be a block and starts chew-ing it	
1.46							
1.47							picks up an-other block
1.48			picks up a block				
1.49		it's play-ing with the brick now			holds it in both hands		
1.50				puts a block into its mouth			
1.51			puts it in its mouth				
1.52							
1.53					knocks ag-ainst his other hand	starts hit-ting the block	
1.54			looks at it				
1.55							
1.56	now looking around at the general surroundings again		eats it				
1.57							
1.58						and now starts chew-ing the block	
1.59					puts it to his mouth		
2.00			puts it in its mouth				

25

Table 4

9 MONTHS.   FINE.

Time in Secs.	1 Subject 35	2 Subject 44	3 Subject 46	4 Subject 48	5 Subject 50	6 Subject 51	7 Subject 55
1			the child is holding a block				
2			she drops the block				
3							
4			and her attention is focused on a doggy/ duck idea		the baby's attention has changed to the duck or the dog		
5							
6							
7		her interest's on the moving object					
8			she's watching it being pushed along				
9	she's now looking at the trolley						
10							
11			her focus of attention is on the duck				
12					it's interested in the movement		
13							
14		now on a pile of toys	now her attention is moved towards a toy with round rings	baby shifted attention from dog to another toy			baby now interested in the object in front of him
15	now she's looking at those rings, now she's picked them up				it's seen something else, a pile of rings		
16							
17		and then on the moving object					
18							
19							
20			she's discarded that and her attention is back on the duck		it discards that in favour of the thing that moves		
21							
22							
23	now her whole attention is on the trolley, the duck						
24							
25				attention goes back to dog			
26							
27			now she's glancing at her mother				
28							
29							
30							

26

Time in Secs	1	2	3	4	5	6	7
31			she's look- ing at the string, her attention wavers again				stops look- ing at the doll
32							
33							
34	she's trying to grasp, when she can't she loses inter- est		she's look- ing around her	attention not on any- thing, it seems to be in a world of its own	it's looking around for something else, some- thing that's not shown on the screen		and looks round the room
35							
36							
37							
38							
39		her inter- est's on the block. which com- petes I ex- pect					
40							
41	she's now looking for something else to play with						
42							
43			focusses her atten- tion on the duck				
44							
45							
46							
47			glances at her mother		it's atten- tion chang- es back to it's mother		
48		interest is on a block					
49							
50							
51							
52			her atten- tion is now focussed on her mother bashing the end of the duck around	attention brought to the block			focusses on the noise the mother's making
53							
54							
55							
56							
57							
58			her atten- tion is now on a block which she is sticking in her mouth		attention again to the moving thing		focus now on block
59							
1.00							

27

Time in Secs	1	2	3	4	5	6	7
1.01						the child's attention is not drawn to the object in front of it but instead to the smaller object	
1.02							
1.03							
1.04			she's dis-carded the block, she glanced at the duck and now she picked up the block again	attention goes back to dog			
1.05							
1.06					discards a block		
1.07		interest in the moving object then on the duck					
1.08							
1.09			her atten-tion is on the string				
1.10	she's now picking up another duck						now moves across losing interest in the block and focussing on the duck
1.11							
1.12				attention to duck			
1.13			now she's looking at another duck				
1.14					attention to the duck	she reaches out for an object not right in front of her but next to the mother	
1.15							
1.16							
1.17							
1.18			she's look-ing around her				
1.19							
1.20			now her at-tention is focussed on the duck				
1.21							
1.22							
1.23							
1.24			she's put-ting the duck in her mouth				
1.25							
1.26							
1.27			she's smil-ing at some-thing in the background				
1.28							
1.29							
1.30							

28

Time in Secs	1	2	3	4	5	6	7
1.31			now she's playing with the duck				
1.32							
1.33							
1.34							
1.35							
1.36		some interest in the block which is far away					
1.37							loses interest in the duck and moves away
1.38			something has caught her attention and she's crawling toward it		the baby's going after something that it can't see		
1.39				baby attracted to something completely different			
1.40	she's now moving towards another block					her attention is drawn to an object further away from her	
1.41							
1.42							
1.43			it's out of the picture				
1.44				moves right away			
1.45							
1.46							
1.47			she's found what she's looking for		it seems to have turned back towards it's mother		
1.48	she's feeling and touching it						finds another block
1.49						and places the object in her mouth	
1.50			she puts it in her mouth				
1.51							
1.52			she's concentrating on the little object, plays with it				
1.53							
1.54							
1.55			she's glanced away but still playing with it				
1.56					she's found something else - blocks to bang together		
1.57			sticking it in her mouth again				
1.58							
1.59							
2.00	she's continuing looking back towards her mother						

29

Table 5

Time in Secs.	1 Subject 2	2 Subject 4	3 Subject 12	4 Subject 26	5 Subject 27	6 Subject 31	7 Subject 36
1	the child's picking up the ball		the child's bouncing the ball			bounces ball	bouncing the ball
2	throwing it				child is now bouncing the ball		
3	looking for it	he's playing with the ball		child bounces the ball			
4							
5	picking it up again				he is concentrating on the ball		
6			his concentration changes when he starts to kick it now				
7	throwing it						
8							
9							
10						he kicks the ball	
11							
12	it's kicking it with its feet and running after it						kicking it now
13				kicks the ball			
14							
15							
16	picking it up						
17							
18							
19				picks it up to throw it		was going to throw the ball to his mother but decided not to	
20							
21							
22							
23	throwing it						throwing the ball
24					now throws the ball		
25			he's still concerned with kicking the ball				
26				throws the ball			
27		now he's shouting at the ball					
28	commenting on where it's gone						
29						fetches the ball	
30							

30

Time in Secs	1	2	3	4	5	6	7
31	running towards it			goes towards the ball to pick it up			
32					he picks it up and throws it over the fence		
33							
34			he now changes his game to throwing the ball over the wall			drops it	throwing the ball over the edge of something
35		now he's playing with it again		throws it over the ledge			
36	tipping it over the bannister						
37							
38					he's surprised to see it come back		
39	and can't get it						
40							
41						finds the ball	
42	found a way to get it						
43							
44							picking up the ball again
45				picks up the ball			
46							
47							
48		now it's speaking with its mother					
49				he calls			
50							
51							
52						attempts to throw the ball to his mother	and kicking it
53	throwing the ball towards its mother	now his attention is back on the ball for the moment					
54							
55		now he's changed to the doll		throws the ball	he now switches his interest from the ball to a doll	finds the doll	
56	its lost interest in the ball and picking up the doll						
57			he now picks up the doll and his concentration has stopped from kicking the ball	mind is attracted to the doll			
58							
59	giving it a hug						
1.00							

Time in Secs	1	2	3	4	5	6	7
1.01							
1.02							bending the doll
1.03			he's inter- ested in the doll				
1.04	examining it						
1.05							
1.06							
1.07							
1.08				looks at the ball			
1.09							
1.10							
1.11							
1.12							
1.13							
1.14							
1.15							bending the body again to make a noise
1.16				he wants the doll to make a sound			
1.17	tipping it over to hear the noise					tries to make the doll talk	
1.18							
1.19							
1.20					interested in the doll crying		
1.21							
1.22							
1.23							
1.24							
1.25							
1.26		now his at- tention is on the ball again	he now loses his interest in the doll and is again concentrat- ing on the ball				Kicking the ball, loses interest in the doll
1.27	its lost in- terest in the doll				now loses interest in the doll and changes to the ball and kicks it		
1.28				goes back to the ball			
1.29							
1.30	kicking the ball again					forgets ab- out the doll	

32

Time in Secs	1	2	3	4	5	6	7
1.31						and carries on with the ball	
1.32							
1.33			he seems to loose his concentration here quicker		leaves the doll		losing interest in the ball and going to a truck
1.34							
1.35		he's lost the attention on the ball and playing with an engine					
1.36					leaves the ball and pulls out a train		
1.37	its found the train, investigating it		plays with the train, it gains his attention for a while	attracted by a truck		inspects the train	
1.38							
1.39							
1.40							
1.41							
1.42	something's caught his attention he's dropped it						losing interest in the truck
1.43							
1.44							
1.45		now he's lost attention on the engine and gone back to a block			leaves the train and turns to a block	discovers a car *	
1.46			until he becomes interested in the block				
1.47	lost interest			he leaves the truck			picking up the block
1.48							
1.49	found a block						already lost interest in the block
1.50			although when his mother starts talking to him he forgets about the block and thinks of Ida	and goes towards a block	now listens to his mother		
1.51							
1.52							
1.53							
1.54	its feeling it, looking at it	his attention is immediately diverted to his mother back to the block and then away again					
1.55							
1.56							
1.57							
1.58					looks round to see where Ida is		
1.59							
2.00	lost interest in the block		he's now thinking about calling "Ida"			* mistaken "car" for "block"	

33

Table 6

14 MONTHS.   FINE.

Time in Secs.	1 Subject 6	2 Subject 14	3 Subject 17	4 Subject 18	5 Subject 19	6 Subject 21	7 Subject 23
1		it's standing still bouncing the ball going towards the table	the baby is holding the ball he bounces it once	bouncing ball	he's bouncing the ball	baby throws the ball down	the child is holding the ball
2	bounces the ball						
3				picks the ball up			he throws it down
4		reaching under it grabbing the ball	he's picking up the ball again		he's changed his thoughts about kicking it	picks it up	he picks it up again
5	picks the ball up						
6		letting it go again		bounces it down again		looks at it throws it down	he throws it down again
7							
8	bounces again		drops again he's obviously finding it fascinating dropping the ball				
9		following the ball					
10	turns around			kicks ball	he's kicked it	makes a sound	
11		kicking it				follows the ball	he kicks the ball
12	runs after it		he's now following the ball with the intention of picking it up again				and he runs happily towards the ball
13		going toward the corner				laughs	
14				picks it up again			
15		picking up the ball			now he picks it up and thinks about throwing it	picks up the ball	
16	picks the ball up						
17						looks toward his mother	he turns towards his mother but he does not want to throw the ball to her
18		going towards mummy	he's obviously finding it exciting, the whole game				
19	turns around			walks towards mother			
20		holding the ball					
21							he throws the ball away
22					he's throwing it		
23	sends ball back	throwing it		throws ball on the floor			
24	bounces it	walking backwards	he throws it once again			throws it across the room and makes verbal sounds	
25	points						
26	points			points to ball			asks his mother to go for the ball
27		contemplating					
28	talks	running forwards					
29			I think he is trying to express himself as to what he has done	runs towards ball to fetch it	he goes to fetch it when his mum says so		
30	runs after the ball					goes to fetch the ball	he then runs towards the ball after

34

Time in Secs	1	2	3	4	5	6	7
31							his mother asked him to do so
32							
33		holding the ball up		picks it up	he picks it up and drops it over the railing	picks it up	he picks the ball up and throws it over the railing
34	picks the ball up						
35	pushes it over	dropping it / letting it go	he now picks up the ball and drops it over the edge of the little play pen wall			throws it over the wall	
36							
37		watching it		throws it over the fence/gate			
38							
39		watching it roll				follows the ball round	he turns around following the movement of the ball
40							
41	turns round and runs	going to fetch the ball		picks the ball up again			
42						picks it up again	
43							and he picks it up again
44		going down				makes a verbal sound	
45	picks the ball up	picking it up		walks towards mother	picks it up	looks at its mother	
46							
47	turns round					holds the ball	
48	walks	walking with the ball					
49		holding it / contemplating	still very intrigued by the whole process of throwing the ball				
50							his mother asked for the ball but he does not want to throw it
51			he's picked it up again				
52				throws the ball on the floor	and he throws it and kicks it		
53	throws the ball	letting it drop and letting it roll	and now dropped it again			stands with the ball	he throws it down and runs towards a doll
54							
55	runs after it		now, I feel he's got bored with the ball	runs towards the table	he changes his mind and picks up the doll	throws it	
56							
57	picks up toy doll	holds up doll		picks up doll		picks up his doll	he picks the doll up
58			he picks up the doll				
59	turns round	walking round with doll				holds the doll and makes a verbal sound	and he holds it in his hand
1.00			he seems to handle it				

35

Time in Secs	1	2	3	4	5	6	7
1.01		looks at doll's face	with a sort of motherly love		after hugging it, he points it downwards		
1.02	walks	holds doll upside down				looks at his doll	he looks at the doll curiously
1.03			turns doll over three times				
1.04	lowers doll	holds it straight					
1.05			he looks at the doll up and down his face				
1.06	picks it up again	holds it upside down				forces it down a bit	bends it backwards and forwards
1.07	lowers it						
1.08		watching mummy wipe dolly's nose					
1.09							
1.10			he doesn't know what to make of it				
1.11		letting mummy wipe his nose					
1.12		showing mummy dolly				picks it up again	takes the doll to his mother
1.13	walks						
1.14				turns the doll over with his mother		makes a verbal sound	
1.15			he's now showing the doll to his mother		he gives it to his mum and tries to make a noise out of it		and he bends it backwards and forwards again
1.16							
1.17		waving doll up and down					
1.18	turns doll over					throws the doll back and forwards	when the dolly makes a sound he is very curious
1.19							
1.20							
1.21							
1.22							
1.23						holds the doll	
1.24		turning around					
1.25		walking towards the ball				walks with the doll towards the ball	
1.26	turns round and walks			walks towards ball and kicks it	now he tries to play with the ball and doll at the same time		he takes the doll
1.27	kicks the ball						he runs towards the ball and kicks the ball
1.28							
1.29			he seems to have lost interest in			makes a verbal sound	
1.30							

36

Time in Secs	1	2	3	4	5	6	7
1.31		playing with the ball	the doll quite rapidly	kicks ball		kicks the ball again	
1.32		kicking the ball			now he just kicks the ball and discovers his train		he throws the doll down and runs towards the train
1.33		sees the train	he's now back to the ball again				
1.34							
1.35	looks after it					makes a verbal sound	
1.36		goes down and picks up the train		picks up truck and plays with it		picks up his truck	
1.37							
1.38	picks up train						
1.39							
1.40		holding train	he's now got hold of a toy train	holds truck in air			he looks at the train for a while – picks it up
1.41		lets train drop					
1.42	picks it up again			drops it again		looks at something	
1.43					loses interest in the train		
1.44						puts the truck down and makes verbal sounds	then he hears footsteps
1.45	puts it down		he's also lost interest in that very rapidly				
1.46		runs towards little car with a block in it		walks towards the ball again			
1.47							he shouts the name "Ida" and runs towards a block
1.48							
1.49					goes and picks up something from the floor		
1.50	picks up block					walks towards a small truck	
1.51			he's just picked up a block of wood				
1.52		contemplating where Ida is					he picks the block up
1.53							
1.54					he's distracted by his mum	looks at his mother	and his mother asks him to call for Ida and he is a little confused
1.55							
1.56		holding block	seems to be handling the wood			plays a bit with the toy	
1.57	turns round	walks around aimlessly towards chair		walks towards chair			
1.58							
1.59	walks					walks somewhere towards ? ?	
2.00							

37

Table 7

2 YEARS   4 MONTHS.   NATURAL

Time in Secs.	1 Subject 16	2 Subject 22	3 Subject 24	4 Subject 34	5 Subject 37	6 Subject 52	7 Subject 56
1						the child is picking up blocks	the child is playing with blocks on the floor, examining them
2		the baby is now looking at some cubes		the first kind of behaviour appears to be playing			
3	the child's pretty intent on what she's working with, she's looking at it and handling it						
4							
5		seems amused					
6				the child investigates			picking them up and looking at them
7							
8							
9						the child puts the blocks on the floor	
10	she seems a bit upset that she has to start again	it's now changed					puts them down
11							
12							
13					and looks for others	and looks for others	
14							
15	but she starts quite happily again, actually						picks up two
16							
17							
18							
19			from playing, she now wants to put them back in			the child starts putting the blocks away into the middle shelf	starts putting them in the second row of the shelf, or the second shelf
20		it tries to put the cubes away prompted by mother			she's putting the things away		
21							
22							
23							
24				change – obeys instructions – puts the toys away			
25							
26							
27							
28							
29							
30							

38

Time in Secs	1	2	3	4	5	6	7
31							
32		she seems hesitant about it					
33							
34							
35							
36							
37							
38							
39							
40							
41		seems serious					
42							picks up the dog
43			she now finds a new thing		and she's playing with the doll, puppy		
44		now turns attention to a play animal		distracted by dog, toy dog			
45						the child now picks up the dog and describes it	
46							
47							
48	she seems to change her handling of the item when she picks up the doll, it's kind of a lot softer type of handling						examines the dog
49							
50							
51							
52							
53							
54		shows it to mother					
55							
56	and she seems to be a lot more interested in it						now tries to make the dog make a noise
57							
58							
59							
1.00		listens to the mother					

39

Time in Secs	1	2	3	4	5	6	7
1.01	she doesn't want to put it where her mother has told her to put it but she does				putting the doll away	the child puts the doll on a different shelf	
1.02			she now puts them in the top shelf instead of the middle				puts it on the top shelf
1.03		and then puts it back on the top of the cage					
1.04							
1.05							
1.06							
1.07							
1.08			she takes the blocks from the top and puts them back into the middle where they belong				it takes the block out of the top shelf and puts it on the second shelf
1.09							
1.10		puts some more cubes down below					
1.11							
1.12							
1.13							
1.14		attention is changed to another toy					
1.15							
1.16						the child looks for more blocks	starts playing with the blocks again on the floor
1.17							
1.18		seems happier about seeing new toy					
1.19	she seems to be quite excited at having found something she had to find						
1.20							
1.21							
1.22							throws two blocks on the dog's head
1.23		also puts that back			showing signs of aggression	and puts them on the top shelf	
1.24							
1.25			she puts the blocks back into the top				
1.26							
1.27							throws another one in the rack
1.28						she then takes them out of the top shelf and puts them into the middle shelf	
1.29		replaces some of the toys below	and puts them back into the middle				
1.30							starts taking the blocks off the top

40

Time in Secs	1	2	3	4	5	6	7
1.31							one and putting them in the middle
1.32							one, including the dog
1.33							
1.34						she puts her dog in the middle shelf as well	
1.35			wants to put the doll in the middle too	organizing toys			
1.36							
1.37							
1.38							
1.39							
1.40							
1.41							
1.42							listens to a motor-bike outside
1.43							
1.44	there is a difference in the way she handled the dog and the other toy the coloured squares	asks if she can go out	distracted, hears something	distracted by motor-bike			
1.45							
1.46						she talks to her mother	
1.47		asks a question					
1.48							
1.49							
1.50							
1.51		doesn't seem to understand what mother is saying					
1.52	she's interested in finding out what the noise is outside						
1.53							
1.54							starts looking at the blocks on the floor again
1.55							
1.56							
1.57		seems attention is distracted by more toys					
1.58	inquisitive, she tries to put her foot in the object on the floor				putting her foot in the bowl		
1.59							
2.00	she decides to pick up a ball & it's a funny action				chucking the ball up in the air	she picks up the ball and throws it on her mother's head	picks up the ball and throws it on the mother's head

she throws it at her mother's head, probably just in fun.

41

Table 8

2 YEARS 4 MONTHS.   FINE.

Time in Secs.	1 Subject 9	2 Subject 10	3 Subject 20	4 Subject 28	5 Subject 39	6 Subject 49	7 Subject 53
1	putting blocks on top of each oth- er and look- ing at them	child's playing, picking up blocks			well, it's just fiddling with the blocks at the moment, no- thing in par- ticular		the child is playing with blocks
2			she's ex- amining the bricks	she's look- ing at the bricks			
3							
4							
5			and trying to put them together the two ends togeth- er	picking them up and exam- ining them			
6						seems to be pretty in- terested in the blocks, concentrat- ing on the individual blocks	
7							
8		puts them down and then she picks them up on her mother's directions					
9	picking up the blocks						
10							
11				she's put the brick down, she's looking at another one			puts the blocks back
12							
13			she's search ing for some more bricks to play with				
14							
15							
16							
17	she puts the blocks into the tray	she puts them in the second tray		she's reach- ing for one in the far corner			
18							
19							looks at dif- ferent blocks
20					now it's put- ting them in a basket	and sudden- ly her at- tention has turned to all the blocks, she wants to put all the blocks away	puts it in a basket
21			and she's putting them away	she's throw- ing them off the shelves			
22							
23							
24							starts putt- ing all the blocks in a basket
25							
26							
27			she's look- ing while she does it	she's throw- ing them off the shelves quite violent ly, she does- n't seem to care about them			
28							
29		still pick- ing them up and putting them in the					
30							

42

Time in Secs	1	2	3	4	5	6	7
31		tray					
32							
33	now she reaches for the dog						
34							
35			now she's not looking				
36							
37							
38	reaches now		and she's throwing them in harder				
39		turns her attention to the dog					
40	her attention is distracted						
41							
42						she's lost interested and her eye has been caught by the little toy dog	
43					now it's more interested in the dog		
44							
45		picks it up					picks up a dog and drops it
46				she's picked up a dog			
47			her attention is being diverted by the dog			and she's just described it to her mother	
48		passes it to her mother					
49	she likes the dog			seems to like it, showing affection for it			and plays with it
50							
51							
52							and gives it to her mother
53							
54		accepts it from her mother		showing it to her mother			
55							watches her mother playing with it
56							
57							
58	she decides to put it on the top shelf	places it on the top shelf					she holds the dog again
59							
1.00				doesn't really seem to		her mother's told her to	

43

Time in Secs	1	2	3	4	5	6	7
1.01				want to let him go		put the dog away, so she's just cast the dog aside and her mind's turned to other things now	
1.02							
1.03	she goes back to putting the blocks back on the shelf	she's found something interesting in the top shelf and moves it down to the middle medium shelf		she's put it on the top shelf	it's carrying on putting things away again		and puts it in the top basket
1.04							
1.05							
1.06							
1.07			she throws the dog down and is trying to put them together, corner to corner			she wants to put some blocks in the tray with the dog	then she gets another block and puts it in the second basket
1.08							
1.09							
1.10							
1.11							
1.12							
1.13					and it's getting very bored now		
1.14		returns her attention to the blocks					
1.15							she watches her mother playing with something and then picks up some more blocks
1.16							
1.17						I think she is looking for a particular colour block perhaps, or some particular block to put in with the dog	
1.18		picks them up and puts them next to the dog		she's showing some excitement at picking up a brick			
1.19							
1.20							
1.21							
1.22				she's throwing that into the top shelf			tries to fit two of the blocks together and puts them in the top basket
1.23							
1.24	she decides now that she's put the block in the wrong tray		and throws them at the door				
1.25							
1.26		moves them to the middle shelf					
1.27							
1.28							
1.29							then she puts another block into the second basket
1.30	she takes the dog and			now she's moved one from the top shelf into			

44

Time in Secs	1	2	3	4	5	6	7
1.31	and puts it also on that tray	moves the dog as well		the bottom shelf			and puts all the toys into the second basket
1.32			now she's putting them from the top to the middle				
1.33						now she's transferring the blocks	
1.34					it's rearranging the packing again	and the dog to the bottom tray and she insists on doing this, her mother told her to leave the dog there, but she's not interested in listening to her mother	
1.35			and she moves the dog	she's having to put the dog into the middle shelf			
1.36							
1.37				she doesn't want to leave it on the top shelf			
1.38		decides to rearrange the position of the blocks within the middle shelf as well	she handles the dog more gently this time				
1.39					it's trying to throw them up against the top basket		
1.40	now she hears a motor-bike or something						she then throws one of the blocks into the second basket, against the wall
1.41							
1.42		responds to stimulus of motor-bike in the background		she's throwing the bricks onto the middle shelf			
1.43						she heard a motor-bike, she becomes distracted by it and points her finger in that direction, and now she seems to go throught a very blank period, her mother talks to her but she's just glancing round the room	she then asks what a noise is outside
1.44					it wants to know what the noise outside is		
1.45			her attention's being distracted by the sound of a motor-bike				
1.46							
1.47		asks her mother what it is					
1.48							
1.49							
1.50							
1.51							
1.52							
1.53							
1.54							
1.55							she watches her mother telling her what to do
1.56	she sees the ball now		she seems bored now				
1.57		starts playing with the various objects on the ground			it's trying to fit its shoe into one of the blocks		
1.58	she picks it up and throws it			she's now putting her foot in a tin			
1.59							
2.00		throws a ball that she has picked up towards her mother and then fetches it.		she's picked up a ball, lobbed it at her mother	throws the ball around	attention attracted her, threw it at her mother, seems to have lost interest	Then picks up a ball and throws it so it hits her mother on the head 45

APPENDIX v

Tables 9 - 16

Linked verbal segments from subject's descriptions
for each 120 sec. action sequence viewed, for each
age group and within both "fine" and "natural"
conditions of instruction.

TABLE 9.

00:27:05   NATURAL

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Child is not interested in his mother something else has his attention. *Personal and exploratory.*			The child is fairly interested in what he is seeing. *Personal.*	Interest. *Personal.*	The baby seems to show interest in the doll crying. *Personal.*		Child showing interest in doll.	4	4 personal. 1 exploratory.
	The baby is staring at the doll. *Exploratory.*				It opens its eyes wide. *Exploratory.*	Child looking. *Exploratory.*	Looking at doll.	3	3 exploratory.
						Hands moving. *Movement.*		1	1 movement.
Reacts to noise. *Reactive*								1	1 reactive.
	She's making vocal sounds and smiling. *Vocal and personal.*	Baby laughs. *Personal.*	So he gives a smile. *Personal.*	He's happy. *Personal.*	Starting to laugh. *Personal.*	Laughing. *Personal.*	Laughing/smiling.	6	6 personal. 1 vocal.
Mother gets its attention for a minute. *Interactional.*								1	1 interactional

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						Moving. *Movement.*		1	1 movement.
	She's reacting to the sound of the doll. *Reactive.*			A little frightened about the whole thing. *Personal.*	Seems she's very interested in the doll. *Personal.*	Frightened. *Personal.*	Reacts to cry of doll.	4	3 personal. 1 reactive.
		Becoming playful. *Personal.*						1	1 personal.
	Now she's staring at the doll with enjoyment. *Exploratory and personal*		Smile again. *Personal.*	Laughter/ enjoyment. *Personal.*			Shows enjoyment.	3	3 personal. 1 exploratory.
			Smile dies. *Personal.*					1	1 personal.
			Surprise change there *Personal and reactive.*		The baby always blinks when the doll comes near it and its always sort of surprised at the cry of the doll. *Personal and reactive.*	Moves head back. *Movement.*	Reacts to cry of doll.	3	2 personal. 2 reactive. 1 movement.

47

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						Blinks eyes. *Movement.*		1	1 movement.
						Open mouth. *Movement.*		1	1 movement.
			Surprise again. *Personal.*					1	1 personal.
			And again. *Personal.*					1	1 personal.
END OF PLAYING WITH DOLL.									
	Now she's become distracted. *Personal.*	Baby is becoming restless. *Personal.*	Child is distracted. *Personal.*	Changed now. Saw something in background, *Exploratory.*	Showing disinterest in doll. *Personal.*		Disinterested/restless.	5	4 personal. 1 exploratory.
	She's turning her head towards it's mother. *Interactional.*			Looking at mother now. *Interactional.*	.	Child looking. *Exploratory.*	Looking at/turning to mother.	3	2 interactional. 1 exploratory.
END OF MOVING FROM DOLL TO MOTHER.									

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Now she's looking at the doll again and touching it. *Exploratory and instrumental.*	Reaches out for the doll. *Instrumental.*	Reaches out. *Instrumental*	Looking back at the doll again. *Exploratory.*	Starts to touch the doll again and to use its hands. *Exploratory and instrumental.*	Child grasping doll. *Instrumental*	Returns to handling doll.	6	3 exploratory. 5 instrumental.
Enjoys the toy. *Personal.*	Startled by its cry. *Personal.*		The sound affects him, he reacts to it. *Personal and reactive.*	Trying to discover what the noise is. *Heuristic.*			Affected by sound of doll.	4	3 personal. 1 reactive. 1 heuristic.
			Moves with his whole body in actual fact. *Movement.*					1	1 movement.
		It's trying to reach for the doll. *Instrumental.*			A little scared as to whether or not to try and feel it. *Personal and heuristic.*		Attempts at contacting doll.	2	1 instrumental. 1 personal. 1 heuristic.
			END OF APPROACH TO DOLL.						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Now its attention goes back to the mother and she attracts it with a toy. *Interactional.*	She's turning towards her mother again. *Interactional.*				The baby seems to be becoming restless. The attention shifts from the mother to the doll. *Exploratory.*	Moving restlessly. *Personal.*	Moves restlessly between mother and toy.	4	2 interactional. 1 exploratory. 1 personal.
END OF RESTLESS AND APPROACHES TO MOTHER PERIOD									
	Touching the doll. *Exploratory.*	It's holding the doll. *Instrumental.*	Reaches for the toy. *Instrumental.*				Returns to handling doll.	3	2 instrumental. 1 exploratory.
It's attracted by the noise. *Personal.*		It's jumping. *Movement.*	He's distracted. *Personal.*	Looks very scared about that, its appearance. *Personal.*	It's moving away from the doll now. *Instrumental.*	Looking away restless. *Personal.*	Distracted by noise of doll.	6	4 personal. 1 movement. 1 instrumental.
	Now she's looking over her mother's shoulder, putting her face into her mother's. *Interactional.*	It snuggles up to its mother. *Interactional.*	Goes to the mother. *Interactional.*				Cuddles up to mother.	3	3 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Reaching out for the doll again. *Interaction al.*					Grasping doll again. *Interaction-al.*	Handles doll again.	2	2 Interactional.
			END OF REACHES OUT FOR DOLL.						
	Looking in front of her. *Exploratory.*							1	1 exploratory.
	Looking around. *Exploratory.*							1	1 exploratory.
			He's not really in-terested in the toy now. *Personal.*					1	1 personal.
			Uncomfort-able. *Personal.*					1	1 personal.
			Moves away. *Movement.*			Moving. *Movement.*	Moves.	2	2 movements.
Attention back to its mother. *In-teractional.*								1	1 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Making vocal sounds *Vocal*		Makes a sound. *Vocal*				Makes sounds.	2	2 vocal.
		END OF DISINTERESTED/RESTLESS PERIOD							
		It's becoming playful again. *Personal.*						1	1 personal.
		It's a bit scared of the noise. *Personal.*	The sound now catches the child. *Reactive.*	Trying to make out the noise. *Heuristic.*			Reaction to cry of doll.	3	1 personal. 1 reactive. 1 heuristic.
	She's smiling again. *Personal.*							1	1 personal.
		END OF ATTENTION ON DOLL.							
It's mother wants the baby to play with the toy, it's not very interested. *Personal.*			Now the child's not interested again. *Personal.*		The doll's cries aren't nearly as interesting to the baby anymore. *Personal.*		Disinterested,	3	3 personal.

1	2	3	4	5	6	7	GLOSSES	No. of g's	FUNCTIONS
			END OF LOSS OF INTEREST IN DOLL.						
Goes back to its mother. *Interactional.*	She's now turned towards her mother. *Interactional.*		Goes to mother. *Interactional.*				Returns to mother.	3	3 interactional.
Attention back to toy. *Exploratory.*	Reaching out in front of her. *Instrumental.*	It's trying to reach for the doll, it wants to play with the doll. *Instrumental.*			It's touching the doll again. *Instrumental.*		Touches/ reaches out for the doll again.	4	3 instrumental. 1 exploratory.
						Moving hands and feet. *Movement.*		1	1 movement.
			END OF APPROACH TO DOLL						
				Uncomfortable. *Personal.*				1	1 personal.
It's not very interested. *Personal.*			Generally he's not interested in the toy. *Personal.*	Lost interest again. *Personal.*			Loses interest in doll again.	3	3 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			END OF LOSES INTEREST IN DOLL						
	Touching the lower limbs of the doll. *Exploratory.*	It's inspecting the doll, looking at its legs. *Exploratory.*		Feeling, again touch. *Exploratory.*	The interest doesn't seem to be in the cries as much as in the touch of the doll or the feel of it's mother. *Exploratory.*	Watching. *Exploratory.*	Exploring doll's legs.	5	5 exploratory.
It's attracted by the noise. *Exploratory.*								1	1 exploratory.
						Moving closer to the doll. *Instrumental.*		1	1 instrumental.
			END OF PLAYING WITH DOLL						
Something else has attracted it's attention *Exploratory.*			The sound doesn't affect him at all. Not looking. *Personal.*				Attention off sound of doll.	2	1 exploratory. 1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			Just look-ing down. He's not in-terested. *Personal.*					1	1 personal.
				END OF NO INTEREST IN DOLL					
	She's start-led again by the baby's cries. *Personal.*	It's sur-prised at the sound. *Personal.*	That sound caught him. *Reactive.*	Interested again. *Personal.*			Reacts to sound of doll.	4	3 personal. 1 reactive.
				Pleased. *Personal.*				1	1 personal.
				END OF REACTION TO DOLL'S CRIES					
						Moving head *Movement.*		1	1 movement.
Mother's ag-ain attract-ed attention with the feet of the toy. *Instrument-al.*	Her atten-tion is ag-ain becom-ing dis-tracted *Reactive.*			Found some-thing else now. *Instrumen-tal.*			Changes at-tention to feet of new toy.	3	1 interactional. 1 reactive 1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			Moves back wriggling. *Movement.*					1	1 movement.
			END OF CHANGE TO NEW TOY						

TABLE 10.

00:27:05 FINE.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Baby is just looking at doll. *Exploratory.*							1	1 exploratory.
			At the mo- its just trying to figure out what's hap- pening. *Heuristic.*					1	1 heuristic.
					She's not very much interested in it. *Instrument- al.*			1	1 instrumental.
	Everytime the doll squeaks it takes no- tice. *Exploratory*	Closes its hand, blinks its eyes, moves back. *Movement.*			She's kind of scared of the doll. *Personal.*		Reaction to cry of the doll.	3	1 exploratory 1 movement. 1 personal.
			It's aware of something being pres - ent. *Personal.*					1	1 personal.

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1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	And its laughing at the moment. *Personal.*		Now its smiling and moving. *Personal and movement.*	There's definitely fascination there. *Personal.*	Now she's starting to smile. *Personal.*	It's been attracted to the doll and laughing. *Exploratory and Personal*	Pleasurable reaction to the doll.	5	5 personal. 1 movement. 1 exploratory.
Baby now looking at doll. *Exploratory.*	Still looking at the doll *Exploratory*						Looking at doll.	2	2 exploratory.
		Leans back. *Movement.*						1	1 movement.
	It's laughing again. *Personal.*	Blinks its eyes and laughs, moves back, Laughs. *Personal and Movement.*	Now laughing. *Personal.*	There's a bit of surprise and happiness at discovering something. *Personal.*	She's getting very excited about the doll. *Personal.*	Its laughing again. *Personal.*	Laughing/ excitement in response to doll.	6	6 personal. 1 movement.
		Leans back. *Movement.*						1	1 movement.
Smiling. *Personal.*	Seems to laugh as it comes closer. *Personal.*	Opens its mouth, laughs. *Movement and personal.*	Now shows surprise. *Personal.*	Again he's showing more kind of pleasure *Personal.*		Surprised. *Personal.*	Pleasurable reaction to doll.	6	6 personal. 1 movement.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Opens it's hands. *Movement.*						1	1 movement.
It's laughing. *Personal.*	And smiling. *Personal.*	Laughs. *Personal.*					Shows pleasure.	3	3 personal.
		Moves back. *Movement.*				And moving back. *Movement.*	Moves back.	2	2 movement.
	It's just looking at the doll's face. *Exploratory*							1	1 exploratory.
				Fascination as well. *Personal.*				1	1 personal.
					She's not so scared of it anymore. *Personal.*			1	1 personal.
			END OF PLAYING WITH DOLL						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
It's moving away from it. *Instrumental*		Moves its head. *Movement.*					Moving from doll.	2	1 instrumental. 1 movement.
	Now it's lost interest. *Personal.*							1	1 personal.
Smiling and moving at the same time. *Personal and movement.*		Moves its head back. *Movement.*	Now it seems to turn it's head towards its mother. *Interactional.*		She turns to look at her mother. *Interactional.*	Moves towards its mother. *Interactional.*	Smiling and turning to mother.	5	3 interactional. 1 personal. 2 movement.
				He's going into a despondency but seems to be aroused by it. *Personal.*				1	1 personal.
		END OF MOVING TO MOTHER							
	Now it's looking at the doll again. *Exploratory.*							1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Now it's wanting to touch the doll. *Instrumental.*	Puts its hand forward *Exploratory.*	It actually feels the doll. *Exploratory.*		Now she's holding the doll. *Instrumental.*	Holds its hand out to the doll. *Instrumental.*	Handles doll	5	2 exploratory. 3 instrumental.
Looks surprised. *Personal.*	But when it squeaked it stopped. *Instrumental*	Gets a fright. *Personal.*					Surprised/ frightened reaction to doll.	3	2 personal. 1 instrumental.
			END OF APPROACH TO DOLL						
			Now it's looking round a bit. *Exploratory.*					1	1 exploratory.
		Laughs. *Personal.*	It laughs. *Personal.*				Laughing.	2	2 personal.
		Moves back. *Movement.*						1	1 movement.
		Moves back. *Movement.*						1	1 movement.
	Just looking at the doll again. *Exploratory.*							1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Turns ar-ound. *Movement.*			She looks at her moth-er again. *Interaction-al.*	Moves to-wards its mother. *Interaction-al.*	Moves to-wards moth-er.	3	1 movement. 2 interactional.
Not inter-ested in the doll. *Personal.*	Now it's looked away. It's lost inter-est again. *Personal.*						No interest in doll.	2	2 personal.
			END OF RESTLESS PERIOD						
	Now it's gone back to the doll. *Instrument-al*				(Looks) back at the doll. *Exploratory.*		Looks back at doll.	2	1 instrumental. 1 exploratory.
It's touch-ing the doll. *Exploratory.*	Now it's trying to hold the doll. *Instrumen-tal.*	Touches it. *Exploratory.*	Now it starts feel-ing again. *Exploratory*	Again he's just attem-pting to touch the doll. *Exploratory*	She touches the doll. *Exploratory.*	Holds the doll. *Instrument-al.*	Handles doll.	7	5 exploratory. 2 instrumental.
			END OF APPROACH TO DOLL						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Moves back. *Movement.*						1	1 movement.
	Now its lost interest again. *Personal*	Looks away. Looks away. *Instrumental.*	Turns towards its mother. *Interactional.*	And then he goes back towards the comfort of the mother. *Interactional.*	Away from the doll, looks away from the doll. *Instrumental.*	Moves away from the doll towards its mother. Cuddles up to the mother. *Instrumental and Interactional.*	Attention turns from doll to mother.	6	1 personal. 3 interactional. 3 instrumental.
			END OF APPROACH TO MOTHER						
Looking at its head. *Exploratory.*	It's looking at the doll again. *Exploratory.*						Looking at doll.	2	2 exploratory.
		Touches it again. *Exploratory.*			Touches the doll again. *Exploratory.*	Puts out its hand towards the doll again. *Instrumental.*	Touches doll	3	2 exploratory. 1 instrumental.
			END OF APPROACH TO DOLL						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Looks away. *Instrument-al.*			Now she looks away from it *Instrument-al.*		Looking away	2	2 instrumental.
Moving away. *Movement.*		Moves back. *Movement.*					Moving away.	2	2 movement.
Looking at mother. *Interaction-al.*								1	1 interactional.
				Struggling too, prob-ably bore-dom. *Personal.*				1	1 personal.
						Becomes dis-interested. *Personal.*		1	1 personal.
		Blinks its eyes. *Movement.*						1	1 movement.
			END OF RESTLESS/DISINTERESTED PERIOD						
Touching the doll. *Exploratory.*		Closes its fingers. *Movement.*					Touching/ holding doll	2	1 exploratory. 1 movement.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Still look-ing. *Exploratory*.							1	1 exploratory.
		END OF MOMENTARY RETURN TO DOLL							
Moving away from it. *Movement*.								1	1 movement.
Turning his head away. *Movement*.								1	1 movement.
			Now its stiffening up. *Movement*.					1	1 movement.
				And again his atten-tion is aroused. *Reactive*.				1	1 reactive.
		Opens its hands. *Movement*.						1	1 movement.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Now it's losing interest again. *Personal.*				Now she's not interested anymore, she's looking at the teddybear. *Personal and Exploratory.*		Loses interest in doll.	2	2 personal. 1 exploratory.
		Moves back. *Movement.*						1	1 movement.
			END OF LOSING INTEREST IN DOLL						
		Moves forward. *Movement.*				Moves towards the doll. *Instrumental.*	Moves towards doll.	2	1 movement. 1 instrumental.
			Using its hands. *Movement.*					1	1 movement.
			END OF MOMENTARY MOVE TOWARDS DOLL						
	It's getting restless as well. *Personal.*							1	1 personal

1	2	3	4	5	6	7	GLOSSES	NO. of S's	FUNCTIONS
		Turns away. *Movement.*		And withdrawing into his mother. *Interactional.*		(Moves) towards his mother. *Interational.*	Turns to mother.	3	1 movement 2 interactional.
			END OF TURNING TO MOTHER						
			She looks pleasantly surprised at the action. *Personal.*					1	1 personal.
Touching it again. *Exploratory.*								1	1 exploratory.
		Moves its hand forwards. *Movement.*						1	1 movement.
			END OF MOMENTARY ATTENTION TO DOLL						
Looking past it. *Exploratory.*								1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				END OF INDECISIVE PERIOD					
					She looks back at the doll. *Exploratory.*			1	1 exploratory.
					She's play-ing with the doll. *Instrument-al.*			1	1 instrumental.
		Moves it's hand. *Movement.*						1	1 movement.
Looking at the doll ag-ain. *Exploratory.*					She looks back at the doll. *Exploratory.*		Looking at doll.	2	2 exploratory.
	Now it's getting in-terested again. *Personal.*							1	1 personal.
	It's play-ing with it's feet, the doll's feet. *Instrumental*			Now he's in-vestigating the doll's legs quite intently. *Heuristic.*	Holding it. She's play-ing with the doll. *In-strumental.*	Holds it's mother's hand and the doll's leg. *Interaction-al and In-strumental.*	Playing with doll's legs.	4	3 instrumental. 1 interactional. 1 heuristic.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Moves its head for-ward. *Movement.*						1	1 movement.
			I think it's a very in-teresting aspect the way he feels to try to be aware ex-actly if the doll is the-re. It's what he finds so confusing. *Exploratory and Person-al.*					1	1 exploratory. 1 personal.
Smiling. *Personal.*								1	1 personal.
		Moves back. *Movement.*						1	1 movement.
		Moves it's hand. *Movement.*						1	1 movement.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Touching it. *Exploratory*.								1	1 exploratory.
	Just looking at the doll again. *Exploratory*.							1	1 exploratory.
Looking at his mother. *Interaction-al*.								1	1 interactional.
		Lifts its head. *Movement*.						1	1 movement.
		Opens its mouth. *Movement*.						1	1 movement.
Touching the doll's feet. *Exploratory*.								1	1 exploratory.
	Everytime it squeaks it looks up. *Exploratory*.			But again he's getting distracted by the other noise of the doll. *Reactive*.			Reacts to sound of doll.	2	1 exploratory. 1 reactive.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					She's lost interest in the doll. She's look-ing away from it more often. *Personal.*			1	1 personal.
					END OF PLAYING WITH DOLL				
		Moves back. *Movement.*						1	1 movement.
					She wants the teddy-bear. *Instrument-al.*			1	1 instrumental.
					END OF CHANGE OF NEW TOY				

TABLE 11

00:39:03   NATURAL

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Picks up the block. *Instrumental.*			It's playing with a brick. *Instrumental.*	Child picks up the brick. *Instrumental.*	Picks up/ plays with block.	3	3 instrumental.
		And drops it. *Instrumental.*	Baby puts down the toy it's holding. *Instrumental.*	Child's just dropped a block. *Instrumental.*		Drops it. *Instrumental.*	Drops block.	4	4 instrumental.
				END OF PLAYING WITH BLOCK					
			And changes its attention. *Exploratory.*	Attention is now on another toy. *Exploratory.*	Changes its attention to the dog on the cart. *Exploratory.*		Attention changes to dog.	3	3 exploratory.
Well, at the moment the baby is just looking around. *Exploratory.*								1	1 exploratory.
Now its focussed on a little trolley *Exploratory.*					Concentrating on the cart. *Exploratory.*		Concentration changes to dog.	2	2 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Gets onto his knees. *Movement.*	He crawls towards the pull-along toy. *Instrumental.*	Started crawling towards it. *Instrumental.*			Crawls towards dog.	3	2 instrumental. 1 movement.
			END OF APPROACH TO DOG.						
	(Focus) now on the ring-toy. *Exploratory.*	Grabs object in the foreground here. *Instrumental.*	Changes its attention towards another toy. *Exploratory.*	But it's distracted by something else. *Reactive.*	And now changing its attention towards the pyramid. *Exploratory.*		Attention on ring-toy.	5	3 exploratory. 1 instrumental. 1 reactive.
				Picks it up. *Instrumental.*		Child picks up the rings. *Instrumental.*	Picks up ring-toy	2	2 instrumental.
		Drops it. *Instrumental.*	And throws it away. *Instrumental.*	And drops it. *Instrumental.*		And throws them out of the way. *Instrumental.*	Drops rings.	4	4 instrumental.
			END OF PLAYING WITH RINGS						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				It's again attracted by the duck. *Exploratory.*	And now attention goes back to the dog on the cart. *Exploratory.*		Attention back to dog.	2	2 exploratory.
	Still concentrating on the trolley. *Exploratory.*				Attention is still on the dog on the cart. *Exploratory.*		Attention on dog continues.	2	2 exploratory.
			Now tries to grab for the toy. *Instrumental.*					1	1 instrumental.
		Grabs for the rope. *Instrumental.*	And now for the string. *Instrumental.*	He holds the pulling cord. *Instrumental.*		Directs his attention to the string attached to the dog. *Exploratory.*	Grabs/holds string attached to dog.	4	3 instrumental. 1 exploratory.
			END OF PLAYING WITH DOG						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				But is again distracted. *Reactive.*				1	1 Reactive.
Now the baby's not looking at the toys anymore but looking at the general surroundings. *Exploratory.*	Just generally looking around, nothing specific. *Exploratory.*	Looking around. *Exploratory.*	Looks around. *Exploratory.*				Looks around.	4	4 exploratory.
			END OF LOOKING AROUND						
					Seems to be changing it's attention towards the block on the right. *Exploratory.*			1	1 exploratory.
					Now seems to be feeling for the block. *Exploratory.*			1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				Picks up the block next to him. *Instrumental.*	And grabs the block. *Instrumental.*	Goes back to playing with the original block. *Instrumental.*	Plays with block.	3	3 instrumental.
			Still looks but now at his mother. *Interactional.*					1	1 interactional.
		Just looking around. *Exploratory.*						1	1 exploratory.
Now the interest is being brought back to the toys again. *Reactive.*								1	1 reactive.
		Puts an object in the mouth. *Instrumental.*		Puts it to his mouth. *Instrumental.*	Moves the block to its mouth. *Instrumental.*		Puts block in mouth.	3	3 instrumental.
		Drops it. *Instrumental.*	Throws away the block. *Instrumental.*	and drops it. *Instrumental.*			Drops block.	3	3 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					She has the attention on the block. *Exploratory*.			1	1 exploratory.
		Picks it up again. *Instrument-al*.		Picks it up again. *Instrument-al*.			Picks up block.	2	2 instrumental.
		And drops it. *Instrument-al*.		And drops it. *Instrument. al*.		Throws block aside. *Instrument-al*.	Drops block.	3	3 instrumental.
			END OF PLAYING WITH BLOCK						
				Again takes hold of the cord. *Instrument-al*.				1	1 instrumental.
	Now it's directed its atten-tion toward the duck. *Exploratory*.				The atten-tion now moves toward a plastic duck *Exploratory*.		Attention on duck.	2	2 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Grabs the duck. *Instrumental.*	Picks up another toy. *Instrumental.*	And then (takes hold of) another toy. *Instrumental.*	Which it picks up. *Instrumental.*	And pursues the duck. *Instrumental.*	Plays with duck.	5	5 instrumental.
		Drops it. *Instrumental.*						1	1 instrumental.
	Concentrating on that at the moment. *Exploratory*				And is studying it. *Heuristic.*		Concentrating on duck.	2	1 exploratory. 1 heuristic.
				Holds it in its hands and puts it to its mouth. *Instrumental.*				1	1 instrumental.
		Picks it up again. *Instrumental.*						1	1 instrumental.
				Puts it down. *Instrumental.*				1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTION
		Starts making a noise (vocal and non-vocal). *Instrumental and vocal*			Starts talking and hitting the duck. *Instrumental and vocal*		Hitting duck (noisily) and vocalizing.	2	2 instrumental. 2 vocal.
				Picks it up. *Instrumental.*				1	1 instrumental.
			Seems to have got excited now. *Personal.*					1	1 personal.
					The attention is fixed on the duck. *Exploratory.*			1	1 exploratory.
		Drops the duck. *Instrumental.*		Drops it. *Instrumental.*		Throws duck aside. *Instrumental.*	Drops duck.	3	3 instrumental.
				END OF PLAYING WITH DUCK					
		Seems to have spotted something else. *Exploratory*						1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Now the baby is moving away from the toys, to go and look at something else. *Locomotory and Instrumental.*	It's making its way towards it. *Instrumental.*	Starts crawling. *Locomotory.*	Crawls right over to the edge of the room. *Locomotory.*	Crawls off. *Locomotory.*	Now the attention changes and it moves over towards the right of the screen towards some other object. *Instrumental.*	And crawls. *Locomotory.*	Crawls – moves away.	7	3 instrumental. 5 locomotory.
			END OF MOVING AWAY						
	It's playing with the brick now. *Instrumental.*	Picks up a block, puts it in its mouth. *Instrumental.*	Puts a block in its mouth. *Instrumental.*	Picks up something else and puts it in its mouth. *Instrumental.*	And she picks up some object which seems to be a block. Starts chewing it. *Instrumental.*	Picks up another block. *Instrumental.*	Plays with block.	6	6 instrumental.
				Holds it in both hands. *Instrumental.*				1	1 instrumental.
				Knocks against his other hand. *Instrumental*	Starts hitting the block *Instrumental*		Knocking/ hitting block.	2	2 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Looks at it. *Exploratory.*						1	1 exploratory.
		Eats it. *Instrument-al.*						1	1 instrumental.
Now just looking around at the general surroundings again. *Exploratory.*								1	1 exploratory.
		Puts it in its mouth. *Instrument-al.*		Puts it to his mouth. *Instrument-al.*	And now starts chewing the block. *Instrument-al.*		Puts block to mouth.	3	3 instrumental.
			END OF PLAYING WITH BLOCK						

TABLE 12.

00:39:03   FINE.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		The child is holding the block. *Instrumental*						1	1 instrumental.
		She drops the block. *Instrumental*						1	1 instrumental.
		END OF PLAYING WITH BLOCK							
		And her attention is focussed on a doggy - duck idea. *Exploratory.*		The baby's attention has changed to the duck or the dog. *Exploratory.*			Changes attention to duck.	2	2 exploratory.
She's now looking at the trolly. *Exploratory.*	Her interest's on the moving object. *Exploratory.*	She's watching it being pulled along. *Exploratory.*					Looking at duck moving.	3	3 exploratory.
		Her focus of attention is on the duck. *Exploratory.*		It's interested in the movement. *Exploratory.*			Continues to watch duck moving.	2	2 exploratory.
		END OF ATTENTION ON DUCK							

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Now she's looking at those rings. *Exploratory.*	Now on a pile of toys. *Exploratory.*	Now her attention is moved towards a toy with round rings. *Exploratory.*	Baby shifted attention from dog to another toy. *Exploratory.*	It's seen something else; a pile of rings. *Exploratory.*		Baby now interested in the object in front of him. *Exploratory.*	Changes attention to ring-toy.	6	6 exploratory.
Now she's picked them up. *Instrumental.*								1	1 instrumental.
			END OF PLAYING WITH RING-TOY						
Her whole attention is on the trolly, the duck. *Exploratory.*	And then on moving object. *Exploratory.*	She's discarded that and her attention is back on the duck. *Instrumental and exploratory.*	Attention goes back to the dog. *Exploratory.*	It discards that in favour of the thing that moves. *Instrumental.*			Attention on duck.	5	4 exploratory. 2 instrumental.
		Now she's glancing at her mother. *Interactional.*						1	1 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						Stops looking at the dog. *Instrumental.*		1	1 instrumental.
She's trying to grasp. When she can't she loses interest. *Instrumental.*		She's looking at the string, her attention wavers again. *Exploratory.*	Attention is not on anything it seems to be in a world of its own. *Personal.*				Momentary approach to duck and then it loses interest again.	3	1 instrumental. 1 exploratory. 1 personal.
			END OF PLAYING WITH DUCK						
She's now looking for something else to play with. *Exploratory.*		She's looking around her. *Exploratory.*		It's looking around for something else, something that's not shown on the screen. *Exploratory.*		And looks round the room. *Exploratory.*	Looking around.	4	4 exploratory.
	Her interest's on the block which competes, I expect. *Exploratory.*							1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	NO. of S's	FUNCTIONS
		Focusses her attention on the duck. *Exploratory*.						1	1 exploratory.
	(Interest on) a block. *Exploratory*.							1	1 exploratory.
			END OF SEARCHING PERIOD						
		Glances at her mother. *Interactional*.		Its attention changes back to its mother. *Interactional*.			Attention on mother.	2	2 interactional.
		Her attention is now focussed on her mother bashing the end of the duck around. *Interactional*.				Focusses on the noise the mother is making. *Interactional*.	Focussing on the noise made by the mother.	2	2 interactional.
			END OF ATTENTION TO MOTHER						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Her attention is now on a block which she is sticking in her mouth. *Exploratory and Instrumental.*	Attention brought back to the block. *Exploratory*		The child's attention does not seem drawn to the object in front of her but instead to the smaller object. *Exploratory.*	(Focus) now on block. *Exploratory*	Attention on block.	4	4 exploratory. 1 instrumental.
				(Attention) again to the moving thing. *Exploratory.*				1	1 exploratory.
		She's discarded the block. *Instrumental.*		Discards a block. *Instrumental.*		Now moves across, losing interest in block. *Instrumental and locomotory.*	Discards block.	3	3 instrumental. 1 locomotory.
				END OF PLAYING WITH BLOCK					
		She glanced at the duck. *Exploratory.*	Attention goes back to dog. *Exploratory.*				Attention on duck.	2	2 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		And now she's picked up the block again. *Instrumental*						1	1 instrumental.
	Interest in the moving object. *Exploratory.*							1	1 exploratory.
		Her attention is on the string. *Exploratory.*						1	1 exploratory.
	(Interest) then on the duck. *Exploratory.*	Now she's looking at another duck. *Exploratory.*	Attention to duck. *Exploratory.*	Attention to the duck *Exploratory.*		And focussing on the duck. *Exploratory.*	Attention on duck.	5	5 exploratory.
She's now picking up another duck. *Instrumental.*					She reaches out for another object, not right in front of her but next to her mother. *Instrumental.*		Picks up duck.	2	2 instrumental.
		She's looking around her. *Exploratory.*						1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Now her attention's focussed on the duck again. *Exploratory.*						1	1 exploratory.
		She's putting the duck in her mouth. *Instrumental.*						1	1 instrumental.
		She's smiling at something in the background. *Personal.*						1	1 personal.
		Now she's playing with the duck. *Instrumental.*						1	1 instrumental.
						Loses interest in the duck. *Instrumental.*		1	1 instrumental.
			END OF PLAYING WITH DUCK						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Some interest in the block which is far away. *Exploratory.*	Something has caught her attention. *Exploratory.*	Baby attracted to something completely different. *Exploratory.*		Her attention is drawn to an object further away from her. *Exploratory.*		Attention on block.	4	4 exploratory.
She's now moving towards another block. *Instrumental.*		And she's crawling towards it, it's out of the picture. *Locomotory and Instrumental.*	Moves right away. *Locomotory.*	Baby's going after something, I can't see. *Instrumental.*		And moves away. *Locomotory.*	Moves after block.	5	3 instrumental. 3 locomotory.
				It seems to have turned back towards its mother. *Interactional.*				1	1 interactional.
		She's found what she's looking for. *Instrumental.*				Finds another block. *Instrumental.*	Finds block.	2	2 instrumental.
She's feeling and touching it. *Exploratory.*								1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		She puts it in her mouth. *Instrument-al.*			And places the object in her mouth. *Instrument-al.*		Puts block in mouth.	2	2 instrumental.
		She's con-centrating on the lit-tle object, plays with it. *Exploratory and Instru-mental.*						1	1 exploratory. 1 instrumental.
		She's glan-cing away but still playing with it. *Exploratory and Instru-mental.*						1	1 exploratory. 1 instrumental.
				She's found something else, blocks to bang to-gether. *Instrumental*				1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		Sticking it in her mouth. *Instrument-al.*						1	1 instrumental.
She's con-tinuing/look-ing back to-wards her mother. *Interaction-al.*								1	1 interactional.
			END OF PLAYING WITH BLOCK						

TABLE   13

1:13:04   NATURAL.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
The child's picking up the ball and throwing it. *Instrumental.*	He's playing with the ball. *Instrumental.*	The child's bouncing the ball. *Instrumental.*	Child bounces the ball. *Instrumental.*	Child is now bouncing the ball *Instrumental.*	Bounces ball *Instrumental.*	Bouncing the ball. *Instrumental.*	Bouncing ball.	7	7 instrumental.
Looking for it. *Exploratory.*								1	1 exploratory.
Picking it up again. *Instrumental.*								1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Throwing it. *Instrument-al.*								1	1 instrumental.
				He's con-centrating on the ball *Heuristic.*				1	1 Heuristic.
It's kicking it with its feet and run-ning after it. *Instrumental and Locomot-ory.*		His concen-tration changes when he starts to kick the ball *Instrument-al.*	Kicks the ball. *Instrument. al.*		He kicks the ball. *Instrument. al.*	Kicking it now. *Instrument. al.*	Kicks the ball.	5	5 instrumental. 1 locomotory.
Picking it up. *Instrument-al.*			He picks it up/to throw it. *Instrument-al.*				Picks up ball.	2	2 instrumental.
					Was going to throw the ball to his mother but decides not to. *Instrument-al.*			1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		He's still concerned with kick-ing the ball *Instrument-al.*						1	1 instrumental.
Throwing it. *Instrumental.*			Throws the ball. *Instrument-al.*	Now throws the ball. *Instrument-al.*		Throwing the ball. *Instrument-al.*	Throws the ball.	4	4 instrumental.
Commenting on where it's gone. *Informative.*	Now he's shouting at the ball. *Regulatory.*						Shouts aft-er ball.	2	1 informative. 1 regulatory.
Running to-wards it. *Instrument-al.*			Goes towards the ball to pick it up. *Instrument-al.*	He picks it up. *Instrument-al.*	Fetches the ball. *Instrument-al.*		Fetches ball	4	4 instrumental.
	Now he's playing with it again. *Instrument-al.*							1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	NO. of S's	FUNCTIONS
Tipping it over the bannister. *Instrumental.*		Now he changes his game to throwing the ball over the wall. *Instrumental.*	Throws it over the ledge. *Instrumental.*	Throws it over the fence. *Instrumental.*	Drops it. *Instrumental.*	Throwing the ball over the edge of something. *Instrumental.*	Throws ball over fence.	6	6 instrumental.
				He's surprised to see it come back. *Personal.*				1	1 personal.
And can't get it. *Instrumental.*								1	1 instrumental.
Found a way to get it. *Instrumental.*					Finds the ball. *Instrumental.*		Finds ball.	2	2 instrumental.
			Picks up the ball. *Instrumental.*			Picking up the ball again. *Instrumental.*	Picks up ball.	2	2 instrumental.
	Now it's speaking with its mother. *Interactional.*		He calls. *Instrumental.*				Speaks/ calls.	2	1 interactional. 1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						And kicking it. *Instrumental.*		1	1 instrumental.
Now his attention is back on the ball for a moment. *Exploratory.*								1	1 exploratory.
Throwing the ball towards it's mother. *Interactional.*			Throws the ball. *Instrumental.*		Attempts to throw the ball to his mother. *Interactional.*		Throws ball to mother.	3	2 interactional. 1 instrumental.
END OF PLAYING WITH BALL									
It's lost interest in the ball and picking up the doll. *Instrumental.*	Now he's changed to the doll. *Exploratory.*	He now picks up the doll and his concentration has changed from kicking the ball. *Instrumental and personal.*	Mind is attracted to the doll. *Exploratory.*	Now he switches his interest from the ball to a doll. *Exploratory.*	Finds the doll. *Instrumental.*	Loses interest and going to a doll. *Instrumental.*	Loses interest in ball and changes to play with doll.	7	3 exploratory. 4 instrumental. 1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Giving it a hug. *Interactional*								1	1 interactional.
						Bending the doll. *Instrumental*.		1	1 instrumental.
		He's interested in the doll. *Exploratory*						1	1 exploratory.
Examining it. *Heuristic*.								1	1 heuristic.
			Looks at the ball. *Exploratory*.					1	1 exploratory.
Tipping it over to hear the noise. *Instrumental*.			He wants the doll to make a sound. *Regulatory*.	Interested in the doll crying. *Exploratory*.	Tries to make the doll talk. *Regulatory*.	Bending the body again to make a noise. *Regulatory*.	Makes doll cry.	5	3 regulatory. 1 instrumental. 1 exploratory.
It's lost interest in the doll. *Personal*.		He now loses interest in the doll. *Personal*.		Now loses interest in the doll. *Personal*.	Forgets about the doll. *Personal*.	Loses interest in the doll. *Personal*.	Loses interest in the doll.	5	5 personal.
			END OF PLAYING WITH DOLL						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
.	Now his attention is on the ball again. *Exploratory.*	And is again concentrating on the ball. *Exploratory.*		And changes (interest) to the ball. *Exploratory.*	And carries on with the ball. *Instrumental.*		Changes back to ball.	4	3 exploratory. 1 instrumental.
Kicking the ball again. *Instrumental.*				and kicks it. *Instrumental.*		Kicking the ball. *Instrumental.*	Kicks ball.	3	3 instrumental.
				Leaves the doll. *Instrumental.*				1	1 instrumental.
	He's lost the attention on the ball. *Personal.*	He seems to lose his concentration here quicker. *Personal.*		Leaves the ball. *Instrumental.*		Losing interest in the ball. *Instrumental.*	Loses interest in ball	4	2 personal. 2 instrumental.
END OF PLAYING WITH BALL									
It's found the train/ – investigating it. *Heuristic.*	Playing with an engine. *Instrumental.*	Plays with the train, it gains his attention for a while. *Instrumental.*	Attracted by a truck. *Exploratory*	And pulls out a train. *Instrumental.*	Inspects the train. *Heuristic.*	And going to a truck. *Instrumental.*	Starts playing with train.	7	4 instrumental. 2 heuristic. 1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Something's caught his attention, has dropped it (the train) and lost interest. *Exploratory and Instrumental.*	Now he's lost attention on the engine. *Personal.*		He leaves the truck. *Instrumental.*	Leaves the train. *Instrumental.*		Losing interest in the truck. *Personal.*	Loses interest in the train.	5	3 instrumental. 2 personal. 1 exploratory.
			END OF PLAYING WITH TRAIN						
Found a block. *Instrumental.*	And gone back to a block. *Instrumental.*	Until he becomes interested in a block. *Exploratory.*	And goes towards a block. *Instrumental.*	And turns to a block. *Instrument. al.*	Discovers a car. * *Exploratory.*	Picking up the block. *Instrumental.*	Starts to play with the block.	7	5 instrumental. 2 exploratory.
It's feeling it, looking at it. *Exploratory.*								1	1 exploratory
Lost interest in block. *Personal.*								1	1 personal.
			END OF PLAYING WITH BLOCK						

* Mistaken for "block".

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	His attention is immediately converted to is mother, back to the block and then away again. *Interactional and exploratory.*	Although when his mother starts talking to him he forgets about the block. *Interactional.*		Now listens to his mother. *Interactional.*			Momentarily listens to mother.	3	3 interactional. 1 exploratory.
		He's now thinking about calling "Ida". *Imaginative.*	And thinks of Ida. *Imaginative.*	Looks round to see where Ida is. *Imaginative.*			Thins about looks for Ida.	3	3 imaginative.
			END OF CONCERN WITH IDA						

TABLE 14.

1:13:04   FINE

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	It's standing still. *Physical* (*Opposite of movement.*)							1	(Physical) movement.
		The baby is holding the ball. *Instrumental.*				The child is holding the ball. *Instrumental.*	Holding the ball.	2	2 instrumental.
Bounces the ball. *Instrumental.*	Bouncing the ball. *Instrumental.*	He bounces it once. *Instrumental.*	Bouncing ball. *Instrumental.*	He's bouncing the ball. *Instrumental.*	Baby throws the ball down. *Instrumental.*	He throws it down. *Instrumental.*	Bounces the ball.	7	7 instrumental.
	Going towards the table. *Instrumental.*							1	1 instrumental.
	Reaching under it. *Instrumental.*							1	1 instrumental.
Picks the ball up. *Instrumental.*	Grabbing the ball. *Instrumental.*	He's picking up the ball again. *Instrumental.*	Picks up the ball. *Instrumental.*		Picks it up. *Instrumental.*	He picks it up again. *Instrumental.*	Picks up ball.	6	6 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				He's changed his thoughts about kicking it. *Personal*.				1	1 personal.
					Looks at it. *Exploratory*.			1	1 exploratory.
Bounces again. *Instrumental*.	Letting it go again. *Instrumental*.	Drops again. *Instrumental*.	Bounces it down again. *Instrumental*.		Throws it down. *Instrumental*.	He throws down again. *Instrumental*.	Bounces ball again.	6	6 instrumental.
		He's obviously finding it fascinating dropping the ball. *Personal*.						1	1 personal.
					Makes a sound. *Vocal*.			1	1 vocal.
Turns around. *Locomotory*.								1	1 locomotory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Following the ball. *Instrumental.*							1	1 instrumental.
	Kicking it. *Instrumental.*		Kicks the ball. *Instrument.*	He's kicked it. *Instrumental.*		He kicks the ball. *Instrumental.*	Kicks the ball.	4	4 instrumental.
Runs after it. *Instrumental.*	Going toward the corner. *Instrumental.*	He's now following the ball with the intention of picking it up again. *Instrumental.*			Follows the ball. *Instrumental.*	And he runs happily towards the ball. *Personal and Instrumental.*	Follows/runs after the ball.	5	5 instrumental. 1 personal.
					Laughs. *Personal.*			1	1 personal.
Picks up the ball. *Instrumental.*	Picking up the ball. *Instrumental.*		Picks it up again. *Instrumental.*	Now he picks it up *Instrumental.*	Picks up the ball. *Instrumental.*		Picks up the ball.	5	5 instrumental.
Turns around. *Locomotory.*	Going towards mummy. *Interactional.*		Walks towards mother. *Interactional.*		Looks towards his mother. *Interactional.*	He turns towards his mother. *Interactional.*	Turns to his mother.	5	4 interactional. 1 locomotory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				And thinks about throwing it. *Personal.*		But he does not want to throw the ball to her. *Instrumental.*	Thinks about throwing ball.	2	1 personal. 1 instrumental.
		He's obviously finding it very exciting - the whole game. *Personal.*						1	1 personal.
	Holding the ball. *Instrumental.*							1	1 instrumental.
Sends ball back - bounces it. *Instrumental.*	Throwing it. *Instrumental.*	He throws it once again. *Instrumental.*	Throws the ball on the floor. *Instrumental.*	He's throwing it. *Instrumental.*	Throws it across the room. *Instrumental.*	He throws the ball away. *Instrumental.*	Throws ball.	7	7 instrumental.
	Walking backwards. *Locomotory.*							1	1 locomotory.
Points, points. *Instrumental.*			Points to the ball. *Instrumental*				Points to ball.	2	2 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Contemplating. *Personal.*							1	1 personal.
Talks. *Vocal.*			I think he is trying to express himself as to what he has done. *Personal/ Informative.*		And makes verbal sounds *Vocal.*	Asks his mother for the ball. *Interactional.*	Talking.	4	2 vocal. 1 personal. 1 informative. 1 interactional.
Runs after the ball. *Instrumental.*	Running forwards *Locomotory.*		Runs toward the ball to fetch it. *Instrumental.*	He goes to fetch it when his mum says so. *Interactional and Instrumental.*	Goes to fetch the ball. *Instrumental.*	Then he runs towards the ball after his mother asked him to do so. *Interactional / Instrumental.*	Fetching ball.	6	5 instrumental. 1 locomotory. 2 interactional.
Picks the ball up. *Instrumental.*	Holding the ball up. *Instrumental.*	He now picks up the ball. *Instrumental.*	Picks it up. *Instrumental.*	He picks it up. *Instrumental.*	Picks it up. *Instrumental.*	He picks the ball up. *Instrumental.*	Picks up ball.	7	7 instrumental.
Pushes it over. *Instrumental.*	Dropping it letting it go. *Instrumental.*	And drops it over the edge of the little playpen wall. *Instrumental.*	Throws it over the fence/gate. *Instrumental.*	And drops it over the railing. *Instrumental.*	Throws it over the wall *Instrumental.*	And throws it over the railing. *Instrumental.*	Throws ball over fence.	7	7 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Watching it. *Exploratory.*							1	1 exploratory.
	Watching it roll. *Exploratory.*							1	1 exploratory.
He turns round and runs. *Locomotory.*	Going to fetch the ball. *Instrumental.*				Follows the ball around. *Instrumental.*	He turns around following the movement of the ball. *Instrumental.*	Follows the ball.	4	3 instrumental. 1 locomotory.
	Going down. *Locomotory.*							1	1 locomotory.
Picks up the ball. *Instrumental.*	Picking it up. *Instrumental.*		Picks the ball up again. *Instrumental.*	Picks it up *Instrumental.*	Picks it up again. *Instrumental.*	And he picks it up again. *Instrumental.*	Picks up ball.	6	6 instrumental.
					Makes a verbal sound. *Vocal.*			1	1 vocal.
					Looks at it's mother. *Interactional.*			1	1 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Turns round. *Locomotory*.								1	1 locomotory.
Walks. *Locomotory*.	Walking with ball. *Locomotory*.		Walks to- wards its mother. *Interaction- al*.				Walking.	3	2 locomotory. 1 interactional.
	Holding it. *Instrument- al*.				Holds the ball. *Instrument- al*.		Holds ball.	2	2 instrumental.
		Still very intrigued by the whole process of throwing the ball. *Personal*.						1	1 personal.
Contemplat- ing. *Personal*.								1	1 personal.
						His mother asks him for the ball but he does not want to throw it. *Inter- actional*.		1	1 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		He's picked it up again. *Instrument-al.*						1	1 instrumental.
					Stands with the ball. *Instrument-al.*			1	1 instrumental.
Throws the ball. *Instrument-al.*	Letting it drop and letting it roll. *Instrument-al.*	And now dropped it again. *Instrument-al.*	Throws the ball on the floor. *Instrument-al.*	And he throws it. *Instrument-al.*	Throws it. *Instrument-al.*	He throws it down. *Instrument-al.*	Throws the ball.	7	7 instrumental.
				And kicks it. *Instrument-al.*				1	1 instrumental.
Runs after it. *Instrument-al.*			Runs towards the table. *Instrument-al.*			And runs to-wards a doll. *Instrument-al.*	Running.	3	3 instrumental.
		Now I feel has got bor-ed with the ball. *Personal.*						1	1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				END OF PLAYING WITH BALL					
Picks up toy doll. *Instrumental.*	Holds up doll. *Instrumental.*	He picks up the doll. *Instrumental.*	Picks up doll. *Instrumental.*	He changes his mind and picks up the doll. *Instrumental.*	Picks up his doll. *Instrumental.*	He picks the doll up. *Instrumental.*	Picks up doll.	7	7 instrumental.
					Holds the doll and makes a verbal sound. *Instrumental and vocal.*	And he holds it in his hand. *Instrumental.*	Holds doll.	2	2 instrumental. 1 vocal.
Turns round, walks. *Locomotory.*	Walking round with doll. *Locomotory and Instrumental.*						Walking around.	2	2 locomotory. 1 instrumental.
		He seems to handle it with a sort of motherly love. *Personal.*						1	1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Looks at doll's face. *Exploratory.*	He looks at the doll up and down his face. *Exploratory*			Looks at his doll. *Exploratory.*	He looks at the doll curiously. *Heuristic.*	Looks at doll.	4	3 exploratory 1 heuristic.
Lowers doll, picks it up again, lowers it. *Instrumental.*	Holds doll upside down. *Instrumental.*		Turns doll over three times. *Instrumental.*	After hugging it, he points it downwards. *Interactional and Instrumental.*	Forces it down a bit. *Instrumental.*	Bends it backwards and forwards. *Instrumental.*	Bending doll to make it cry.	6	6 instrumental. 1 interactional.
	Watching mummy wipe dolly's nose. *Exploratory.*							1	1 exploratory.
	Letting mummy wipe his nose. *Interactional.*							1	1 interactional.
		He doesn't know what to make of it. *Heuristic.*						1	1 heuristic.
Walks. *Locomotory.*								1	1 locomotory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					Picks it up again. *Instrumental.*			1	1 instrumental.
	Showing mummy dolly. *Interactional.*	Now he's showing the doll to his mother. *Interactional.*				Takes the doll to his mother. *Interactional.*	Shows doll to his mother.	3	3 interactional.
					Makes a verbal sound. *vocal.*			1	1 vocal.
Turns doll over. *Instrumental.*	Waving doll up and down. *Instrumental.*		He turns the doll over with his mother. *Instrumental.*	He gives it to his mum and tries to make a noise out of it. *Interactional and regulatory.*	Throws the doll back and forwards. *Instrumental.*	And he bends it back and forwards again. *Instrumental.*	Turns doll over.	6	5 instrumental. 1 interactional. 1 regulatory.
						When the dolly makes a sound, he is very curious. *Heuristic.*		1	1 heuristic.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					Holds the doll. *Instrument-al.*			1	1 instrumental.
			END OF PLAYING WITH DOLL						
Turns round and walks. *Locomotory.*	Turning around walking towards the ball. *Instrument-al.*		He walks towards the ball. *Instrument-al.*	Now he tries to play with the ball and the doll at the same time. *Instrument-al.*	Walks with the doll towards the ball. *Instrument-al.*	He takes the doll and he runs towards the ball. *Instrument-al.*	Playing with ball and doll.	6	1 locomotory. 5 instrumental.
Kicks the ball. *Instrument-al.*			And kicks it. *Instrument-al.*			And kicks the ball. *Instrument-al.*	Kicks ball.	3	3 instrumental.
		He seems to have lost interest in the doll quite rapidly. *Personal.*						1	1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNTIONS
					Makes a verbal sound. *Vocal.*			1	1 vocal.
	Playing with the ball. *Instrumental.*	Now he goes back to the ball again. *Instrumental.*					Plays with ball again.	2	2 instrumental.
	Kicking the ball. *Instrumental.*		Kicks the ball. *Instrumental.*	Now he just kicks the ball. *Instrumental.*	Kicks the ball again. *Instrumental.*		Kicks the ball.	4	4 instrumental.
						Throws the doll down. *Instrumental.*		1	1 instrumental.
Looks after it. *Exploratory.*								1	1 exploratory.
			END OF PLAYING WITH BOTH BALL AND DOLL						
					Makes a verbal sound. *Vocal.*			1	1 vocal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						And runs towards the train. *Instrumental.*		1	1 instrumental.
	Sees the train. *Exploratory.*			And discovers his train. *Exploratory.*		He looks at the train for a while. *Exploratory.*	Looks at train.	3	3 exploratory.
Picks up train. *Instrumental.*	Goes down and picks up the train. *Locomotory and Instrumental.*	He's now got hold of a toy train. *Instrumental.*	Picks up truck and plays with it. *Instrumental.*		Picks up his truck. *Instrumental.*	Picks it up. *Instrumental.*	Picks up train.	6	6 instrumental. 1 locomotory.
	Holding train. *Instrumental.*		Holds truck in air. *Instrumental.*				Holds train.	2	2 instrumental.
	Lets train drop. *Instrumental.*							1	1 instrumental.
Picks it up again. *Instrumental.*								1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					Looks at something. *Exploratory.*			1	1 exploratory.
Puts it down. *Instrumental.*			Drops it again. *Instrumental.*		Puts the truck down *Instrumental.*		Puts down train.	3	3 instrumental.
		He's also lost interest in that very rapidly. *Instrumental.*		Loses interest in the train. *Instrumental.*			Loses interest in train.	2	2 instrumental.
			END OF PLAYING WITH TRAIN						
						Then he hears footsteps. *Imaginative.*		1	1 imaginative.
					And makes verbal sounds. *Vocal.*	He shouts the name 'Ida'. *Instrumental.*	Shouts.	2	1 vocal. 1 instrumental.
			END OF CONCERN FOR IDA						

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Runs toward little car with block in it. *Instrument-al.*		Walks to-wards the ball again. *Instrument-al.*	Goes to pick up something from the floor. *Instrument-al.*	Walks to-wards a small truck. *Instrument-al.*		Moves to-wards a toy.	4	4 instrumental.
Picks up a block. *Instrument-al.*		He's just picked up a block of wood. *Instrument-al.*				He picks the block up. *Instrument-al.*	Picks up block.	3	3 instrumental.
	Holding block. *Instrument-al.*	Seems to be handling the wood. *Exploratory.*			Plays a lot with the toy. *Instrument-al.*		Handles block.	3	2 instrumental. 1 exploratory.
			END OF PLAYING WITH TOYS						
	Contemplat-ing where Ida is. *Imaginative.*			He's dis-tracted by his mum. *Interaction-al.*	Looks at his mother. *Interaction-al.*	And his mo-ther asks him to call for Ida, he's a lit-tle confus-ed. *Inter-actional & personal.*	Concerned about Ida.	4	1 imaginative. 3 interactional. 1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			END OF CONCERN WITH IDA						
Turns round. *Locomotory*.								1	1 locomotory.
Walks. *Locomotory*.	Walks around aimlessly towards chair. *Locomotory*.		Walks towards chair. *Locomotory*.		Walks somewhere towards? *Locomotory*.		Walking.	4	4 locomotory.
			END OF WALKING						

TABLE 15

02:20:03 NATURAL.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			The first kind of behaviour appears to be playing. *Instrumental.*		The child is picking up blocks. *Instrumental.*	The child is playing with blocks on the floor - examining them *Instrumental and heuristic.*	Starts playing with blocks.	3	3 instrumental. 1 heuristic.
The child is pretty intent on what she is working with. She's looking at it and handling it. *Instrumental and Exploratory.*	The baby is now looking at some cubes. *Exploratory.*		The child investigates *Heuristic.*			Picking them up and looking at them. *Exploratory.*	Studying blocks.	4	3 exploratory. 1 heuristic. 1 instrumental.
	Seems amused. *Personal.*							1	1 personal.
					The child puts the blocks on the floor. *Instrumental.*	Puts them down. *Instrumental.*	Puts down blocks.	2	2 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
She seems upset that she has to start again. *Personal.*								1	1 personal.
					And looks for others. *Exploratory.*			1	1 exploratory.
						Picks up two. *Instrumental.*		1	1 instrumental.
But she starts quite happily again actually *Instrumental and Personal.*								1	1 instrumental. 1 personal.
	It tries to put the cubes away prompted by mother. *Instrumental and Interactional.*	From playing she now wants to put them back in. *Instrumental.*	Change, obeys instructions - puts the toys away. *Instrumental and interactional.*	She's putting the things away. *Instrumental.*	The child starts putting the blocks away into the middle shelf. *Instrumental.*	Starts putting them in the second row of the shelf, the second shelf. *Instrumental.*	Puts away blocks on rack.	6	6 instrumental. 2 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	She seems hesitant about it. *Personal.*							1	1 personal.
	Seems serious. *Personal.*							1	1 personal.
			END OF PLAYING WITH BLOCKS						
	Now turns attention to a play animal. *Exploratory.*	She now finds a new thing. *Exploratory.*	Distracted by dog, toy dog. *Exploratory.*	She's playing with the doll - puppy. *Instrumental.*	The child now picks up the dog and describes it. *Instrumental and informative.*	Picks up the dog. *Instrumental.*	Starts to play with dog.	6	3 exploratory. 3 instrumental. 1 informative.
					Examines the dog. *Heuristic.*			1	1 heuristic.
She seems to change her handling of the item when she picked up the doll, it's kind of a lot softer type of handling. *Personal and Instrumental.*								1	1 personal. 1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
	Shows it to mother. *Interactional.*							1	1 interactional.
And she seems to be a lot more interested in it. *Personal.*								1	1 personal.
						Now tries to make the dog make a noise. *Regulatory.*		1	1 regulatory.
	Listens to the mother. *Interactional.*							1	1 interactional.
She doesn't want to put it where her mother has told her to put it but she does. *Instrumental and Interactional.*	And then puts it back on top of the cage. *Instrumental.*	She now puts them in the top shelf instead of the middle. *Instrumental.*		Putting the doll away. *Instrumental.*	The child puts the doll on a different shelf. *Instrumental.*	Puts it on top of the shelf. *Instrumental.*	Puts dog away on top shelf.	6	6 instrumental. 1 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				END OF PLAYING WITH DOG.					
	Puts some more cubes down below. *Instrument- al.*	She takes the blocks from the top and puts them back into the middle where they belong. *Instrument- al.*				It takes the block out of the top shelf and puts it on the second shelf. *Instrument- al.*	Takes blocks from top to middle shelf.	3	3 instrumental.
					The child looks for more blocks. *Exploratory.*			1	1 exploratory.
						Starts play- ing with the blocks on the floor again. *Instrument- al.*		1	1 instrumental.
				END OF PLAYING WITH BLOCKS					
	Attention is changed to another toy. *Exploratory.*							1	1 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
She seems quite excited at having found something she had to find. *Personal and Instrumental*	Seems happier about seeing toy now. *Personal.*						Discovers new toy.	2	2 personal. 1 instrumental.
	Also puts that one back. *Instrumental.*							1	1 instrumental.
			END OF PLAYING WITH NEW TOY						
		She puts the blocks back into the top. *Instrumental.*			Puts them on the top shelf. *Instrumental.*		Puts blocks back in top rack.	2	2 instrumental.
				Showing signs of aggression. *Personal.*		Throws two blocks on the dog's head. *Instrumental.*	Throws blocks aggressively.	2	1 instrumental. 1 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						Throws another one in the rack. *Instrumental.*		1	1 instrumental.
	Replaces some of the toys below - can't give a reason for putting it below. *Instrumental.*	And puts them back into the middle. *Instrumental.*			Then she takes them out of the top shelf and puts them into the middle shelf. *Instrumental.*	Starts taking the blocks off the top one and putting them in the middle one. *Instrumental.*	Puts blocks in middle shelf.	4	4 instrumental.
			END OF PLAYING WITH BLOCKS						
		Wants to put doll in the middle too. *Instrumental.*	Organizing toys. *Instrumental.*		She puts her dog in the middle shelf as well. *Instrumental.*	Including the dog. *Instrumental.*	Puts dog in middle shelf.	4	4 instrumental.
There is a difference in the way she handled the dog and the .../other									

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
other toy, the coloured squares. *Instrumental and Personal.*								1	1 instrumental. 1 personal.
				END OF PLAYING WITH DOG					
She's interested in finding out what the noise is outside. *Heuristic.*	Asks if she can go out, asks a question. *Heuristic.*	Distracted hears something. *Exploratory.*	Distracted by motorbike. *Exploratory.*		She talks to her mother. *Interactional.*	Listens to a motorbike outside. *Exploratory.*	Reacts to motor-bike.	6	3 exploratory. 2 heuristic. 1 interactional.
	Doesn't seem to understand what mother is saying. *Interactional.*							1	1 interactional.
				END OF REACTION TO MOTOR-BIKE					
	Seems attention is distracted by more toys. *Exploratory.*					Starts looking at the blocks on the floor again. *Exploratory.*	Starts playing with toys again.	2	2 exploratory.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Inquisitive she trys to put her foot in an object on the floor. *Personal and Instrumental.*				Putting her foot in the bowl. *Instrumental.*			Puts foot in object.	2	1 personal. 2 instrumental.
			END OF PLAYING WITH TOYS ON FLOOR						
She decides to pick up a ball and it's a funny action, she throws it at her mother's head, probably just in fun. *Instrumental and interactional.*				Chucking the ball up in the air. *Instrumental.*	She picks up the ball and throws it on her mother's head. *Instrumental.*	Picks up the ball and throws it on the mother's head. *Instrumental.*	Throws ball at mother's head.	4	4 instrumental. 1 interactional.
			END OF THROWING BALL AT MOTHER						

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TABLE 16

2:20:03 FINE

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Putting blocks on top of each other. *Instrumental.*	Child's playing, picking up bricks. *Instrumental.*			Well, it's just fiddling with the blocks at the moment, nothing in particular. *Instrumental.*		The child is playing with blocks. *Instrumental.*	Playing with blocks.	4	4 instrumental.
And looking at them. *Exploratory.*		She's examining the bricks. *Heuristic.*	She's looking at the bricks. *Exploratory.*				Studying blocks.	3	2 exploratory. 1 heuristic.
Picking up the blocks. *Instrumental.*	Puts them down and picks them up on her mother's directions. *Instrumental and Interactional.*		Picking them up. *Instrumental.*				Picks up blocks.	3	3 instrumental. 1 interactional.
			Examining them. *Heuristic.*		She seems to be pretty interested in the blocks. Concentrating on the individual blocks. *Exploratory.*		Examining blocks.	2	1 heuristic. 1 exploratory.

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1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			She's put the brick down. *Instrument-al.*			Puts the blocks back. *Instrument-al.*	Puts blocks down.	2	2 instrumental.
		She's search-ing for more bricks to play with. *Instrument-al.*	She's look-ing at an-other one. *Exploratory.*			Looks at different blocks. *Exploratory.*	Looking for more blocks.	3	2 exploratory. 1 instrumental.
She puts the blocks into the tray. *Instrument-al.*	She puts them into the second tray. *Instrument-al.*	And she's putting them away. *Instrument-al.*		It's put-ting them in a basket. *Instrument-al.*	And suddenly her attention has turned to all the blocks, she wants to put all the blocks away. *Instrument-al.*	Puts it in a basket, starts put-ting all the blocks in a basket. *Instrument-al.*	Puts blocks in rack.	6	6 instrumental.
			She's reach-ing for one in a far corner. *Instrument-al.*					1	1 instrumental.
			She's throw-ing them off the shelves, *Instrumental.*					1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
		She's look-ing while she does it. *Instrument-al.*						1	1 instrumental.
		Now she's not looking and she's throwing them in hard-er. *Instrument-al.*	She's throw-ing them off the shelves quite viol-ently, she doesn't seem to care ab-out them. *Personal.*				Throws blocks.	2	1 instrumental. 1 personal.
	Still pick-ing them up and putting them in the tray. *Instrument-al.*							1	1 instrumental.
			END OF PLAYING WITH BLOCKS						
Now she re-aches for the dog. *Instrument-al.*								1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
Reaches now. *Instrumental.*								1	1 instrumental.
Her attention is distracted. *Reactive.*					She's lost interest. *Personal.*		Loses interest.	2	1 reactive. 1 personal.
	Turns her attention to the dog. *Exploratory.*	Her attention is being diverted by the dog. *Exploratory.*		Now it's more interested in the dog. *Personal.*	And her eye has been caught by the little toy dog. *Exploratory.*		Attention turns to dog.	4	3 exploratory. 1 personal.
	Picks it up. *Instrumental.*		She's picked up a dog. *Instrumental.*			Picks up a dog. *Instrumental.*	Picks up dog.	3	3 instrumental.
						And drops it. *Instrumental.*		1	1 instrumental.
					And she's just described it to her mother. *Informative.*			1	1 informative.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						And plays with it. *Instrument-al.*		1	1 instrumental.
She likes the dog, I suppose. *Personal.*			Seems to like it, showing af-fection for it. *Personal.*				Shows she likes the dog.	2	2 personal.
	Passes it to mother. *Interaction-al.*					And gives it to her moth-er. *Interaction-al.*	Gives dog to mother.	2	2 interactional.
			Showing it to her moth-er. *Interaction-al.*					1	1 interactional.
						Watches her mother play-ing with it. *Interaction-al.*		1	1 interactional.
	Accepts it from mother. *Interaction-al.*							1	1 interactional.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
						Holds the dog again. *Instrumental.*		1	1 instrumental.
			Doesn't really seem to want to let him go. *Instrumental.*					1	1 instrumental.
		She throws the dog down. *Instrumental.*			Her mother's told her to put the dog away, so she's just cast the dog aside and her mind's turned to other things now. *Interactional and exploratory.*		Throws dog down.	2	1 instrumental. 1 interactional. 1 exploratory.
She decides to put it on the top shelf. *Instrumental.*	Places it on the top shelf. *Instrumental.*		She's put it on the top shelf. *Instrumental.*	It's carrying on putting things away. *Instrumental.*		And puts it in the top basket. *Instrumental.*	Puts dog on top of rack.	5	5 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					END OF PLAYING WITH DOG				
She goes back to putting the blocks on the shelf. *Instrument-al.*					She wants to put some blocks in the tray with the dog. *Instrument-al.*		Puts blocks in rack.	2	2 instrumental.
	She's found something interesting in the top shelf and moves it down to the middle/med-ium shelf. *Instrument-al.*					Then she gets another bl-ock and puts it in the second bas-ket. *Instrument-al.*	Moves block to middle rack.	2	2 instrumental.
		And is try-ing to put them togeth-er, corner to corner. *Instrument-al.*						1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
				And it's getting very bored now. *Personal.*				1	1 personal.
						She watches her mother playing with something. *Interactional.*		1	1 interactional.
	Returns her attention to the blocks. *Exploratory.*				I think she's looking for a particular colour block perhaps, or some particular block to put with the dog. *Exploratory.*		Attention on blocks.	2	2 exploratory.
	Picks them up and puts them next to the dog. *Instrumental.*					And then picks up some more blocks. *Instrumental.*	Picks up blocks.	2	2 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			She's show-ing some ex-citement at picking up a brick. *Personal.*					1	1 personal.
		And throws them at the door. *Instrument-al.*						1	1 instrumental.
			She's throw-ing that in-to the top shelf. *Instrument-al.*					1	1 instrumental.
						Tries to fit two of the blocks to-gether and puts them in the top bas-ket. *Instrument-al.*		1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
She decides now that she's put the block in the wrong tray. *Instrument-al.*								1	1 instrumental.
	Moves them to the middle shelf. *Instrument-al.*	Now she's putting them from the top into the middle. *Instrument-al.*	Now she's moved one from the top shelf into the bottom shelf. *Instrument-al.*		Now she's transferring the blocks. *Instrument-al.*	Then she puts another block into the second bas-ket. *Instrument-al.*	Moves blocks to middle rack.	5	5 instrumental.
			END OF PLAYING WITH BLOCKS						
She takes the dog and puts it also into that tray. *Instrument-al.*	Moves the dog as well. *Instrument-al.*	And she mo-ves the dog. *Instrument-al.*	She's hav-ing to put the dog on-to the mid-dle shelf. *Instrument-al.*	It's rear-ranging the packing ag-ain. *Instrument-al.*		And puts all the toys in-to the sec-ond basket. *Instrument-al.*	Moves dog to middle rack.	6	6 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			She doesn't want to leave it on the top shelf. *Instrumental.*		She insists on doing this. Her mother told her to leave the dog there but she's not interested in listening to her mother. *Regulatory.*		Ignores mother's request to leave dog on top rack.	2	1 instrumental. 1 regulatory.
		She handles the dog more gently this time. *Personal.*						1	1 personal.
			END OF PLAYING WITH DOG						
Decides to rearrange the position of blocks within the middle shelf as well *Instrumental.*								1	1 instrumental.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
			She's throwing the bricks onto the middle shelf. *Instrumental.*	It's trying to throw them up against the top basket. *Instrumental.*		She then throws one of the blocks in the second basket against the wall. *Instrumental.*	Throws block around in middle rack.	3	3 instrumental.
				END OF PLAYING WITH BLOCKS					
Now she hears a motor-bike or something. *Exploratory.*	Responds to stimulus of motor-bike in the background, asks her mother what it is. *Heuristic.*	Her attention is being distracted by the sound of a motor-bike. *Exploratory.*		It wants to know what the noise outside is. *Heuristic.*	She heard a motor-bike, she's become distracted by it and points her finger in that direction. *Heuristic.*	She then asks what the noise outside is. *Heuristic.*	Responds to noise of motor-bike.	6	2 exploratory. 4 heuristic.
				END OF REACTION TO MOTOR-BIKE					
		She seems bored now. *Personal.*			And now she seems to go through a very blank period. *Personal.*			2	2 personal.

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
					Her mother talks to her but she's just glancing around the room. *Exploratory.*	She watches her mother telling her what to do. *Interactional.*	Response to mother talking to her.	2	1 exploratory. 1 interactional.
	Starts playing with the various objects on the ground. *Instrumental.*							1	1 instrumental.
			She now put her foot in a tin. *Instrumental.*	It's trying to fit it's shoe into one of the blocks. *Instrumental.*			Puts foot in object on floor.	2	2 instrumental.
		END OF PLAYING WITH VARIOUS TOYS ON FLOOR							

1	2	3	4	5	6	7	GLOSSES	No. of S's	FUNCTIONS
She sees the ball now, she picks it up and throws it. *Instrumental.*	Throws a ball that she's picked up towards her mother and then fetches it. *Instrumental and interactional.*		She's picked up a ball, lobbed it at her mother. *Instrumental and interactional.*	Throws the ball around. *Instrumental.*	* Attention attracted her. Threw it at her mother. Seems to have lost interest in the blocks and dog which is probably why the ball attracted her. *Personal and Interactional.*	Then picks up a ball and throws it so it hits her mother on the head. *Instrumental and interactional.*	Throws ball at mother's head.	6	5 instrumental. 4 interactional. 1 personal.
			END OF THROWING BALL AT MOTHER'S HEAD.						
					* As described by subject, possibly should read "attracted her attention"				

APPENDIX vi

Operative words.

Table 17   Summary Table showing the operative words
used most frequently to describe the behaviour
of the children of different ages within both
experimental conditions.

Table 18   The frequencies of operative words used to
describe the behaviour of the children of
different ages within both experimental
conditions.

TABLE 17. Summary Table showing the operative words used most frequently to describe the behaviour of the children of different ages within both experimental conditions.

00:27:05		00:39:03		1:13:04		2:20:03	
NATURAL	FINE	NATURAL	FINE	NATURAL	FINE	NATURAL	FINE
8% Move (physical)	16% Look	11% Pick up	21% Attend	10% Throw	15% Pick up	21% Put	17% Put
7% Look	15% Move (physical)	10% Attend	10% Look	7% No interest	9% Throw	8% Seems to	8% Pick up
6% No interest	7% Laugh	9% Drop	9% Interest	Pick up	6% Hold	7% Pick up	3% Look
Attend	6% Touch	8% Look	7% Focus	3% Bounce	Walk	5% Look	Attend
4% Interest	4% No interest	Put	4% Discard	Find (physical)	5% Kick	4% Play	Try (physical eg. "to grab")
Touch	Hold	5% Crawl	Glance	Interest	Run	Throw	Play
Reach	3% Smile	Chew	Move (physical)	Leave	4% Go	Take	
3% Surprise	Surprise	Change (attention)	3% Find (physical)	Look	Turn (physical)		
	Turn (body)	Hold (physical)	No interest	Play	Look		
		4% Throw	Pick up	Concentrate	3% Bounce		
		Grab	Play	Change (attention)	Drop		
		3% Seems to be			Make vocal sounds		

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TABLE 18. Frequencies of operative words used to describe the behaviour of the children of different ages within both experimental conditions.

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
ACCEPT								.06
AFFECTED BY	.06							
AGGRESSION							.08	
AIMLESS						.04		
AMUSED							.08	
APPEARS TO BE							.08	
AROUSE		.05						
AROUSE (Mental eg. attention)		.05						
ASK						.04	.08	1.00
ATTEMPT		.05			.66			
ATTEND	6.00	.05	10.00	21.00	7.00		2.00	3.00
ATTRACT (By physical object)	2.00	.05	.07	.09	.66			
ATTRACT (Attention)	1.00				.66			1.00
AWARE		1.00						
BANG				.09				
BASH				.09				
BEND (Object)					1.00	2.07		
BLINK	1.00	2.00						

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
BORE		.05				.04		1.00
BOUNCE					3.00	3.00		
BRING BACK (Mental concept eg. interest)			.07	.09				
CALL					.66			
CAN'T GET					.66			
CARRY ON					.66			.06
CAST ASIDE								.06
CATCH (Mental concept eg. attention, thoughts)	1.00			.09	.66			.06
CHANGE (Mental concept, eg. attention)	.06		5.00	2.00	3.00	.07	2.00	
CHANGE (Physical direction)					.66		2.00	
CHEW			2.00					
CHUCK (Slang "to throw")							.08	
CLOSE (Ref. bodily part eg. hand)		1.00						
CONCENTRATE			2.00	.09	3.00			.06
CONFUSE		.05				.04		
CONTINUE				.09				
COMMENT					.66			
CONCERN					.66			

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
CONTEMPLATE						1.00		
CRAWL			5.00	.09				
CUDDLE		.05						
CURIOUS						.07		
DECIDE					.66		.08	2.00
DESCRIBE							.08	.06
DESPONDENT		.05						
DIRECT (Mental concept, eg. attention)			2.00					
DISCARD				4.00				
DISCOVER	.06	.05			.66	.04		
DISTRACT (Mental concept, eg. attention)	2.00	.05	2.00			.04	2.00	2.00
DIVERT (Mental concept, eg. attention)					.66			.06
DO (Physical)						.04	.08	
DOESN'T AFFECT	.06							
DOESN'T CARE								.06
DOESN'T KNOW						.04		
DOESN'T UNDERSTAND							.08	
DOESN'T WANT TO						.07	.08	2.00
DRAW (Mental concept eg. attention)				2.00				

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
DROP			9.00	.09	1.00	3.00		.06
EAT			.07					
ENJOY	2.00							
EXAMINES					.66		2.00	1.00
EXCITE		.05	.07			.04	.08	.06
EXPRESS						.04		
FASCINATE		1.00				.04		
FEEL (Physical movement)	2.00	2.00	.07	.09	.66			
FETCH					.66	1.00		.06
FIDDLE								.06
FIGURE-OUT (Mental concept)		.05						
FIND (Mental concept eg. To find a way)		.05			.66	.07		
FIND (Physical Movement eg. To find an object)	.06			3.00	3.00		2.00	.06
FIT								1.00
FIX (Mental concept, eg. attention)			.07					
FOCUS (Mental concept. eg. attention)				7.00				
FOCUS (Eyes, physical)			2.00					
FOLLOW						2.00		
FORCE (Down)						.04		

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
FORGET					.66			
FRIGHT	1.00	.05						
FUN							.08	
GAIN (Mental concept, eg. attention)					.66			
GENTLE								.06
GET (Physical movement eg. ... and object)								.06
GET (Ref. Bodily movement eg. get onto knees)			.07					
GET (Attention)								.06
GIVE (Physical)						.04		.06
GIVE (As with shows Ref. a smile etc.)	.06				.66			
GLANCE				4.00				.06
GOES (Mental concept eg. attention)	2.00		.07	2.00	2.00			.06
GOES (Physical movement, back or towards)	2.00	1.00	2.00	.09	4.00	4.00		.06
GRAB			4.00			.04		
GRASP	1.00			.09				
HANDLE						.04	3.00	.06
HAPPY	.06	.05				.04	2.00	
HEAR					.66	.04	.08	1.00
HESITANT							.08	

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
HIT			2.00					
HOLD (Object, person)	.06	4.00	5.00	.09		6.00		.06
HUG					.66	.04		
INQUISITIVE							.08	
INSIST								.06
INSPECT	.06				.66			
INTEND		.05				.04	.08	
INTEREST	4.00	1.00	.07	9.00	3.00		2.00	2.00
INTRIGUE						.04		
INVESTIGATE		.05			.66		.08	
JUMP	.06							
KICK					7.00	5.00		
KNOCK			.07					
KNOW								.06
LAUGH	2.00	7.00				.07		
LEAN (Physical movement)		1.00						
LEAVE					3.00			.06
LET (ie. allow/go)						2.00		.06
LIFT (Bodily part eg. head)		.05						

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
LIKE								1.00
LISTEN						.66	2.00	
LOBBED								.06
LOOK	7.00	16.00	8.00	10.00	3.00	4.00	5.00	3.00
LOSE (Mental concept eg. attention)					2.00			
LOVE						.04		
LOWER (Object)						.07		
MAKE (Object do something)					.66	.04	.08	
MAKE (Sound - non-vocal)	.06		.07		.66			
MAKE (Vocal sounds)	1.00					3.00		
MAKE (Way towards)			.07					
MAKE OUT (Mental concept)	.06							
MOVE (Mental concept eg. attention)			.07	.09	.66			
MOVE (Physical movement)	8.00	15.00	2.00	4.00				2.00
NO INTEREST (Include 'lost' and 'disinterest')	6.00	4.00		3.00	7.00	1.00		2.00
NOTICE		.05						2.00
NOT LISTENING								.06
NOT LOOKING	.06		.07	.09				.06
OBEY							.08	

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
OPEN (Bodily part eg. mouth)	1.00	2.00						
ORGANIZE							.08	
PASS (Object)								.06
PICK UP			11.00	3.00	7.00	15.00	7.00	8.00
PLAY	2.00	1.00	2.00	2.00	3.00	1.04	4.00	3.00
PLEASE	.06	1.00						
PLACE (Ref. bodily part eg. block in mouth)				.09				
PLACE (Ref. deliberate movt. eg. block on shelf)								.06
POINT (Bodily part)						1.00		.06
POINT (Object)						.04		
PROBABLE							.08	
PULL					.66			
PURSUE				.07				
PUSH						.04		
PUT (Ref. bodily movt. eg. hand forward)	.06	1.00						
PUT (Ref. deliberate movt. with object eg. put blocks together/in mouth)			8.00	2.00		.07	21.00	17.00
REACH	4.00			.09		.04		2.00
REACT	2.00							
REARRANGE								1.00

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
REPLACE							.08	
RESPOND								.06
RESTLESS	2.00	.05						
RETURN (Mental concept eg. attention)								.06
RUN					1.00	5.00		
SCARE	2.00	1.00						
SEARCH								.06
SEE	1.00			.09		.04	.08	.06
SEEMS TO	2.00	2.00	3.00	2.00	.66	1.00	8.00	3.00
SENDS						.04		
SERIOUS							.08	
SHIFT (Mental concept eg. attention)	.06			.09				
SHOUT					.66	.04		
SHOW (Physical display)						.07	.08	.06
SHOW (State of mind eg. ... signs of pleasure)	1.00	2.00					.08	1.00
SMILE	2.00	3.00		.09				
SNUGGLE	.06							
SOFTER							.08	
SORT OF	.06							

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
SPEAK					.66			
SPOT (Slang, eg. discover)			.07					
STAND						.07		
STARE	1.00							
START							.08	
STARTLE	1.00							
STICK (Slang eg. ... block in mouth)				2.00				
STIFFEN		.05						
STUDY (eg. an object)			.07					
STOP (Ref. bodily movt.)		.05						
STOP (Ref. mental concept eg. ... thinking)					.66			
STRUGGLE		.05						
SURPRISE	3.00	3.00						
SWITCH (Mental concept eg. interest)					.66			
TAKE						.07	4.00	.06
TAKE NOTICE (Mental concept)		.05						
TALK			.07			.04		
THINK					1.00	.04		
TIP (Physical movt.)					1.00			

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
THROW			4.00		10.00	9.00	4.00	8.00
TOUCH	4.00	6.00		.09				
TRANSFER								.06
TRY (Mental concept, eg. to make out)	1.00	1.00			.66	.04		
TRY (Physical movt. eg. to ... grab)	2.00	.05	1.00	.09	.66	.07	2.00	3.00
TURN (Body)	2.00	3.00		.09		4.00		.06
TURN (Mental concept eg. Mind)							.08	.06
TURN (Object)						1.00		
UNCOMFORTABLE	1.00							
UPSET							.08	
USE (Bodily mvt. eg. hand)	.06	.05						
VIOLENT								.06
WALK						6.00		
WANT (Something eg. an object)	.06	1.00					2.00	2.00
WANT (S) (Object to do something)					.66			
WATCH	.06			.09	1.00			2.00
WAVE						.04		
WAVER (Mental concept eg. attention)				.09				

	00:27:05		00:39:03		1:13:04		2:20:03	
	Natural	Fine	Natural	Fine	Natural	Fine	Natural	Fine
	%	%	%	%	%	%	%	%
WITHDRAW		.05						
WORK	.06						.08	
WRIGGLE								

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