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AN INVESTIGATION OF THE PROBLEMS
OF IDENTIFYING AND ANALYSING AFFECTIVE
INTERACTION IN AN OPEN PLAN CLASSROOM.

A thesis presented in partial fulfilment
of the requirements for the degree of
Masterate of Arts in Education at Massey
University.

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ABSTRACT OF THESIS

The investigation was part of a wider research into an Open Plan infant complex. Of central concern to this thesis was "The Problem of defining, locating and analysing 'Affect' in the Open Plan".

Six randomly selected subjects were tape recorded on six randomly selected mornings for approximately three hours each. The tapes and subsequent transcripts provided the data for the study. The affect was deemed to be located in the wider context of the general interaction of the social milieu under analysis. This wider dimension of total environmental interaction was specified according to (a) the participants (b) the task they engaged in; and 16 categories were defined. Affective behaviour was finally analysed on the basis of approving and disapproving actions of teachers. This analysis studied affect according to (a) direction of affect i.e. positive or negative, approving or disapproving and (b) method of communication of affect i.e. verbal, non-verbal, neutral or combinations of these.

The methodology was not fully conceptualized at the beginning but evolved from the literature and from experimentation, as the problem developed. When an accepted methodology was formulated the trends that the analysis would probably indicate were presented as "General Tendencies".

The general interaction segments were identified, timed and numbered in terms of the defined categories. The affective incidents were located as units of affect within a defined sequence of general interaction.

Results confirmed previously stated beliefs that some classrooms are basically stable social environments in that there was little variation in the patterns of general interaction. The proportion of time allocated to (a) participants (b) tasks was basically the same over the six days analysed. The most prevalent behaviours located were those associated with Task Instructional, with the difference between Task Organization, Task Experiential and Non-Task being insignificant. The role of the teacher was central in this study. More approval than disapproval was identified with minimal variation in the tapes as to the affect dispensed.

The research directed attention at the importance of non-verbal cues in an analysis of the social dynamics of the classroom. Teaching, as an increasingly interactive phenomenon will need to recognize the significance of non-verbal communication and this implies a necessary emphasis that should be given to education courses to ensure a full understanding of classroom interaction.

This thesis has been unencumbered for the most part by an explicitly enunciated overall plan. It is more evolutionary and descriptive than precise and prescriptive. The programme that evolved was rather that of unrestricted freedom that non-theoretical liberty allows. This is consistent with the author's view that true discovery is likely to lie somewhere along the roads of interest. For a considerable number of years the author has had a deep professional and personal interest in the analysis of classroom interaction. Teacher-pupil interaction seems such a significant aspect of teaching that it could well be presumed that to study interaction in the educative setting is synonymous with the study of teaching.

Tracing the impulses that lead to research is often a difficult if not impossible task. Davitz¹ suspects that most research in the social sciences has its origins somewhere in the personal life of the researcher though these sources are rarely promulgated as being the key motivating factor. The argument could well be put forward that such personalized origins for research have limited scientific value. It could be claimed that they might even disrupt the main purposes of scientific communication. This claim would have unfortunate implications if as a result of it pseudo-theoretical rationales were considered a requirement that was necessary to give research an aura of respectability.

It is the author's contention that education is both a scientific and a humanistic enterprise and the justification for one method of analysis cannot deny the validity of another or negate the possibility that a combination of many approaches may offer the greatest opportunity for the formulating of acceptable truths about teaching.

That this thesis did not begin with a tightly structured conceptualization or an explicitly formulated theoretical view is not considered a disadvantage. What was considered of value was the opportunity to work in close conjunction with other researchers in an area of deep personal interest. This interest was centred upon an investigation into the teaching of children in an Open Space situation at a time when this type of educational organization was truly innovative in the New Zealand educational system.

When the possibility emerged of an opportunity to view this complex interactive educational environment according to the definition, the location and the distribution of affective interaction then the general interest of the author became specific and challenging enough to provide the impetus required for the work which follows.

I wish to acknowledge the patience, devotion and loving support accorded this thesis by Maxine, Pete, Andy, Shelley and Little Cherie.

I am equally indebted to Professor Adams for persuading me to begin this thesis, and to Professor Hill, for providing the impetus to complete it. Their encouragement and tolerance has been both scholarly and gentlemanly.

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INTRODUCTION

This investigation into "the Problems associated with the identification and analysis of affective behaviour in an Open Plan" was an outcome of an investigation undertaken by Professor Adams of Massey University into specified aspects of the Open Plan infant room.

The research initiated by Professor Adams was based on the assumption that "teachers will be better able to modify their actions in accordance with the needs of the innovation (i.e. Open Plan Teaching) if useful and relevant information could be provided for them". With this in mind a series of observational studies of the Open Plan situation, in action, was planned in such a way that the research would result in information which could be made available to the teachers as reliable evidence as to what was actually taking place.

As a consequence of this information, teachers would be able to evaluate their actions and make appropriate changes where they were deemed to be consistent with the curriculum design for the Open Plan.

The research was designed according to three differing phases. They were:

- Phase I Individual pupil activity
- Phase II Pupil group activity
- Phase III Individual Teacher Activity

It is from Phase I that the material was gathered which matched the interest of the author in such a way that a thesis was initiated.

Professor Adams in his research proposal, contended that two aspects of the pupils' life-space were relevant

- i) The verbal environment to which the pupil is exposed
 - because it can provide one indication of the intellectual demands being made
- ii) The activity in which he becomes involved
 - because in conjunction with (i) this has significant educational relevance

Initially it was proposed to take day-long observational records of a randomly selected number of pupils (8-10) on a number of randomly selected days. The verbal environment was to be taped by having the selected children wear radio-microphones with the resultant transmission being recorded on a master tape.

Due to conditions beyond the control of the investigating team, minor modifications were made to the extent of data collection. Six tape-recordings of six randomly selected children (four boys, two girls) were taped on six randomly selected days. Because of gross variations in the afternoon programme the length of each tape was limited to the morning so that approximately eighteen hours of tape recordings were available for processing. At the same time as the tapes were being made, activity observations were made of the selected pupil by non-participant human observers.

The author worked with the research team on four of the six tapes and transcribed two of the six tapes into a continuous verbal record of all the recognizable verbal content identified on the recordings. The quality of the actual tape recordings was variable as the sensitive microphones being used, distorted sounds at times when the children were working in areas with shiny, reflective surfaces.

There was not a high proportion of the verbal communication on the tape recordings that could not be identified. The main concern to the transcribers was undoubtedly the ease with which the identification of the verbal message was effected.

As a consequence of close association with the collection of data from the investigation, it became apparent that contained within the data was a veritable fund of information that reflected accurately, naturally-descriptive segments in the life space of children involved actively in Open Space education. In the act of transcribing tapes over long wearisome hours, the author intuitively became aware that "how a teacher said something" appeared at least as significant as "what was being said", yet as a result of transcription the manner in which the verbal message was carried was lost. This relationship of what was conveyed verbally to the manner in which it was being conveyed indicated other than cognitive criteria. It seemed to be more related to such general criteria as the interpersonal relationships, the rewarding or sanctioning of behaviour, the regard that the teacher had for children, and the affect displayed by the pupils for the teacher.

This concern led to the conceptualization of the topic for the thesis which was formulated as being

"The problem of identifying and analysing affective interaction in the

Open Plan teaching situation".

It appeared that this could be an area of fruitful endeavour although it was also clear that the successful resolution of the problem in an appropriately academic manner would be contingent upon the resolution of critical problems of definition and instrumentation which must inevitably occur.

That the path might be thorny and the end uncertain was considered inconsequential and certainly no deterrent. What was considered important was the belief that education as a process implies that not all the rewards must come at the end of an enterprise, that the growth, the awareness and the opportunity to meet and attempt to solve problems is an equally important aspect of education.

CHAPTER 1. THE CONCEPT OF AFFECTIVE INTERACTION

Having the problem defined was a moment of some relief although this was short lived for the difficulties of definition became immediately apparent as soon as the research of the literature relevant to this aspect of the analysis was initiated.

The Significance of Interaction.

The term "interaction" has been used by social scientists to refer to the act of communication between or among people. When people interact a two-way process is involved. This is basic to all concepts of interaction. For example a teacher may initiate an interactive exchange in the classroom by asking a question but it cannot be assumed that interaction has taken place until the sender of the communication receives some indication from the recipient. Thus the initiation of communication is part of the two-way process which needs an observable or identifiable signal to be returned. Homans² a prominent sociologist, synthesizes the concept of interaction in the following terms:

"When we refer to the fact that some unit of activity of one man follows or, if we like the word better, is stimulated by some unit of activity of another, aside from any question of what the units may be, then we are referring to Interaction"†

The importance of interaction in the educational setting of the school has been increasingly acknowledged, as evidenced by the number and variety of instruments that have been developed to analyse interaction and the increased number of educationists concerned with researching the interaction patterns of the classroom.

In the classroom a great deal of verbal communication takes place and if the definition of interaction is applied to all the reciprocal communications of the classroom then it becomes immediately apparent that during an average day a teacher may engage in between two and three thousand interactions. (Hudgins³). On a numerical basis it is obvious that a great many interactions take place and when this quantity is related to the differing types of interaction that can be instanced, then interactively-speaking, the classroom is obviously a very complex place.

The classroom teacher whether he operates in a single classroom with a group of children or in an Open Plan in conjunction with other teachers accepts as part of his role the overall responsibility for the children placed under his care. As a professionally educated person he is concerned with aspects of the cognitive, social, physical and emotional development of each child. Much of the desirable learning that the teacher intends to take place will be

†Homans 1950 P. 36 Op Cit 2.

initiated in the interactive situation where the mind of the child (or children) is stimulated to action by the spoken word. The teacher in his role as the authority figure in the classroom (Johnson ⁴) can legitimately expect that what he says and does will have a significant impact upon the children with whom he is concerned. As Gorman ⁵ suggests the possibility always exists that whatever a teacher says or does is right because it comes from the teacher.

That teaching is an interactive activity seems evident. That there are differing types of interaction is highly possible and that the teacher is a central figure in the interaction patterns of the classroom is equally obvious. But what of affective interaction? What is its particular significance to the classroom? Affective Interaction.

Research into classroom interaction analysis has as yet been unable to identify significant indications of emotional or affective behaviour within the context of the classroom. Flanders ⁶ contends that the classroom is an "affectional desert". Adams & Biddle ⁷ located affect in the sociation category which attracted minimal recognizable examples, i.e. about half of one percent of the total behaviour. Evans ⁸ found that affectivity averaged at 1.38% of the total teaching behaviours of seven biology teachers (Affectivity in Evans study was defined as being those behaviours that are intended to elicit and reinforce, positively and negatively, contributions to the teaching-learning process by an individual or group of students). This lack of behaviours identifiable as affective or emotive could well be due to other reasons than that such behaviours seldom exist. Parsons ⁹ in a theoretical conceptualization for characterizing the interdependence of people in groups, suggested a general criterion of affectivity - non affectivity was present in all interpersonal relationships. Schmuck and Schmuck ¹⁰ state that in some classes expression of feelings by students are welcomed and supported but in many others students are encouraged to keep feelings of happiness or displeasure to themselves. Schutz ¹¹ using a different theoretical framework compared compatibility for persons in terms of their needs for (a) inclusion, (b) control, (c) attention. Compatibility of classrooms could be gauged by assessing whether or not each one of these needs is expressed in sufficient amounts to satisfy students' requirements. Classes are cited as having emotional support problems if too little warmth and love is expressed.

Emphasis in education is being directed towards a more interpersonal approach where interaction, i.e. two-way communication, is seen as a necessary component in the educative process. Many of the current innovations in educational organization (such as team teaching or Open Plan teaching) or in methodology (discovery learning, activity methods and integrated programmes) involve the teacher and the child in a more interactive-type situation where

frequent communication between child/teacher, child/child, teacher/child is an accepted feature of the new emphases.

The general conceptualization of children wanting to learn in a warm supportive classroom environment would find acceptance as a currently appropriate educational expectation. It is highly probable that teachers will be expected to dispense more positive affect to support a generally affective classroom climate and to develop appropriate attitudes to learning on the part of the children. Teacher reward is seen as a necessary condition of the modern learning situation. Christensen¹² supported the contention that the affective response of the teacher was more important for growth in achievement than teacher permissiveness. Hughes¹³ developed a comprehensive set of categories with which to classify teacher behaviour and as a result was able to list seven behaviour categories of optimum interaction functioning of teachers for desirable learning conditions in the elementary school. A 10-20% range was listed as being desirable for positive affectivity, whilst a 3-10% range was given as the optimum range for negative affectivity. This upper limit of 30% of affective interaction, or 13% at the lower level, far exceeds the proportion that has thus far been identified in empirical studies listed previously (Flanders, Adams, Evans).

One of the very real problems in the research of affective behaviour in classrooms is that as yet affectivity has been virtually neglected as an area worthy of study in its own right. Too often assessments of affectivity have been as a consequence of analysing the total classroom situation or it has been studied as a "less" significant feature in association with variables such as cognitive growth and student achievement. Bion¹⁴ and Thelen¹⁵ stress however that the affective aspect of all interpersonal communication is unavoidable. Interaction for them, must always be located at some level of feeling. Emotionality and affective interpersonal ties are inevitable consequences of human interaction. And one could hypothesize that the more regular a group meets and the more personally familiar they become, the greater the level of affectivity exchanged.

That affective behaviour is behaviour that is evident in interactive classrooms seems unarguable. That it is not easy to define and identify also seems apparent. These difficulties however do not preclude the assumption that a large number of pupils operating in a social environment that includes a number of teachers in a complex set of communication networks must inevitably result in some degree of affective interaction. Not only should the affective interaction be a more significant aspect of total classroom behaviour than has previously been established but current trends in developing a warm, supportive classroom environment should lead to the conclusion that more positive affect than negative affect should be evidenced.

Flexibility in grouping, which is claimed as one of the significant advantages of Open Space teaching, tends to allow for greater choice on the part of each individual and is claimed to be encouraging in that it develops attitudes leading towards success in the learning situation. Ostensibly the child progresses at a rate which is challenging yet not frustrating. Warwick 16 claims that Open Space teaching reasserts the importance of people and their relationships or reactions to one another.

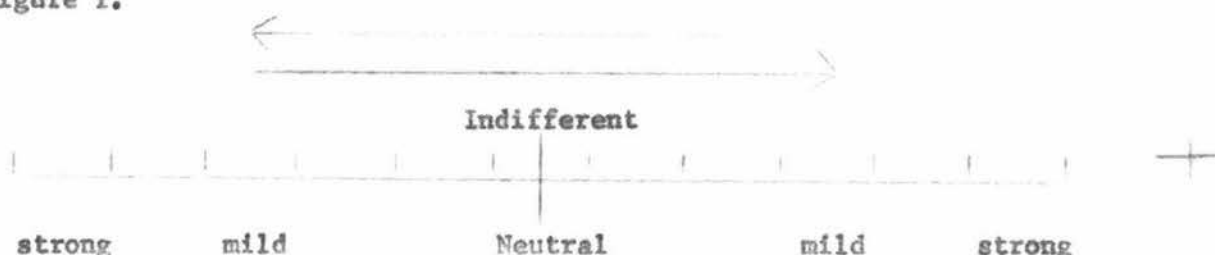
But what is this affectivity, this emotional aspect, this feeling that seems an inevitable characteristic of human encounters? Affect - an educationally justifiable concept?

It is virtually impossible to give a definition of emotion or affect which all psychologists, psychiatrists, educationists or social scientists agree upon. The difficulty in defining a concept such as emotion is that, like teaching, emotion is an exceedingly complex phenomenon that has been studied, observed and analysed from various schema depending upon the interests of those concerned. Jaspers ¹⁷ states that "as for emotion it is often uncertain what is meant by it in a given case". Rapaport ¹⁸ says, "There has been an indiscriminate application of the words emotion and affect and feeling and their adjectival forms to almost everything that is not apparently rational or lawful".

Virtually every attempt to classify emotion leads to a differentiation of the various attitudes of an individual to his social environment. Anger, surprise, fear, disgust, contempt and joy as a few examples are characteristic attitudes of an individual to other people or to social situations. Affect may be initially a state of mind but for the concept to be an appropriate interactive phenomenon it needs to be directed towards someone or something. If considered a reaction to conditions of the environment an emotion must be considered more social than biological. For this reason the kind and form of such emotional attitudes needs to satisfy certain social norms and the affect or emotion displayed in the classroom will not be prescribed by generalized ideas on emotions but will emanate specifically from the norms that distinguish the classroom as a special sort of social setting.

Arnold ¹⁹ stated that emotional behaviour follows the intuitive appraisal of a situation. She defined emotion as a tendency to move towards anything appraised as good (beneficial) or away from anything appraised as bad (harmful). This definition has one distinct advantage for this study in that it links the concept of emotion to the hedonistic continuum which extends from extremes of negative affectivity such as loathing and hatred to the extremes of positive affectivity such as delight or love. See Figure 1.

Figure 1.



Different intensities of affective arousal are represented by arbitrary units marked off on the continuum. Midway between negative and positive affectivity is a range of indifferent or neutrally affective states and gradations define degrees of emotional intensity.

It was hypothesized that this method of conceptualization would be of direct benefit in the analysis of affect because once the affect had been identified as far as type was concerned, the location of it upon a continuum would allow for intensity of emotion to be assessed. This would have allowed for a classification system to be constructed which analysed the three important aspects of affective behaviour. These are:

- (a) Sign - the type of emotion. This categorization was initially thought of with reference to an established system of identification such as those of Tomkins²⁰, Woodworth²¹, Schlosberg²² or Osgood²³.
- (b) Duration - which would have been assessed according to a unit of time (Seconds).
- (c) Intensity - the strength of the emotion according to the placement of the emotion on the continuum.

In the formulation of a method of analysis it became apparent that the range of affective interaction in no way reflected those present in the systems previously indicated. The conviction that affective interaction was present in the interactions recorded on the tapes was strongly held but the type and intensity of emotion did not readily fit those categories established in the psychological systems conceived to assess emotion.

At this point there ensued a retracing of the ground that had already been covered in the search for a definition of interaction. Attention was redirected back to the literature concerning systems of classroom interaction analysis to see if there were any appropriate indicators of affective behaviour that would match the limitations imposed by the apparent lack of the psychological concept of emotion and by the restriction placed upon the analysis by the fact that the only available data were the transcripts and the tape recordings.

Soar²⁴ indicated that observation of the affectivity of cues given by teachers can be profitably pursued. He suggested that a specific dimension of

these cues: the affective-hostility dimension may be regarded as having very substantial potential as a criterion in the assessment of teacher performance. His was an adaptation of the Fowler Hostility-Affection schedule (Smith 25) in which eight categories were developed each of which elaborated specific activities such as "teases" "frowns" "smiles" "praises". This system that has had some documented veracity looked promising but had the unfortunate requirement of a visual image. Although the original intention was to utilize the video transcripts which were made as Phase II and Phase III of the research a detailed analysis of video recordings revealed that the visual recordings were insufficient in terms of detailed focus to allow for the visual discrimination to be utilized. There was also the problem of comparing the verbal message of the microphone with a video message taken at another point in time.

An analysis of systems of analysing interaction from MIRRORS OF BEHAVIOUR 26 indicated a wide divergence of systems according to the needs of the research and the theoretical conceptualization of the authors. Most category systems included some generalized measure of Teacher Approval and Disapproval. From a surprising number of research analyses of these teachers-affective responses to students have some predictions of subsequent pupils' cognitive outputs such as achievement in subject matter and rise in intelligence scores. As quoted in MIRRORS OF BEHAVIOUR, "it is surprising enough when a variable in education actually predicts something but even more surprising to find that how teachers say what they say appears to be a better predictor of change in pupils' behaviour than anything else educational research has turned up to date".

Teacher approval or disapproval as a predictor of cognitive growth seems logically linked with the idea that these affective measures are concerned with the reinforcement a pupil receives for the responses that he has made. How a teacher reacts to a pupil's response is equivalent verbal mediation of positive or negative reinforcement. If a student's idea is acceptable to the teacher and this acceptance is transmitted in some communication channel, then positive reinforcement could be presumed to have taken place. If a teacher responds negatively with a frown or a change in tone of verbal cue or a negation, then the student will receive a negative reinforcement. Thus from such analysis, which matches by and large typical classroom behaviour, it can be seen that the reinforcing of students' cognitions can be effected via affective channels.

However, a teacher is concerned with other than cognitive behaviour and in his organizational, managerial, social and emotional roles, a teacher is also involved in dispensing approval and disapproval. Teachers are people who have feelings and in communicating with children it is highly probable that these feelings will be obvious. Each statement transmitted could be considered to involve two channels, an information or content channel and an affective channel. Lail 27 states that if teachers are to become more effective in the classroom

they need to become attentive not only to what they are communicating but to how they are communicating it. In a sufficiently threatening or ambiguous environment it appears that the affective portion of the message can so negatively bias the climate that the content aspect ceases to be of any significance.

The importance of affective behaviour in the classroom has not received full acknowledgement. As a form of behaviour it can be considered affective if the main focus is on the emotional aspect of communication. That is, if the behaviour takes into account some measure of the expression of feeling. Indications are that this class of behaviour cannot be coded finitely from a written script because very often the affective aspect of communication is carried by the tone of the voice, by the facial expression, by gesture or by other types of non-verbal behaviour.

Biddle²⁸ stated that greatest emphasis in any classification system should be given to objective analysis and in any category system each category should be mutually exclusive yet reasonably exhaustive of the domain of the behaviours being analysed. His suggestion was for facet analysis where variables are defined in terms of their component elements which fitted closely to give comprehensive yet total analysis. He gave as an example a design which labelled behaviours as

- i) Teacher positive verbal
- ii) Teacher negative non-verbal
- iii) Pupil positive verbal
- iv) Pupil negative non-verbal

but the obvious limitation of this was that these did not cover all the possibilities that existed between the significant sets of variables that had been specified i.e.

- a) Teacher - Pupils
- b) Positive Affect - Negative Affect
- c) Verbal - Non-Verbal

Summary

The review of literature relevant to the Concept of Affective Interaction raised certain problems the answers to which were not contained fully within the readings. However, more than anything, the attempt to clarify and delineate the affective behaviours indicated the area of the problem with which the author could be legitimately concerned. It had become clear that affectivity is a general term that had a host of educational implications for the manner in which children learn appropriate or inappropriate behaviours.

That every interactive communication has an affective element appears a necessary and logical condition contained within the duality of the concepts defined by affective interaction. It seemed also to be plain that the nature

of the educational environment is such that the full range of affective meaning will not be revealed in the day to day interactions that take place between teacher and pupil but will tend to be mild in degree and should, in the light of modern educational emphases, be positive in direction. The classroom appears to contain its own type of affective behaviour, which is consistent with the view that affect is a product of the social milieu in which it is located. The forces operating upon affect in the classroom would indicate that it falls more within the range of approving (positive) behaviours and disapproving (negative) or sanctioning behaviours.

Chapter II. THE IMPORTANCE OF THE NON-VERBAL CHANNEL IN THE ASSESSMENT OF AFFECTIVE INTERACTION

Introduction

In expressing affective communications language is too often used as a means of disguising the real or true feelings rather than as a means of directly illustrating them. The openness of classroom communication would be accentuated if a teacher who had made a mistake that was evident, because of a deep purple blush, would clarify his feelings to his students if he were to verbally confirm the obvious state of his feelings by indicating "I feel embarrassed" or "I feel uncomfortable by what I have just done", rather than to attempt to direct attention away from the mistake by some verbal subterfuge. His feelings at the moment of blush would have been as obvious as if he had made the verbal clarification but as soon as he attempts to recover the feeling then some of the pupils who perceived the non-verbal signal must be confused. Non-verbal messages that are contradictory to the verbal message must inevitably lead to some degree of confusion and ambiguity in the minds of the recipient of the message as to what the sender is really feeling and thinking because if confusion intervenes in one channel (affective) the prospects of it causing concern in the other (cognitive) must also be enhanced. This indicates the problem of concern. Which is the significant communication channel, verbal or non-verbal?

Non-Verbal Emotional Expression.

Expressions of feelings can take the form of many body changes. Thus anger can be portrayed by as wide a variety of means as great heavy bodily movements or by frozen stillness. Any specific non-verbal expression may also arise from a wide variety of actual feelings; a blush for example could indicate embarrassment, pleasure or even hostility. Nor is a specific feeling always expressed in the same non-verbal way. A student with an obvious positive regard for a teacher may well reveal her feelings in a variety of ways: by blushing when in close proximity to the teacher, by eagerly doing tasks for the teacher, or by making an extra effort to do work better than the usually accepted standard.

That many teachers do not realize the importance of the non-verbal communication would be substantiated by the number of teachers who contradict the verbal message with the non verbal. Teachers by and large rely upon words and verbalisms to convey content and meaning in the instructional situation. Galloway²⁹ states that teachers believe that teaching is telling. They appear to be ready to accept the notion that to be instructive is to be verbal or to be verbal is to be instructive. Aschner³⁰ claims that language is more important in the analysis of teaching than anything else because it is both the instrument and the vehicle of teacher-pupil interaction. In the interactive

situation it could hypothetically be imagined that teachers constantly check upon the accuracy of the students' verbal remarks by assessing and analysing the non-verbal cues. But as interaction is a two way process the messages that are conveyed by the teacher are just as likely to be analysed for verification. And perhaps with a greater degree of accuracy because on a percentage basis the teacher, as an interactant, is involved in more interaction than any one other person. Thus the sum total of teacher participation must be at a proportionately higher level which would allow for a more sustained analysis on the part of the pupil.

The awareness that "how" a teacher says something is at least as significant as "what" he says may not be easy for a teacher to appreciate because up to now little conscious thought or detailed analysis has been expected of teachers concerning the conveying of communication, through the non-verbal channels. Galloway³¹ states that the immediate and total understanding one has of another is commonly referred to as empathy. Yet personal understanding at the empathetic level tends to be associated with an intuitive type insight or a "moment of truth" something akin to a woman's "sixth sense". This type of understanding is probably much more likely to reflect the correct interpretation of the verbal and non-verbal cues in such a way that interactive agreement has resulted.

It is by reacting to the non-verbal cues of others - their facial expressions, gross body movements, postures, mannerisms, vocal tones and gestures - that additional information is relayed and received and utilized in such a way that interaction is totally effective. All of this expressive, non-verbal action appears to be a naturally-spontaneous part of interaction and as such the influence that this has on the interaction is not perceived with the same awareness that verbal content is.

This is not to deny that some non-verbal signals carry an intended message or are utilized in a fully conscious manner to support the verbal message. It is here contended that there is not the same level of awareness of the implications and importance of the non-verbal message and as such there is not the same degree of control over its use. Our language patterns are cognitively conceived to achieve a desired end and teachers in a position of acknowledged linguistic influence, exert reasonably tight control over particular aspects of the language patterns that they use.

In any analysis of the interactive forces operating in the classroom there would seem good cause for including both verbal and non-verbal aspects of communication as necessary for the full understanding of the total interactive process.

Review of Literature.

That human social interaction consists of both verbal and non-verbal dimensions has been stated by Ekman and Friesen³² and Argyle³³ as a consequence of research they have done. Hall³⁴ maintained that the non-verbal channel was a sort of "silent language channel that operated in a background of consciousness". Davitz³⁵ suggested that verbal and non-verbal messages are received by quite different processes. Ekman and Friesen³⁶ observed a variation in degree of non-verbal stimuli and concluded that some non-verbal stimuli are more non-verbalized than others. A distinction seems apparent on the basis of type and degree in the recognition of non-verbal stimuli. Argyle³⁷ related his research to interpersonal behaviours when he substantiated a hypothesis that language is normally used for communicating information about events external to the speakers whilst the non-verbal code is used by humans and by non-human primates to establish and maintain interpersonal relationships. Mehrabian and Wiener³⁸ compared the relative cues for verbal and non-verbal signals for emotions. Single words were tape recorded with the affective tone of the words varying. It was found that judgements of the stimuli were based mainly on the tone of the voice. Argyle et al³⁹ hypothesized that non-verbal cues for interpersonal attitudes have more impact than verbal signals. Non-verbal cues were found to have over four times the effect of verbal cues on shifts in rating.

These examples from the literature substantiated the belief that the analysis of affective interaction would have to include non-verbal criteria. It had been originally intended to utilize both vocal and facial cues in the identification and analysis of affect.

Gates⁴⁰ found that children were more accurate in their judgements of facial cues than vocal expression of feelings. Unfortunately her method allowed for only a tentative conclusion that feeling was easier to identify in the facial medium. However there was some corroboration of Gate's finding by Leavitt⁴¹. In his study communicators were filmed as they attempted to convey six emotions facially and vocally using neutral verbal material. The decoding of facial and vocal stimuli in combination was only as strong as the decoding of facial stimuli alone. And both conditions were more accurate than the decoding of the vocal stimuli alone. This finding indicates that in the bipolar facial-vocal channel for communicating emotion the facial channel contributes more to the decoding of the total message than the vocal. The fact that the face is perhaps the most effective centre of accurate emotional stimuli was verified by Mehrabian⁴² who introduced conflicts into the verbal content in an experimentally controlled situation and compared three criteria (i) the

verbal content, (ii) the accompanying vocal cues, and (iii) the facial expression. Using these three dimensions he found that the words accounted for only 7% of the affective impact whilst the vocal cues produced 38% of the effect and the facial expression contributed the remaining 55%.

Given optimum conditions for research it would seem that the analysis of the facial cues would be a necessary component in any analysis of affective behaviour. The strength of the literature would possibly indicate that the words, the vocal cues, and the facial expression would carry by far the most significant aspects of affective interaction to an extent probably sufficient for those remaining attributes such as posture, gesture, and gross body cues to be ignored.

The Vocal Non-Verbal Cues.

When it was clear that the video-tape could not be utilized, the problem of analysis of affective behaviour became clearly delineated. The problem was now one of assessing the theoretical strength that could be brought to bear on an analysis of affective behaviour that had been carried via the verbal record of the transcript and the vocal cues of the tape-recordings.

Harrison⁴³ and Davitz⁴⁴ both conclude that, regardless of the technique used, emotional meaning can be accurately communicated in the vocal channel. The 1959 study by Davitz and Davitz⁴⁵ found that on an average feelings were communicated far beyond chance expectation. However speakers showed a marked variation in the accuracy with which the vocal expressions were recognized. One speaker's expressions were identified in 23% of the cases whilst another communicated accurately over 50% of the time. Listeners also showed a similar variation from 20% to 50% accuracy. In substantiation of other reports, feelings themselves were a significant variable in that there were marked variations in the accuracy with which they were communicated. Anger was communicated accurately over 63% of the time whilst pride was assessed accurately in 20% of the cases. Likewise Pfaff⁴⁶ found that joy and hate were most accurately communicated whilst shame and love were the most difficult to assess in the nine emotions he analysed.

Davitz⁴⁷ reports that the research has not been especially productive in the actual defining of the vocal cues which convey specific emotional meaning. The main difficulties seem to be linked to the complex technical problems involved in establishing reliably consistent measures of vocal characteristics. Two studies by Fairbanks and Hoaglin⁴⁸, and by Skinner⁴⁹, indicate that rate pitch and time of pause in vocal expression are consistently related to the meaning expressed. However studies have also indicated that when speakers whisper (which eliminates the frequency of the normal voice) the accuracy of the

listener's ability to assess affect was over four times that expected by chance. Pollack et al ⁵⁰ found that emotional communication was possible with speech samples that were only of 60 milliseconds duration.

In recent years a number of studies have capitalized upon the use of electronic filtering devices which aim at editing out the verbal content without destroying the attendant vocal cues. The instance of a person overhearing a heated exchange from which the words do not make sense but the feelings of the people interacting are obvious is too prevalent in the lives we lead for this method of analysis not to be acknowledged as worthy of study. Soskin and Kauffman ⁵¹, 1954a, 1954b ⁵², Soskin and Kauffman ⁵³ 1961, Starkweather ⁵⁴ 1956 have all worked with significant results.

This methodology offered so much promise in the current research analysis that discussion and experimentation was initiated with an electronics technician. Unfortunately the variable quality of the tapes and the length of tapes made this method impracticable.

This methodology of electronic filtering is probably the best hope for a standardized method of analysing the vocal cues of affective interaction. But this alone will not provide the full answer, as complementary to the micro-filtering system is the idea that the auditory cues that can be discriminated by the listener are also worthy of investigation. For these cues heard by the listener represent the means by which the emotion in affective interaction is carried. Another obvious problem that has general significance is that differences exist among speakers in their ability to convey particular feelings - even when they intend to.

Obvious difficulties are apparent in any attempt to assess or analyse affective behaviour in the vocal channel. Most of the research analysed has been experimented with under reasonably controlled semi-clinical conditions. The difficulty associated with analysing the interaction centred upon a chosen subject in the natural setting of the classroom seems ominous.

What are these vocal cues?

From Harrison's ⁵⁵ classification of paralinguistic qualities, six voice qualities were studied in such a way that an awareness was developed of the normal or neutrally affective range of the subjects and the teachers with whom they interacted. Prolonged practice in listening to the tapes allowed for auditory discrimination of variations from what was considered normal speech.

These variations were:

1. Range - concerned the width of pitch
2. Resonance - the sound made - (tone)
3. Tempo - or speed of execution

4. Control of (a) lips
 - (b) articulation
 - (c) rhythm

These voice qualities have general acceptance and refer to more or less enduring aspects of an individual's paralinguistic repertoire and as such are idiosyncratic to the person, in that they allow for speakers to be individually differentiated. From the listed vocal cues, inferences can be made about a person's age, background, status, social class, vitality, etc. But given that these can be assessed as being normal to a person, he may express such voice qualities according to temporary changes which are likely to carry the emotional message.

These temporary qualities are:

- a) Intensity - where the vocal production is over loud or very soft.
- b) Pitch - Height - the vocal stream may be over high or very low.
- c) Extent - the voice is drawn out or cut short - drawled or clipped.

The Search for a Key.

The analysis of data was now conceived in terms of assessing the verbal and non-verbal indicators according to stated criteria. The problem that was still to be resolved was that of linking the non-verbal affective indicators to the limited type of affect that seemed evident in the classroom: that of approving or sanctioning behaviours.

Earlier in the research conceptualization it had been stated that the range of affective behaviours exhibited was not as wide as the width of emotional expression evidenced in a less formally controlled field. The role of the teacher as the authority figure, as the model, as the classroom leader, would conceivably mean that there was a limited range of affective behaviour being used. The other speculative predictions concerned the direction of the approving or sanctioning behaviour. The stated preference being for more positive than negative behaviours being utilized certainly by the teachers if not by the pupils. Zaidel and Mehrabian⁵⁶ investigated the variation in affective expression and found that communicators were able to express variation in negative affect better than variations in positive affect whether using facial or vocal cues. They hypothesized that perhaps now verbal expressions of negative affect are practised more than positive ones because it is seldom appropriate to express negative feelings openly. Thus they are relegated to the subtle non-verbal channels more frequently than are positive feelings and people become more proficient in expressing their negative feelings verbally.

Already the literature has indicated that non-verbal behaviours are more important and basic than verbal ones and the reason for emphasizing the vocal non-verbal cues has been clarified but the relationship of these cues to positive and negative affective actions need some clarification. Piaget⁵⁷

developed a premise that suggested that non-verbal behaviour reflects very basic social orientations which could be considered major correlates of social environments. Positive and negative affects and evaluations are seen as basic cognitive distinctions made in early childhood and retained through adult life. They are instrumental in determining approach/avoidance tendencies towards persons and objects. The affective evaluation of objects and persons is seen as a crucial aspect of intellectual functioning and even of survival.

It can be generally accepted that much of a teacher's behaviour will be concerned with approving or disapproving, with praising or sanctioning, with rewarding or criticising children or actions they have or have not done. Rosenshine⁵⁸ emphasises the importance that these variables have in educational research, although he notes that "existing research on teacher disapproval or teacher criticism appears inadequate because as yet insufficient definition has been prescribed to the context in which these behaviours occur". The recommendation that Rosenshine proposed was that events both prior to and immediately after the criticism or disapproval should be analysed as well as the immediate context of criticism. Specification of categories such as teacher approval and teacher disapproval also seemed necessary because they could not be subsumed under the more generalized forms of teacher warmth. Additionally, up to this point, little research had been done on the relationship of teacher approval and disapproval. The assumption that an observer's classification of an event as being that of teacher criticism may not be justified if the student does not appear to interpret the remark as criticism.

When is a non-verbal message incongruous?

The last problem that seemed important in this review was the possibility of contradictory messages being carried in the different communication channels and the probable implications for the classroom that could be drawn from this. That verbal messages could be contradicted by the non-verbal cues seems a common sense notion that has found credence in a host of interactive situations. The sarcastically heavy emphasis ascribed to a Form II boy: "My, John, that's good work for an infant", leaves the boy in doubt as to (i) whether the work is good or not (ii) whether the teacher is joking or not, or (iii) whether there is criticism intended or not. It is not difficult to imagine interactions where the discrepancy between the verbal content and the non-verbal signal causes confusion. Sarcasm and "kidding" are common examples of communications which has approval and disapproval operating at an almost simultaneous time. Humour is frequently used to negate the negative message and reduce the strength with which it was carried.

Bugental⁵⁹ et al in one study perceived a major difference between adults and children in interpreting incongruous messages. Young children in contrast to adults perceived women's smiles when combined with a neutral statement and a neutral tone, as being natural. Children responded to a woman's smile as being supportive only when there was confirmation from another channel. This first research led to the hypothesis that messages containing positive visual content (smile) negative vocal content (tone) and negative verbal content ("You're a complete idiot") would result in children adjudging the women as being negative in affect dispensation. Direct implication was made from a second study of teacher/pupil communication, that a teacher making a critical comment to a child would presumably be in error if she were to assume that the child would think she was joking because she smiled at the same time. Children it seems tend to interpret words literally.

Chapter III. METHODOLOGY FOR THE ANALYSIS OF DATA

The survey of literature and the discussion that evolved from this clarified the problems associated with analysing affective interaction at both the conceptual and at the practical level. An overall schema was now developed within which the exploratory analysis would take place. This was formulated in the knowledge that all the problems may not have been encountered and that subsequent redirection may be necessary in the loosely conceived overall plan. This was consistent with the fact that the study was exploratory and descriptive, and as such was not restricted by the explicit controls of a tightly conceived cognitive, theoretical schema. The research of literature had provided considerable insights into the problems associated with mapping affective interaction and there was little doubt that the attempt to analyse the data would add to these.

Review: The practical task ensuing was delineated as "Defining, locating, and analysing the affective information contained within an Open Space teaching situation".

The raw data consisted of six transcripts of four boys and two girls and the six audio tapes from which the transcripts had been made. Each transcript was between forty-five and fifty pages of typed foolscap and each tape had a playing length of approximately three hours. The six subjects had been randomly selected and were studied on randomly selected days. The process that evolved was basically determined by two major considerations:

- (a) the direction that had been indicated by the review of literature; and
- (b) the intuitive insights that had been gained as a result of
 - (i) prolonged association with the open plan in question,
 - (ii) working on the research team that collected the data for related research, and
 - (iii) transcribing two tapes.

At the beginning of the development of the research design it was intended that the programme should be formulated and put into action in the analysis of one tape. This would be considered a trial analysis which would allow for modifications to be made in the analysis of the subsequent tapes.

Defining the Subjects.

No attempt was made in the transcribing of the tapes to identify any specific subject other than the one chosen to wear the microphone. As subsequent transcribing verified, no problems arose in the identification of the designated subjects. To locate the interaction recorded in a social setting,

three types of participants were specified. One that would remain constant, i.e. the subject, and two types of participants that reflected the possibilities for interaction that existed within the Open plan. Thus all participants that were transcribed were categorized according to their being either:

- (a) Subject
- or (b) Teacher
- or (c) Other

"Teacher" was designated as all those adults with whom the children had contact within the formal framework of the time recorded on tapes, and applied therefore to the four teachers assigned to the Open Plan to students posted, on section, to the Open plan and to other adults formally associated with the school (such as the headmaster).

"Other" generally referred to all other participants and, as the tapes revealed, were exclusively "peers" of the subject.

Location of the Participants into a Total Interactional Sequence.

Affective interaction is located within the total interaction pattern prescribed for any set of interactants. In order to locate affective interaction it was deemed necessary to identify and map the total range of interaction. This was done very simply by stating the range of possibilities that existed for the participants with two additional criteria being designated.

The interaction was considered to be Main stream if it included the subject and considered to be second stream if it did not. It appears obvious that most if not all of the interaction would be central to the subject in that the microphone was located on his person. However it was conceivable that conditions could occur where the subject was working silently on an assigned task of a non-interactive nature whilst, in close proximity, but peripheral to the task of the subject, others could be interacting. To make coding easier a number was associated with each category.

The categories for interaction were defined as:

- | | | |
|------------------------|---|---------------|
| 1. Subject and Other |) | |
| 2. Subject and Teacher |) | Main Stream |
| 3. Other and Other |) | |
| 4. Teacher and Teacher |) | Second Stream |

Interaction was defined as being reciprocal communication and because the communication analysis was limited to the vocal and verbal record of the tapes and the transcripts, some sign or signal of response was stated as being a necessary condition of interaction. This sign could conceivably be that the content of the interaction remains constant.

The Content of Interaction.

The location of interactive sequences must inevitably take into account both aspects of interaction: the participants, and the content of the interaction. This recognizes that whenever participants interact in any given situation there is always some meaning or purpose that can be ascribed to the interaction other than the specification of participants. The manner in which this content is specified is dependent upon the rationale established for the analysis of the interaction. Within the educational context of classroom interaction, analysis needs to be prescribed by those specific criteria that apply to a given situation, but which are considered also to be generally appropriate in the educative sense. Thus it was seen necessary to locate the interactions already prescribed along a specified range of dimensions which when applied would conceivably cover most, if not all, of the possibilities for interaction. The problem was that this total description was a necessary condition for the effective analysis of affective interaction, but was not the main task of the analysis. What was required was a simple, yet relevant set of criteria that did not inhibit the analysis by being too specific. Broad general categories seemed to be consistent with this expectation.

Prior observation of the Open Plan indicated that although a wide range of activities were engaged in by both pupils and teachers, three broad general categories seemed to cover generally the majority of behaviours engaged in. All were prescribed by the formal function of the organization in which the participants were located and as such reflected the stated educational objectives that had been defined.

Three major content or task categories were determined.

1. Task Organisational.

These were defined as those interactions which were concerned with directing, organizing, administering, and controlling behaviours.

(Adams ⁶⁰ states that "under this heading fall communications that are concerned with controlling and directing personnel or property").

These behaviours could be:

- (a) Teacher Directed and include such actions as
 - (i) taking the roll each morning,
 - (ii) directing children into instructional groups;
 or the interactions could be
- (b) Child Initiated
 - (i) Two children involved in putting books away, or
 - (ii) Organizing a group,
 both without having been explicitly directed by the teacher. In other words they have assumed responsibility for some of

the organizing or controlling behaviours that the teacher normally is concerned with.

2. Task Instructional.

Where the interactions reflect in some way the stated cognitive expectations of the group or the class. The emphasis is upon the children learning and engaging in appropriate learning behaviours that are consistent with the curriculum design for the class under the direction and control of a teacher. This is reflected in a wide range of activities in which the teacher is the central figure as the initiator, the organizer, the controller of the instructional sequence, and as such is concerned with the more formally supervised interactions associated with such things as reading, language, maths, writing, etc.

3. Task Experiential.

This is a necessary category that reflects a particular dimension of the Open Plan situation and is concerned with the informal range of activities which the children engage in. Observation has previously indicated that there are many activities that the children engage in which are related to the formal instructional goals, but in which the responsibility shifts from the teacher to pupil for the effective implementation of these. For example there is a wide range of developmental maths equipment that is available and forms the basis of daily activities towards which the children are generally directed. However the outcomes are not specifically enunciated. The pupils are not formally directed nor formally supervised in that they can choose more or less freely which activity they engage in from the range offered. By and large the presence of the teacher was not required unless it was for the purpose of controlling deviant behaviours or for resolving inter- and intra-group conflict. The role is then organizational or supervisory and not instructional. Within the Open Plan, with fluidity of movement from group to group and teacher to teacher, there seemed to be more opportunity to engage in these informal, yet important, cognitive activities. Other examples of activities that seemed likely to be considered under the category of Task Experiential were such things as skittles, draughts, jigsaws, number patterns, use of art material, matching word building cards. Seldom did children appear to undertake these activities alone. In the socially alive atmosphere of the Open Plan situation interaction is prevalent, if not rampant.

However general the three specified categories may have been, they were not comprehensive enough to offer an acceptable coverage of interaction. In any sustained interactive educational situation, the minds of the children will frequently interpret the immediate environment in

terms of their wide range of experience and these interpretations are not always linked to the organizational, the instructional or the experiential outcomes designed for them. They frequently turn to "television", to "what happened at home", to "what they will do at play time".

A category of

4. Non-task was defined to cover those interactions which occurred but had other than formally-derived educational functions.

As a consequence of the definition of the content of interaction it was now possible for the interactions that take place in an Open Space situation to be identified and located on the basis of a more or less conceptually justifiable basis.

The same numerical criteria that had been applied to the participant categories was applied to the content categories so that when these two systems of analysis were combined the following designations now offered a set of categories that were discrete, would be relatively easy to code, and were reasonably total in their coverage of the full range of interactions exhibited in the Open Plan situation.

In the numerical representation the first number ALWAYS refers to the participants of the interaction and the second number ALWAYS refers to the content area of the interaction so that the category,

- 1.1 locates the interaction in the main stream between Subject and Other on matters concerning Task Organization
 - 2.2 locates interaction in the main stream between Teacher and Subject (and possibly Other) on Task Instructional behaviours.
 - 3.1 locates Teacher and Other in Interaction on Task Organization.
 - 1.4 locates Subject and Other in Interaction on Non-Task behaviours.
- (For full range of categories, refer to Appendix I).

The category system that was devised provided an efficient, economical way of locating and recording the interactions. Although rather gross it was functional in that it allowed for affective interaction to be located within a conceptually sound system of analysis. That the identification and recording of affective interaction posed great difficulties was apparent. But these difficulties in no way limited the power of the system of general analysis. As the system evolved it became obvious that it had a "generative" power in that, although not intended, in the initial conceptualization, the available information that could emanate from the classification of behaviour according to the categories was more extensive than that desired for the analysis of affective interaction.

In the spirit of hopeful anticipation the transcripts and tapes could now be coded according to the sixteen discrete categories that were summarized in numerical form. A stop watch would be used to time the interactions once identified so that the following data would be available for analysis:

- (a) length of Interactions
- (b) Number of Interactions
- (c) Type of Interactions on the basis of :
 - (i) participants
 - (ii) content (task)

CHAPTER IV. THE ANALYSIS OF AFFECTIVE INTERACTION

The review of literature had been very discouraging from the point of offering a method to analyse affective interaction that would be operative on data available from the natural setting of a Open Plan educational situation. From the literature many important considerations had found verification. It seemed obvious that:

- (i) the analysis of affective interaction in an education situation was a virtually untapped well;
- (ii) that affect was an important, if not the most important, factor in any interaction;
- (iii) that affect is carried in both channels of communication, i.e. in the verbal and non-verbal, and there is every reason to believe that the non-verbal is the more important; and,
- (iv) that it is legitimate to expect a limited range of affect being exhibited in the classroom: The range being governed by the approving and sanctioning behaviours of the classroom with the tendency in the direction of the former.

But these were all conceptual considerations and in no way offered a methodological solution. It was clear that what was being attempted was of considerable significance in the overall educative process yet answers to the method of analysis in no way seemed immediately available. Given that a general conceptual schema had evolved, the specific resolution of the problems of analysis seemed certain to lie within the data to be studied.

The location of affect and its subsequent analysis had to be conceived within the limitations of the available data; the tape recordings and the transcripts; the non-verbal and the verbal channels of communication.

At this point it was decided to run a trial analysis on Tape 2. This was a tape that had not been transcribed by the author and he had not been involved with when the data was being collected. Both of these criteria were seen as advantages for it was considered that in not having heard the tape the author would be able to do an analysis of the affective indicators carried in the transcript without being aware of previous contact with the non-verbal at the same time.

Perhaps the only ray of light was offered by Mehrabian and Weiner⁶¹ where they identified verbal content on the basis of the meaning conveyed by words such as honey, thank, dear, as examples of positive content, maybe, really, oh as neutral contents, don't, brute, terrible as instances of negative content.

The method of analysis while not fully appropriate indicated a closeness to the types of verbal comments that may be used in schools. The difficulty of the neutral category became immediately apparent and was virtually dispensed with, in that it was considered that if every communication has an affective component then the task of analysis would become insurmountable. Research indicates a lack of affect in the classroom but in terms of logical inference it must exist. What has been accepted as affect has been positive or negative variations and this is assuredly the concern of the current investigation. On this basis, neutral affect was acknowledged to exist but was neglected in that once positive and negative indicators of approval or disapproval had been identified then the remainder of the interactions must be considered to be neutrally non-affective.

At this point the trial transcript was read closely and all verbal statements that carried any degree of

- (a) positive approval or
- (b) negative disapproval

were withdrawn for analysis.

Similarities amongst statements were looked for so that generalized categories could be organized in such a way that the category system would be (a) discrete and (b) total in its description of the behaviours identified.

The following categories were identified and the transcript analysed according to them.

Category 1.

Negative Affectors which were defined in terms of the following sub-categories

- (i) Directives: i.e. "Don't run"
- (ii) Action Descriptives: "You're not looking"
- (iii) Negative Identifiers: "You should know that, John".

According to the transcript these categories seemed to cover the range of behaviours exhibited in the negative verbal channel although their application to all negative behaviours indicated that the problem of discreteness of categories had not been solved for an affective interaction may include two categories in juxtaposition and thus three additional categories were created which were not new categories in themselves, but combinations of those categories already listed.

- (iv) Directives / Action Descriptives
- (v) Directives / Negative Identifiers
- (vi) Action Descriptives / Negative Identifiers

Category 2. Positive Affectors (Approvers)

The same procedure was applied to the analysis of positive verbal comment as for negative, and the following categories recognized:

- (i) Self Identifiers - "I like that".
- (ii) Person Affectors - "Dear", "Honey".
- (iii) Mild Approvers - "Good", "Right", "Fine".
- (iv) Modifiers - "Very good", "Excellent". Name of Child.

However there was the same difficulty with the negative channel and four additional combinatory categories were listed:

- (v) Mild Approvers / Modifiers e.g. "Good boy, John".
- (vi) Mild Approvers / Person Affectors e.g. "That's good, dear".
- (vii) Mild Approvers / Self Identifiers e.g. "I think that's good".
- (viii) Person Affectors / Self Identifiers e.g. "I like that dear".

These categories were applied to the transcript of Tape 2 and were then assessed according to verification or not of the verbal message in the non-verbal vocal channel. To establish what was significant as a non-verbal vocal cue the tapes were closely studied and using the synthesized criteria as listed on Pages (13, 14) an attempt was made to intuitively develop what could be considered a normal or a neutral set of characteristics for each participant, bearing in mind the idiosyncratic nature of each person's voice. Significant variations that were perceived were then regarded as being examples of non-verbal affective cues.

Subject 2 was then analysed according to the indicated criteria and the data recorded (Refer Appendix III).

The Key didn't Fit

Difficulties in effective analysis were apparent as this attempt at affective analysis proceeded but once a start was made on the method described then it was felt that it was important to complete it so that the method could be re-evaluated as a total process. A retrospective analysis indicated such major weakness that new directions and new paths had to be attempted. The major weakness appeared to be in the lack of generality that the category system offered. That the system that was developed reflected the behaviour of the tape was probable but the possibility of legitimately applying the system of analysis to every other tape or any future tape seemed beyond the realms of legitimate academic expectation. It seemed that an analysis of another tape could well lead to different categories being established and as such the power of the system of analysis seemed very limited and specific, and as such not worthy of continuation.

With the hope of a system that would give clearly specific indicators of affective interaction now minimal, emphasis was redirected back to the general concepts that seemed to have the soundest theoretical and conceptual strength.

This re-examination of the literature resulted in the formulation of a method of analysis that although more general than initially anticipated promised to be reasonably useful in its application in the educational situation.

In line with what has already been established in the literature and verified in the explanatory analysis of Tape 2 the range of affective behaviours that would be likely to be found in the interactions that take place in the formal conditions of the classroom would appear to lie within the range of:

- (a) Positive or approving actions
- (b) Negative, disapproving or sanctioning actions
- and (i) Verbal
- (ii) Non-Verbal (Vocal)

interactions.

That this should be the extent of the affective analysis was initially a little disappointing but on further analysis the combining of these variables added two additional perspectives which not only increased the categories, thus making them more specific and accurate but enhanced its acceptance as a theoretically valid set of constructs within which to analyse classroom affective interaction.

The first possibility was that an approving or disapproving action might be carried in only one communication channel. This being so the other channel could be defined as being neutrally affective. The second possibility which has significant implications is that the approving or disapproving action could be identified in one channel and contradicted in the other. A possibility that the literature was able to verify. Refer to Bugental et al ⁶².

Thus a category system was developed which analysed three classes of affective behaviour:

- (a) Positive or approving actions
- (b) Negative or disapproving actions
- (c) Incongruous

in two channels, with the possibility that only one channel might convey the message.

Thus the channels used could be:

- (i) Verbal
- (ii) Non-verbal
- (iii) Neutral in one
- (iv) Carried in both

The exhaustive list of possibilities thus represents a conceptually sound system:

Indicators of Approval	(i)	Verbal Approval	-	Non Verbal Neutral
	(ii)	Verbal Neutral	-	Non Verbal Approval
	(iii)	Verbal Approval	+	Non Verbal Approval
Indicators of Disapproval	(iv)	Verbal Disapproval	-	Non Verbal Neutral
	(v)	Verbal Neutral	-	Non Verbal Disapproval
	(vi)	Verbal Disapproval	+	Non Verbal Disapproval
Incongruous Indicators	(vii)	Verbal Approval	-	Non Verbal Disapproval
	(viii)	Verbal Disapproval	-	Non Verbal Approval

The full methodological approach now appeared consistent with the general intentions that initiated the study.

The identification and analysis of interaction has been fully outlined in Part 1 of Chapter IV. The following steps were now considered necessary for the location of affective interaction in the total interactional settings:

- to
- (a) Analyse the verbal content to locate verbally approving or disapproving actions;
 - (b) Compare these verbal actions with the message that is carried in the non-verbal or vocal channel;
 - (c) Analyse the complete non-verbal (vocal) channel to identify additional approving and disapproving behaviours not revealed in the verbal channel (recognizing that the vocal cues will probably account for a significantly higher proportion of affective cues).

The six tapes were consequently analysed on the prescribed basis.

CHAPTER V. SUPPLEMENTARY CONSIDERATIONS

In many ways this research parallels that of a problem solving or discovery learning situation. It was evident that the relationship of a general overall schema in the investigation to the actual analysis of data had resulted in many problems that had been resolved en route. The methodology that evolved matched the requirements of the study in that it had been adapted to meet the needs as the needs had changed. That the investigation was a process of development more than the analysis of the product had certain implications that require clarification.

One of these concerned the formulation of hypotheses.

"To hypothesize or not" that is the question.

Because of the exploratory structure of the analysis of the problem, hypotheses did not seem appropriate until the methodological problems had been resolved. The investigation had been partly initiated on the rather loosely based assumptions (1) that affective behaviour was a more prevalent aspect of classroom behaviour than had been indicated by research and (2) that problems would inevitably occur in any attempt to investigate affective behaviour in the natural setting of an Open Plan situation. At the conclusion of Chapter III the methodological problem appeared to have been sufficiently resolved for the analysis of data to be undertaken. The question arose: "Was it appropriate to formulate hypotheses at this stage?" Governed by the rather loose structure that had pervaded the investigation the author was unwilling to define his presumptions as hypotheses. The term hypotheses has implicit within its meaning, inevitable and necessary scientific connotations and it appeared unwise to ascribe scientific conditions to this investigation. No need was felt to hide behind the pretensions of respectability that the links with more rigidly scientific criteria would bring. That the investigation was acceptable as a largely intuitive piece of work was deemed to have been demonstrated. Thus the term hypotheses in light of its scientific specifications was by-passed and the speculative trends that the analysis of the data would hopefully reveal were called "General Tendencies". And whilst these were not formulated with the precision and direction required by hypotheses they never the less did have conceptual origins. They developed as a consequence of:

- (1) the review of the literature;
- (2) the experiential familiarity with some of the research data as a result of its examination in attempts to find solutions to methodological problems; and,
- (3) the background of personal experience that threw up "conceptual insights".

These "General Tendencies" were concerned with the two main areas of the research that had been delimited. The first arose as a consequence of viewing interaction in the total context of the classroom, and, as has been already explained, resulted in the location of the participants of interaction according to specified tasks.

General Tendencies related to the Total Interaction Analysis

The following appeared plausible derivatives of the specified variables in interaction.

- (1) That the subject would figure centrally in the interaction analyses.
- (2) That Teachers would figure centrally in the interaction analysed. (Elman and Freisen⁶³ indicated that adults' voices are easier to determine than children's in the audio medium).
- (3) That in the life-space recorded of six-to-eight-year-olds in a larger than usual social medium (i.e. the Open Plan) the behaviour would be predominantly vocal.
- (4) That the length of interaction would vary according to the activity engaged in.
- (5) That the number of interactions would vary according to the activity engaged in.
- (6) That interactions concerning Task Instructional and Task Organizational would be longer and more numerous than those of Task Experiential and Non-Task.
- (7) That an insignificant amount of time would be spent in Task Experiential and Non-Task.
- (8) That teacher initiated and teacher controlled interaction would be more significant than those interactions where Subject and Others were central.
- (9) That the tapes would reflect a variety and range of activities.

General Tendencies of Affective Interaction

As indicated in the review of literature there were many trends which would be presumed from an analysis of affect. The following seem justifiable:

- (1) That the teacher, as designated, would dispense more affect (via the definition of approval/disapproval) than any other single interactant.
- (2) That the teacher would dispense significantly more approval than disapproval.

- (3) That the teacher would dispense a significant proportion of approval/disapproval in the verbal channel alone.
- (4) That the disapproval that the teacher dispensed would be indicated in both channels (Verbal and Non-Verbal) simultaneously.
- (5) That there would be a minimum amount of incongruous affective interaction.
- (6) That more approval/disapproval would be dispensed by the teacher in Task Instruction than in Task Organization.
- (7) That a significant number of interventions by the teacher in Task Experiential and Non-Task would be of an affective nature (i.e. approving or disapproving actions).
- (8) That Subject and Other would display more affective behaviour (approving/disapproving) actions in Task Experiential and Non-Task than in Task Organizational and Task-Instructional.

The Problem of Defining Affect as an Interaction

As indicated in the methodological outline the stated intention was to map all instances of affect displayed on a positive (approving) or negative (disapproving) basis and this was to be described along the verbal, non-verbal, or neutral range. Two problems became obvious as the methodology was invoked, which caused additional modifications. The first concerned the location of approval or disapproval. It had been intended that the affects should be located as specific interactions within a general interaction schema. This was thought to be of significant advantage in that comparison of a mathematically proportionate nature could legitimately be made. The identification of the approving or disapproving behaviours presented no problem, but their assessment as an interaction that was equivalent to the general definition of interaction was highly questionable. The approval/disapproval identified did not have the same quality of continuity that the generally-defined interactions had. In the general context if the participants and the task remained the same, then interaction was considered continuous and as results indicated could range from five seconds to seven hundred and fifty seconds in length. But approving/disapproving actions seemed to be more closely linked to specific points in time than to a continuous time sequence. This difficulty was compounded in that in an affective sequence, the discrimination of the approval or disapproval may be contingent upon the tone of the voice varying for only one word.

An analysis of the following sequence may clarify this point. An example of disapproval from Tape 2 Transcript, Page 12 is:

Teacher "... (1) what have we done - what have we done ... (2) Lindsay
you are not looking, you're not thinking - (3) What have we
done from here to there"?

This above sequence took 5 seconds to say as part of a 190 second interaction on Task Instructional. The methodology outlined for affective interaction demanded that the sequence be defined as 3 distinct interactions.

- (1) It was non-verbal disapproval as indicated by the tempo and tone of the voice.
- (2) It was both verbal and non-verbal. The word 'not' indicates disapproval which was substantiated in the non-verbal - the voice was raised sharply at both "not looking" and "not thinking".
- (3) Once again on instance of non-verbal; the tone was that of slow deliberate disapproval.

Thus this 5 second sequence consisted of three discrete units of disapproval. An analysis of other such examples, specifically Tape 2 Transcript, P.16:

Teacher: "Good girl",

an example of approval carried in both verbal and non-verbal channels which when timed took $\frac{3}{10}$ th of a second. It was realized that to time such brief units of affective behaviour accurately would be technically impossible given the resources and conditions of the investigation.

The affective units, once located, were defined as "incident interactions" and plotted as points in time on a unitary basis without the dimension of continuous time. This allowed an analysis of approval/disapproval on a numerically equivalent basis but denied the comparison of them on a percentage basis with the total interaction pattern on a time comparative dimension.

The Problem of Discreteness in Participant Categories.

By and large the categorization of general classroom behaviour on the basis of participants and tasks was easily effected. But one situation emerged which had not been envisaged. The situation frequently occurred. (Example given from Page 36 Tape 4) where the teacher took a central role in a group discussion (ranging from 3-20 participants) of which the Subject was a participant. Given these conditions of oral interchange, the interaction could conceivably move from (a) $T \rightarrow S$ to (b) $T \rightarrow O$ to (c) $T \leftarrow S$ to (d) $T \leftarrow O$ to (e) $O \rightarrow S$ to (f) $O \rightarrow T$ with all these variations in interaction being centred upon the initially designated task. The implementation of the category system as defined indicated that the above sequence could be represented as (a) 2.2; (b) 3.2;

(c) 2.2; (d) 3.2; (e) 1.2; (f) 3.2. It was considered that this fragmentation of the sequence would have given a distorted view of the continuous interaction that had occurred. A decision was made which defined such a teacher-controlled group discussion with Subject as a special example of 2.2 and that, although the interaction could include Others (O), a change of category would not be recorded unless the Subject initiated interaction with another on a topic other than the Task controlled by the teacher. Whilst the group containing the Subject continued interaction on a specified topic, the category would not change.

Perhaps two other areas of concern need discussion. These, while of minor importance to the study, may be useful in the overall findings of the thesis. The first relates to the nature of the equipment used for the collection of data; the second to the absence of trained recorders to verify and corroborate that what was being identified was behaviour that was not idiosyncratic to the observer.

The Microphone: An Intruder in the Natural Setting.

One of the long-standing difficulties of research in educational situations has been the method of data collection. The role of the participant observer is questionable in that the presence of someone other than a regular member of a social system must inevitably cause some change, however minimal, on the actions and interactions of the regular participants. One of the basic factors which had been attractive about the particular form of investigation, of which this was a part, was the presumption that what was likely to be recorded was a reasonably accurate record of the interactions of pupils, student-teachers and teachers that generally reflected their normal behaviours. The question that is still applicable is the extent to which the presence of the research team (either two or three in number) and the research equipment changed the behaviours of the subject in particular and the teachers and others in general. At the logical level this question defies resolution because it implies that normal functioning takes place when the teachers and pupils are alone but as soon as a person who is more socially distant is introduced the behaviour by definition becomes abnormal. This concept of normality and its logical implication is not reflected in the conditions that appeared to operate in the Open Plan in question. The specific layout where the research took place, was one of the first school buildings that was specifically designed as a fully functioning Open Plan complex to be utilized in New Zealand. It was also established in a Normal School which by definition, is a school specifically staffed to help in the practical training of Teachers College

students, with lower pupil-teacher ratios, bolstered salaries and certain professional advantages.

All the above factors had implications for the manner in which the impact of the research team in Phase I could be considered minimal. The organization was a socially dynamic situation that was accustomed to frequent interventions into its social life space by students, school staff, visitors, parents.* The reaction of the children to the frequent adult interventions was interesting in that the children seemed very socially accepting and uninhibited in the social situation. Whether this was due in part to the Open Plan organization and to the large number of adult visitors (one a consequence, of the other) is open to speculation. The technical equipment was stored in a large teachers room which was situated in the middle of the Open Plan. This proved a very advantageous location for the equipment in that two large observation windows allowed indirect observation of the large Open floor space and of the largest of the three group teaching rooms. From this central location the technician monitored the master tape recording and dubbed a time frequency signal onto the tape at one minute intervals.

Perhaps the most significant impact that the equipment made was in the personal discomfit that the individual microphone caused to each Subject. The microphone was attached on a cord tied at the neck of the Subject and the battery-powered transistorized transmitter was carried in a holster worn around the waist and strapped to the leg in much the same way as a gun holster. That this at first caused much attention was obvious from the transcripts. Close analysis of the tapes and the transcripts indicate that the amount and degree of attention that was centred upon the equipment worn on the subject was variable. Initially a novelty effect seemed to operate and to minimize this, on the transcript, the children were dressed in their micro-transceiving equipment 20-25 minutes before formal recording took place. References throughout the transcripts and the tapes make it apparent that the children did not completely forget about the equipment. Rather than regular reference the children seemed to go through a familiarity stage during which the equipment was of central concern to the Subject and to his peers in close proximity. This lasted as long as half an hour in one case and as short as 15 minutes in another. After this, references tended to be spasmodic and more

*On one of the frequent occasions the author was in the Open Plan he observed, in the course of a morning 26 adults other than those who were formally designated to the organization.

time-filling than central. Generally the subjects responded freely to the interactions that were of central concern to them and the intimate knowledge that was gained of the Subject in the hour by hour listening was reassuring as to the small effect that the physical presence of the equipment had. That its physical dimensions were such that it could not be ignored was obvious; that its significance moved from that of maximal significance to minimal significance was equally obvious.

The Use of Trained Recorders.

The problem of participant bias and consequent lack of objectivity was never overcome. The hundreds of hours that were spent, initially transcribing and then coding, firstly the participant and content interaction, and then the approving/disapproving incidents, resulted in a personal familiarity with the material that could not have been expected from another person.

Silent on Non-Interactional Time.

The definition of interaction as indicated in Chapter III did not account for the total time that was recorded on the tapes. The following reasons are presumed as the causes of the difference between time categorized and time totalled.

- (1) There were times identified on the tape when the children were engaged in work of a non-interactive nature, i.e.
 - (a) Silent Reading, Printing or Recording in Language and Mathematics and
 - (b) where their involvement in some task was fully cognitive, i.e. working out a puzzle, problem or a move in a game of draughts.
- (2) There were instances on the tapes where the high level of activity made the interaction indistinguishable.
- (3) There were instances where the technical limitations of the equipment caused gaps in transmission. These occurred when the strength of the signal was weakened by some external influence which resulted in a shadow effect of the transmission.

CHAPTER VI.

DISCUSSION OF RESULTSPart 1.Resumé of Investigation.

The six randomly selected subjects from the Open Plan Infant Complex* were tape recorded on six selected mornings for approximately three hours each.

The tapes were transcribed so that written and audio-records of the interactions were available for analysis. In attempting to formulate a basis for analysis problems were encountered and resolved.

The analysis of affective interaction was located in the total sequence of interaction that took place in the classroom. These interactions would have the dual dimensions of:

- (a) Participants
- (b) Tasks

and the categories defined are enumerated in Appendix I. These interactions were timed and numbered so that the participants and the task could be considered on a time-quantity dimension.

Affective interaction was defined on the basis of approving/disapproving behaviour generally engaged in by teachers. The analysis of this took place according to the specification of approval (positive) and disapproval (negative) and verbal, non-verbal and neutral patterns. As a consequence of linking the two factors the possibility of defining incongruous behaviour emerged which was necessary in the full description of affective behaviour. The difficulty of locating affective behaviour on a time dimension resulted in the analysis of approval/disapproval on a numerical basis.

Once the behaviours had been identified, each interaction in the participant/task analysis was timed with the second being utilized as the unit of analysis. Totals for each category within each tape were calculated on both a numerical (time) basis and a percentage basis (the relationship of each unit of analysis to the whole). This does not represent a total analysis of the time that was taped but concedes that a difference exists, between identified interaction time and total time. For the purpose of analysis, where percentages are indicated on a part/whole basis, then the percentage represents part of the total interaction time.

*(The pupil roll was 125. There were 4 teachers attached).

Part II. Analysis of General Interaction.

The percentage of interaction identified in comparison with the total time of recording ranged from 69%¹. (Tape Four) to 96% (Tape Two) with the average comparison being 88%. The total recording time was 16 hours 16 minutes with a Subject range from 2 hours 52 minutes (Tape Four) to 2 hours 32 minutes (Tape Six). The total interaction time identified was 13 hours 36 minutes with a range from 1 hour 59 minutes (Tape Four) to 2 hours 32 minutes (Tape Two)². The reason for the difference between the intended 3 hours of recording and the totals recorded is due to the breakdown in effective transmission that occurred as a result of the 20 minute play interval that occurred daily.

(This play time was so regular in occurrence and so impossible to transcribe that it was withdrawn from the research on the premise that it was not interaction time that was formally prescribed or controlled by the organization under analysis. Its description lay more correctly within the general range of events prescribed for the school as a whole).

Two significant points emerge from an analysis of time. The first being that the range of definable interaction was variable. The second being the high average that exists when interaction time is compared with total time. On the evidence, social interaction is a very important factor in the life space of a child in an Open Plan situation.

Task Distribution of Interactions.

It is important to remember that from this point on all comparisons of part to total will be based on total interaction time.

The distribution of interaction according to the four task categories are:

	%	<u>Time</u>
Task Organizational	12	1 hr 34 min
Task Instructional	61	8 hrs 16 min
Task Experiential	12	1 hr 33 min
Non-Task	16	2 hrs 6 min
		13 hrs 28 min

These figures reflect several of the stated "General Tendencies" although a point of interest is that Non-Task activities were more prevalent than Tasks Organizational or Tasks Experiential.

Results that Focus on Participants in Interaction.

Each of the participant categories was analysed separately with the full analysis for each included in the Appendices IV to VII. Specification of

1. Percentages used were calculated to two decimal places but have been rounded to whole numbers in the text.
2. Refer to Appendix III for the full range of details relevant to this time analysis.

the full interaction analysis of the Subject and the Teachers caused the two categories to be combined for each instance. Full details are included in Appendices VIII and IX.

The Subjects were in interaction with "Others" for 43% of the total time and were in interaction with the "Teachers" for 50% of the time which gave a total of 93% of the time for "Subject" interaction. This was an expected outcome. The microphone was attached directly to each Subject. The range of Subjects' participation in total interaction was from 84% for Tape Two to 99% for Tape Five.

The teachers were in interaction with Subjects and Others for 56% of the total interaction time with the range across the tapes being 48% for Tape One and 61% for Tape Five. That a child is in interaction with the Teacher for the percentage indicated adds to the conception of the Open Space as a dynamic social environment.

There appeared no grounds for assuming that the amount of time that the Teachers spent in interaction with the six Subjects was any different from the amount of time the teachers interacted with any or every other child.

Number and Length of Interactions.

The methods used in the collection of data enabled the enumeration of (a) the length of interactions and (b) the number of interactions. Full details are included in Appendices X - XII.

Altogether 588 interactions were identified.

The range varied from 90 (15%) on Tape Two to 120 (20%) on Tape Six. The average length of interactions varied from 62.6 seconds on Tape Six to 101.2 seconds on Tape Two. When the number and length of interactions are considered co-jointly, Tape Two with the least number of interactions had the longest interactions and Tape Six with the greatest number had the shortest interactions. This offers partial explanation for the differences that exist between these two tapes for the differences between the remainder of the tapes on the dimensions of number and length of interactions are minimal:

	<u>Number</u>	<u>Time in Seconds</u>
Tape One	93	87.4
Tape Two	90	101.2
Tape Three	98	83.3
Tape Four	91	78.3
Tape Five	96	90.0
Tape Six	120	62.6
Total	<u>588</u>	<u>Av. length 82.47</u>

These figures reflect the fact that on the two criteria of interaction indicated the Open Plan is a very stable educational environment.

When the length and number of interactions are analysed according to the Task categories the following results emerge (Full details in Appendix X):

	<u>No. of Interactions</u>	<u>%</u>	<u>Length (in seconds)</u>
Task Organizational	144	24	39.83
Task Instructional	218	37	137.09
Task Experiential	60	10	94.60
Non-Task	166	28	46.05
Totals	<u>588</u>	Av.Length	<u>182.47</u>

With reference to the full breakdown of figures it is interesting to note that category 2.2 (Teacher Subject and possibly Others in interaction on Task Instructional) accounted for 100 interactions each of 193.3 seconds in length. When this is considered along with the totals for Tasks Instructional it is clear that this is the area of sustained interaction in an Open Plan context. Significantly the highest number of interactions took place in Category 1.4 (Subject and Other in interaction on Non Task) with an average length of 50.65 seconds. Non-task activities clearly are frequent yet brief. The same can be said for organizational activities where 144 interactions took an average of 39.83 seconds. That organizational behaviours are communicated directly and explicitly is verified by the data.

Results related to Task Dimensions.

- (A) When Task Organization categories (i.e. categories 1.1; 2.1; 3.1; 4.1) were analysed the range in the Tapes was from 12%, of Task Organizational behaviour, on Tape 4 to 21%, on Tape 2. When the Tasks Organization were located in the total interaction sequence then the category distinctions were as follows:

<u>Category</u>	<u>% of Total Task Org.</u>	<u>% of total time</u>
1.1	12	1
2.1	72	8
3.1	16	2
4.1	1	0

- (B) For Tasks Instructional the results were:

<u>Category</u>	<u>% of Total Task Instructional</u>	<u>% of Total Interaction</u>
1.2	29	18
2.2	65	40
3.2	6	4
4.2	0	0

There was a minimal range on the six tapes for Tasks Instructional. When the data from each tape were compared with the total data for Tasks Instructional the range was from 15% on Tape Six to 20% on Tape One. This indicates a marked similarity of Tasks Instructional on each of the six days surveyed.

(C) For Tasks Experiential the results were:

<u>Categories</u>	<u>% of Total Tasks Experiential</u>	<u>% of Total Interaction</u>
1.3	88	10
2.3	6	1
3.3	-	-
4.3	6	1

The results show that in Tasks Experiential the Subject is central to the activity being engaged in. When the individual tapes were compared a significant difference appeared in that in Tape Two 37% of the total Tasks Experiential were discerned and in Tape One there were no Tasks Experiential. This range of 37% with the other Tapes being positioned almost equidistant between the two extremes was the most significant range to appear in any part of the research. Significantly the two tapes to record the lowest percentage Tape One (Nil) and Tape Four (9%) were those that recorded the highest percentage of Non-task behaviours. This suggests that the movement from Task Experiential to Non-Task is an easy and frequent phenomenon.

(D) The results for Non-Task categories were:

<u>Categories</u>	<u>% of Total Non-Task</u>	<u>% of Total Interaction</u>
1.4	86	13
2.4	7	1
3.4	2	0
4.4	6	1

The Subject in interaction with Other accounts for almost the total Non-Task behaviours. Educationists would be encouraged with the minimum amount of Non-Tasks engaged in by the Teachers in interaction. When the Teacher is analysed by combining Categories 2.4 and 3.4 the total is 8%. The range of each Tape to the total Non-Tasks was from 22% on Tape Four to 12% on Tape Two.

The full details for this analysis included in Appendices XIII - XVI.

Part III. The Analysis of Affect.

As previously noted, because of methodological problems it was impossible to compare affective interactions with general interactions as had been initially intended. Affective indicators were located as incidents and were recorded on the basis of the number and type of affective indicators located within categories enumerated for general interaction.

A total of 442 affective indicators were identified in the six tapes.

	<u>Indicators of Approval</u>		<u>Indicators of Disapproval</u>		<u>Incongruous Indicators</u>		<u>Total</u>	<u>%</u>
Tape One	50		8		6		64	14
Tape Two	54		44		-		98	22
Tape Three	29		22		-		51	12
Tape Four	40		32		3		75	17
Tape Five	50		40		2		92	21
Tape Six	37		23		2		62	14
Totals	<u>260</u>	+	<u>169</u>	+	<u>13</u>	=	<u>442</u>	

Indicators of Approval accounted for 59 of the total indicators, Indicators of Disapproval for 38% and Incongruous indicators for 3%. Variations in the range of each were:

- Indicators of Approval ranged from 7% of the total affective indicators for Tape Three to 12% for Tape Two.
- Indicators of Disapproval from 2%, of the total for Tape One, to 10% for Tape Two.
- Incongruous indicators from Nil % in Tapes Two and Three to 1% for Tape One.

The general conclusion that can be drawn is that there is about the same amount of approval being directed over the six tapes but that the disapproval is more widely distributed. The lack of Incongruous indicators is encouraging in that the teachers would generally appear to be conveying the affective message in the manner they intend.

Initial examination would indicate that approving indicators follow the pattern that was outlined in the "General Tendencies", i.e. there would be more positive affect dispensed in an Open Plan situation than negative affect. The proportional difference in percentage distribution supports this. This however could be misleading and needs analysis in the context of one significant factor outlined by the literature. A teacher's use of such terms as "Good", "Right", "Fine", if carried in the verbal channel alone may not be considered approving by the children. This would add a new significance to the

possible interpretation for 150 Indicators of Approval were carried in the Verbal Approval/Non-Verbal Neutral channel. This represents 58% of the Indicators of Approval. Thus any change that a re-interpretation of these indicators would give would be significant.

It it were true that the Verbal Approval/Non-Verbal Neutral was an ineffective transmitter of affect then the relationship of positive to negative affect changes dramatically. If there is justification in doubting the strength of the signal carried in the Verbal Affective/Non-Verbal/Neutral channel then there would probably be the same justification for doubting the strength of the signal in the Verbal Disapproval/Non-Verbally Neutral. This would leave the comparison of the remaining two channels in the Approval and Disapproval categories as being the basis of appropriate comparison. This comparison is outlined:

(a) Indicators of Approval	<u>Totals</u>	<u>% of Totals</u>
Non-Verbal Approval/Verbal Neutral	8	2
Verbal Approval/Non-Verbal Approval	102	23
	<u>110</u>	<u>25</u>
(b) Indicators of Disapproval		
Non-Verbal Disapproval/Verbal Neutral	51	12
Verbal Disapproval/Non-Verbal Disapproval	76	17
	<u>127</u>	<u>29</u>

On this basis the relationship of Indicators of Approval to Indicators of disapproval is more equal in the affect displayed in the Open Plan (Refer to Appendicies (XVIII - XXII) for more detailed analysis).

Affective Indicators Located in (a) Tasks Organization.

The two categories of Tasks organization that involved the Teachers (i.e. 2.1; 3.1) were analysed and 89 affective indicators were identified. Of these 49 or 11% were approving, 37 or 8% were disapproving and 3 or 1% were incongruous. The range over the six tapes was from 11 on Tapes Three and Five, 19 indicators in Tapes One and Two or in percentages 2% to 4% , an insignificant difference.

(b) Tasks Instructional

The two teacher categories of Tasks Instructional were categories 2.2 and 2.3. These were 338 or 76% affective indicators located within these categories, 202 or 46% were approving, 126 or 29% were disapproving and 10 or 2% were incongruous. The range across the tapes varied from 39 or 12% on Tape Three to 79 or 23% on Tape Five.

The fact that 76% of the Indicators of affect was located in 61% of the

interaction may seem to reflect the "General Tendency", stated in Chapter V, that there would be a higher proportion of affective indicators identified in Tasks Instructional. But this neglects to take into account that Task Experiential is essentially a child-orientated task and as such does not include the teacher. A proportionally distributive criterion would therefore need to be applied in any attempt to compare the two sets of criteria.

(c) In the Non-Task categories (i.e. 2.4 and 3.4)

9 indicators of approval or 2% and 5 indicators of disapproval or 1%, were located. These totalled 14 and were 3% of the total Affective Indicators. There were very few teacher directed affective incidents during Non-Task activities. On a proportionate basis they represent fewer than may have been expected.

EPILOGUE

Teaching is acknowledged to be a complex activity (Adams and Biddle⁽⁶⁴⁾ Smith and Geoffrey⁽⁶⁵⁾ and any attempt to assess the complexities caused by its inter-related characteristics must also recognize the variable nature of the activity.

Any educational research must accept that the scientific explanation of the phenomenon being studied is governed by three conditions which reflect the general, complex nature of the total teaching construct. That full explanation is a possible derivative of a methodological approach is unlikely: what is much more probable is that scientific research into education will (a) offer partial explanation of the total range of behaviour (b) provide full explanations for some aspects of education (c) will indicate one of many explanations which may be equally acceptable.

That such a complex human activity will involve many and varied methods of analysis is inevitable.

That this investigation was not researched vigorously or scientifically is evident. The problems that developed as a consequence of attempting to look globally at specific instances of behaviour were never overcome. Its generative, prescriptive; and predictive power is limited: yet despite this insights have been gained which may have applicability. The thesis reflects a held belief that teaching is interactive.

It makes no sense to define teaching as anything less than a communicative process. In Green⁽⁶⁶⁾ and Short's⁽⁶⁷⁾ view communication is central to education and indicates that the ability to communicate information, ideas and feelings to fellow beings rapidly, accurately and fluently will continue to be a primary factor in man's evolution. In this study the method of analysis was not considered as important as the opportunity to attempt to define, locate and analyse one aspect of the interactive process: that of affective interaction. That affective interaction was not able to be effectively defined within the framework of the investigation was disappointing: as was the lack of specificity, that was evident, from the attempts to organize "affective" classroom behaviour into a set of categories. Intuition had provided the impetus to delimit the range of affective responses but in the long run it did

not provide the answers.

From the research many ideas have been confirmed. Some classrooms are basically stable, social environments that after many and varied opportunities for interaction. That the majority of these are instructional, that some are organizational and some child-orientated is also evidenced. The role of the teacher is as central in an Open Plan as it is in any other educational situation (see also Flanders⁽⁶⁷⁾, Hudgens⁽⁶⁸⁾, Adams and Biddle⁽⁶⁹⁾). That children, in the formal setting, of the school are, basically directed or orientated towards the specified tasks is also clear in that interactions on instructional tasks were more sustained than any others.

That there was more approval than disapproval used in the Open Plan was confirmed in the study although an alternative method of evaluating the verbal approval/non-verbal neutral category has implications for the way this is viewed. The amount of affect distributed across the 6 tapes reflects much the same pattern that the analysis of the total interaction revealed. On the six days studied there was much the same behaviours exhibited by both teachers and pupils. Most of the affect was located in task instructional which is consistent with expectations of current educational practice.

These general factors and others more specific have been discussed in the previous chapter.

However there is one area that this research has indicated as being especially important. That is the significance of non-verbal communications in the analysis of affect in the educational situation. (This would certainly be no surprise to McLuhan⁽⁷¹⁾).

This century has seen the emphasis in schooling shift from content-dominated instruction, where teaching was considered synonymous with telling, to a child-involved approach. As a result interaction has become an important factor in the classroom.

Knowledge is changing in such a way that whereas in 1900 it was very important what was learned, in 1960 it was as important how it was learnt, as it may be important in 1980, how one feels about what is learnt.

In the analysis of affect the importance of the non-verbal medium will continue to be of extreme importance. Teachers as communicators can manipulate the verbal message so that the intention of the message is clear. Galloway⁽⁷²⁾ suggests that teachers have often said that they were not precisely sure of what they thought until they heard themselves speak. Words thus become data not only for others but for ourselves.

We can capitalize on what we say in such a way as to provide a sort of feed-back loop to check upon the intent and meaning.

However one cannot see oneself in the same way that one can hear oneself. The response of others is a necessary requirement if a person is to comprehend the full effect that his communication has had.

The general awareness that teachers have of the significance of non-verbal cues is probably not as great as this investigation has indicated it needs to be. The wider recognition of the importance of non-verbal cues in the interaction process will assuredly focus attention upon methods employed in teacher training to ensure a more complete awareness.

This investigation indicates that listening to transcribed accounts of tape recordings would help but undoubtedly the use of self analysis techniques where students teach a group of children and subsequently study the video-tape of the teaching would be more desirable.

APPENDIX I

Categories developed for the analysis of interaction.

	<u>Code</u>	<u>Participants</u>		<u>Task</u>
M A I N	1.1	Subject and Other	in	Task Organizational
	1.2	Subject and Other	in	Task Instructional
	1.3	Subject and Other	in	Task Experiential
	1.4	Subject and Other	in	Non-Task.
S T R E A M	2.1	Subject and Teacher	in	Task Organizational
	2.2	Subject and Teacher	in	Task Instructional
	2.3	Subject and Teacher	in	Task Experiential
	2.4	Subject and Teacher	in	Non-Task.
S E C O N D	3.1	Teacher and Other	in	Task Organizational
	3.2	Teacher and Other	in	Task Instructional
	3.3	Teacher and Other	in	Task Experiential
	3.4	Teacher and Other	in	Non-Task.
S T R E A M	4.1	Other and Other	in	Task Organizational
	4.2	Other and Other	in	Task Instructional
	4.3	Other and Other	in	Task Experiential
	4.4	Other and Other	in	Non-Task.

- Notes.
1. In codes 2.1 - 2.4 the possibility exists for Subject Teacher and Other to be in interaction.
 2. In codes 3.1 - 3.4 the possibility that Teacher is:- Interaction with Teacher exists.
 3. Main stream interaction always includes Subject. Second stream interaction never includes Subject.

DATA FROM EXPLORATORY ANALYSIS OF TAPE TWO

Total Affective Incidents	143			
		%	%	Total.
	Incidents	Positive	Negative	%
Teacher	112	47.55	30.77	78.32
Subject	12	2.10	6.29	8.39
Other	19	3.50	9.79	13.39
	143	53.15%	46.85	100.00.

	Verbal	Verb/N. Verb	Non/Verbal	Total
Teacher	42.66	20.98	14.69	78.32
	+ 36.36 - 6.29	+ 10.49 - 10.49	+ 0.70 - 13.99	+ 47.55 - 30.77
Subject	2.10	5.59	0.70	8.39
	+ 0.70 - 1.40	+ 0.70 - 4.89	+ 0.70	+ 2.10 - 6.29
Other	4.30	7.69	1.40	13.29
	+ 0.70 - 3.50	+ 2.80 - 4.89	- 1.40	+ 3.50 - 9.79
Totals	48.96	34.29	16.79	100%
	+ 37.76 - 11.19	+ 13.99 - 20.27	+ 1.40 - 15.39	

APPENDIX III

Analysis of Time

	Recording Time	Interaction Time	Silent Time	Total Time
T. One	2 hr. 49 m.	2 hr. 15 m. 79.88%	34 m.	169 m. 17.31%
T. Two	2 hr. 39 m.	2 hr. 32 m. 95.56%	7 m.	159 m. 16.29%
T. Three.	2 hr. 45 m.	2 hr. 16 m. 82.42%	29 m.	165 m. 16.9%
T. Four	2 hr. 52 m.	1 hr. 59 m. 68.24%	53 m.	172 m. 17.64%
T. Five	2 hr. 39 m.	2 hr. 20 m. 88.05%	19 m.	159 m. 16.29%
T. six	2 hr. 32 m.	2 hr. 5 m. 82.24%	27 m.	152 m. 15.57%
	16 hr. 16 m.	13 hr. 27 m.	2 hr. 49 m.	976 m.

APPENDIX IV

An Analysis of Subject in Interaction with Other

	1.1	1.2	1.3	1.4	Total
Tape One	→ 0.76% ↓ 32s. 4.62%	69.14% 2924s. 33.66%		30.17% 1273s. 19.33%	4229s. 20.15%
Tape Two	4.57% 193s. 27.85%	26.04% 1100s. 12.66%	48.27% 2039s. 40.63%	21.12% 892s. 13.55%	4224s. 20.13%
Tape Three	3.05% 100s. 14.43%	40.94% 1340s. 15.42%	24.84% 813s. 16.20%	31.16% 1020s. 15.5%	3273s. 15.6%
Tape Four	0.21% 5s. 0.72%	30.65% 728s. 8.38%	8.13% 193s. 3.85%	61.01% 1449s. 20.01%	2375s. 11.32%
Tape Five	3.02% 105s. 15.15%	30.62% 1063s. 12.24%	39.86% 1384s. 27.58%	26.5% 920s. 13.97%	3472s. 16.55%
Tape Six	7.57% 258s. 37.29%	44.94% 1532s. 17.63%	17.28% 589s. 11.74%	30.21% 1030s. 15.64%	3409s. 16.26%
Totals	693s.	8687s.	5018s.	6584s.	20982s. Shr. 49m. 42s. 42.87 of Total

Information available from above table.

- Matrix Tape One, 1.1 states that 32 seconds of Interaction time was located in this section.
- This was 0.76% of the total time on Tape One where Subject was in Interaction with other
- This was 4.62% of all the interaction time that Subject was in Interaction with other on Task Organization
- 693s. was 3.3% of the total interaction time where Subject was in Interaction with other.
- The total for Tape One was 20.15% of the total for the six tapes.

APPENDIX V

An Analysis of Subject in Interaction with Teacher

	2.1	2.2	2.3	2.4	Totals
Tape One	→ 17.38% 657s. ↓ 15.96%	77.83% 2942s. 15.22%		4.49% 181s. 34.94%	3780s. 15.55%
Tape Two	15.26% 528s. 12.82%	82.89% 2868s. 14.84%	1.85% 64s. 18.82%		3460s. 14.23%
Tape Three	18.3% 847s. 20.57%	79.72% 3683s. 19.05%		1.95% 90s. 17.37%	4620s. 19.01%
Tape Four	12.36% 488s. 11.85%	85.31% 3368s. 17.42%		2.33% 92s. 17.76%	3948s. 16.24%
Tape Five	19.07% 953s. 23.15%	77.03% 3849s. 19.91%	1.00% 50s. 14.70%	2.90% 145s. 28.00%	4997s. 20.56%
Tape six	18.4% 644s. 15.64%	74.86% 2620s. 13.55%	6.46% 226s. 66.47%	0.28% 10s. 1.93%	3500s. 14.40%
Totals	16.94% 4117s.	79.53% 19330s.	1.4% 340s.	2.13% 518s.	24305s. 49.66 of Total.

Interpretation of Matrix.

- 657seconds is the time on Tape One that the Subject was in Interaction with Teacher.
- This was 17.38% of the total time on Tape One when Subject was in Interaction with Teacher
- Tape One accounted for 15.96% of the time on all the tapes that Subject was in Interaction with the Teacher on Task Organization.

Analysis of Other in Interaction with Other

	4.1	4.2	4.3	4.4	Totals
Tape One					
Tape Two					
Tape Three	→ 15.6% 25s ↓ 71.73%	9.37% 15s. 33.33%	6.25% 10s. 3.14	68.72% 110s. 26.31%	160s. 19.61%
Tape Four	1.91% 10s. 28.57%	5.74% 30s. 66.6%	58.90% 308s. 96.86%	33.46% 175s. 41.87%	523s. 64.09%
Tape Five				40s. 9.57%	40s. 4.90%
Tape Six				93s. 22.25%	93. 11.40%
Totals	4.49% 35	5.51% 45	38.97% 318	51.22% 418	816 1.67% of Total

Information from Matrix
- as for Appendix

APPENDIX VII

Analysis of Teacher in Interaction with Other.

	3.1	3.2	3.3	3.4	Totals
Tape One	→ 49.15% ↓ 58s. 6.51%	50.85% 60s. 3.29%			↓ 118s 4.16%
Tape Two	35.18% 50s. 56.23%	64.11% 913s. 50.08%		0.7% 10s. 8%	1424 50.16%
Tape Three	9.26% 35s. 3.93%	61.64% 233s. 12.78%		29.10% 110s. 88%	378s. 13.31%
Tape Four	64.52% 180s. 20.20%	35.48% 99s. 5.43%			279s. 9.83%
Tape Five	51.85% 70s. 7.86%	48.15% 65s. 3.56%			135s. 4.75%
Tape Six	9.31% 47s. 5.27	89.70% 453s. 24.85%		0.99% 5s. 4%	505s. 17.79%
Totals	31.38% 891s. 31.38%	64.21% 1823s. 64.21%		4.40% 125s. 4.40%	2839s. 5.8% of Total

Interpretation of Matrix

- 58 seconds represent the time on Tape One that the Teacher was in Interaction with Other of Task Organization.
- This was 49.15% of the Total time on Tape One where Teacher was in Interaction with Other.
- Tape One accounted for 6.51% of the time spent on all the Tapes when Teacher was in Interaction with Other on Task Organization.

Appendix VIII

Subject and Teacher in Interaction.

	1.1 and 2.1	1.2 and 2.2	1.3 and 2.3	1.4 and 2.4	Totals.
Tape One	→ 3.6% ↓ 689s 14.32	7.3 24% 5866s. 20.93		18.15% 1454s. 20.47	8009s. 17.58
Tape Two	9.38% 721s. 14.99	51.64% 3968s. 14.16	27.37% 2103s. 37.37	11.61% 892s. 12.56	7684s. 16.86
Tape Three	12.00 947s. 19.69	63.64 5023s. 17.92	10.30 813s. 14.45	4.06 1110s. 15.63	7893s. 17.72
Tape Four	7.78 493s. 10.25	64.83 4106s. 14.65	3.07 193s. 3.43	24.33 1541s. 21.70	6333s. 13.90
Tape Five	12.49 1058s. 22.00	58.00 4912s. 17.53	16.93 1434s. 25.48	12.58 1065s. 15.00	8469s. 18.59
Tape Six	12.56 902s. 18.85	57.84 4152s. 14.81	15.11 1085s. 19.28	14.49 1040s. 14.64	7179s. 15.75
Total	10.56 4810s.	61.51 28027s.	12.35 5628s.	15.59 7102s.	45567s. 92.53%

APPENDIX IX

Total Teacher Interaction

	2.1 and 3.1	2.2 and 3.2	2.3 and 3.3	2.4 and 3.4	Totals
Tape One	→ 18.34 715s. 14.28	77.01 3002s. 14.19		4.64 181s. 28.15	3898s. 14.36
Tape Two	21.07 1029s. 20.55	77.42 3781s. 17.87	1.31 64s. 18.82	0.20 10s. 1.56	4884s. 17.99
Tape Three	17.65 882s. 17.61	78.35 3916s. 18.51		4.00 200s. 31.1	4998s. 18.41
Tape Four	15.8 668s. 13.74	82.02 3467s. 16.39		2.18 92s. 14.31	4227s. 15.57
Tape Five	19.93 1023s. 20.43	76.27 3914s. 18.50	0.97 50s. 14.71	2.83 145s. 22.53	5132s. 18.91
Tape Six	17.25 691s. 13.8	76.73 3073s. 14.53	5.64 226s. 66.47	0.37 15s. 2.33	4005 14.75
Totals	18.65 5008s.	77.93 21153s.	1.25 340s.	1.36 643s.	27144.

APPENDIX X

Analysis of Number and Length of Interactions

<u>1. Task Organizational</u>			
	Time	Interactions	Average Length
1.1	693s.	13	53.31
2.1	4117s.	92	44.75
3.1	891s.	36	24.75
4.1	35s.	3	11.67
	<u>5736s. (11.72%)</u>	<u>144 (24.49%)</u>	<u>39.83</u>

<u>2. Task Instructional</u>			
1.2	8687	83	104.66
2.2	19930	100	193.30
3.2	1823	33	55.24
4.2	45	2	22.50
	<u>29885 (61.06%)</u>	<u>218 (37.07%)</u>	<u>137.09</u>

<u>3. Task Experiential</u>			
1.3	5018	48	104.54
2.3	340	6	56.67
3.3	-	-	-
4.3	318	6	53.00
	<u>5676 (11.60%)</u>	<u>60 (10.20%)</u>	<u>94.60</u>

<u>4 Non-Task</u>			
1.4	6584	130	50.65
2.4	518	16	32.37
3.4	125	5	25.00
4.4	418	15	27.87
	<u>7645 (15.62%)</u>	<u>166 (28.23%)</u>	<u>46.05</u>

Grand Totals. 48,492 588 83.23

APPENDIX XINumber of Interactions

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Total	%
Subject - Other	1.1	2	3	1	1	2	4	13
	1.2	19	15	14	7	11	17	83
	1.3	-	12	8	2	14	12	48
	1.4	27	19	17	24	19	24	130
	48 (17.52%)	49 (17.88%)	40 (14.6%)	34 (12.41%)	46 (16.79%)	57 (20.80%)	274 (46.6%)	46.6 of Total
Subject - Teacher	2.1	17	9	15	15	17	19	92
	2.2	16	9	22	16	18	19	100
	2.3	-	1	-	1	4	6	6
	2.4	6	3	3	3	1	16	16
	39 (15.22%)	19 (8.88%)	40 (18.69%)	34 (15.89%)	39 (18.22%)	43 (20.09%)	214	36.4% of Total
Teacher - Other	3.1	3	15	4	6	3	5	36
	3.2	3	6	6	4	5	9	33
	3.3							
	3.4		1	3			1	5
	6 (8.11%)	22 (29.73%)	13 (17.57%)	10 (13.51%)	8 (10.81%)	15 (20.27%)	74	12.58 of Total
Other and Other	4.1		1	2				3
	4.2		1	1				2
	4.3		1	5				6
	4.4		2	5	3	5	15	15
			5 (19.23%)	13 (50%)	3 (11.54%)	5 (19.23%)	26	4.42% of Total

Totals

	93 (15.82%)	90 (15.31%)	98 (16.67%)	91 (15.48%)	96 (16.33%)	120 (20.41%)	588	
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APPENDIX XII

Average Length of Interactions.

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Av.
1.1	16s.	64.3	100	5	52.5	64.5	53.31
1.2	133.9	73.3	95.7	104	96.6	90.1	104.66
1.3		169.9	101.6	96.5	98.8	49.1	104.54
1.4	47.1s	46.9	60	98.9	48.4	42.9	50.65
Av.	88.1	86.2	81.8	42.6	75.5	59.8	
2.1	38.6	57.7	56.5	32.5	56	33.9	44.75
2.2	183.9	318.7	167.4	210.5	213.8	137.9	193.3
2.3		64			50	56.5	56.67
2.4	30.1		20	30.7	48.3	10	32.37
	96.9	182.1	115.5	116.1	128.1	81.4	
3.1	19.3	33.4	8.7	30	23.3	9.4	24.75
3.2	20	152.2	38.8	25	13	50.3	55.24
3.3							
3.4		10	36.7			5	25.00
	19.7	64.7	29.1	27.9	16.9	33.7	
4.1			25	5			11.67
4.2			15	30			22.5
4.3			10	61.6			53.0
4.4			55	35	13.3	18.6	27.87
			22	40.2	13.3	18.6	
Total Av.	87.4	101.2	83.3	78.3	90	62.6	82.47

APPENDIX XIII

Analysis of Task Organizational Interaction

	1.1	2.1	3.1	4.1	Totals
Tape One	→ 4.28% ↓ 32s. 4.62%	87.95% 657s. 15.96%	7.76 58s. 6.51%		↓ 747s. 13.02%
Tape Two	15.79% 193s. 27.85%	43.21% 528s. 12.82%	41.00% 501s. 56.23%		1222s. 21.30%
Tape Three	9.93% 100s. 14.43%	84.11% 847s. 20.57%	3.47% 35s. 3.93%	2.48% 25s. 71.43%	1007s. 17.55%
Tape Four	0.73% 5s. 0.72%	71.45% 488s. 11.85%	26.35% 180s. 20.20%	1.46% 10s. 28.57	683s. 11.91%
Tape Five	9.31% 105s. 15.15%	54.45% 953s. 23.15%	6.20% 70s. 7.86%		1128s. 19.66%
Tape Six	27.19% 258s. 37.29%	67.86% 644s. 15.64%	4.96% 47s. 5.27%		949s. 16.54%
Totals	12.08% 693s.	71.77% 4117s.	15.53% 891s.	0.61% 35s.	5736s.

i) The matrix should be interpreted thus.

- 32 seconds were spent on Tape 1 of Subject and Other in Interaction on Task Organization.
- This was 4.28% of the total Task Organization Interaction on Tape 1.
- Tape 1 accounted for 4.62% of the Task Organization interaction when Subject was interacting with Other.

ii) % Time of Task Organization compared with Total Interaction Time.

	%
1.1	1.42
2.1	8.42
3.1	1.81
4.1	0.07

11.72 of Time spent on Task Organizational.

APPENDIX XIVAnalysis of Interactions of Task Instructional

	1.2	2.2	3.2	4.2	Totals
Tape One	→ 49.34% ↓ 2924s 33.66%	49.64% 2942s 15.22	1.01% 60s. 3.29%		↓ 5926s 19.83%
Tape Two	22.54% 1100s. 12.66%	58.76% 2868s. 14.84%	18.70% 913s. 50.08%		4881s 16.33%
Tape Three	25.42% 1340s. 15.42%	69.87% 3683s. 19.05%	4.42% 233 12.78%	0.28% 15s. 33.3%	5271s. 19.14%
Tape Four	17.23% 728s. 8.38%	79.72% 3368s. 17.42%	2.34% 99s. 5.43%	0.71% 30s. 66.6%	4225s. 14.14%
Tape Five	21.36% 1063s. 12.24%	77.33% 3849s. 19.91%	1.31% 65s. 3.56%		4977s. 16.65%
Tape Six	33.27% 1532s. 17.63%	56.90% 2620s. 13.55%	9.84% 453s. 24.85%		4605s. 15.41%
Totals	29.07% 8687s.	64.68% 19330	6.10% 1823	0.15% 45	29885s.

1) For interpretation see Appendix

2) % Time spent on Task Instructional compared with Total Interaction Time.

1.2 17.75
2.2 39.5
3.2 3.72
4.2 0.09

61.06 of Total Time spent on Task Instructional.

APPENDIX XVAnalysis of Task Experiential Interactions

	1.3	2.3	3.3	4.3	Totals
Tape One					
Tape Two	→ 96.96% ↓ 2039 40.63%	3.04% 64 18.82%			2103 37.05%
Tape Three	98.78% 813 16.20%			1.22% 10 3.14%	823 14.5%
Tape Four	38.52% 193 3.85%			61.48% 308 96.86%	501 8.83%
Tape Five	96.51% 1384 27.58%	3.49% 50 14.7%			1434 25.26%
Tape Six	72.27% 589 11.74%	27.73% 226 66.47%			815 14.36%
Totals.	88.41% 5018	5.99% 340		5.6% 318	5676

i) See Appendix for Interpretation of Data.

ii) % Time of Task Experiential compared with Total Interaction Time.

	%
1.3	10.25
2.3	0.69
3.3	-
4.3	0.65

11.60 of Task Experiential compared to
Total Interaction Time.

APPENDIX XVIAnalysis of Non-Task Interaction

	1.4	2.4	3.4	4.4	Totals.
Tape One	→ 87.55% ↓ 1273s. 19.33%	12.45% 181s. 34.94%			1454s. 19.02%
Tape Two	78.89% 892s. 13.55%		1.01% 10s. 8%		902s. 11.78%
Tape Three	76.69% 1020s. 15.5%	6.77% 90s. 17.37%	8.27% 110s. 88%	8.27% 110s. 26.31%	1330s. 17.4%
Tape Four	84.44% 1449s. 22.01%	5.36% 92s. 17.76%		10.2% 175s. 41.87%	1716s. 22.45%
Tape Five	83.26% 920s. 13.97%	13.12% 145s. 28%		3.62% 40s. 9.57%	1105s. 14.45%
Tape Six	90.5% 1030s. 15.64%	0.88% 10s. 1.93%	0.44% 5s. 4%	8.17% 93s. 22.25%	1138s. 14.88%
Totals.	86.12% 6584s.	6.77% 518s.	1.63% 125s.	5.47% 418s.	7645

1) % at top of each square relates total in square to Tape Total.

2) % at bottom of square relates total in square to sum of the tapes.
ie the total at the bottom.

% time spent on Non-Task compared with Total Interaction Time.

	%
1.4	13.45
2.4	1.06
3.4	0.25
4.4.	0.85

15.62 of Total Interaction Time spent on Non-Task.

Analysis of Affect

a) Indicators of Approval

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six.	Total	%
V. Approval N.V. Neutral	28	30	23	20	32	17	150	33.94
N.V. Approval V Neutral	1	3	-	2	2	-	8	1.81
Verbal Appr. N.V. Approval	21	21	6	18	16	20	102	23.08
Totals	50	54	29	40	50	37	260	
% of App.	19.23%	20.71%	11.15%	15.38%	19.23%	14.23%		
% of Total	11.31	12.22	6.56	9.05	11.31	8.37		58.82

b) Indicators of Disapproval.

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six.	Total	%
V. Disapproval N.V. Neutral	5	5	12	3	14	3	42	9.50%
V. Neutral N.V. Disapproval	1	17	3	12	6	12	51	11.54%
V. Disapproval N.V. Disapproval	2	22	7	17	20	8	76	17.19%
Totals.	8	44	22	32	40	23	169	38.23
% Disapproval	4.73	26.03	13.01	18.93	23.67	13.61		
% of Total	1.81	9.95	4.98	7.24	9.05	5.20		38.23

c) Incongruous Indicators.

	T. One	T. Two	T. Three	T. Four	T. Five	T. Six.	Total	%
V. Approval N.V. Disapproval	3			3	2	1	9	2.04
N.V. Approval V. Disapproval	3					1	4	0.91
Total	6			3	2	2	13	2.95
% Incongruous	46.15			23.08	15.38	15.38		
% of Total	1.36			0.68	0.45	0.45		2.95

APPENDIX XVIII

Affect Identified in 2-1 and 3-1st combined.

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Total	% of 2-1 3-1	% of Total
V. app. N.V. neutral	11	11	2	3	6	2	35	39.32	7.92
V. neutral N.V. disapp.									
V. app. N.V. disapp.	3	4	1	2	-	4	14	15.73	3.17
V. disapp. N.V. neutral	2	1	4	1	2	1	11	12.36	2.49
V. neutral N.V. disapp.	-	2	2	2	-	5	11	12.36	2.49
V. disapp. N.V. disapp.	-	1	2	5	3	4	15	16.88	3.39
V. App. N.V. disapp.	2						2	2.25	0.45
V. Disapp. N.V. App.	1						1	1.12	0.23
Total	19	19	11	13	11	16	89	100	
% 2-1, 3-1	21.35	21.35	12.36	14.61	12.36	17.98	100		
% of Total	4.30	4.30	2.49	2.94	2.49	3.62			20.18

* This identifies affect in all the Teacher categories concerned with Task Organization.

Affect identified in Category 2.1*

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Total	% of 2.1	% of Total.
V. App. N.V. Neutral	11	10	2	2	5	2	32	44.87	7.74
V. Neutral N.V. App.									
V. App. N.V. App.	3	3	1	2	-	4	13	16.67	2.94
V. Disapp. N.V. Neutral	2	-	4	1	2	1	10	12.82	2.26
V. Neutral N.V. Disapp.	-	1	2	-	-	5	8	10.26	1.81
V. Disapp. N.V. Disapp.	-	1	2	3	2	4	12	15.38	2.71
V. App. N.V. Disapp.	2	-	-	-	-	-	2	2.56	0.45
V. Disapp. N.V. App.	1	-	-	-	-	-	-	1.28	0.23
	19	15	11	8	9	16	78	100.00	
% of 2.1	24.36	19.23	14.10	10.26	11.54	20.51	100.00		
% of Total	4.30	3.39	2.49	1.81	2.04	3.62			17.65

* Category 2.1 is Teacher Subject (Other) in Interaction with Task Organization.

Affect Identified in Task Instructional 2-2*

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Total	% of 2-2	% of Total
V. App. N.V. neutral	15	11	18	17	26	13	100	34.36	22.62
V. Neutral N.V. App.	1	-	3	2	2	-	8	2.75	1.81
V. App. N.V. App.	16	15	5	8	16	8	68	23.37	15.38
V. Disapp. N.V. Neutral	3	4	8	2	2	10	27	9.28	6.11
N.V. Disapp. V. Neutral	1	13	1	10	5	7	37	12.71	8.37
V. Disapp. N.V. Disapp.	2	11	3	11	15	1	43	14.78	9.73
V. App. N.V. Disapp.	1			3	2	-	6	2.06	1.36
V. Disapp. N.V. App.	2						2	0.69	0.45
Totals	41	54	38	53	76	29	291	100	
% of 2-2	14.04	18.56	13.06	18.21	26.12	9.96	100		
% of Total	9.28	12.22	8.60	11.99	17.19	6.56			65.84

*Teacher in Interaction with Subject.

Affect located in Categories 2.2 and 2.3*

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Total	% 2.2 3.2	% total
V. App. N.V. Neutral	15	17	18	17	26	15	108	31.95	24.43
V. Neutral N.V. App.	1	-	3	2	2	-	8	2.37	1.81
V. App. N.V. App.	16	17	5	16	16	16	86	25.44	19.46
V. Disapp. N.V. Neutral	3	4	8	2	11	2	30	8.87	6.79
V. Neutral N.V. Disapp.	1	14	1	10	6	7	39	11.34	8.82
V. Disapp. N.V. Disapp.	2	20	4	11	16	4	57	16.86	12.89
V. Approv. N.V. Disapp.	1	-	-	3	2	1	7	2.07	1.58
V. Disapp. N.V. App.	2	-	-	-	-	1	3	0.89	0.68
Totals	41	72	39	61	79	46	338	100	
% of 2.2, 3.2	12.13	21.30	11.54	18.05	23.37	13.61	100		
% Total.	9.28	16.29	8.82	13.86	17.87	10.41			76.47

* These categories are both Teacher in Interaction, in 2.2 with subject, in 3.2 in interaction with Other on Tasks Instructional.

Affect located in Non-Task Categories 2.4 and 3.4*

	Tape One	Tape Two	Tape Three	Tape Four	Tape Five	Tape Six	Totals	% 2.4 3.4	% total
V. App. N.V. neutral	2	2	3				7	50.00	1.58
V. Neutral N.V. App.							-		
V. App. N.V. App.	2						2	14.28	0.45
V. Disapp. N.V. Neutral					1		1	7.14	0.23
V. Neutral N.V. Disapp.		1					1	7.14	0.23
V. Disapp. N.V. Disapp.		1		1	1		3	21.43	0.68
V. App. N.V. Disapp.									
V. Disapp. N.V. Disapp.									
Totals	4	4	3	1	2	-	14	100	
% of 2.4+3.4	28.57	28.57	21.43	7.14	14.28			100	3.17

* Categories 2.4 and 3.4 are is where Teacher is in interaction with Subject (2.4) and Other (3.4) on Non-Task.

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