INTRINSIC MOTIVATION IN PRIMARY SCHOOL CHILDREN: THE EFFECTS OF GENDER, DEVELOPMENTAL LEVEL AND TEACHER ORIENTATION TOWARD AUTONOMY VERSUS CONTROL

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ABSTRACT

Theories of motivation are briefly reviewed and compared with Deci's (1975, 1980) conceptualization of intrinsic motivation as an innate need for feelings of competence and self-determination. An outline is given of Deci's 'cognitive evaluation theory' concerning the effect of rewards on intrinsic motivation, and research evidence in support of the theory is referred to.

It has been suggested (Deci and Ryan, 1980) that teachers whose general orientation is toward control tend to administer classroom rewards controllingly, while teachers whose general orientation is toward autonomy reward informationally. 'Cognitive evaluation theory' would predict that the intrinsic motivation toward school learning of pupils of the former teachers would decrease, and that of pupils of the latter teachers would increase. Support for this view has been found by Deci, Nezlek and Sheinman (1981) and by Deci, Schwartz, Sheinman and Ryan (1981).

Other findings concerning intrinsic motivation in school are gender differences (reported in Deci and Ryan, 1980) and a tendency for intrinsic motivation to decrease over the developmental period (Harter, 1981b).

The study involved 459 boys and girls at three developmental levels (Standard 1, Standard 3 and Standard 5 - approximate ages eight, ten and twelve years) and under two teacher conditions (control-oriented and autonomy-oriented). The teacher orientation variable was controlled as follows. A total of 71 teachers had previously completed the 'Problems in Schools' questionnaire (Deci, Schwartz, Sheinman and Ryan, 1981) on which a high score indicates an orientation toward autonomy and a low, or negative, score indicates an orientation toward control. Teachers whose scores were more than half a standard deviation above or below the mean were classified as 'high' and 'low' scorers, respectively. For each school level in the study, three class teachers with 'high' scores

and three class teachers with 'low' scores were identified, and the pupils of these teachers were selected for the sample.

The three motivation subscales of the Harter (1981b) scale, designed to assess intrinsic versus extrinsic orientation in the classroom, were administered to the 18 classes involved during school time, but in the absence of the class teacher. In addition, an exploratory behavioural measure of intrinsic motivation was attempted with the 46 Standard 1 pupils of the most extreme control-oriented teacher and the most extreme autonomy-oriented teacher, and the parents of a subsample of these pupils were individually interviewed.

The results indicated gender differences in favour of girls both in strength of intrinsic motivation and in reaction to teacher orientation for two out of the three subscales. A developmental decrease in intrinsic motivation was found for the 'Challenge' subscale and from Standard 3 to Standard 5 for the 'Independence' subscale, although in the latter case, only among pupils of autonomy-oriented teachers. Teacher orientation had the predicted effect, but more clearly on girls for the 'Challenge' and 'Curiosity' subscales and only on Standard 3 pupils of both sexes for the 'Independence' subscale. The behavioural measure and the parent interviews provided evidence suggestive that the intrinsic motivation of Standard 1 pupils was also favourably affected by a teacher orientation toward autonomy.

The discussion refers to possible reasons for the pattern of interactions which emerged, certain limitations of the study and some metatheoretical arguments in favour of the encouragement of intrinsic motivation in school.

CHAPTER I

APPROACHES TO MOTIVATION IN THE FIRST HALF OF THE 20th CENTURY

1. Introduction

The most comprehensive and the most influential approaches to motivation in the first half of the 20th century were psychoanalytic interpretations having their roots in the work of Freud (1933), and behaviourist explanations, notably those of Hull (1943) and of Skinner (1938, 1953). In addition, certain theorists and researchers have considered the role of factors such as instinct, arousal, affect and the need for meaning and self-development in relation to various types of behaviour. Although many of these approaches are well-known, they are briefly reviewed in this chapter in order to sketch a background to their conceptualizations of intrinsic motivation, which will be discussed in Chapter III (pp.41-45).

Each approach makes implicit assumptions about the nature of human functioning. Since such assumptions influence both theory and methodology it is important to be clearly aware what they are. It is equally important to recognise that, at the metatheoretical level, conceptualizations of human nature are a matter of personal judgement.

2. The Psycho-analytic Approach

Freud (1933), the originator of the psycho-analytic tradition, held that human beings are creatures driven by innate biological needs. His model was homeostatic and he thought of these needs as being directed towards the reduction of excitation. All behaviour results, either directly or indirectly, from the urge to satisfy certain drives, the most important of which he believed to be the sex drive. Hunger and thirst are also powerful drives, but, since their satisfaction does not usually involve conflict, Freud did not consider them so important in the complex determination of motivation. He also postulated a self-destructive drive, or death-wish, to account for man's aggressive tendencies. He believed that psycho-sexual energy, or libido, provided the original activating force for behaviour. Each individual was thought to possess a fixed amount of libidinal energy, derived ultimately from metabolic sources, which could be invested in different objects at different times.

The personality, according to Freud, consists of the superego, an internalised representation of the moral rules of society; the ego, a more or less conscious and rational structure concerned with reality; and the id, an irrational, often unconscious structure concerned only with achieving satisfaction of its needs. The basic principle of both the ego and the id is hedonism, but while the ego takes account of real difficulties and arranges real satisfactions in the service of the id, the id ignores reality in its demands and may also do so by adopting fantasy gratification as a means of tension reduction.

When the irrational pleasure-seeking demands of the id come into conflict with the environment as perceived by the ego, or with the values of society as internalised by the superego, they may be repressed. These unconscious wishes continue to influence, direct and possibly distort behaviour. Behaviour can take many forms since a drive can have a variety of objects, i.e. is capable of being gratified in many different ways. The type of object selected by a particular individual is determined by his stage of psycho-sexual development, his past learning and his current expectation of satisfaction. If conflict arousing needs are not completely repressed, anxiety is experienced, and the individual may indulge in one or more of the defence mechanisms of the ego, motivated by a desire to reduce anxiety.

This brief outline does not do justice to the complexity of Freud's thought but does, it is hoped, reveal certain mechanistic, biological and homeostatic aspects of his approach to motivation. Freud's many followers have developed and built upon his ideas. The present trend is away from biological and mechanistic concepts towards an emphasis on the integrating strengths of the ego, as, for example, in the ego psychology of Erikson (1950, 1956, 1959). It should be noted that, even in Freud's original approach, although arousal of behaviour is determined by drives, its direction is determined by the individual's past history and present expectancy. Past history can be interpreted to mean learned associations, but expectancy can only be a cognitive variable. Weiner (1972) writes that Freud's theory of motivation "... specifies clearly that cognitive processes intervene

between the onset of the driving stimuli and the final response ..." (pp.275-6) and it appears that recent psycho-analytic theory is placing even more emphasis on the cognitive variables involved in ego activity.

3. The Behaviourist Approach

3.1 Drive theory

Hull (1943) attempted to formulate a formal, empirically verifiable theory of motivation based on the principles of learning and the Darwinian notion of survival-related biological drives. He too adopted a homeostatic model of man, assuming that the preferred state of an organism was an absence of stimulation. He saw needs as disturbing a state of equilibrium, and behaviour as initiated and continued until the motivating need was satisfied, after which the organism would return to an inactive condition.

Individuals, Hull maintained, are innately endowed with certain primary drives which serve survival needs and which recur in a cyclic fashion. Tissue needs associated with a drive give rise to physical stimulation within the organism. This general drive state (referred to by Hull as 'D') arouses behaviour. The direction of behaviour is accounted for either by innate programming or, more importantly, by learned associations.

Associations are learned in the following way. When a particular response proves to be drive-reducing, an association is formed

between it and the original stimulus because the behaviour has, in effect, been rewarded. In this way, habits are formed. Behaviour sequences are the result of a process of redintegration, by which a response becomes in turn the stimulus for a further response, allowing the learning of chains of responses. Hull proposed that complex human behaviours having no apparent connection with biological needs could be explained by higher order conditioning (i.e. of stimuli associated contiguously with a drive state) and by secondary reinforcement (i.e. of stimuli associated contiguously with primary reinforcement).

Hull himself (1952) suggested certain modifications to his original theory. He introduced a 'K' variable which represents the influence of contemporaneous events in the environment. This implies an admission that behaviour depends to some extent on incentive provided by the environment. In addition, in the light of research findings, e.g. those of Miller (1948), Hull revised his theory that only biological needs could result in drive stimulation and allowed that any strong stimulus could have drive properties.

The theory had considerable influence and much empirical data supports the later Hullian position. A great deal of it consists of closely controlled studies of animals under deprivation conditions. It can be questioned, however, (a) whether predictions about behaviour which hold under these conditions can be generalised to everyday situations which offer alternative possibilities over a wide range of behaviours; and (b) whether studies of animal behaviour do in fact take into account all the factors which operate in motivating human behaviour.

There are further difficulties with Hull's (1952) approach. Firstly, research evidence also exists which does not support the theory, e.g. the latent learning studies of Blodgett (1929) and the investigations of the motivational effects of success and failure by Weiner (1966). Secondly, there is the awkward fact that individuals quite often behave in what appears to be a stimulus-seeking manner. Thirdly, many behaviours occur which do not appear ever to have been linked contiguously to a primary drive state. Fourthly, Kendler (1965) points out that Hull's theory seems to assume that behaviour is episodic - a series of completed actions with intervals of inaction between them, whereas observation suggests that human behaviour at least is an ongoing process. Finally, by the 1952 revision the theory loses one of its original strengths - the rigour of its definitions. Problems occur with the definition and measurement of the 'K' variable, and 'D' itself loses its link with observable processes.

Hull's carefully detailed attempt to bring scientific rigour to the study of motivation deserves and has received recognition. The quality of his work inspired many others thinking and operating within the behaviourist paradigm. Nevertheless, a mechanistic explanation of motivation based essentially on stimulus-response associations and drive reduction does not, perhaps, take adequately into account the fact that human beings appear to be active, information-processing organisms.

3.2 Learning theory

Watson (1913) claimed that psychology should be the science of behaviour and should concern itself only with processes that could be observed and measured. Hull (1943, 1952) brought together the notion of innate biological needs and the behaviourist theory of learning in an approach which attempted to meet Watson's requirements by linking intervening variables to behaviourally observable data. Skinner's (1938, 1953, 1971) position is more extreme. He refuses to indulge in theoretical speculation about any unobservable variables such as inner processes. It is his belief that all behaviour can very satisfactorily be accounted for in terms of the reinforcement history of the organism and the contingencies in the present environment. He does not consider drive a necessary concept. He writes (1938) that drive is "... a hypothetical state interpolated between operation and behaviour ..." which is "... not actually required in a descriptive system ..." (p.368).

His work has mainly been concerned with the investigation of operant conditioning techniques which are based largely on Thorndike's (1913) Law of Effect. Briefly, the Law of Effect states that if a behaviour is followed by reinforcement, the likelihood increases that the same behaviour will occur again. Skinner's method of ensuring that a reinforcer will be effective is to deprive the subjects in some way beforehand. He is then primarily interested in how reinforcers can be used to manipulate behaviour.

Skinner's success in modifying animal behaviour and his

enthusiastic belief in similar possibilites for human behaviour have made him an influential figure. The body of empirical evidence on which he bases his claims cannot be ignored. It is without question true that in many circumstances human action can be controlled by careful manipulation of environmental contingencies. But it must also be noted that Skinner's methodology influences the kind of behaviour which can be studied, and that there are certain types of human behaviour which are not easily explained in these terms, e.g. the development of language and the use of the imagination.

Furthermore, the definition of reinforcers as circumstances which increase the probability of a given response avoids the issue of specifying how and why reinforcement operates. It seems that the very concept of reinforcement implies that individuals are capable of discrimination and evaluation, otherwise all events would be of equal reinforcement value. In addition, the fact that an organism produces, out of innumerable possible responses, the one which is associated with a preferred outcome, seems at least as likely to suggest the ability to select (a cognitive attribute) as to be evidence of an automatic association.

4. Other Approaches

4.1 The role of instinct

Darwin's (1859) account of man as a creature directed by instinctual forces influenced many psychologists. The theory

of McDougall (1923) is one of the most elaborate and best known. Psychologists tended to explain all behaviour by postulating an instinct - so much so that Bernard (1924) noted that over 2 500 instincts had been postulated.

As an explanatory concept instinct tended to produce circular arguments and, moreover, it was difficult to reconcile with obvious cross-cultural variations in behaviour. In addition, instincts did not appear to have any measurable physiological or physical correlates and were therefore not able to be the objects of empirical research. By the late 1920's instinct was a concept which had fallen from favour with psychologists.

More recently, the discipline of ethology has reinstated the term instinct. Ethology studies the behaviour of the total organism (animal or human) in natural surroundings, using the objective methods of experiment and observation. The behaviour of interest is innate behaviour (instinct) as opposed to learned behaviour. Tinbergen (1951) has outlined a theory of instincts as organised nervous system mechanisms which can be influenced by both internal and external priming, releasing and directing impulses. Motivation is explained as the activation of the instinct centres in the brain, either by internal stimuli from organs, hormones or nervous impulses, or by external stimuli such as changes in temperature.

Instinctual behaviour in the form of a specific response to a releasing cue is thought to be rare in the human species, although it does occur. A recent conceptualization of curiosity behaviour as a form of instinct will be discussed in Chapter III (p. 43).

4.2 The role of arousal needs

Arousal needs have been proposed, not as a general theory of motivation, but primarily as the source of behaviours involving curiosity, exploration, manipulation, etc. Interest in arousal as a factor in motivation became apparent round about 1950 and has continued ever since. Although strictly speaking this approach does not belong in the first half of the 20th century, it is included in this chapter as part of the general background of motivation theory against which cognitive theories have developed.

Physiological arousal theories are based on neuro-physiological research concerning the role of the reticular activating system (RAS) of the brain. It is proposed that for a given individual at a given time in the sleep-wakefulness cycle there is a level of RAS stimulation which is experienced as optimal. Consequently, the individual engages in behaviours designed to reduce arousal if the level is too high. It is also postulated that, since optimal arousal is rewarding, responses which facilitate this will be strengthened. The individual is believed to function most effectively when arousal is optimal. It is assumed that certain physiological measures, e.g. the electrical resistance of the skin, indicate the degree of arousal. This, briefly, is the position of, among others, Hebb (1955) and Fiske and Maddi (1961). Motivation is for them a kind of general drive state originating in the physiology of the central nervous system.

Some theorists consider arousal a psychological, rather than

physiological, variable. The basic assumption is, however, still of an optimal level which the individual attempts to maintain. This is variously conceived of as: small deviations from an established adaptation level (McClelland, Atkinson, Clark and Lowell, 1953); optimal stimulus complexity (Dember and Earl, 1957); optimal psychological incongruity (Hunt, 1965, 1971): moderate arousal increment (Berlyne, 1971, 1973).

Berlyne (1950, 1960, 1963, 1966, 1967, 1971, 1973) has made the most comprehensive study of arousal, and can be said to represent an integration of the physiological and psychological approaches. In the course of his research he has proposed various explanations. He claims that certain behaviours occur because they establish internal conditions experienced as rewarding by the organism. These conditions are related to the needs of the brain. His recent view (1971, 1973) is that two mechanisms operate, one which seeks to reduce arousal and one which seeks moderate increments in arousal. Moderate increments in arousal are produced by stimuli possessing moderate levels of arousal potential. The arousal potential of a stimulus is determined by its collative properties. Collative properties are those which activate the normal information processing mechanisms of the organism, e.g. comparing, contrasting and categorising.

Arousal explanations of behaviour overcome several of the problems associated with the Hullian position. They explain why individuals sometimes seek stimulation and why behaviour occurs without apparent reference to need deprivation. Moreover, they suggest empirically definable variables. They are equilibrium

models, but do not assume, as do both Hull and Freud, that the preferred level of stimulation is zero. Theories of psychological arousal refer to a variable which is clearly related to cognitive needs.

4.3 The role of affect

The role of emotion in determining behaviour has tended to be neglected. Those who have recognised the importance of hedonic impulses (the desire for positive affect) have been inclined to re-define emotion in terms of neuro-physiological conditions. For example, Leeper (1948) writes that "... emotional processes are one of the fundamental means of motivation in the higher animals - a kind of motivation which rests on relatively complex neural activities ..." (p.19). Arnold (1960) and Young (1961) maintain, as does Leeper, that affective states determine differences in behaviour.

The widely known affective-arousal theory of McClelland, Atkinson, Clark and Lowell (1953) introduced the notion that affect was an important factor in achievement motivation. A motive is defined as "... the redintegration by a cue of a change in an affective situation ..." (p.28). All motives, whether related to viscerogenic or to psychogenic needs, are assumed to be learned. Motives involve a present state of affect and a previous state of affect which is redintegrated by some cue. The previous state may be more or less agreeable than the present state. In the former case, approach behaviour towards the cue situation can be expected; in the latter, avoidance is likely. For McClelland, motivated

behaviour is always on the dimension of approach/avoidance, and motivation is concerned with both the arousal and the direction of behaviour.

Affect is defined in terms of psychological arousal. Stimulus situations representing small deviations in either direction from an established adaptation level are considered to be rewarding and thus conducive to approach behaviour. Situations containing elements very discrepant from the current adaptation level are avoided as aversive.

4.4 The role of 'higher needs'

This type of approach is based on the model of humanity proposed by existential philosophers. It is assumed that human nature is essentially growth-oriented and that there are innate tendencies toward self-fulfilment and meaningful existence. Of the supporters of this view Maslow (1943, 1955, 1970) is the one who has most clearly outlined how these tendencies may interact with other human needs in the motivation of behaviour. He postulates a hierarchy of needs, ranging from those concerned with biological survival to those related to self-actualization, and suggests that all lower level needs have to be adequately met before higher level needs can operate. While it is not claimed that other sources of motivation do not exist, it is maintained that 'higher needs' are the most important since it is only in satisfying these that the optimal conditions of human existence can be reached.

The approach tends to favour the phenomenological method as a

source of insights and it is thus not surprising that it is often criticised as lacking empirical support. Korman (1974) points out that the evidence generally quoted in its favour can also be used to support other theories, and that no attempt is made to explain the role of critical environmental variables. Nevertheless, the humanistic view of motivation has attracted considerable interest. It seems likely that its appeal lies in its alternative conception of human nature, which admits the possibility of active, creative and unpredictable behaviour. It is noteworthy that this is the only motivation theory which conceptualizes human beings as truly free. All other approaches, including the cognitive ones to be discussed in chapter II, envisage behaviour as in some way determined.

5. Conclusion

The theoretical positions referred to in this chapter approach the question of motivation from different angles, with varying degrees of generality. In certain areas they overlap; in others they contradict each other. Each approach describes motivation in the way which seems most appropriate and useful in terms of its own psychological and metatheoretical assumptions. Clearly, these differences will be reflected in their conceptualizations of intrinsic motivation. Although certain approaches are not inconsistent with the notion of cognitive variables, there is no real recognition of their importance and no attempt to describe their operation. Cognitive perspectives on motivation are considered in Chapter II.

CHAPTER II

COGNITIVE PERSPECTIVES ON MOTIVATION

1. Introduction

The approaches to be discussed in this chapter range from those which merely include a cognitive element to those which attempt to specify precisely how cognitive processes operate to determine behaviour. Although considerable overlap does exist, an effort will be made to distinguish expectancy models, consistency models and attributional models, each of which will be treated in a separate section.

2. Expectancy Models

Certain early theorists recognised the importance of expectations in determining behaviour, even while the general approach to motivation took another direction. Recent exploration of the role of expectations has taken place in two major contexts - achievement-related behaviour and organizational behaviour.

2.1 Early models

Tolman (1932, 1959) and Lewin (1936, 1938, 1951) are regarded as precursors of the cognitive approach. Tolman, who saw himself as a kind of behaviourist, worked primarily with animals

and based his views on the results of empirical studies. Lewin, whose work is in the tradition of Gestalt psychology, adopted a more theoretical approach and concerned himself with human, rather than animal, behaviour. Nevertheless, they came to similar conclusions. Both conceived of behaviour as goal-seeking and both emphasized the importance of the organism's expectations about how a goal might be reached.

2.2 Expectancy-value theory: achievement context

The major exponents and developers of this approach have been Atkinson (1964, 1977); Atkinson and Feather (1966); Atkinson and Birch (1970, 1974, 1978); Raynor (1969, 1974) and Feather (1982).

The tendency to approach: According to Atkinson (1964) the tendency to approach an achievement related goal involves three factors. These are: the motive for success (need for achievement) (M_S) - a personality variable influenced by individual differences; the probability of success (P_S) (as subjectively assessed) and the incentive value of success (I_S) (as subjectively assessed).

The variable P_S refers to a subjective cognitive expectancy or anticipation that a certain action will lead to a certain goal. This is very similar to Tolman's (1932) concept of expectancy. It differs, however, in that Atkinson maintains that any information that influences a subject's belief about his achievement (ability to perform, to reach a goal) may affect the strength of P_S. He has manipulated P_S by informing

subjects about normative performances on a proposed task. P_S is clearly a cognitive variable.

The incentive value of a goal (I_S) increases as P_S decreases. Atkinson describes the incentive value of an achievement goal as an affect, e.g. a feeling of pride in accomplishment. Achievement related activities may arouse positive or negative affective anticipations depending on prior experience.

The tendency to avoid: Atkinson posits that a tendency to avoid achievement related tasks also exists. This is made up of a motive to avoid failure (M_{AF}), the probability of failure (P_f) and the incentive value of failure ($-I_f$). The last element is presumed to be the negative affect, shame. Resultant achievement motivation is considered to be the sum of the strength of the tendency to approach an expected success and the strength of the tendency to avoid an expected failure.

Risk taking behaviour: Persons differing in strength of resultant achievement motivation behave differently as regards risk-taking. In a voluntary situation, the person in whom $M_S > M_{AF}$ will approach most willingly an achievement related task of a moderate degree of difficulty (P = ,5). The first choice of a person in whom $M_{AF} > M_S$ is to leave the field of an achievement related task. If compelled to remain, he will select tasks where P approaches either 0 or 1 so as to minimize his anxiety about failure.

The inertial tendency: In order to account for the fact that a previously aroused but unsatisfied tendency to reach a

goal will persist, Atkinson introduced another variable, T_{Gi}. This represents the unsatisfied tendency and is referred to as 'the inertial tendency'. It can be expected to affect the strength of any subsequent tendency to behave in a way believed to lead to successful achievement, but not to affect tendencies toward behaviour with other consequences, e.g. eating. Atkinson likens the inertial tendency to the Freudian conception of the persisting unfulfilled wish.

Elaboration of the model by Raynor: The theory of achievement motivation as presented by Atkinson (1964) and Atkinson and Feather (1966) has been elaborated by Raynor (1969, 1974). The original theory dealt only with immediate goals and threats as experienced in laboratory tasks. In real life situations expectations about more distant future goals appear to affect behaviour at any given time. Raynor's expanded theory can handle data of this sort, and his predictions from it have, according to de Charms and Muir (1978), been supported by empirical findings.

Reconstruction of the theory by Atkinson and Birch: A more major reconstruction of the theory has been effected by Atkinson and Birch (1970, 1974, 1978). Atkinson (1977) summarizes the new conception. He writes that all previous motivation theories, whether behaviourist or cognitive, have assumed that the individual is inactive until a stimulus situation confronts him. Atkinson criticizes this episodic view of behaviour and maintains that it is more realistic to view behaviour as a continuous stream in which one activity follows another. The focus is no longer on the initiation of isolated activities, but on

the juncture between different activities.

Motivational variables are re-defined as follows. A stimulus situation arouses an instigating force (F) or an inhibitory force (I). The kind of force depends on previous experience of rewards and punishments in similar situations. The force F causes an action tendency (T) which is an increased inclination to engage in the activity. The force (I) causes a negaction tendency (N) which is an increased disinclination to engage in the activity. The strength of T and of N depends on the duration of the individual's exposure to forces F and I. The resultant action tendency is T - N.

The theory assumes that at any given moment in a waking state the individual is actively motivated by several resultant action tendencies which persist until acted upon by some psychological force which either increases or decreases their strength. When tendencies are incompatible, behaviour is an expression of the strongest action tendency.

Atkinson and Birch (1978) also consider that the tendency (T) to approach a task is compounded and strengthened if there is both an instigating force (F) and some extrinsic incentive. Extrinsic incentives can thus be used to overcome an initially negative resultant action tendency. But, claims Atkinson (1977), these are not essential because if the individual stays in the situation long enough the effect of resistance (temporal delay) will be overcome.

2.3 Expectancy-Value Theory: Organizational Context

In the field of organizational psychology an expectancy-value approach has been proposed by Vroom (1964) and by Lawler and Porter (1967). Research findings supporting this view have been reported by the latter and by several others cited in Korman (1974).

Vroom's (1964) model

An employee's motivation to perform (the force towards action) is claimed to depend on two factors - the expectancy of achieving a desired outcome and the value (valence) of the outcome. The expectancy is a subjective probability assumption. The valence of an outcome is a function of the valences of all other outcomes (second order outcomes) that it might help to achieve, and the instrumentality of that outcome toward attaining second order outcomes. Instrumentality is explained as the subjective perception of how an outcome may lead to other outcomes.

Deci (1975) comments that the theory concerns itself only with extrinsic outcomes and recommends the suggestion of Galbraith and Cummings (1967) that the model be modified to include the valence of intrinsic rewards as contributing to the valence of first order outcomes. Without this modification, first order outcomes have no intrinsic valence - their value depends on other outcomes to which they may lead. In this respect Vroom's approach differs from that of Atkinson, for whom the value of attaining a goal refers to the goal itself, and not to its possible consequences. Further differences are:

that Atkinson suggests a relationship between expectancy and incentive value (I = 1 - P) while Vroom presumes the two variables independent; and that Atkinson includes a personality variable in his equation, while Vroom does not.

All expectancy-value theories imply cognitive evaluation in order to arrive at subjective expectancies. It appears that those theories originating in organizational psychology also stress cognition in the value variable. Lawler (1972) suggests that the reward value of outcomes "stems from their perceived ability to satisfy one or more needs ..." (p.285) and Vroom's model implies a complex appraisal of valences in order to establish the valence of first order outcomes. Achievement related theories on the other hand tend to stress the affective aspect of the value variable.

2.4 Expectancy Models Assessed

The extensive research on achievement motivation has been conducted with admirable concern for scientific rigour. The motivation theory which has emerged contains both cognitive and mechanistic elements. Weiner (1972) refers to the theories of Lewin and of Atkinson as 'quasi-cognitive' and criticizes the latter not not being more specific about the cognitive processes he suggests. In addition, Weiner points out that although the theory may be applied to behaviour in general, its data base is limited to the domain of achievement motivation.

Although much early data concerned achievement motivation, this qualification of expectancy-value theory is not wholly justified

in the light of Feather's (1982) work, which discusses expectancy-value models in relation to the contexts of attribution theory, information feedback, social learning theory, values and attitudes, organizational psychology and decision-making as well as that of achievement motivation. Feather concludes that the expectancy-value approach is a significant form of theoretical analysis which "... stands as a major alternative to competing, mechanistic theories of motivation such as traditional and neo-behaviouristic analyses ..." (p.396). Much, however, remains to be investigated and clarified, for example, the determinants of expectations and valences and the nature of the interaction between them, the relative roles of thought and affect and the extent to which the approach is generally applicable.

3. Cognitive Consistency Models

Expectancy approaches assume that at least one cognitive process (expectations) has a role in determining behaviour, although the precise functioning of the process is not clarified. Consistency models stress cognitive needs rather than cognitive processes. It is assumed that cognitive balance, congruity or consistency is the individual's preferred state. The models differ from the psychological arousal theories discussed in the previous chapter in that they conceive of behaviour as concerned with the total avoidance of incongruity rather than with the maintenance of an optimal level of stimulation including some incongruity. They tend to have developed within a specific domain, (e.g. inter-personal relations,

attitude change), and cannot be considered general theories of motivation.

3.1 Heider: Cognitive balance

Heider (1946, 1958, 1960) proposed the first theory of this kind. He maintains that behaviour is directed toward achieving a cognitively balanced state involving harmonious relations among entities. When cognitions conflict, the individual seeks to re-establish balance, either through action or through mental re-organization. Korman (1974) cites certain research findings supportive of the theory, but also mentions some significant flaws. Weiner (1972) remarks that there has not been a great deal of research on the motivational properties of imbalance. The theory refers specifically to interpersonal relations.

3.2 Osgood and Tannenbaum: Cognitive congruity

Osgood and Tannenbaum (1955) outline a similar theory in the field of attitude change. Congruity theory states that individuals attempt to balance their perceptions by liking or disliking objects which are perceived as linked together and keeping liking and disliking separate for objects which are perceived as separate. When sources of statements and objects of statements are linked incongruously, it is predicted that there will be a tendency to change attitudes to both in the direction of greater congruence. The theory has generated little research, despite the fact, noted by Korman (1974), that it has the advantage of

being more precise that that of Heider.

3.3 Festinger: Cognitive Dissonance

Festinger's (1957) cognitive dissonance approach is widely known. Two cognitions are dissonant, according to Festinger, if "... the obverse of one element would follow from the other ..." (1957, p.13). Zajonc (1968) describes dissonance in the following way. Cognitive dissonance is a state individuals perceive as aversive. They attempt to avoid it, or to reduce or eliminate it if it exists. This can be accomplished by adding new cognitions or by changing existing ones. In order to do so, new information may have to be sought. The importance of the cognitions involved, and their number, affect the severity of the dissonance and the consequent strength of the tendency to reduce or eliminate it.

From the point of view of motivation, dissonance is seen as a drive, the complete reduction of which (no dissonance) is thought of as the aim of the organism. Festinger writes that "... the presence of dissonance leads to action to reduce it, just as, for example, the presence of hunger leads to action to reduce the hunger ..." (1957, p.18). Weiner (1972) criticizes this Hullian type of approach, and suggests that it would be more appropriate to relate the theory to a cognitive conception of behaviour.

Festinger's theory has generated a great deal of research, which has produced both supportive and controversial evidence.

3.4 Consistency models assessed

Support for consistency models has been found in the field of equity theory (Adams, 1963), which is yet another example of this type of approach. Like drive theory, consistency approaches propose a homeostatic explanation of behaviour. They are thus equally open to criticism as failing to account satisfactorily for creativity, altruism or self-destruction. More specific problems for dissonance theory are associated with the variety of possible modes of dissonance reduction, measurement difficulties, and alternative explanations of the data (e.g. Bem, 1967). Korman (1974) suggests that the approach remains viable because its supporters are responsive to data and continue to make revisions and adaptations as these become necessary. Korman contrasts this approach with expectancy-value theory, which assumes that human beings are rational, utility-seeking organisms. He suggests that motivation to maintain consistency with some previously defined standard could result at times in apparently irrational behaviour. Viewed in this way, the theory can possibly accommodate altruism and self-destruction, although creativity remains outside its province. It appears that under certain circumstances the need for cognitive consistency motivates behaviour, but the approach cannot be thought of as a general theory of motivation. Moreover, although cognitive processing is implied, no attempt is made to describe the precise sequence of cognitive events which precedes and accompanies behaviour.

4. Attributional Models

Certain theorists stress the importance of clarifying precisely how cognitive processes operate to influence behaviour. Both Weiner (1972) and Deci (1975) suggest a possible series of cognitive events. In their approaches both make use of concepts from attribution theory and invoke the notion of locus of control.

4.1 Attribution theory

Attribution theory is a general theory about how people perceive the causes of events. Kelley and Michela (1980) describe it as "... The study of perceived causation ..." (p.458). They point out that the theory has relevance for motivation but add that research to date has resulted in piecemeal theories, rather than a fully synthesized model. Both Heider (1958) and Kelley (1967) contend that human beings require an understanding of the causal structure of the environment in order to give meaning to their experience. As Weiner (1982) puts it, "... information seeking and veridical processing are believed to be normative ..." so that "... at the least, comprehension stands with hedonism among the primary sources of motivation ..." (p.164). Individuals thus look for ways of accounting for events.

Heider suggests that causes are perceived either as personal or as environmental forces. Personal forces may be either power/ability (the 'can' aspect) or effort (the 'try' aspect). Effort is a motivational concept made up of intentions and

exertion. Forces in the environment include barriers (e.g. task difficulty) and luck. Attributions may be considered as immediate and phenomenal or as the result of a complex cognitive process.

It is claimed that the attributions made concerning the causality of an event affect subsequent behaviour, which may take the form of expectations, emotions or actions. Weiner (1972) refers to several studies in which the motivating effect of induced false attributions has been demonstrated experimentally. Nisbett and Valins (1971) suggest that an attributional approach to dissonance phenomena is a better explanation of motivation than that offered by Festinger (1957). Heider, like Hull, Freud, Lewin and Atkinson, believes that behaviour is determined by both internal and external forces. He differs from other theorists in stressing the importance of the subjective attribution of forces as causal factors.

4.2 The notion of locus of control

This notion refers to the beliefs people hold about who or what is responsible for their condition. Rotter (1954, 1966) has studied causal attributions within the context of his social learning theory. He proposes that generalised expectancies concerning locus of control exist and affect motivation. 'Internals', who tend to perceive the locus of control within themselves, believe that they can control potential reinforcement and thus take personal responsibility for their achievement or lack of it. 'Externals', who tend to perceive the locus of

control as outside themselves, believe that either others or impersonal forces control reinforcement, and neither blame themselves for errors not accept credit for success. 'Internals' have an increased expectancy of success in future tasks when they succeed, and a decreased expectancy of success when they fail. The expectancies of externals remain unchanged whether they succeed or fail. They may thus be relatively unmotivated even in a situation which involves systematic reinforcement.

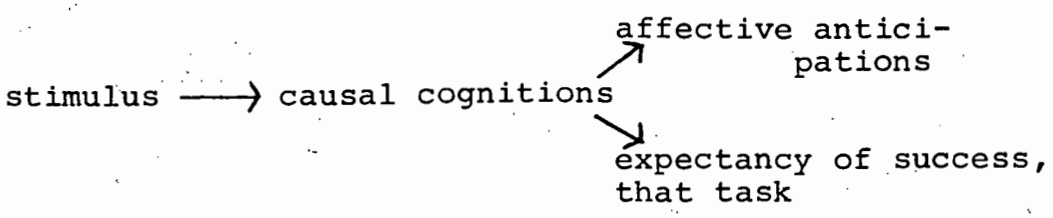
It is suggested that there are individual and cultural differences in the perception of locus of control and, consequently, in the kind of attributions people tend to make about the causes of success and failure.

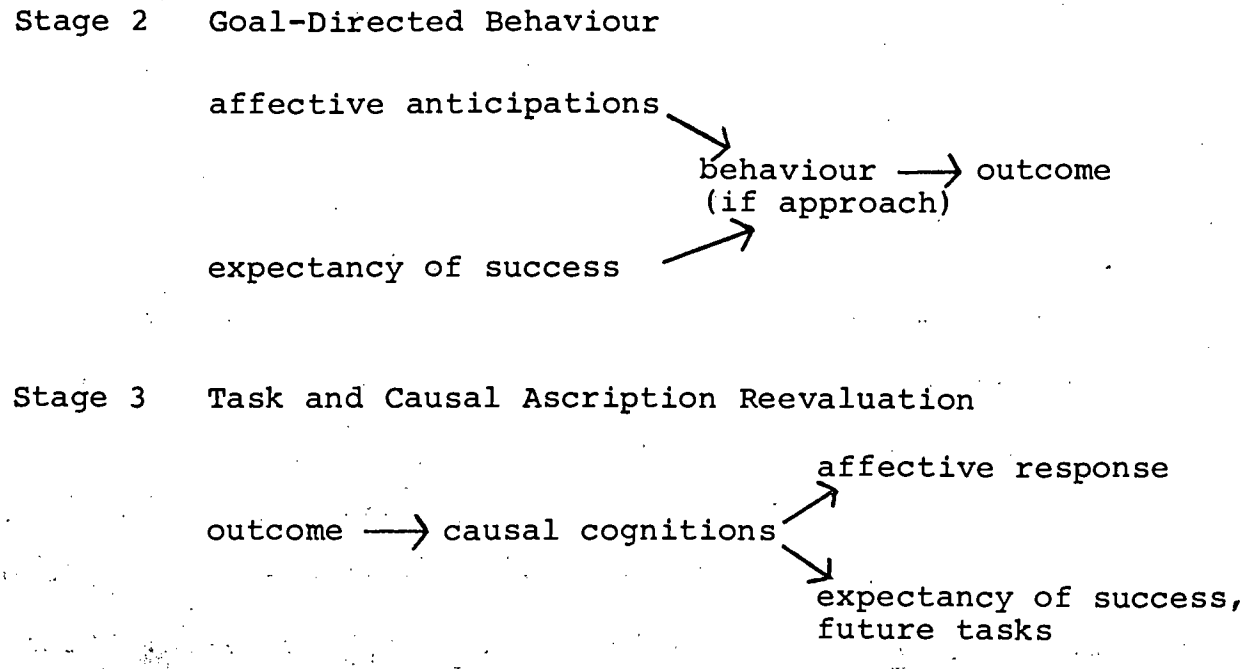
4.3 Weiner's model

Weiner (1972) proposes a development within the framework of Atkinson's (1964) model of achievement motivation. His aim is to specify in detail a sequence of cognitive processes, indicating the role of causal cognitions (attributions) in relation to both affect and expectancy.

The Cognitive sequence:

Stage 1 Task Evaluation





(Weiner, 1972, p.351)

Dimensions of causal cognitions: Weiner originally proposed that the causal cognitions of stage 1 vary along two dimensions - locus of control (external or internal) and stability (stable or unstable). The ascriptions made by an 'internal locus of control' person may be stable (ability) or unstable (effort). Similarly, the ascriptions made by an 'external locus of control' person may be stable (task difficulty) or unstable (luck). He considers that these two dimensions are confounded by Rotter.

Each dimension is related to a particular kind of result. When presented with an achievement related task, an individual's causal attributions concerning success and failure on the dimension 'locus of control' influence achievement-related affect. Affect is believed to be maximized by ascription to internal factors, particularly effort. Causal attributions on the dimension 'stability' have a separate influence on

achievement-related expectations. Ascriptions to stable factors increase the expectation of success in future similar tasks.

Studies which Weiner and various colleagues have undertaken have led him to conclude that individual differences in achievement needs are one source of differences in dispositions to perceive causality. Those high in achievement needs have been observed to attribute success to ability and effort, and failure to lack of effort. Those relatively low in achievement needs appear to perceive themselves as generally low in ability and attribute failure to lack of ability. Positive achievement related behaviours appear to be dependent on cognitions that effort is an important causal determinant, and Weiner (1972) suggested that other behaviours (e.g. those serving power or affiliation needs) may require similar causal attributions.

Later modifications of the theory: Weiner has subsequently expanded and modified his views (Weiner, 1982). He now identifies three primary dimensions of causality - stability, locus and control, each of which is linked to certain psychological consequences. Stability remains related to expectancy change; locus is a concept similar to the locus of control dimension and affects esteem-related emotions; the dimension of control categorizes causes, either internal or external, as controllable or uncontrollable, and is related to interpersonal judgements (e.g. re helping, evaluating and liking). There are also thought to be secondary linkages between causal dimensions and psychological effects, e.g. 'stability' relates to depression

type affects and 'control' relates to various intrapersonal states of perceived freedom. It is believed that there are probably a number of subordinate causal dimensions, two of which may be intentionality and globality.

The major difference from the original theory is in the discrimination between the two dimensions of locus and control. There is also a modification concerning the effect of the locus dimension. It was initially thought that ascriptions of internality inevitably maximized emotional reactions. Weiner (1982) refers to research evidence which indicates that this relationship is not invariant, and concludes that the way in which locus affects emotions is a great deal more complex than was at first proposed.

The revised theory has a wide range of applicability. Weiner (1982) refers to research in the areas of hyperactivity, mastery, parole decisions, affiliation and depression which demonstrates this. He concludes that a general theory of motivation is in the process of evolving. He maintains that, while attribution theory may not provide all the answers, it is a "... reasonable direction toward the formulation of a theory of motivation in which thoughts are systematically related to action ..." (1972, p.418).

4.4 Deci's model

Deci's (1975) model uses concepts from attribution theory rather than being totally committed to an attributional explanatio of motivation. It is included at this point because Deci and

Weiner are the two most emphatically cognitive theorists of motivation and certain interesting parallels are apparent in their work.

The cognitive sequence: Like Weiner (1972) Deci outlines a sequence of cognitive processes which precede and provide on-going control of behaviour. The model consists of five elements - stimulus inputs; energy source or motive; establishment of a goal; goal-directed behaviour; and reward and satisfaction.

Stimulus inputs: Stimulus inputs provide the individual at any given moment with a cognitive awareness of his situation. Information is derived at times from external stimuli reflecting conditions in the environment, at times from internal stimuli and often from a combination of the two. Internal stimuli may come from memory, in the form of recollections of other events and situations, or from internal bodily conditions such as blood sugar level, or from personal awareness of affective or intrinsic motivational states.

Energy source: The energizing and direction of behaviour, according to Deci, is a consequence of the individual's awareness of potential satisfaction, i.e. that another state is possible and that it would be preferable to the present one. This awareness is the result of a cognitive evaluation of stimulus inputs. The stimulus inputs may present information about drive states, about emotional states or about competence and self-determination needs.

Establishment of a goal: The third element in Deci's model is the establishment of a goal. A goal can be considered to

in comparison with a preceding state). The second part is the result of the rewards, i.e. feelings of satisfaction. Deci admits that in the case of intrinsic and affective rewards it may be difficult to separate the feeling which is the reward from the feeling of satisfaction that follows the reward, but maintains that, conceptually, they are distinct. The feeling of satisfaction operates as feedback to the 'awareness of potential satisfaction' which initiated the behaviour, and causes termination if the two match. The achievement of a goal may terminate a particular behaviour sequence, but only the achievement of satisfaction will terminate the awareness of the need for action to produce change which originally initiated the sequence. Deci thus proposes that individuals make use of the TOTE mechanism described by Miller, Galanter and Pribram (1960) on two occasions - firstly to determine goal achievement, and secondly to determine satisfaction.

The sources of motivation: Deci proposes the following tentative outline for a general theory of motivation. He suggests that three classes of perceived condition can motivate the individual to engage in behaviour designed to change that condition. The first is primary drive states. A person who is aware that he is hungry will act in a way which he believes will result in the satisfaction of his hunger. The second is emotional states. A person who is aware of strong feelings of fear will act in a way which he believes will lead to the reduction of these aversive feelings. The third class, and the one to which Deci pays greatest attention, is an intrinsic need to feel both competent and self-determining. Deci conceives of this as a

permanent condition of the wakeful human organism, interrupted from time to time by emotional and primary drive needs. Deci's (1975) conceptualization of intrinsic motivation, together with some later elaborations of the theory, is discussed in detail in Chapter III (p.45).

Deci's conception of the human organism as innately programmed to seek feelings of competence and self-determination is not dissimilar to the attributionist view of human beings as information-processors in search of understanding. It is hardly possible for a person to feel competent and in control if he does not understand his environment. But Deci does not attempt, as Weiner does, to build a general theory of motivation on the basis of causal attributions. His connection with attribution theory is most evident in his description of the manner in which intrinsic motivation is affected by extrinsic rewards, as outlined in his 'cognitive evaluation theory'. This theory concerns itself with variables very similar to those considered by Weiner in relation to the dimensions of locus and control. Cognitive evaluation theory is referred to in detail in Chapter III (p. 57).

4.5 Attributional models assessed

Of the cognitive theorists, only Weiner and Deci attempt the surely fundamental task of specifying in detail precisely how cognitive processes operate in determining behaviour. Weiner has made a serious attempt to develop an operational theory whereas, at present Deci's (1975) approach, as he freely admits, is simply a tentative conceptual framework. Nevertheless

it has the advantage of appearing more broadly based than that of Weiner, and the concept of an innate need for feelings of competence and self-determination has both theoretical and empirical support, as well as possessing considerable intuitive appeal.

5. Conclusion

If it is accepted that cognition plays an important role in human motivation it is important to investigate the exact nature of this role. It appears that the most direct attempts to do so have been made by those advocating attribution-type models which emphasize the need for an awareness of personal control, conceptualized either as understanding or as self-determination.

CHAPTER III

INTRINSIC MOTIVATION

1. Introduction

Everyday observation of human behaviour leads to the conclusion that two forms of motivation operate. Certain activities are clearly undertaken as the means to some discernible end, while other activities appear to be ends in themselves, associated with no further reward. It has been common to refer to the former type of behaviour as extrinsically motivated and to the latter as intrinsically motivated. It has been assumed that extrinsic and intrinsic motivation are not necessarily mutually exclusive. It is, of course, possible to argue that apparently intrinsically motivated behaviour is, in fact, related to some unobservable extrinsic reward. However, there are several reasons for the rejection of this interpretation.

At the level of metatheory, an organismic, interactive model of human functioning cannot accept that all motivation is extrinsic. This would imply that individuals are passively acted upon by forces which they do not control, incapable of being actively involved in choosing to behave as they do. An organismic model assumes that human beings can evaluate stimulus input and decide on appropriate responses in terms of their own goals.

There is also growing empirical evidence that certain types of behaviour are intrinsically motivated in both humans and infra-humans. The behaviours concerned are those which involve stimulation, choice, a degree of challenge and the possibility of mastery. Numerous animal studies conducted in the 1950's (cited in Deci, 1975) indicate that activities involving exploration and manipulation are experienced as rewarding. Developmental approaches to children's play, e.g. that of Bruner, Jolly and Sylva (1976), confirm the intuitive belief that these clearly voluntary behaviours are experienced as satisfying in themselves. Furthermore, research into the effects of stimulus deprivation shows clearly that the absence of adequate opportunities for cognitive processing is experienced as aversive to the extent that normal functioning and development is disrupted. Several studies of this nature are cited in Deci (1975) and mention may also be made of the work of Casler (1968). It seems that situations involving exploration, discovery and the satisfaction of curiosity are valued and even sought out by the human organism.

In this chapter, the ways in which different approaches to motivation conceptualize intrinsic motivation are outlined and compared with the conceptualization of Deci (1975, 1980) and Deci and Ryan (in press). Reference is made to methods of measuring intrinsic motivation, after which research findings concerning the relationship between intrinsic motivation and extrinsic rewards are presented, together with Deci's 'cognitive evaluation theory'. The place of intrinsic motivation in education, and its implications, are briefly considered, followed

by an account of some research in educational settings.

2. Conceptualization of Intrinsic Motivation in Terms of Various Theories

Early attempts at explanation of intrinsically motivated behaviour were Woodworth's (1918, 1958) 'behaviour primacy' theory, which postulated that an activity provides its own drive, and Allport's (1937) notion of 'functional autonomy'. Of the approaches to motivation outlined in Chapters I and II, some have paid more attention than others to this type of behaviour, and some appear better able than others to account for it.

2.1 Psycho-analytic conceptualizations

Within the psycho-analytic tradition, intrinsically motivated behaviour has not been a major issue. It can be inferred that it would be conceptualized either as the indirect satisfaction of unconscious needs of a psycho-sexual nature or as a form of ego activity related to integration and mastery. While the former conceptualization implies a mechanistic and homeostatic approach, the latter is closer to an organismic viewpoint, with ego activity suggestively similar to cognitive functioning.

2.2 Behaviourist conceptualizations

Behaviourist theory offers various explanations. It was popular in the 1950's to claim that a drive of some sort was operating, e.g. an exploratory drive (Montgomery, 1954) or a

drive to avoid boredom (Myers and Miller, 1954). Deci (1975) sums up the criticisms of this approach made by White (1959). White pointed out that a drive is considered to have certain properties not possessed by the 'drives' in question. They do not involve any persistent non-nervous system tissue need, nor do they result in any consummatory response which reduces a need. In fact, organisms have been observed to seek out novel stimuli, which is a response inconsistent with the notion of exploration as drive reduction.

It has also been suggested, within the Hullian tradition, that exploratory and manipulatory behaviours are paired with the reduction of primary drives and that they thus become a form of secondary reinforcement. Deci (1975) and others argue that this explanation is implausible, in view of the fact that strong exploratory responses appear shortly after birth. A final drive theory position is that exploration is a form of learned anxiety reduction. Both White (1959) and Deci (1975) reject this explanation. They point out that this would imply that individuals would avoid novel stimulation, whereas in fact they are often observed to seek it out.

A learning theory approach rejects the concept of intrinsic motivation and simply assumes that such behaviour is elicited when certain reinforcement contingencies are present. There is no way to disprove this theory because, if the behaviour occurs, the reinforcement is assumed to be operative, i.e. the argument is circular. No attempt is made, however, to explain on what basis certain experiences are considered rewarding by the organism. Deci (1975) points out that Skinner

is, in fact, making the hedonistic assumption that some kind of internal pleasurable experience is involved. Learning theory requires, as does drive theory, the metatheoretical assumption of a mechanistic, reactive model of human functioning.

2.3 An instinct conceptualization

It has been proposed (Lorenz, 1976) that a readiness to respond to novel stimuli is an instinctive behaviour which has evolved in the higher mammals to serve survival needs. It is argued that, while the lower vertebrates are characterized by fixed innate behaviour patterns elicited by certain features of the environment, the evolutionary trend is toward a wider range of responses and a greater flexibility in their use. In a versatile, non-specialized species investigative exploratory behaviour is both possible and conducive to survival. It therefore becomes, over time, a characteristic of the species. This behaviour occurs only during a brief developmental phase in young animals, but in the human species it is a permanent characteristic.

An instinct approach to intrinsic motivation can easily be related to either physiological or psychological arousal explanations. Ellis (1973) writes that, in order to inherit curiosity, "... All that is needed is to breed into the germ plasm a predisposition to be rewarded by the emission of new responses and the occurrence of novel stimulus events ..." (p.114). The mechanism of such a predisposition could well be arousal needs.

2.4 Arousal conceptualizations

Arousal theory has concerned itself particularly with the kind of behaviour considered to be intrinsically motivated and is well able to account for it. The need to maintain a certain level explains both active response to novel and challenging events and the tendency to seek them out. While purely physiological arousal explanations have mechanistic and biological implications, psychological arousal needs suggest a more active cognitive model.

2.5 Implications of affect and humanistic approaches

These approaches cannot be said to have conceptualized intrinsic motivation since they have paid little specific attention to this issue. It can be inferred that the former would assume that some agreeable affect was either present or expected to be present. The latter would probably claim that intense and prolonged intrinsic motivation to engage in certain types of behaviour indicated that some personal need for self-actualization was being met.

2.6 Cognitive conceptualizations

Expectancy-value theory has contributed little directly to this field beyond the implication that cognitive processes (in the form of expectations) must be involved. Theories of cognitive consistency all suppose a homeostatic model, assuming that incongruity, imbalance or dissonance are always experienced as

aversive. Thus although they explain interaction with the novel, they cannot account for the tendency to seek it out. Of the attributional motivation theorists, Weiner (1972) has not concentrated on the phenomenon of intrinsic motivation, although his expanded theory (1982) can account for it in terms of causal cognitions. Deci (1975, 1980) and Deci and Ryan (in press), however, have given a central role to intrinsic motivation. Their conceptualization will be presented in the section which follows.

3. Deci's Conceptualization of Intrinsic Motivation.

3.1 The concept of intrinsic motivation

Deci's model of human functioning is organismic, interactive, non-homeostatic and cognitive. His outline of a general theory of motivation and his account of the precise way in which cognitive processes operate to determine behaviour have been presented in Chapter II (pp.33-37).

With regard to intrinsic motivation, Deci maintains that "... All humans are born with the basic and undifferentiated need for feeling competent and self-determining ..." (1975, p.65). This is the permanent condition of the wakeful human organism. It may be interrupted from time to time by primary drive needs, e.g. hunger, and by real time emotional needs, e.g. fear. But for a great deal of the time the individual's natural state is an awareness of his intrinsic need for feelings of competence and self-determination. Consequently, if free to

choose, he will engage in behaviours which he believes will satisfy this need. If opportunities for such behaviours are not provided by the existing environment he will actively seek out suitable stimulation.

The kind of behaviours likely to result in feelings of competence and self-determination are those which involve choice and the possibility of mastering challenge. If challenge is to be mastered it must be of an appropriate degree of difficulty. Thus people tend to engage in or to seek out situations which are near the limit of their own perceived capacities.

Deci does not deny that people may also be extrinsically motivated by the prospect of rewards. It does appear, however, that the extrinsic rewards valued by most people are related to either emotional or primary drive needs. By definition, the rewards associated with intrinsic motivation (pleasurable feelings of self-determined competence) cannot be administered by an outside source. Deci points out that Rotter's (1966) concept of internal locus of control (referred to in Chapter II, p.29) is a necessary pre-requisite for intrinsic motivation. Deci and Ryan (1980) define intrinsically motivated behaviours as "... those behaviors that are motivated by the underlying need for competence and self-determination ..." and add that the operational definition of such behaviours is "... those that are performed in the absence of any apparent external contingency ..." (p.42).

Deci and Ryan (in press) have elaborated the original model of intrinsic motivation as follows. They identify three classes

of behaviour generally considered to be self-regulated. The first is genuine self-determination - the unfolding of a person's internal nature by means of direct interaction with the environment, independently and voluntarily engaged in. The other two are both forms of internalization as the result of experience. Such internalizations are necessary as ways of accommodating to inflexible aspects of the environment. If the internalizations are 'integrated' (i.e. fully assimilated so that they do not generate conflict) they function as internally informational events upon which the person can base choices. If, however, the internalizations are 'introjected' (i.e. merely the internal representations of external controls with the element of conflict between controller and controlled still present) they function as internally controlling events which force the person to behave in certain ways.

It is argued that only genuine self-determination and 'integrated' internalizations can be the source of truly intrinsically motivated behaviour. 'Introjected' internalizations result in behaviour which is apparently self-regulated. In fact, the external control is still operating.

3.2 The development of intrinsic motivation

Deci considers that human infants are born with a basic need to feel competent and self-determining and that this need becomes differentiated into specific motives as a consequence of the child's interaction with the environment. Achievement motivation and the need for self-actualization, he suggests, may be

examples of specific intrinsic motives. The differentiation process results in certain relatively stable motives in adulthood but continues throughout life to modify intrinsic motives. Deci (1975) points out that his view is similar to the accounts proposed by White (1959) and Kagan (1972) of the differentiation of motives, and that it can be related to Maddi's (1970) suggestion that an innate need to discover meaning develops as a result of interaction with the environment. He adds that it is also consistent with the account outlined by Hunt (1965, 1971) of the way in which increasing cognitive capacity leads to an interest in novel situations during the first two years of life.

Deci and Ryan (1982) refer to three lines of research which indicate that for any motivational orientation to develop there must be clear contingencies between behaviours and outcomes. Children require an environment in which the relationship between their behaviour and its consequences is consistent and discernible. The development of an intrinsic orientation requires, in addition, that contingent outcomes be administered in a manner which responds to the child's behaviour, rather than attempting to demand or control that behaviour. The issue of controlling versus informational rewards will be fully discussed later in this chapter (pp.57-61).

The child's motivational orientation thus develops as a result of his socialization experiences. Since girls and boys are treated very differently from birth, it seems possible that they will differ in both the extent to which genuine intrinsic motivation develops and in the kind of internalizations

(integrated and introjected) which they make. Deci does not specifically refer to this point, but he interprets research findings (Deci, Cascio and Krusell, 1975) of gender differences in terms of the different socialization experiences of males and females.

3.3 Comparison with other conceptualizations

Deci's conceptualization of intrinsic motivation contradicts behaviourist and early psycho-analytic accounts of this type of behaviour. It is, however, compatible with a psychological arousal approach and Deci has, in fact, proposed certain modifications to Hunt's (1965) theory which would accommodate his own view by allowing the individual a more active role in determining behaviour. The tradition which has stressed the role of emotion in motivation links up with Deci's position in that he too envisages the human organism as seeking agreeable affect (associated with feelings of competence and self-determination). Both humanistic and recent psycho-analytic approaches to motivation seem aware of the kind of need which Deci describes, but neither approach is as precise in its definition or as specific in describing the process by which the need is linked to its satisfaction. In comparison with other cognitive perspectives, Deci's view is at variance with cognitive consistency models, but not totally unrelated to the attributional approach of Weiner (1972).

4. Related Approaches

4.1 Competence oriented approaches

Deci acknowledges the work of White (1959) as significant in its insistence that motivation theory take account of competence related behaviour. White suggested a 'competence' or 'effectance' motivation based on an intrinsic need to deal effectively with the environment. He maintained that this need resulted in behaviours such as exploration, manipulation, attention, perception, thought and communication. Mastery achieved through these behaviours resulted, he claimed, in feelings of efficacy which were inherently pleasurable. He conceived of such intrinsic motivation as an ongoing condition of the organism, energized by the central nervous system and periodically interrupted by tissue needs.

Harter (1981a, 1982) has expanded and differentiated White's global model of effectance motivation from a developmental perspective. Her major focus has been the elaboration of a model of mastery motivation consisting of a network of related variables. She outlines the following developmental sequence. Innate effectance needs are present at birth, but are powerfully influenced by socialization processes. Evaluative reactions by significant others to the product of mastery attempts influence children's sense of competence, while affective responses by these others to the process of attempting mastery influence children's sense of self and self-esteem. Finally, around the age of six, children internalize the standards and criteria

of the significant others in their environment and become able to evaluate their own performance. It is hypothesized that the degree to which this internalization takes place influences the extent to which children perceive themselves as personally in control of mastery behaviour and its outcomes, and therefore competent. The associated agreeable affect of pride in one's own competence maintains interest in mastery behaviours. The inborn urge to be effective, although still present, is, according to Harter, to a large extent replaced by a need which has developed out of it, a need to be competent, to perform in accordance with internalized evaluative criteria.

Thus Harter, like Deci and Ryan (in press), proposes that there are two sources of apparently self-regulated behaviour, namely, the innate effectance need and internalized standards of competence. She does not, however, make the distinction between integrated and introjected internalizations. She makes clear that her use of the term 'intrinsic' refers to "... an experiential process whereby motivational and informational functions once extrinsic to the child are modeled, incorporated, such that they become internal to the child ..." (1982, p.18) and suggests that a better label might be 'internalized' motivation. This clarifies the fact that Harter's emphasis is very different from that of Deci and Ryan. She chooses to ignore the direct role of innate effectance needs in motivating behaviour, and, although she acknowledges the significance of the cognitive variable, 'perceived control', she does not stress the importance of feelings of self-determination.

Harter and her colleagues have developed domain specific measures

for the various constructs in their model. The measure of intrinsic orientation in the cognitive domain uses a classroom learning context (Harter, 1981b). It takes the form of a self-report questionnaire incorporating the two informational and three motivational components of mastery behaviour identified by the model, these latter being challenge seeking, curiosity and independent mastery attempts. The three motivational sub-scales of this questionnaire make up one of the measures of intrinsic motivation used in the present study. The questionnaire is described in Chapter IV (p.74) and the actual text (with minor amendments) is to be found as Appendix II.

Deci and Ryan (1980) point out that Bandura's work is related to the idea of intrinsic motivation. Bandura (1977) maintains that people engage in behaviours only if they have expectations that they can perform them efficaciously. Although Bandura refuses to assume any underlying motivational construct, his theory is based on the importance of efficacy or competence.

4.2 Self-determination oriented approaches

A concern with the notion of perceived responsibility is evident from several directions. The notion of locus of control (Rotter, 1966) and the growing recognition of the importance of internal attributions of control and causality in motivating approach behaviour have been referred to in Chapter II.
Brehm (1966) considers the response to loss of freedom in his theory of psychological reactance, and Steiner (1970) is concerned with perceived freedom. Seligman (1975) has investigated

learned helplessness, and de Charms (1968, 1976) stresses the importance of a sense of personal causation, which he expresses as an awareness of acting as an origin, rather than of being acted upon as a pawn.

4.3 Piaget's account of cognitive development

Deci (1975) points out that assumptions similar to his own are implicit in the work of Piaget. Piaget (1977) maintains that the human organism has an innate tendency to develop more complex cognitive structures. This is achieved by the related processes of assimilation and accommodation. Assimilation refers to the incorporation of new aspects of the environment into existing cognitive structures. Accommodation refers to the modification of existing cognitive structures in the light of new information from the environment. Development requires stimulus situations which permit a balance or equilibrium of these two functional invariants. This would imply that human beings require stimulus inputs that are moderately discrepant. Deci maintains that seeking challenge represents seeking a situation which is assimilable but not completely so, while conquering challenge represents accommodation and the subsequent assimilation of the new situation. Deci adds that an innate tendency to develop more complex cognitive structures is precisely what might be expected if there is in fact an intrinsic need for competence and self-determination, since more adequate cognitive abilities must provide a better means of satisfying this need.

Deci refers to Mischel's (1971) interpretation of Piaget which discusses the motivating power of inconsistency. He is in agreement with Mischel's conclusion that organisms need to make sense out of the novel, but believes that not enough emphasis is placed on the need to seek out inconsistency in order to reduce it. Elkind (1971) has proposed that intrinsic growth forces motivate cognitive growth cycles which consist of seeking stimulus nutriment, gating, storage and intellectual play. Deci comments that this is an elaboration of the seek and conquer process described by him. He is in agreement with Elkind's conclusion that performance (involving a fully assimilated activity) is not intrinsically motivating. Deci reasons that it is not possible to continue to feel competent and self-determining without moving on to new situations.

5. The Measurement of Intrinsic Motivation

In terms of the operational definition of intrinsic motivation proposed by Deci and Ryan (1980), namely, behaviours which are "... performed in the absence of any external contingency ..." (p.42), the most common measure is amount of time spent on an activity when subjects are under no apparent obligation to do so, and when at least some other occupations are possible. Other behavioural measures which have been used are willingness to participate in another similar experiment and desire for additional information (Harackiewicz, 1979). Self reported levels of interest or enjoyment have also been taken to indicate intrinsic motivation (Harackiewicz, 1979; Calder and Staw, 1975).

A common experimental paradigm in studies investigating the relationship between intrinsic motivation and rewards is to have the subjects perform some activity generally considered to be intrinsically motivating (e.g. puzzles of various kinds, drawing) and to reward one group of subjects (under various conditions) and not another. Subjects are then observed when they believe the experiment to be over, and the amount of time, if any, that they spend on an activity of the same type as the experimental task is recorded. During this period alternative activities are of course available.

A difficulty arises when an attempt is made to measure intrinsic motivation which is the result of internalizations of competence values. The behaviours are domain specific and are often performed in situations in which either an intrinsic or an extrinsic motivational orientation could be operating. Self reports of the perceived reasons for one's behaviour can be either consciously or unconsciously inaccurate. As yet, no satisfactory other form of assessment has been devised. It would seem in principle feasible to develop a behavioural measure based on inferred differences between intrinsic and extrinsic approaches to the same type of situation. Another possibility is ratings on a standardized checklist by third parties.

6. The Effect of Rewards on Intrinsic Motivation

6.1 Research findings

A considerable amount of research has been devoted to the

investigation of the relationship between extrinsic rewards and intrinsic motivation. A common finding is that extrinsic rewards tend under some circumstances to undermine motivation that was originally intrinsic. It appears that being given a reward leads to the perception that the activity is performed in order to receive the reward, with a subsequent decrease in intrinsic motivation. Lepper, Greene and Nisbett (1973) pointed out that self-perception theory implied this 'over-justification hypothesis' and the phenomenon is often referred to as the 'overjustification effect'. Results of this nature were obtained by Lepper et al (1973) with pre-school children, by Kruglanski, Alon and Lewis (1972) with school children, by Deci (1971, 1972) with college students and by Calder and Staw (1975) with business students. The findings were consistent whether the dependent measure was the amount of time spent on the activity in a free choice situation (Deci, 1971, 1972) or self-reported enjoyment of the activity (Kruglanski et al, 1972) or performance measures (Kruglanski, Freedman and Zeevi, 1971). Field experiments (Staw, 1974; Notz, 1975) yielded similar results to those found in controlled experimental settings. Deci and Cascio (1972) showed that negative rewards (i.e. avoidance of punishment) functioned in the same way as positive rewards. It has also been found that withdrawal of extrinsic rewards leads to the enhancement of intrinsic motivation (Weick, 1964; Staw, 1974). A recent review of studies in this general area can be found in Deci and Ryan (1980).

Research has also been conducted from a behaviourist perspective (Farr, 1976; Finegold and Mahoney, 1975; Hamner and Foster,

1975; Reiss and Sushinsky, 1975; Farr, Vance and McIntyre, 1977). These studies have reported findings which do not support the undermining effect of rewards on intrinsic motivation, or have accounted for such undermining in terms of reinforcement.

Deci and Ryan (1980) maintain that the conclusion that the effect does not exist is unwarranted, since theoretical and methodological differences account for these findings. They reiterate the point made by Deci (1976) that preference for a reinforcement rather than a cognitive explanation is largely a statement of preferred metatheory. In addition, they reject the term 'overjustification' as being theoretically tied to an attributional self-perception framework which, they believe, is an incomplete explanation of the phenomenon.

6.2 Cognitive evaluation theory.

Deci (1975) proposed this theory as an explanation of the effect of rewards on intrinsic motivation. The theory states, firstly, that intrinsic motivation decreases when the perceived locus of causality of an activity changes from internal to external; secondly, that intrinsic motivation is increased when an activity enhances feelings of competence and self-determination. Thirdly, according to the theory, extrinsic rewards always have both a controlling and an informational aspect. If the controlling aspect is salient to the person being rewarded, the locus of causality becomes external and intrinsic motivation decreases; if the informational aspect is salient to the person, intrinsic

motivation is increased. Deci adds that information in the form of continued negative feedback (which is perceived as implying incompetence) will also have a detrimental effect on intrinsic motivation.

Deci and Ryan (1980) point out that the theory does not simply refer to attributions of external causation. This account of the process is intended as "... a heuristic description of the perceptions and cognitions that accompany changes in underlying motivational processes ..." (p.44). They consider that the motivational source remains internal, but that the extrinsic, rather than the intrinsic, motivational subsystem is called into play.

Deci and Ryan's (1980) account of cognitive evaluation theory contains modifications of the 1975 statement. Firstly, the term 'perceptions' of competence, rather than 'feelings' of competence, is employed. This does not imply that feelings are not present, but makes the statement consistent with the reference to 'perceptions' of the locus of causality. Secondly, the self-determining and competence components of intrinsic motivation are separated. The one process is conceptualized as oriented toward self-determination and the other as oriented toward the need for competence. The latter only involves self-determination in so far as this is a prerequisite for perceptions of competence. Thus a reward of which the controlling aspect is salient decreases intrinsic motivation because it is associated with the perception of an external locus of causality (the self-determination component); while a reward of which the informational aspect is salient increases intrinsic motivation

because it is associated with the perception of competence (the competence component).

6.3 Support for cognitive evaluation theory

This consists, firstly, of the repeated findings already referred to of the detrimental effect of reward on intrinsic motivation over a variety of different rewards. Secondly, it can be argued that, if rewards invoke the extrinsic motivational sub-system because they give rise to perceptions of external causality, other externally imposed controls should have the same effect. Findings that this is the case have been reported by Amabile, de Jong and Lepper (1976) with external deadlines and by Lepper and Greene (1975) with surveillance. It has also been found that increases in the perceived internality of the locus of causality have a positive effect on intrinsic motivation (Swann and Pittman, 1977; Fisher, 1978; Zuckerman, Porac, Lathin, Smith and Deci, 1978).

There is also evidence that intrinsic motivation is enhanced by positive competence feedback, which may be self-administered (inferred from successful performance) or administered by another person, usually in the form of a verbal reward (praise). Findings to this effect are reported by Anderson, Manoogian and Reznick (1976), Martin (1977), Swann and Pittman (1977) and Boggiano and Ruble (1979) using children as subjects; and by Harackiewicz (1979), Arnold (1976) and Deci (1971) with adult subjects.

It has been observed, however, that verbal rewards sometimes

have an adverse effect on intrinsic motivation in adult females (Deci, Cascio-and Krusell, 1975; Carone, 1975). Deci and Ryan (1980) suggest the plausible explanation that, owing to differential socialization, females have a greater tendency to interpret verbal rewards as controlling rather than as informational competence feedback.

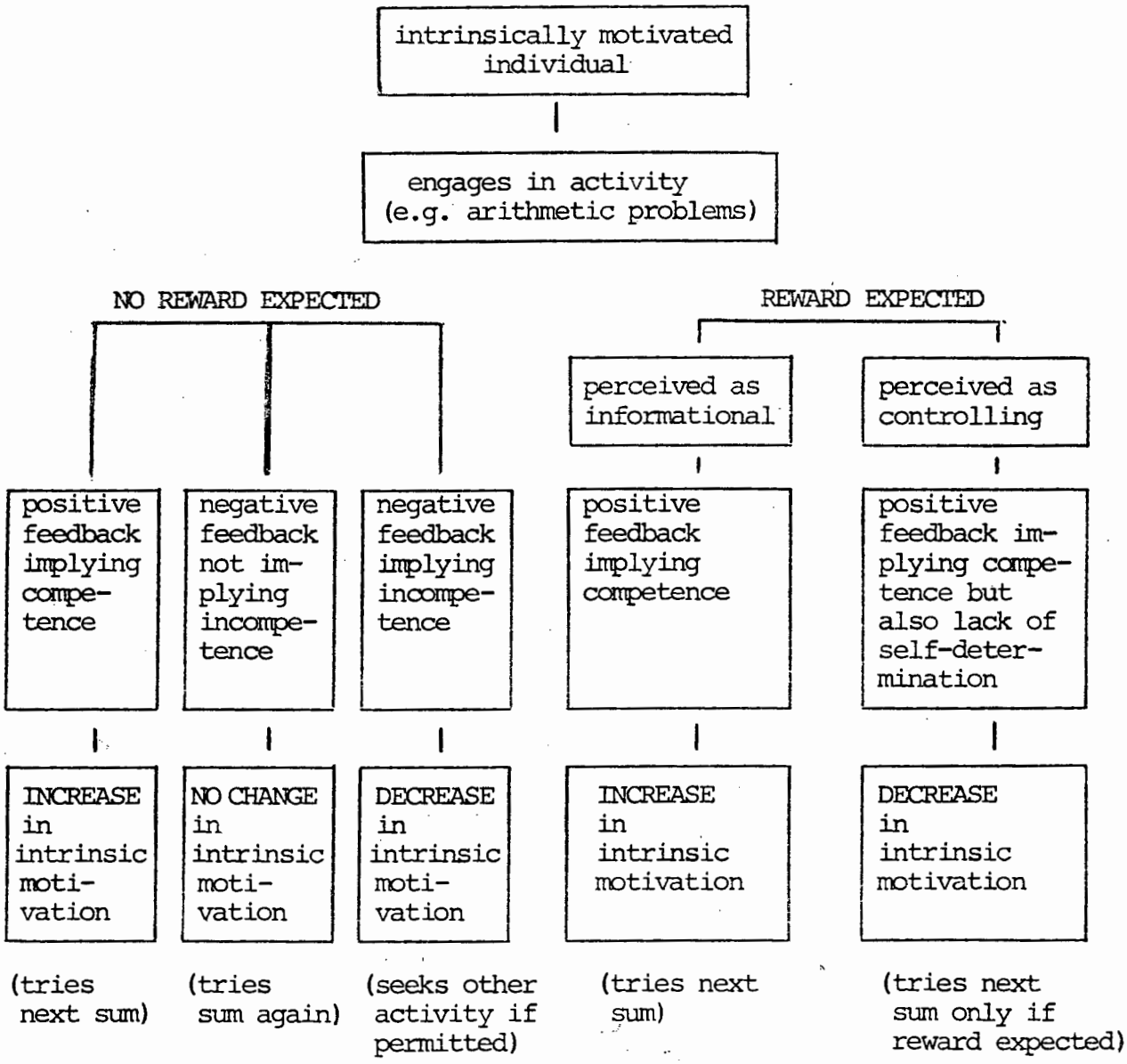
Studies indicate that negative competence feedback, either verbally from another person or self-administered in the light of performance, results in a decrease in intrinsic motivation. Findings to this effect have been reported by Deci and Cascio (1972) and Deci, Cascio and Krusell (1973). It should be noted that only negative feedback which implies incompetence has this detrimental effect. Negative feedback which provides helpful information is made use of in new attempts to become competent.

The third proposition of cognitive evaluation theory is that all rewards have both a controlling and an informational aspect. When the controlling aspect is salient, the reward provides extrinsic satisfaction, but decreases intrinsic motivation by inducing a change in the perceived locus of causality from internal to external. When the informational aspect is salient, and conveys positive competence feedback, intrinsic motivation is increased. Several studies have attempted to vary reward conditions in order to compare these two aspects. Deci and Porac (1978), Enzle and Ross (1978), Rosenfield, Folger and Adelman (1980) and Pittman, Davey, Alafat, Wetherill and Wirsul (1980) all report that rewards administered 'informationally' tend to increase intrinsic motivation, while rewards

administered 'controllingly' tend to have either no effect or a detrimental effect on intrinsic motivation.

Figure 1

Intrinsic motivation: effects of reward and no reward situations



6.4 Factors which influence the perception of rewards

Deci and Ryan (1980) claim that factors in the rewardee, the situation, and the rewarder influence the manner in which a reward is perceived, i.e. whether the controlling or the informational aspect is salient.

With regard to the rewardee, the factors which research to date indicates may be relevant are gender (differential reactions to praise) and locus of control (differential reactions to praise and to intrinsic feedback). It seems very likely that there may be others.

Situations which have been suggested as conducive to the perception of the controlling aspect of rewards as salient are those in which rewards are expected and performance-contingent. Lepper et al (1973) reported this effect of expected rewards and Deci and Ryan comment that this is understandable, since no instrumentality between the activity and the reward can be built up if the existence of the reward is unknown when the activity is performed. Deci (1972), Weiner and Mander (1978), Harackiewicz (1979) and others report decreases in intrinsic motivation following performance-contingent rewards, but the opposite result has also been found. Deci and Ryan argue that performance-contingent rewards can be either controlling or informational depending on the manner in which the contingency

is constructed. Thus such rewards need not necessarily have an adverse effect on intrinsic motivation. Salience of the reward in the experience of the rewardee has also been suggested as a condition likely to lead to a decrease in intrinsic motivation (Ross, 1975), but Deci and Ryan point out that a salient reward can be perceived as either controlling or informational. It is the aspect of the reward which is salient that determines the effect on intrinsic motivation.

It is suggested by Deci and Ryan that rewarders whose usual mode of interaction is authoritarian will be likely to behave more controllingly in general and to convey this fact in one way or another when administering rewards. Two field studies involving teachers as rewarders (Deci, Nezlek and Sheinman (1981) and Deci, Schwartz, Sheinman and Ryan (1981)) have indicated a certain amount of support for this inference. These studies are described in detail on pp.66-69.

7. Intrinsic Motivation and Education

7.1 Motivational orientations in the school situation

It is usual in human societies for adults to conduct some form of education in order to socialize the young according to the accepted values, attitudes and behaviours of the community. Two common aspects of formal education in modern society are its compulsory nature and its predetermined content. Neither of these characteristics is likely, in terms of the theory outlined in this chapter, to be conducive to the enhancement

of intrinsic motivation in its original form. It is possible to conclude that an extrinsic motivational orientation is both inevitable and acceptable for this type of education. On the other hand, it may be that educators can design environments which foster intrinsic motivation, although in one sense this is itself a form of controlling manipulation.

An intrinsic motivational orientation is nevertheless possible toward schoolwork as the result of internalizations of the competence values of the community. Deci and Ryan (in press) would add that school related behaviours only involve the intrinsic motivational sub-system when the internalizations which evoke them are integrated rather than introjected.

Deci and Ryan (1982) make the value judgement that it is desirable for pupils to be intrinsically motivated. Some possible reasons for agreement with this view are presented in Chapter VI (p. 134).

7.2 Implications for educational practice

If intrinsic motivation is to be encouraged children require a contingent environment in which they have the opportunity to make choices. In the classroom, the responsibility for such an environment lies with the teacher. She must provide, firstly, a certain amount of consistent yet flexible and non-controlling structure within which individual pupils can choose to learn, and, secondly, informational feedback about competence. Deci and Ryan (1982) make the point that this can mean allowing children to fail rather than forcing them to succeed. Children coerced in this way may fail intentionally as a way of regaining their freedom, or they may achieve a compliant success for which they

cannot take full responsibility. But children who have chosen to succeed are fully committed to the tasks they have set themselves.

Deci and Ryan acknowledge that many difficulties face teachers who wish to operate in this manner, for example, the demands of the school system, the size and ability range of classes, the home backgrounds of the pupils and the increasingly controlling environment in which teachers themselves have to function. They consider that the effort is nevertheless worthwhile in view of the number of children who do not seem to benefit greatly from education by more traditional methods.

7.3 Research findings in educational settings.

There has been little research into factors which influence intrinsic motivation in schools and the only available measure is the Harter (1981b) Scale of Intrinsic Versus Extrinsic Orientation in the Classroom. For a description of this questionnaire, see Chapter IV, p. 74, for the actual text (with minor amendments) see Appendix II.

Harter (1981b) reports a consistent trend in several samples for intrinsic motivation to decrease over the course of elementary (primary) education. The trend is reversed for the two informational subscales of her measure and the same result is also described by Deci and Ryan (1980). The latter do not, however, clarify whether the motivational subscales showed an appreciable difference.

In view of the very different socialization experiences of boys and girls it might well be expected that gender differences exist. A finding of such differences is referred to by Deci and Ryan (1980) who report boys as tending to be more intrinsically motivated than girls.

More attention has been paid to the question of the effect of controlling rewards in the classroom. Two field studies which investigate this are described below.

On both occasions it was reasoned that teachers whose general orientation was toward control would tend to administer classroom rewards controllingly, while teachers whose general orientation was toward autonomy would tend to reward informationally. Cognitive evaluation theory would predict, therefore, that the pupils of the former teachers would become less intrinsically motivated and that the pupils of the latter teachers would become increasingly intrinsically motivated. Teachers' orientations were assessed by a questionnaire developed by Deci, Schwartz, Sheinman and Ryan (1981). For a description of this questionnaire, see Chapter IV, p. 72, for the actual text (with minor amendments) see Appendix I. Pupils' intrinsic motivation was measured by Harter's (1981b) scale.

In the first study, Deci, Nezlek and Sheinman (1981) administered the 5 subscales of the Harter measure to pupils in 35 primary school classrooms (4th, 5th and 6th grade - Standards 2, 3 and 4) on two occasions, separated by 7 months. An average score for each classroom was calculated, as was an average change score for each classroom. The 35 teachers concerned completed

the Deci et al questionnaire (on which a high score indicates an orientation toward autonomy) and the nature of the teachers' orientations was confirmed by a significant positive correlation (,35) between teachers' scores and the children's perceptions of the classroom climate as supportive of intrinsically oriented behaviour.

It was found that the teacher measure correlated significantly with the children's perceived competence scores (on the Perceived Competence Scale for Children (Harter, in press)) and with the pupils' intrinsic motivation scores on the three motivational subscales of the Harter measure. Teachers who scored high on the autonomy versus control measure tended to have classrooms where the average intrinsic motivation was higher, and teachers who had low scores (indicating a controlling orientation) tended to have classrooms where the average intrinsic motivation was lower. The teacher measures did not, however, correlate with the children's change scores over the seven-month period, as had been predicted. Deci and his colleagues conclude that teacher orientation had a clear and important impact on the children's intrinsic motivation within the first six weeks of school. They reason that the relationship (which remained comparatively stable) did not become stronger as the school year progressed because the children made an early adaptation to the teacher's orientation which did not change while the situation remained constant. They speculate that the ambience of the school (in this case, traditional, middle-class, suburban) has more impact as the school year progresses, limiting the impact of individual teachers.

The second study also supports the theory, although Deci, Schwartz, Sheinman and Ryan (1981) were primarily concerned with establishing the reliability and validity of their questionnaire to assess teachers' control/autonomy orientations. Only the relevant aspects of this study will be described here. These researchers selected six teachers who had completed the questionnaire (but whose pupils had not taken part in the first study), three scoring above the mean and three scoring below the mean. The three motivational subscales and two of the perceived competence subscales from the Harter measures were administered to their pupils on the second day of school and again seven weeks later. The children's change scores between the two administrations were weighted with the teachers' z-scores. The weights were assigned because four of the six teachers' scores were close to the mean and not expected to have as much impact as the two more extreme scores (z-scores of -1,482 and 1,375).

The data were subjected to an analysis of variance for each of the five subscales. The change score on the perceived cognitive competence subscale was highly significant in the predicted direction. No significant changes in intrinsic motivation were observed. But a t-test of the difference between the change scores of the classrooms of the two extreme teachers showed significant differences in intrinsic motivation in the predicted direction for two out of the three subscales (preference for challenge : $p = ,10$ and independent mastery : $p = ,01$).

Both studies thus indicated that intrinsic motivation is affected by teacher orientation, with the suggestion that this effect is more apparent when teacher orientations are extreme.

8. Conclusion

The conceptualization of intrinsic motivation as an innate need to perceive oneself as both competent and self-determining is pleasing at the level of metatheory, plausible as a theory, and supported by a considerable amount of empirical evidence. Cognitive evaluation theory offers an equally plausible and well supported explanation of how intrinsic motivation operates and accounts satisfactorily for the effects of extrinsic rewards. If intrinsic motivation is accepted as desirable in school pupils, it is important to ascertain the factors which influence it so that practices conducive to its enhancement can be encouraged.

CHAPTER IV

AIM, HYPOTHESES AND METHOD

1. Introduction

The nature of intrinsic motivation and its role in the school situation have been discussed in the previous chapter. This chapter outlines the specific aim and hypotheses of the present study, and describes the measures, subjects and procedures involved in each of its three parts, namely, the pilot study, the teacher orientation measure and the main study.

2. Aim and Hypotheses

The aim of the study was to measure and compare the intrinsic motivation toward schoolwork of male and female primary school pupils at three developmental levels (school standards 1, 3 and 5: approximate ages 8 years, 10 years and 12 years) and under the two contrasting teacher conditions of an orientation toward control and an orientation toward autonomy. (A preliminary study used a questionnaire measure (see p. 72) to assign teachers to one or other of these categories).

The first hypothesis was that gender differences would be apparent, owing to the obvious differential socialization of girls and boys.

Secondly, it was predicted, in the light of the findings of Harter (1981b), that intrinsic motivation toward schoolwork would be found to be highest at Standard 1 level (the third year of formal schooling) and to decline steadily over the primary school years.

The third hypothesis was based on the assumption by Deci and Ryan (1980) (see Chapter III, p.63) that teachers whose general orientation is toward control tend to administer classroom rewards controllingly, while teachers whose general orientation is toward autonomy tend to give such rewards informationally. Cognitive evaluation theory would thus predict that, after a period of exposure to teachers, the pupils of the former would be less intrinsically motivated than the pupils of the latter. The support already found for this notion by Deci, Nezlek and Sheinman (1981) and Deci, Schwartz, Scheinman and Ryan (1981) has been described in Chapter III, (pp.66-69).

These studies report that a comparatively stable adjustment to teacher orientation develops early in the school year. It was, therefore, considered meaningful to compare directly the intrinsic motivation of pupils who had been exposed to different teacher orientations for almost a whole term. It was predicted that this difference would be most apparent in those pupils who spent a large proportion of the school week in the care of the same class teacher and least apparent in those pupils whose class teacher taught them for only a fraction of the total school week, as is the case in the higher primary standards of many South African schools.

3. Method

3.1 Measuring instruments

3.1.1 The 'Problems in Schools' questionnaire

The questionnaire was developed by Deci, Schwartz, Sheinman and Ryan (1981) in order to assess adults' orientations toward control versus autonomy with children. A high score represents an orientation toward autonomy, while a low, or a negative, score indicates an orientation toward control.

The measure consists of eight examples of common problem situations in school. Each example is followed by four possible response options which are scored as 'highly controlling', 'moderately controlling', 'moderately autonomous' and 'highly autonomous'. These response options are presented in varying order across the eight examples. Subjects are asked to consider a problem and then rate each of the four options for appropriateness, given their own personal style. The rating is on a 1-7 scale, with 7 representing maximum appropriateness.

The ratings yield a subscale score for each of the four types of response option. Each subscale score is then averaged to give a score with a range of 1-7. A total score is calculated by weighting the 'highly controlling' subscale with -2, the 'moderately controlling' subscale with -1, the 'moderately autonomous' subscale with +1 and the 'highly autonomous' subscale with +2, and then summing the weighted values.

Thus the total scale score can range from -18 to +18, with a greater positive score indicating a stronger orientation toward autonomy.

Summary statistics were computed on an administration of the scale to 68 teachers in six North American schools. The effective range of the data was found to be between 2,13 and 12,13 (although there was one extreme score of -10,13) and the scores within the effective range were normally distributed with a mean of 6,98 and a standard deviation of 3,11.

The scale appears to have good internal consistency, split half reliabilities for each of the four subscales yielding Cronbach's alpha values of ,73; ,71; ,63 and ,80. In addition, when each of the eight items of each of the four subscales was correlated with its subscale total none of these correlations was found to be below ,40, and items related strongly to their own subscale totals and not to subscale totals to which they did not belong.

The reliability co-efficient of the total scale has been found to be ,70, with subscale reliabilities ranging from ,77 to ,82. Validity studies indicate that there are significant correlations between teachers' scores on the questionnaire and children's scores on the classroom climate measure developed by de Charms (1976) (r = ,35) and between teachers' scores and pupils' scores on the three motivation subscales of the Harter (1981b) scale (r values between ,27 and ,56). In addition, the teacher scale correlates significantly with the general self-worth and cognitive competence subscales of the Perceived Competence Scal

(Harter, in press) with r values between ,29 and ,43.

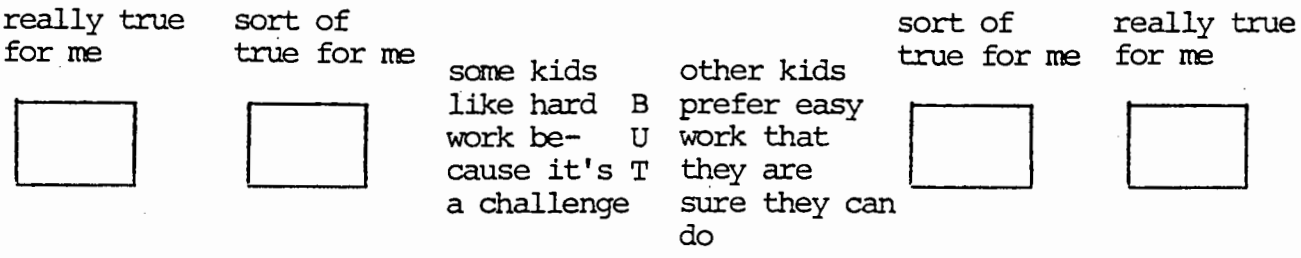
The format of the questionnaire is non-threatening and the situations to be assessed represent recognizable problems for South African teachers. It was decided, therefore, that it could usefully be used to measure teacher orientations toward control versus autonomy. For use in South African schools the wording of the original questionnaire was changed in minor ways, e.g. "marks" replaces "grades", "souvenir coin" replaces "silver dollar paperweight" and certain of the children's names were changed to those considered more common in a South African environment. A copy of the amended questionnaire is attached as Appendix I.

3.1.2 The 'Classroom Questionnaire'

The scale was developed by Harter (1981b) as a self-report measure of intrinsic versus extrinsic orientation in the classroom. The original scale consists of five subscales representing five dimensions of classroom learning, each of which can be characterized as having both an intrinsic and an extrinsic pole. This study made use of a questionnaire consisting of only the three motivation subscales of the Harter scale. These are characterized as follows:

	Intrinsic pole		Extrinsic pole
Subscale A	Preference for challenge	v	Preference for easy work assigned
Subscale B	Curiosity/ interest	v	Pleasing the teacher/ getting good marks
Subscale C	Independent mastery	v	Dependence on the teacher

Each subscale is made up of 6 items presented in a structured alternative format, viz.:



Completion of the questionnaire involves marking only one block for each item. The final questionnaire used in this study consisted thus of 18 such items ordered so that no two successive items represented the same subscale.

The scoring of the items is on an ordinal scale from 1 to 4 with a score of 1 indicating maximum extrinsic motivation and a score of 4 indicating maximum intrinsic motivation. The scoring order of the response options is varied between items, the possibilities being 4,3,2,1 or 1,2,3,4. The questionnaire yields a subscale score on each of three separate motivation dimensions and each score is averaged to produce subscale scores with a range of 1-4. Since these scores represent different aspects of classroom motivation it is not considered meaningful to combine them (Harter, 1981b).

Scale construction studies involved over 3 000 pupils (3rd to 6th grades) in four North American states. In each sample the socio-economic level ranged from lower to upper middle class, and there were approximately the same number of children at each grade level and about the same number of males and females within each grade.

Subscale reliabilities were assessed by means of the KR 20 formula and reliability coefficients for the three motivation subscales ranged from ,78 to ,84; from ,68 to ,82; and from ,54 to ,78. Test-retest reliability data were collected after a 9-12 month period and yielded values ranging from ,48 to ,63 across the various subscales.

Much attention has been given to the factorial validity of the scale. After a pilot study, a revised scale was devised which adjusted the five subscales to represent the various dimensions of classroom motivation in line with the factor structure which had emerged. Factor analyses were then performed on two samples (n = 761; n = 793). Both orthogonal and oblique solutions revealed the same basic factor structure. Five factors emerged, with items loading on their designated factors and with virtually no cross-loadings.

The discriminant validity of the scale is supported by the fact that mean scores of pupils at a private 'open' school (which emphasized the educational principles captured by the intrinsic pole of the subscales) were found to be significantly higher than the mean scores of a group matched for age and sex at a 'traditional' state school. In addition, a parallel teacher rating scale with the same format as the motivation questionnaire was constructed and pupils were individually rated by their classroom teachers. Correlations between teacher ratings and pupil scores were ,73 for Subscale A (challenge); ,67 for Subscale B (curiosity) and ,61 for Subscale C (mastery). The results of the pilot study (see Chapter V, pp.90-94). indicated that the measure was not inappropriate for use with

South African pupils. As with the 'Problems in Schools' questionnaire, minor changes in the wording were considered necessary, e.g. "children" instead of "kids" and "marks" instead of "grades". The amended version of the scale which was used in the present study is attached as Appendix II.

3.1.3 The behavioural measure

In view of the well known problems associated with self-report measures, it was felt that the classroom questionnaire should be supplemented by some more direct behavioural measure of intrinsic motivation to perform schoolwork tasks. For this purpose, the 'Activity Book' was devised. It was designed to be presented to pupils as 'something to keep them busy' while they waited for the 'real' questionnaire, which, the investigator claimed, had been forgotten but was on its way. This measure was compiled specifically for the present study, as an exploratory device, and consequently has no reliability or validity data associated with it.

The 'Activity Book' is a 12-page booklet, the first six pages of which offer paper and pencil activities of a type usually enjoyed by 8-year olds, e.g. colouring, 'join the dots', drawing patterns and pictures. Then follow three pages of arithmetic tasks requiring the writing in of a one or two digit answer or a word. The final three pages present language tasks including the writing of one word phonics answers, the selection of correct comprehension answers from a multiple choice and the composition of a story in response to a picture. The school work tasks were devised in collaboration with the class

teachers of the pupils with whom the measure was to be used. This, it was hoped, would ensure that the tasks would be of the exact level of difficulty appropriate for the 'average' or 'middle' group in the class concerned. The booklet was thus not identical for each class with which it was used.

The booklet is scored by allocating 1 for each simple sum or word task attempted, 3 for each maths problem answered, 5 for each comprehension answer and 3 for each line of story written. This makes a possible total of 70 for maths, and approximately 70 for language (assuming an 8-line story). Clearly, no attempt need be made to assess whether or not an answer is correct. The booklet is designed so that it is possible for a child to engage in one specific type of school-work for the full period that it is in his possession (15 minutes). Thus scores approaching the maximum are not to be expected. The 'Activity Book' is attached as Appendix III.

3.2 Pilot study

This was undertaken toward the end of the school year at a state primary school and at a private school in Cape Town. Its primary aim was to discover whether the motivation measure designed for use with United States school children was appropriate and valid in a South African setting. It also provided valuable experience in administering the scale.

The 'Classroom Questionnaire' was administered to 121 pupils in Standards 1-5 at the state school and to 20 pupils in Standard 5 at the private school. The class teacher left the

room and the investigator told the pupils that she was interested in finding out 'how different children felt about their school work'. It was made clear that no-one at the school would see the completed questionnaires and that there were no right or wrong answers. Pupils were shown how to fill in the questionnaire and then the investigator read aloud each item slowly, after which the pupils marked the appropriate block.

Each teacher was asked to provide a 'motivation assessment' on a 1-4 scale for every child in her class. Teachers were given the guidelines, 'likes challenge'; 'shows curiosity'; and 'prefers to work independently' to bear in mind during their assessment.

The pupils' motivation subscale scores were calculated and for each class the scores for each subscale were correlated with the scores allocated by their teachers. Class means were calculated in order to be able to compare them with those established by Harter (1980a) for similar age groups. The means of the Standard 5 pupils at the state and the private school were compared since it was considered that a significantly higher motivation score at the private school (reputedly 'freer' than state schools) would support the validity of the scale. All results obtained are presented in Chapter V (pp.90-94).

3.3 Teacher orientation measure

The subjects in the teacher study were 71 teachers at eight state primary schools in the Cape Peninsula whose pupils were judged to be of comparable socio-economic status. Permission

to approach the staff was requested from school principals and, in the cases where this was granted, the teachers as a group were asked to co-operate in a survey of teacher styles of handling problems. Selection of teachers depended thus to a certain extent on the goodwill of school principals and on the willingness of individual teachers to take part.

Teachers were assured that their participation was voluntary and that no persons or schools would be mentioned by name when the study was written up. They were also told that feedback, in the form of the general results of the study, would be provided to the school in due course. Teachers took home the 'Problems in Schools' questionnaires and then returned them to the school from where they were collected. Teachers were also asked to indicate the total number of hours in the school week and the total number of hours that they spent with their own classes. This proved to be an average of 87%, 72% and 30% of the school week for Standard 1, 3, and 5 teachers respectively.

Although the desired design only included teachers of Standard 1, Standard 3 and Standard 5 pupils, it was considered advisable to ask all teachers to complete the questionnaire, in case it became necessary to adjust the design because a sufficient number of teachers for each cell was not obtained. The final numbers were as follows:

Standard 1 teachers	10
Standard 2 teachers	12
Standard 3 teachers	16
Standard 4 teachers	15
Standard 5 teachers	18
Total	71

Of this total, 22 of the teachers were male and 49 were female. It would have been preferable to select only female teachers in order to control for sex of teacher. However, it was decided not to do so in view of the practical difficulties involved in obtaining the required number of teachers in each of the planned categories. Moreover, the report of Deci and Ryan (1980) that "... there is little evidence of meaningful difference between male and female teachers in terms of their impact on the intrinsic motivation. ... of children ..." (p.75) suggests that control of this variable may not be vitally important.

Of the eight schools involved in the study, six were co-educational and the other two were a single sex girls' school and a single sex boys' school. Teachers from co-educational schools made up 47 of those who completed the questionnaire, while the remaining 24 were 13 teachers of boys and 11 teachers of girls. The fact of including the two single sex schools is a weakness of the study which will be discussed in Chapter VI, (pp.131-132).

The results of the teacher study are presented in detail in Chapter V (pp.94-96). Teachers who scored more than half a standard deviation above or below the mean were identified, and their pupils in certain classes were the subjects of the main study.

3.4 Main study

The main study attempted to assess pupils' intrinsic motivation in three different ways. These were: a self-report questionnaire completed by the pupils themselves, a behavioural measure under controlled circumstances and a semi-structured interview with the parents of the pupils concerned. For reasons of practical economy, the latter two procedures were carried out with only a comparatively small subsample of the total sample of pupils who completed the questionnaire.

3.4.1 Self-report measure: 'Classroom Questionnaire'

Composition of the sample: The subjects who completed the 'Classroom Questionnaire' were the pupils of the three most autonomy-oriented, and the three most control-oriented, teachers (as identified by z-scores on the 'Problems in Schools' questionnaire) at each of three levels - Standard 1, Standard 3, and Standard 5. Thus a total of 18 classes was involved in the following design, with an average of 38 pupils in each cell (N = 459)

Table 1

Research Design for Main Study

	Standard 1		Standard 3		Standard 5	
	m	f	m	f	m	f
Control oriented teachers						
Autonomy oriented teachers						

As has already been mentioned (p.81), of the original eight schools which took part in the study, six had pupils of both sexes, while the remaining two were a single sex boys' school and a single sex girls' school. Thus in order for there to be a reasonable balance between male and female subjects in a specific cell, either it had to consist of three mixed sex classes, or of two single sex classes (one of boys and one of girls) and a mixed sex class.

This presented no difficulty at Standard 5 level or at Standard 3 level. At Standard 1 level, however, a problem arose with the autonomy-oriented cell. Of the 10 Standard 1 teachers who completed the questionnaire, only four had positive z-scores, which were as follows: 2,13; 0,71; 0,47 and 0,31. The two largest z-scores both came from the same single sex school, while the score of 0,31 came from the single sex school of the opposite sex.

Since gender was one of the variables in the study it was considered undesirable to have a large disproportion between the sexes in any one cell. The classes selected were, therefore, those of the teachers whose z-scores were 2,13, 0,47, and 0,31. Thus, unfortunately, two of the teachers involved were only mildly autonomy-oriented and not likely to have a powerful effect on their pupils.

Administration of the questionnaire: On the second visit to the six schools involved the principals and teachers concerned were told that these teachers had been identified as having a consistent style (not specified) of classroom interaction and that, since it was considered possible that such styles might have an effect on classroom motivation, it would be appreciated if they would agree to allow their pupils to complete the motivation questionnaire.

The questionnaire was administered during normal school hours. The class teacher left the room and the investigator explained that she wished to find out which pupil attitudes were most common and discover possible differences, e.g. between different schools or between age groups. Pupils were assured that there were no right or wrong answers and that their answers would not be shown to any school authority (a matter of some concern to them). The method of completing the questionnaire was demonstrated on the blackboard, after which pupils attempted the sample questions. When it had been established that everyone understood, the investigator read out each item slowly, and

allowed time for pupils to reflect (if necessary) before marking their response. That the administration was technically successful is indicated by the fact that out of 468 questionnaires only nine (five of which were in the same Standard 1 class) had to be discarded as incorrectly completed.

The questionnaires were scored, and a mean score and standard deviation for each of the three subscales were calculated for each cell of the design.

Statistical procedure: The original intention was to subject the data to a 3-way Analysis of Variance test. It was discovered, however, that in the case of each subscale, the scores did not meet the conditions under which an Anova is the appropriate statistical technique. Firstly, the scores were not normally distributed, but negatively skewed (see Appendix IV). Attempts to normalize the distribution by performing transformations did not have the desired effect. Secondly, it was questioned whether the data were based on genuinely interval measurement. Although the Anova is known to be a comparatively robust test, it was considered unwise to disregard the violation of two of its assumptions.

It was ascertained that the most appropriate statistical procedure to assess the inter-relationships between the variables would be to fit log-linear models to the multi-dimensional contingency tables of frequencies (Bishop, Fienberg and Holland, 1975).

Scores were classified as follows: the 19 possible scores on the questionnaire, ranging from 1,0 to 4,0, were assigned to four categories, namely :

Code 1 scores of 1,00; 1,17; 1,33 and 1,50.
Code 2 scores of 1,67; 1,83; 2,00; 2,17; 2,33 and 2,50.
Code 3 scores of 2,67; 2,83; 3,00; 3,17; 3,33 and 3,50.
Code 4 scores of 3,67; 3,83 and 4,00.

Fewer scores were included in Codes 1 and 4 because it was considered desirable to isolate the extreme scores where differences might be most clearly observable. When the frequencies were calculated it became apparent that it was necessary to collapse Codes 1 and 2 into one category (low scores) while leaving Code 3 as middle range scores and Code 4 as high scores. Even so, Category 3 accounted for approximately 50% of the scores for each subscale. Possible reasons for this are discussed in Chapter VI (pp.128-129).

Contingency tables were set up and log linear models fitted to each using the BMDP P4f computer program. Tests of marginal (Brown, 1976) and partial (Birch, 1972) association were conducted to assess the importance of each interaction in the multi-dimensional contingency table. On the basis of these, certain log-linear models were fitted to the data and their goodness of fit assessed by means of the likelihood ratio Chi-square statistic (Kotze, 1982).

3.4.2 Behavioural measure: 'Activity Book'

The subjects in this part of the study were the 25 pupils of the most extremely control-oriented teacher and the 21 pupils of the most extremely autonomy-oriented teacher at Standard 1 level. Since these pupils spend nearly the whole

school week with the same teachers it was reasoned that any effect of teacher orientation would be most in evidence at this level. In addition, schoolwork in Standard 1 does not range over such a wide variety of separate subjects as it does at higher levels of primary school. These considerations also facilitated the practical application of the measure at this level, as did the relative naivity of the pupils.

A third visit was paid to the schools of the two teachers concerned and permission was obtained to 'check' the results of the questionnaire with another measure. The teacher was in each case asked to co-operate in planning the 'Activity Book' so that the schoolwork would be appropriately challenging for her pupils.

The measure was used as follows. Once the teacher had left the room the investigator explained to the pupils that she had accidentally left the new questionnaires at home, but that they were being brought to the school. As if on impulse, she offered the pupils the 'Activity Book' to occupy them until the questionnaires arrived. The contents of the booklet were demonstrated and it was mentioned casually that the schoolwork of course would not be marked. The booklets were handed out and the investigator again indicated that the children should 'just choose something to keep themselves busy'. She then moved restlessly around the room, consulting her watch frequently. After 15 minutes it was announced that, since the questionnaires had not arrived, the project would have to be abandoned, as there would not be time to complete them. The pupils asked (as expected) if they could keep the booklets. They were

told that the investigator needed them as the unused pages would probably be required for other children. It was added that they should mark their names on the booklets in case it was found possible after all to return them.

The one class of 8-year olds was debriefed as soon as the booklets had been collected. Since this resulted in a certain amount of confusion and some anxiety the debriefing procedure was not carried out with the other class.

The booklets were scored, and means and standard deviations calculated for each class. The correlations between the pupils' scores on the 'Activity Book' and their scores on each of the three subscales of the 'Classroom Questionnaire' were also calculated.

3.4.3 Parent interviews

The two teachers whose classes had been given the 'Activity Book' were asked to provide the names of parents who would be likely to agree to being interviewed. These parents were to be, if possible, those of children in the middle range of abilities. It was reasoned that these pupils ought to be the most intrinsically motivated in any class since motivation would not be reduced by negative feedback (work too difficult) or lack of challenge (work too easy). Each teacher supplied six names, and 11 parents agreed to the interview. Fathers were usually at work so that the parent involved was generally the mother. This was not considered a great disadvantage, as the mothers were judged to spend more time with their 8-year olds and to be more aware of their general attitudes.

Parents were spoken to in their homes. Their children knew about the visit but were not present at the interview. It was explained that research was being conducted into motivation in school and that the pupils had already completed a questionnaire. Parents were asked to complete the same questionnaire, answering as they believed to be true about their children.

This introductory phase was followed by informal discussion in which the parent was invited to say how she thought her child felt about school and schoolwork. The following questions were also introduced into the conversation. What does your child like to do in his spare time? Does he enjoy reading, and if so, what kind of book? Has he ever asked at home for additional information about something presented at school? The entire interview lasted between 20 and 30 minutes.

The scores on the 'Classroom Questionnaire' given to children by their parents were calculated for each subscale, and correlated with the children's own scores.

4. Conclusion

It was hoped that the three different approaches to the assessment of pupils' intrinsic motivation would complement each other and provide insight into the operation of some of the factors which influence it. The actual results obtained are presented in Chapter V, and discussion of both method and results is to be found in Chapter VI.

CHAPTER V

RESULTS AND ANALYSIS

1. Introduction

The results of the pilot study are given first, followed by the results of the teacher orientation measure. The main study findings are then presented separately for each of the three subscales of the 'Classroom Questionnaire', after which the results of the behavioural measure (the 'Activity Book') and the parent interviews are given.

2. Pilot Study

The pilot study was conducted in order to establish the validity of the 'Classroom Questionnaire' in a South African setting and to gain experience in administering the measure. The results obtained in the pilot study administration of the 'Classroom Questionnaire' are presented in Table 2. Table 3 gives, for comparison, the results obtained by Harter (1980a) using the same measure on equivalent aged subjects.

Table 2

Means and standard deviations of pupil scores on each subscale of the 'Classroom Questionnaire', arranged by school class

School class	Subscale A		Subscale B		Subscale C	
	mean	s.d.	mean	s.d.	mean	s.d.
std.1	3,56	,53	3,02	,70	3,44	,52
std.2	2,81	,64	2,89	,54	2,93	,60
std.3	2,97	,80	2,95	,58	2,87	,81
std.4	2,76	,68	2,80	,55	2,97	,59
std.5	3.02	,59	3,18	,65	3,06	,55
* std.5	3,06	,57	3,17	,64	2,87	,62

*This class was at a private school. All others were at the same state school.

Table 3

Means and standard deviations obtained by Harter (1980a) using the 'Classroom Questionnaire' on 3rd to 7th grade subjects

Grade	Subscale A		Subscale B		Subscale C	
	mean	s.d.	mean	s.d.	mean	s.d.
3rd	3,17	,63	3,01	,77	2,96	,62
4th	2,96	,66	2,74	,77	2,90	,65
5th	2,87	,71	2,56	,83	2,75	,65
6th	2,83	,65	2,37	,79	2,80	,63
7th	2,54	,63	2,18	,64	2,63	,60

The means and standard deviations of the Cape Town sample were on the whole fairly close to those obtained by Harter (1980a). Where mean differences of any magnitude occurred, the Cape Town scores were usually higher. There was a similar tendency for

scores to become lower from Standard 1 to Standard 4. This was not, however, observable at Standard 5 level, where Cape Town scores on all three subscales reversed the trend and were noticeably higher than those obtained by Harter. The one exception was the subscale C mean for Standard 5 pupils at the private school, which was lower than the Standard 4 mean, although higher than that obtained by Harter.

Table 4 gives the means and standard deviations of pupils scores assessed by their own class teachers on a 1-4 intrinsic motivation scale. The correlation coefficients of these teacher assessment scores and pupil scores on each of the three subscales of the 'Classroom Questionnaire' are to be found in Table 5.

Table 4

Means and standard deviations of pupil motivation scores, assessed by class teachers, arranged by school class

School class	Teacher assessment	
	Mean	s.d.
std.1	2,35	,93
std.2	2,57	1,08
std.3	2,27	1,08
std.4	2,50	1,07
std.5	2,59	,91
* std.5	2,25	1,16

* (private school)

Table 5

Correlation coefficients of pupil scores as assessed by teachers and scores on each subscale of the 'Classroom Questionnaire'

School class	Subscale A	Subscale B	Subscale C
std.1	,37	,13	,46 *
std.2	,18	,37	,04
std.3	,43 *	,15	,01
std.4	,23	,07	,14
std.5	,34	,34	,24
std.5	,47 *	,43 *	,60 **

** $p < ,01$

* $p < ,05$

Teacher assessments on the global measure were consistently lower than pupils' assessments of themselves and teacher ratings showed greater variance. No developmental trend was apparent. The teacher assessments did show moderate positive correlations with the scores for at least one subscale of the 'Classroom Questionnaire' for each class and these correlations either reached, or just failed to reach, significance.

Adequate measures of intrinsic motivation are difficult to devise. The questionnaire as a measuring instrument has well-known problems associated with it. It was, nevertheless, decided, in view of the pilot study findings, that the 'Classroom Questionnaire' was a reasonably appropriate measure of intrinsic motivation in school for use with Cape Town pupils. One important reason for this decision was that the alternative would have been the development of a completely new measure. It was,

however, considered advisable to include in the final study two other tentative attempts to assess intrinsic motivation.

3. Teacher Orientation Measure

The purpose of the teacher orientation measure was to assess teachers' orientation toward control (indicating a tendency to administer classroom rewards controllingly) or autonomy (indicating a tendency to administer classroom rewards informationally) so that the pupils in the main study could be selected as having teachers who were strongly oriented in one or other direction. A total of 71 teachers from eight schools completed the 'Problems in Schools' questionnaire. The maximum number of teachers from any one school was 13, and the minimum number was four. There were at least 10 teachers from each school class from Standard 1 to Standard 5. The scores were normally distributed with a mean of 5,26 and a standard deviation of 3,16.

A cut-off point of half a standard deviation above or below the mean was selected. Teachers with positive z-scores of ,50 and greater were classified as autonomy-oriented and teachers with negative z-scores of -,50 and greater were classified as control-oriented. The number of teachers of each school class for each of these categories is shown in Table 6.

Table 6

Number of teachers of each school class with positive or negative z-scores greater than ,50

School class	Positive z-scores	Negative z-scores
std.1	2	3
std.2	5	3
std.3	4	6
std.4	5	6
std.5	5	5
total	21	23

Although all teachers were requested to complete the questionnaire so that a sufficient response would be ensured, the preferred design only involved pupils in Standards 1, 3 and 5 (see Chapter IV, p.82). The teacher orientation measure results facilitated this design except in the case of Standard 1 teachers with positive z-scores. For this category it was necessary to include the classes of two teachers whose z-scores were below the desired cut-off point in order to complete the cell and maintain a reasonable balance between boys and girls (see Chapter IV, p.83-84). The z-scores of the teachers whose classes were selected to take part in the pupil study are given in Table 7.

Table 7

Z-scores of teachers of Standards 1, 3 and 5 whose classes took part in the pupil study

School class	Positive z-scores	Negative z-scores
std.1	2,13	-1,11
	0,47	-0,88
	0,31	-0,84
std.3	1,85	-1,78
	1,07	-1,23
	0,66	-1,23
std.5	1,46	-1,83
	1,30	-1,59
	1,26	-1,30
Mean	1,17	-1,31

4. Main Study: Pupil Motivation Measures

4.1 'Classroom Questionnaire'

The results of the three motivation subscales which make up the questionnaire will be presented separately since these subscales are not designed to be combined into a single measure (Harter, 1981b). As indicated in Chapter IV (p.74), Subscale A assesses preference for challenge, Subscale B assesses curiosity and interest, and Subscale C assesses preference for independent mastery, as opposed to their respective opposites. To avoid confusion with the letters used to identify the variables in the statistical analysis, Subscale A will be referred to as the 'Challenge' subscale, Subscale B as the 'Curiosity' subscale, and Subscale C as the 'Independence' subscale.

For each subscale, the mean scores for each cell of the design will be presented first in order to indicate the general nature of the results. This will be followed, firstly, by the multi-dimensional contingency table of frequencies; secondly, by the results of tests for marginal and partial association which were conducted to assess the importance of each interaction in the table; and thirdly, by the model which was fitted to the data. Finally, the interactions identified as significant by the model will be interpreted in terms of the research hypotheses.

4.1.1 'Challenge' subscale

Table 8

'Challenge subscale' : mean scores of pupils

	School Class					
	std.1		std.3		std.5	
	m	f	m	f	m	f
Control-oriented teachers	3,17	3,16	2,95	2,90	2,89	2,79
Autonomy-oriented teachers	3,45	3,31	2,84	3,35	2,48	2,95

Table 9

Challenge subscale: 4-way contingency table of frequencies

* Score category		Teacher Orientation	Gender	School Class std.1	std.3	std.5	
1		C	M	0	1	3	
			F	0	2	2	
		A	M	0	3	3	
			F	1	0	5	
2	low scores	C	M	10	14	10	
			F	8	14	10	
		A	M	2	9	16	
			F	5	5	6	
3	middle range scores	C	M	21	14	20	
			F	17	26	18	
		A	M	15	18	16	
			F	20	15	12	
4	high scores	C	M	10	10	9	
			F	11	6	5	
		A	M	12	6	2	
			F	17	18	12	
	Total			149	161	149	459

* Score categories : 1 : scores of 1,0 to 1,5
2 : scores of 1,67 to 2,5
3 : scores of 2,67 to 3,5
4 : scores of 3,67 to 4,0

(for explanation of categories, see Chapter IV, p. 86).

Table 10

'Challenge' subscale: tests for partial and marginal association

	Effect	DF	Partial association Chi-square	Prob.	Marginal association Chi-square	Prob.
*	D	2	0,62	0,7327		
**	X	1	0,26	0,6075		
***	T	1	1,15	0,2829		
****	C	2	32,96	0,0000		
	DX	2	1,04	0,5939	1,58	0,4548
	DT	2	0,38	0,8265	0,23	0,8902
	DC	4	17,18	0,0018	17,63	0,0015
	XT	1	0,40	0,5278	0,67	0,4121
	XC	2	3,66	0,1606	4,53	0,1038
	TC	2	5,53	0,0630	5,72	0,0572
	DXT	2	2,12	0,3462	2,20	0,3326
	DXC	4	2,57	0,6324	1,88	0,7569
	DTC	4	7,00	0,1362	6,54	0,1624
	XTC	2	8,80	0,0123	9,62	0,0081
	DXTC	4	10,80	0,0289		

* D : school class
** X : gender
*** T : teacher orientation
**** C : score

On the basis of the above results (Table 10) several models were fitted to the data and their goodness-of-fit assessed by means of the likelihood ratio chi-square statistic. For the above table, the model XTC,DC yielded a good fit (χ^2 = 22,65; d.f. = 18; p = 0,2042). The non-significant p-value indicates that the model provides a good fit to the data.

Interpretation of the model

The model which most closely fitted the data was found to be XTC,DC. This indicates that there is a significant 3-way interaction between gender, teacher orientation and scores, and a significant 2-way interaction between school class (standard) and scores.

Table 11

'Challenge' subscale : frequencies according to gender, teacher orientation and score category (XTC interaction)

Score category	Teacher orientation	Gender M	F	Total
Codes 1 & 2	C	38	36	74
	A	33	22	55
	Total	71	58	129
Code 3	C	55	61	116
	A	49	47	96
	Total	104	108	212
Code 4	C	29	22	51
	A	20	47	67
	Total	49	69	118

Examination of Table 11 reveals that there was an overall tendency for girls to be more highly represented than boys among high scorers (59%), and less highly represented than boys among low scorers (45%). Among pupils whose scores were in the middle category the sexes were more or less equally represented.

The difference between boys and girls was, however, much more noticeable in the pupils of autonomy-oriented teachers. Of these, boys accounted for 60% of the low scores and 30% of the

high scores, while girls made up 40% of the low scores and 70% of the high scores. Among pupils of control-oriented teachers, all scores were more or less equally distributed between boys and girls.

In the middle range score category boys were more or less equally divided between the two teacher orientations. Among high and low scoring boys there was a slight tendency for pupils of control-oriented teachers to predominate. Among girls there were clear differences. Only 38% of the low scoring girls were pupils of autonomy-oriented teachers, while 68% of the high scoring girls were pupils of autonomy oriented teachers.

Table 12

'Challenge' subscale': frequencies according to school class (standard) and score category (DC interaction)

Score category	Standard 1	3	5	Total
Codes 1 and 2	26	48	55	129
Code 3	73	73	66	212
Code 4	50	40	28	118
Total	149	161	149	459

It can be observed from Table 12 that there was a tendency for low scores to become more frequent and for high scores to become less frequent over the developmental period. Of all Standard 1 pupils, 17% had low scores and 34% had high scores; of all Standard 3 pupils, 30% had low scores and 25% had high scores; of all Standard 5 pupils, 37% had low scores and 19% had high scores.

* See p. 33 for

4.1.2 'Curiosity' subscale

Table 13

'Curiosity' subscale: mean scores of pupils

	School class					
	std.1		std.3		std.5	
	m	f	m	f	m	f
Control-oriented teachers	2,81	3,00	3,02	3,05	2,92	3,01
Autonomy-oriented teachers	3,01	3,10	3,01	3,28	2,78	3,08

Table 14

'Curiosity' subscale: 4-way contingency table of frequencies

* Score category		Teacher Orientation	Gender	School class std.1	std.3	std.5
1		C	M	2	0	1
			F	0	0	0
		A	M	0	0	1
			F	0	0	0
2	low scores	C	M	15	13	12
			F	12	8	6
		A	M	7	9	13
			F	10	5	7
3	middle range scores	C	M	18	17	20
			F	18	29	26
		A	M	18	22	18
			F	25	19	17
4	high scores	C	M	6	9	9
			F	6	11	3
		A	M	4	5	5
			F	8	14	11

* See p. 98 for scores within each category.

Table 15

'Curiosity' subscale: tests for partial and marginal association

			Partial association		Marginal association	
	Effect	DF	Chi-square	Prob.	Chi-square	Prob.
*	D	2	0,62	0,7326		
**	X	1	0,26	0,6077		
***	T	1	1,15	0,2829		
****	C	2	85,25	0,0000		
	DX	2	1,58	0,4528	1,58	0,4548
	DT	2	0,39	0,8224	0,23	0,8901
	DC	4	5,30	0,2579	5,18	0,2695
	XT	1	0,44	0,5081	0,67	0,4121
	XC	2	8,94	0,0114	9,21	0,0100
	TC	2	1,55	0,4610	1,67	0,4338
	DXT	2	2,72	0,2564	2,20	0,3326
	DXC	4	2,75	0,6003	2,07	0,7237
	DTC	4	5,04	0,2835	4,48	0,3446
	XTC	2	7,51	0,0235	6,45	0,0397
	DXTC	4	2,03	0,7311		

* D : school class
X : gender
T : teacher orientation
C : score

On the basis of the above results (Table 15) several models were fitted to the data and their goodness-of-fit assessed by means of the likelihood ratio chi-square statistic. For the above table, the model XTC,D yielded a good fit (χ^2 = 19,25; d.f. = 22; p = 0,6297). The non-significant p-value indicates that the model provides a good fit to the data.

Interpretation of the model

The model XTC,D indicates that there is a significant 3-way interaction between gender, teacher orientation and scores, and that school class does not interact significantly with any other variable.

Table 16

'Curiosity' subscale: frequencies according to gender, teacher orientation and score category (XTC interaction)

Score category	Teacher orientation	Gender m	f	total
Codes 1 and 2	C	43	26	69
	A	30	22	52
	Total	73	48	121
Code 3	C	55	73	128
	A	58	61	119
	Total	113	134	247
Code 4	C	24	20	44
	A	14	33	47
	Total	38	53	91

Table 16 shows that, as with the 'Challenge' subscale, there was a tendency for girls to predominate among the high scorers (58%) and for boys to predominate among the low scorers (60%). This difference was particularly noticeable among high scoring pupils of autonomy-oriented teachers, of whom 70% were girls.

Boys were more or less evenly divided between the two teacher orientations in the middle range score category. Boys with

control-oriented teachers, however, made up 59% of the boys with low scores, and 63% of the boys with high scores. Among girls, those with low scores tended to be pupils of control-oriented teachers, and 62% of the high scoring girls were pupils of autonomy-oriented teachers.

4.1.3 'Independence' subscale

Table 17

'Independence' subscale: mean scores of pupils

	School class					
	std.1		std.3		std.5	
	m	f	m	f	m	f
Control oriented teachers	2,97	2,89	2,89	2,93	2,93	2,86
Autonomy oriented teachers	3,05	3,08	3,32	3,24	2,78	3,05

Table 18

'Independence' subscale: 4-way contingency table of frequencies

* Score category		Teacher orientation	Gender	School class std.1	std.3	std.5
1		C	M	1	3	1
			F	0	2	2
		A	M	0	0	1
			F	2	0	0
2	low scores	C	M	11	12	11
			F	13	14	8
		A	M	7	2	14
			F	8	8	9
3	middle range scores	C	M	23	18	23
			F	17	22	19
		A	M	19	20	19
			F	22	15	19
4	high scores	C	M	6	6	7
			F	6	10	6
		A	M	3	14	3
			F	11	15	7

* See p. 98 for scores within each category

Table 19

'Independence' subscale: tests for partial and marginal association

		Partial association		Marginal association	
Effect	DF	Chi-square	Prob.	Chi-square	Prob.
* D	2	0,62	0,7327		
** X	1	0,26	0,6076		
*** T	1	1,15	0,2829		
**** C	2	68,96	0,0000		
DX	2	1,32	0,5164	1,58	0,4548
DT	2	0,61	0,7355	0,23	0,8902
DC	4	8,68	0,0695	8,62	0,0714
XT	1	0,56	0,4560	0,67	0,4121
XC	2	2,38	0,3042	2,81	0,2449
TC	2	6,55	0,0378	6,35	0,0418
DXT	2	2,21	0,3319	2,20	0,3326
DXC	4	2,38	0,6665	2,39	0,6645
DTC	4	10,18	0,0375	9,72	0,0453
XTC	2	0,66	0,7202	0,35	0,8406
DXTC	4	6,06	0,1948		

* D : school class
** X : gender
*** T : teacher orientation
**** C : score

On the basis of the above results (Table 19) several models were fitted to data and their goodness-of-fit assessed by means of the likelihood ratio chi-square statistic. For the above table, the model DTC,X yielded a good fit (χ^2 = 16,14; d.f. = 17; p = 0,5137). The non-significant p-value indicates that the model provides a good fit to the data.

Interpretation of the model

The model DTC,X indicates that there is a significant 3-way interaction between school class (Standard), teacher orientation and scores, and that gender is an independent variable.

Table 20

'Independence' subscale: frequencies according to school class (Standard), teacher orientation and score category (DTC interaction)

Score category	Teacher orientation	School class std.1	std.3	std.5	total
Codes 1 and 2	C	25	31	22	78
	A	17	10	24	51
	Total	42	41	46	129
Code 3	C	40	40	42	122
	A	41	35	38	114
	Total	81	75	80	236
Code 4	C	12	16	13	41
	A	14	29	10	53
	Total	26	45	23	94

Table 20 shows that, at Std.1 level, 60% of the low-scoring pupils had control-oriented teachers. Among middle range and high scoring pupils, the scores were more or less equally distributed between the two t eacher orientations. At Std.3 level, however, 76% of the low scoring pupils had control-oriented teachers and only 36% of the high scoring pupils had control-oriented teachers. For Std.3 pupils with middle range scores, and for all Std.5 pupils the proportion of pupils in each category did not differ greatly between the two

teacher orientations.

Of all Standard 1 pupils, 28% had low scores and 17% had high scores. Of Standard 3 pupils, 26% had low scores and 28% had high scores. Among Standard 5 pupils, 31% had low scores and 15% had high scores. Thus there was a tendency for Standard 5 pupils to have more low scores and fewer high scores than Standard 3 pupils but the expected developmental pattern was not confirmed by the scores of Standard 1 pupils. Among them, low scores were about as frequent as among Standard 3 pupils, and the proportion of Standard 3 pupils with high scores was considerably greater than the proportion of Standard 1 pupils with high scores.

The developmental tendency for low scores to become more frequent and high scores to become less frequent between Standard 3 and Standard 5 was very much more noticeable among pupils of autonomy-oriented teachers. Among such pupils, Standard 3 pupils accounted for 20% and Standard 5 pupils for 47% of all low scores, while Standard 3 pupils were responsible for 55% and Standard 5 pupils for 19% of all high scores.

4.2 Activity Book

The results of this attempt at a behavioural measure of the intrinsic motivation of the 46 Standard 1 pupils of the two most extreme scoring teachers are presented in Table 21.
Table 22 shows the correlations between 'Activity Book' scores and scores on each of the 'Classroom Questionnaire' subscales.

Table 21

'Activity Book': means and standard deviations of pupil scores

Teacher orientation	Mean	S.D.
Control	14,88	14,54
Autonomy	24,33	22,09

$t = -1,74$; $p < ,05$

The mean score of pupils of the autonomy-oriented teacher was significantly greater than that of the pupils of the control-oriented teacher.

Table 22

Correlation coefficients of 'Activity Book' scores and motivation subscale scores

Subscale A 'Challenge'	Subscale B 'Curiosity'	Subscale C 'Independence'
,09	,13	,14

Low positive correlations in the region of ,10 were found between scores on the 'Activity Book' and scores on the three motivation subscales measured by the 'Classroom Questionnaire'.

4.3 Parent Interviews

The parents of 11 Standard 1 pupils, six of whom had an autonomy-oriented teacher and five of whom had a control-

oriented teacher, completed the 'Classroom Questionnaire' on behalf of their children. The mean scores allocated by the parents for each subscale, together with the means of the children's own scores, are presented in table 23. The correlations between parent and pupil assessments for each subscale are given in Table 24. These tables are followed by a summary of the descriptions of their children given by the parents in the interview.

Table 23

Mean scores on each motivational subscale: parents' and pupils' own assessments compared

	Subscale A 'Challenge'	Subscale B 'Curiosity'	Subscale C 'Independence'
Pupils	3,44	3,20	3,14
Parents	2,89	2,77	2,35

Parents' estimation of their children's intrinsic motivation was systematically lower than that of the children themselves, with the greatest difference being in the case of preference for independent mastery.

Table 24

Correlation coefficients of parents' assessments and children's own assessments for each motivation subscale

Subscale A 'Challenge'	Subscale B 'Curiosity'	Subscale C 'Independence'
,01	,76	,28

Parents' judgements were most in accordance with the children's perceptions of themselves in the case of the 'Curiosity' subscale and least in accordance with the pupils' own assessments in the case of the 'Challenge' subscale. Parents' ratings related only moderately closely to children's reports of their preference for independent mastery.

Children's free-choice activities were described similarly by all parents. These included outdoor games, building and construction toys, particularly Lego, practical activities such as helping to fix cars or cooking, and reading fiction. In the case of the two girls, playing school was also mentioned but further discussion revealed that the activity involved was primarily controlling others rather than performing language or number associated tasks. No parent reported her child as ever having asked for additional information about something originally presented at school and only one parent stated that her child occasionally read non-fiction. No parent volunteered any information to the effect that her child played any sort of game with words or numbers from choice, although all children were described as active, curious and busy.

Parents' comments on children's attitude to school, however, had a different tone in the two groups. Half the parents of pupils of the autonomy-oriented teacher spontaneously mentioned that their child "loved school", while this remark was never made by parents of pupils of the control-oriented teacher. These latter parents made comments such as "would not do school-work from choice", "does it because he has to", and "seems

to be bored at school". Parents of pupils of the autonomy-oriented teacher also tended to mention more often children's valuation of the extrinsic rewards school has to offer, making statements such as "likes to do well", "loves good marks" and "really likes to please".

5. Conclusion

This chapter has presented results which provide a reasonable amount of support for the three research hypotheses. There are, however, important qualifications both with regard to the results themselves and with regard to the methodology employed. These will be discussed in Chapter 6.

CHAPTER VI

DISCUSSION

1. Introduction

The findings reported in Chapter V supported each of the research hypotheses, with certain qualifications. The results are discussed in terms of the three independent variables involved, namely, gender, developmental level and teacher orientation, in that order. This is followed by comment on the distribution of the 'Classroom Questionnaire' scores and a general discussion of some of the limitations of the study. Some wider implications concerning the notion of intrinsic motivation and its relationship to education are then considered, after which an indication is given of possible directions for future research.

2. The Effect of Gender

Both the 'Challenge' and the 'Curiosity' subscale results indicated a trend for girls to report themselves as more intrinsic than boys and a tendency for girls and boys to respond differently to teacher orientation. Girls' scores are affected by teacher orientation in the way predicted by cognitive evaluation theory. Among low scoring boys, pupils of control-oriented teachers predominate as the theory would predict. Boys who describe them-

selves as high in preference for challenge and curiosity are, however, also more frequently pupils of control-oriented teachers.

The similarity in the results of these two subscales is understandable. Curious and interested behaviour is usually evidence of a general search for appropriate stimulation in terms of competence needs. Preference for challenge in a given situation reflects a specific instance of an attempt to meet competence needs.

The fact that girls appear in general to be more intrinsic in their attitude to school learning may be the result of different socialization experiences with regard to competence. In the white, middle class South African community to which these children belong it is common for boys to be encouraged from an early age to behave in competence-seeking ways. Curiosity, exploration and 'seeing how things work' are behaviours considered more typically masculine than feminine. Boys are expected to experiment with a wide range of practical and outdoor activities and thus have many potential sources for meeting competence needs. Girls, while not debarred from such activities, are subtly directed to value interpersonal skills more highly. By the time children come to school different areas of gender appropriate competence are well established. Boys are likely to be already able to satisfy their competence needs in many areas and to tend to perceive the classroom learning situation as not gender appropriate. This tendency may be strengthened by the fact that the competence values of the classroom are often conveyed to young children by female teachers. Girls, who have fewer competence opportunities, tend to perceive the

classroom as a potential source of need satisfaction which is appropriate to their gender identity. Another way of saying this is that girls are more ready and more likely to internalize the competence values of the school.

Gender differences in response to teacher orientation require explanation. Girls seem more sensitive than boys to teacher orientation and this is understandable in terms of more direct responsiveness to interpersonal influences and a greater personal investment in the competence potential of the classroom. But the results also show a tendency which is more difficult to interpret. Both boys and girls who say that they prefer easy work are likely to be pupils of control-oriented teachers. Among pupils who say that they prefer difficult work and are highly curious in the classroom boys are not simply less affected than girls by teacher orientation but appear to be affected in the opposite way. It seems extremely unlikely that boys who are highly intrinsic toward classroom learning are that way because they have teachers who administer rewards controllingly. If such were really the case, then low scoring boys would be more likely to be pupils of autonomy-oriented teachers, and the findings of the study do not indicate this. Perhaps a more probably explanation is that boys are less accurate than girls in their self-reports. Boys who have a control-oriented teacher may acknowledge their lack of intrinsicality, but they may also react by conscious or unconscious misrepresentation of their own reasons and preferences. It may be important for boys to perceive themselves as preferring difficult tasks and as curious and exploratory because these

are seen as more masculine attributes.

Gender did not significantly affect the scores on the 'Independence' subscale. This is precisely what might be expected in terms of the conceptualization of intrinsic motivation proposed in this study. The competence aspect of intrinsic motivation is affected by different socialization experiences but the more fundamental self-determination aspect is not. Girls, therefore, do not differ from boys in the amount of reported preference for independent mastery. Children of both sexes respond similarly to teacher orientation because of its very direct relationship with opportunities for self-determination.

The results thus suggest that, in the classroom, girls tend to be more intrinsic than boys in terms of competence needs and more sensitive than boys to differences in teacher orientation. It is argued that, although the results are confusing, boys are, in fact, similarly affected, but possibly to a lesser extent. In terms of self-determination needs no gender differences are apparent either in degree of intrinsic motivation or in response to teacher orientation.

The finding that girls tend to more intrinsically motivated than boys on two out of the three subscales does not agree with the results reported by Deci and Ryan (1980). According to them, intrinsic motivation of girls was found to be equal to that of boys for three of the five subscales of the Harter measure and less than that of boys for the other two (subscales not specified). A possible reason for this is that North American society has broken away to an extent from traditional sex-role stereotypes which are still current in South Africa.

Harter has not paid a great deal of attention to gender differences, but does report (Harter, 1980b) that, at elementary school level, the intrinsic motivation of boys was found to be best predicted by their perceived competence, while that of girls was best predicted by their competence affect (feelings of pride or shame). This difference indicates that girls are perhaps more conscious of affect, but for children of both sexes perceptions of competence are necessary for intrinsic motivation. Girls can only experience positive competence affect if they receive positive competence feedback.

3. The Effect of Developmental Level

The predicted decrease in intrinsic motivation scores as pupils grew older was generally observable and significant in the results of the 'Challenge' subscale, although the mean for each school class tended to be higher than that obtained by Harter (1980a). Results for the other two subscales were not so clearcut.

For both the 'Curiosity' and 'Independence' subscales mean scores increased from Standard 1 to Standard 3 and then decreased to Standard 5. In both cases the mean scores obtained for Standard 1 pupils were very close to those found by Harter while the means for Standards 3 and 5 were noticeably higher. The statistical analysis of the 'Curiosity' subscale results showed no significant differences and the analysis of the 'Independence' subscale results revealed a significant interaction between school class and teacher orientation.

It is puzzling that the 'Curiosity' subscale did not reflect the same developmental trend as the 'Challenge' subscale. It may be that children remain equally curious and interested in school learning throughout primary school but it seems more likely, both intuitively and in view of the results of the 'Challenge' subscale, that they become less so with age. One possible, but not entirely satisfactory, explanation of the results obtained is that the 'Curiosity' subscale is a less sensitive measure. It has already been mentioned that curiosity behaviour is related broadly rather than specifically to competence needs. Moreover, the kind of choice pupils have to make in responding to the 'Curiosity' subscale is different from the choices involved in the other two subscales. The 'Challenge' subscale requires a statement of preference in terms of 'easy' versus 'difficult' and the 'Independence' subscale requires a similar statement in terms of 'assistance' versus 'no assistance'. But the 'curiosity' subscale requires a judgement about the reason for behaviour in terms of 'because I want to know' versus 'because I want some extrinsic reward' (marks, teacher approval). The children in the study did find this a difficult decision and often appeared to be genuinely uncertain of their own reasons. It was noticeable, too, that many children who reported themselves as generally intrinsic on this subscale contradicted themselves on the two items

which referred to getting good marks. Some indirect confirmation of the possible lack of precision and clarity in the results of the 'Curiosity' subscale is provided by the study by Deci, Schwartz, Sheinman and Ryan (1981) which found significant differences in pupils' change scores in the classes of extreme teachers for both the 'Challenge' and 'Independence' subscales but not for the 'Curiosity' subscale.

It is not clear, however, why this subscale is capable of detecting the same interaction between gender and teacher orientation as is found by the 'Challenge' subscale and yet does not reveal the same developmental trend. One tentative explanation is that the developmental trend is not very marked, and therefore does not show up in the less precise subscale.

The results of the 'Independence' subscale showed an increase in intrinsic motivation between Standard 1 and Standard 3 and the predicted trend for intrinsic motivation to decrease between Standard 3 and Standard 5. Closer study of the data revealed that these differences were very marked in pupils of autonomy oriented teachers and hardly apparent in pupils of control-oriented teachers.

It seems worthy of comment at this point that the mean scores for all three subscales at each developmental level were higher than those found by Harter (1980a) in her study of equivalent aged children, except for the scores of Standard 1 pupils on the 'Curiosity' and 'Independence' subscales, which were more or less the same as Harter's findings. It is possible that the pupils in the Cape Town study tended on

the whole to be more intrinsically motivated, but it is also possible that the two Standard 1 means are the most accurate results. The younger children may only have perceived the social desirability of preferring 'difficult' schoolwork (the 'Challenge' subscale) while for older children this factor influenced all their responses. If this is so, it would help to explain the difference in developmental pattern.

There are other possible reasons why the Standard 1 pupils in the study did not report themselves as having greater preference for independent mastery. The simplest explanation lies in the experimental design. Two out of the three autonomy-oriented teachers at Standard 1 level were only minimally autonomy-oriented (z-scores of ,47 and ,31) and may have had little effect on their pupils. Since the same Standard 1 teachers did seem to affect their pupils' preference for challenge this explanation requires the assumption that teacher orientation needs to be more extreme to affect the 'Independence' subscale (related to self-determination) than to affect the 'Challenge' subscale (related to competence).

Alternatively, the Standard 1 children in the study may not have believed the classroom to be an appropriate setting for self-determination. Traditional child-rearing in their community stresses conformity, obedience and respect for authority. These 8-year olds may not have had the self-confidence to prefer independent mastery of school learning owing to a lack of experience of such a situation. Under such circumstances children may only become fully aware of the possibility of independent mastery in the classroom at a later age.

The interaction between school class and teacher orientation found in the results of the 'Independence' subscale is interesting. The developmental increase in intrinsic motivation between Standards 1 and 3 and decrease between Standards 3 and 5 was apparent only among pupils of autonomy-oriented teachers. Examination of the mean scores for the 'Challenge' subscale reveals that, although the trend for scores to become lower over the developmental period is also evident among pupils of control-oriented teachers it is noticeably stronger among pupils of autonomy-oriented teachers. Since Harter's results did not take teacher orientation into account as a variable it is possible that the teachers of the pupils in her study were in general more autonomy-oriented.

The suggestion that the Standard 1 pupils in the Cape Town study did not consider self-determination appropriate in the school situation might also account for the significant increase in preference for independent mastery at Standard 3 level only among pupils of autonomy-oriented teachers. Supposing most Standard 1 pupils to be hesitant about self-determination in the classroom, a control-oriented teacher at a later stage may simply confirm existing attitudes, while an autonomy-oriented teacher facilitates preference for independent mastery.

The finding that, regardless of teacher orientation, Standard 5 pupils tend to report themselves as not very intrinsically motivated either with regard to preference for challenge or to preference for independent mastery may reflect what children learn about school over the primary school years. This seems to be that school is not the place to look for satisfaction of

intrinsic needs for competence and self-determination and that the appropriate motivational orientation is extrinsic. If they are convinced that certain results which they value are contingent on their efforts they may be powerfully motivated to achieve, but the motivation is not intrinsic. Harter (1980a) comments on her findings of a developmental decrease in scores on all three subscales, "... Perhaps the most value laden interpretation is that our school systems are gradually stifling children's intrinsic interest in school learning, specifically with regard to challenge, curiosity, and independent mastery ..." (p.13). If this is in fact the case it is important to be aware of the relative merits of intrinsic and extrinsic motivational orientations to school learning, and this issue will be discussed later in the chapter (pp.133-134).

For the 'Independence' subscale the only developmental level at which children appeared to be sensitive to teacher orientation was Standard 3 , where the intrinsic motivation of pupils of control-oriented teachers was significantly lower than that of pupils of autonomy-oriented teachers, The lack of response to teacher orientation among Standard 1 pupils may have been the result of having teachers who were only mildly autonomy-oriented or it may have been because of the children's attitudes to the school situation. If the classroom is not perceived as an appropriate setting for self-determination perhaps teacher orientation is irrelevant. Standard 3 may represent the peak of pupil expectations concerning self-determination in the classroom. By Standard 5 pupils may have learned that extrinsic motivation is appropriate and become indifferent to teacher

orientation. The latter pupils, moreover, spent only 30% of school time with their class teachers, as opposed to 72% for Standard 3 pupils, so they were hardly likely to be as responsive.

In sum, then, there seems to be some evidence for a decrease in intrinsic motivation over the developmental period and this decrease tends to be most evident among pupils of autonomy-oriented teachers. That the trend was not evident for the 'Independence' subscale at Standard 1 level may possibly be explained by factors in the background of the pupils or in the design of the study.

4. The Effect of Teacher Orientation

4.1 'Classroom Questionnaire' Results

Significant differences attributable to teacher orientation were observed in the results of the 'Classroom Questionnaire'. Since the differences occurred in interaction with either gender or developmental level they have been discussed in detail together with the effects of these variables. The general finding was that autonomy-oriented teachers enhanced and control-oriented teachers diminished intrinsic motivation under certain conditions. With regard to the competence-related subscales teacher orientation had the predicted effect on girls, and probably also on boys, although this was not so clear. With regard to the self-determination related subscale teacher orientation had the predicted effect on Standard 3 pupils of both sexes but not on pupils in the other standards.

4.2 'Activity Book' results

The 'Activity Book' results indicated that Standard 1 pupils of a fairly extreme autonomy-oriented teacher (z = 2,13) tended to engage in more school work in a voluntary situation than did pupils of a fairly extreme control-oriented teacher (z = -1,11). When the pupils involved were convinced that the situation was genuinely voluntary and had no connection with teachers or assessment, they were able to perceive the school-work in the 'Activity Book' as an opportunity for independent mastery and the teacher orientation to which they were accustomed was reflected in the extent to which they made use of this opportunity.

An interesting incidental finding was that the children showed a very strong preference for mathematics rather than language tasks. No pupil attempted the comprehension, one wrote a story and four completed the phonics answers. Since all the school work was devised in collaboration with the class teacher, it seems that the reason for this is not in the nature of the 'Activity Book' but in the attitudes of the children themselves. The pupils concerned were mainly boys, which might explain the preference for mathematics, but it seems very possible that differences in the nature of the tasks were contributory factors.

The fact that few of the children engaged in a great deal of schoolwork indicates that the 'Activity Book' did not really stimulate curiosity or offer attractive challenge. Weaknesses in the design and administration of the 'Activity Book' will be discussed more fully together with other limitations of the study.

The low correlations between 'Activity Book' scores and scores on the three motivation subscales of the 'Classroom Questionnaire' require comment. Firstly, the correlations were, at least, positive. Their lack of magnitude seems to indicate either that one measure is not highly successful, or, as is more probable, that there are weaknesses in both. Problems of measurement will be more fully discussed when the limitations of the study are considered.

4.3 Parent interview results

The general impression created by the parent interviews was that, for all the children (2 girls and 9 boys), genuine or original intrinsic needs were adequately met outside the school situation. Any intrinsic orientation toward school learning would thus be the result of the integrated internalization of the competence values associated with the school.

It did seem that pupils of the autonomy-oriented teacher distinctly perceived the school as a source of positive rewards to a greater extent than did pupils of the control-oriented teacher. Although some of these rewards were no doubt extrinsic it seems reasonable to assume that their teacher's primarily informational rewards contributed to agreeable feelings of competence in these pupils and that this encouraged an intrinsic orientation toward classroom learning. The pupils of the control-oriented teacher, on the other hand, were reported by their parents as operating in terms of avoidance of aversive consequences. The sample was, however, very small and the results can only be interpreted as suggestive.

Parents' lower assessments than pupils' own for each motivation subscale probably indicate a tendency for pupils to overestimate. But at the same time, parents may not fully appreciate their children's intrinsic needs. For two of the subscales the children reported a preference, and this preference may not necessarily have accorded with many actual situations. In this connection it is interesting that the greatest discrepancy was between parents' and pupils' perceptions of preference for independent mastery. Parents may be particularly likely to underestimate their children's need for self-determination.

The correlation of parents' and children's assessments suggest that parents and children are most in agreement ($r = ,76$) concerning the subscale ('Curiosity') which, it has been suggested, is least likely to be accurate. Perhaps this is because the children's general beliefs about why they do their schoolwork are to a large extent learned from their parents' attitudes. Thus, if there are inconsistencies, those of the children match those of their parents. Children's statements of what they prefer in a specific school situation are more independent, and parents often commented that they did not know what their child was like at school. It was not surprising, therefore, that the other correlations were low.

The results thus indicate reasonable support for the predictions of cognitive evaluation theory with reference to the effect of teacher orientation. This was evident in the case of the competence related subscales, particularly when the subjects were girls. In the case of the self-determination related subscale

the effect was apparent in Standard 3 pupils of both sexes. Reasons in the background of the subjects and in the design of the study are suggested to explain why the effect was not observable in Standard 1 pupils. The 'Activity Book' results provide additional confirmation and the general comments of parents seem to point in a similar direction.

5. The Distribution of the 'Classroom Questionnaire' Scores

It was a very obvious finding of the study that the scores on all three subscales of the 'Classroom Questionnaire' were not normally distributed but negatively skewed (see Appendix IV). One possibility is that, among the children who completed the 'Classroom Questionnaire', intrinsic motivation for school learning is not normally distributed. It could be argued that the children came from backgrounds where an intrinsic orientation is encouraged. But this does not seem likely to be the case. The general impression given by parents in the middle-class areas where the study was conducted was of a traditional Judao-Christian conceptualization of human nature as requiring control. While such parents may pay a certain lip service to the desirability of intrinsic motivation and a few many actually believe in it, the general tendency is to encourage an extrinsic orientation toward school learning. They differ, perhaps, from lower class parents in emphasizing positive rather than negative rewards, but they are firm believers in controlling incentives. This is not surprising since most of them operate in an employment environment structured

in this way, and believe that their children should be prepared for a similar adult life.

It appears thus more probable that the children either could not discriminate accurately between integrated and introjected internalizations or perceived some factor of social or personal desirability in the items which indicated an intrinsic orientation. Harter (1981b) claims that the format eliminates this factor and this may have been so for the children in her sample. The comments made by the pupils during the administration of the scale in the Cape Town study indicated that they were aware of it and their self-reports of intrinsicality were often contradicted by their response to items which referred to getting good marks. It seemed that the children did not altogether like to describe themselves as anxious to please the teacher, or as liking easy work, but achieving good marks was generally considered an appropriate reason for doing schoolwork.

The skewed distributions affected the choice of method of statistical analysis and resulted in approximately 50% of the scores for each subscale being in Category 3 in the multi-dimensional contingency tables. It might be expected that the scores of children who were genuinely only mildly intrinsically motivated would be least affected by the independent variables. But although referred to as 'middle range' scores, the scores in Category 3 reflected both moderate and fairly high levels of intrinsic motivation (see Chapter IV, p. 86). If they were accurate it is surprising that no differences attributable to the independent variables were apparent.

6. Limitations of the Study

The most obvious limitation of the study was the problem of measurement. The reliability and validity of the 'Classroom Questionnaire' in a South African setting have not been thoroughly investigated and there seems reason to believe that a factor of social desirability influenced children's responses. In addition, as a measure of intrinsic motivation the curiosity subscale may tend to be imprecise since it demands judgements about the reasons for doing schoolwork which the children find it difficult to make. This issue has already been discussed on p. 119. Several subjects also commented that the term 'schoolwork' was too general and indicated that they might wish to respond differently concerning different kinds of schoolwork.

The 'Activity Book' content did not appear to stimulate curiosity or to present an attractive challenge. It seems clear that this was because the tasks were too similar to the schoolwork which the children had just been doing. Intrinsic motivation makes a person want to engage in a particular activity, but not continuously in exactly the same way. The booklet might also have been improved by providing informational feedback in the form of an answer sheet. Administration in the classroom was another disadvantage because, particularly in the classroom of the control-oriented teacher, the atmosphere may have contributed to a feeling that schoolwork 'ought' to be attempted. The measure is potentially useful, but requires modification and testing. In this study the 'Activity Book' results probably

tended to underestimate intrinsic motivation.

The parent interviews provided valuable insights although this method requires careful planning and structuring if it is not to be vague. The results were interesting, but the sample was too small for them to be more than suggestive. Individual interviews with several of the pupils themselves would, of course, have enhanced the study, but various practical reasons made this impossible.

Other methodological limitations were related to the selection of subjects and their allocation to teacher orientation categories. Firstly, the teachers who completed the 'Problems in Schools' questionnaire were not ideally extreme in their orientations to control versus autonomy. In addition there was no way of ascertaining whether in fact their behaviour in the classroom matched their scores on the questionnaire. Secondly, some of the teachers had single sex classes. In fact, a large proportion of the teachers whose scores indicated that they were autonomy oriented came from these schools. This is interesting in itself and may suggest that it is easier for a teacher to be consistently autonomy-oriented in a single sex class since the ways of mediating autonomy to boys and girls are not the same. It is quite possible that boys and girls perceive the same rewards differently. On the other hand, this could simply be the result of the general ambience of the two schools concerned.

Having single-sex classes involved made it difficult to carry out the planned research design controlling for both gender

and teacher orientation (see Chapter IV, pp.83-84). It was also feared that gender differences might appear simply as an artefact of the design, which included 2 single-sex classes in each autonomy-oriented cell and no single sex classes in the control-oriented cells. That this was not the case is shown by the fact that no gender differences were observable for the 'Independence' subscale.

It could be argued that the greater intrinsic motivation of pupils of autonomy-oriented teachers was attributable not to teacher orientation but to the fact of being at a single sex school. The results showing interactions between gender and teacher orientation and between developmental level and teacher orientation suggest that this was not so. Nevertheless it would have been preferable to exclude the extra variable of type of school. The main reason for not doing so was that availability of both teacher and pupil subjects was very much dependent on the goodwill of school principals and it was thus not really possible to be as selective as could have been wished.

The skewed distribution of the results of the 'Classroom Questionnaire' affected the choice of statistical test. Analysis of Variance tests, if appropriate, might have given clearer and more easily interpretable results than those obtained from log linear analyses.

Finally, the study was limited to one provincial education authority, one language group and one racial group in a society which provides separate education facilities in terms of these categories. Moreover, the white, English-speaking pupils who

made up the sample came from middle class homes and schools. The results, therefore, are not generalizable beyond such limits.

7. Wider Implications

It seems to be clear that the school as a compulsory formal institution is not likely to be perceived as a source of satisfaction of original intrinsic needs for competence and self-determination. It is interesting to speculate whether, and to what extent, existing schools could be modified so that this would change. The school can, however, be a source of intrinsic satisfaction of competence needs resulting from integrated internalizations of the competence values of society. Less radical changes in schools may contribute to facilitating this kind of intrinsic orientation and the study has been concerned with discovering the direction some of these changes might take.

An awareness of the possibility of intrinsic motivation does not imply that an extrinsic motivational orientation toward school learning is never appropriate or commendable. It is, however, important to realize that the rewards associated with an extrinsic orientation may sometimes have what Lepper and Greene (1978) refer to as 'hidden costs'. Human functioning requires a considerable amount of extrinsically motivated behaviour. Children need to acquire many skills. If this involves boring practice extrinsic rewards may be in order since children may not be able to conceptualize the long-term competence aim. What is important is that children do not learn that an extrinsic

orientation is appropriate to all learning and knowledge and in fact to everything connected with the school. In other words, as has been implied throughout the study, it is desirable to foster an intrinsic orientation toward school learning. Some reasons for this value judgement are given below.

Firstly, while some kinds of learning occur quite satisfactorily within an extrinsic framework, there are a great many which require an intrinsic orientation if the material learned is to become part of the pupil's permanent store of useful cognitions. Behaviours and skills learned to gain some extrinsic reward are often forgotten when the reward is no longer in operation. Secondly, if it is true that human beings have innate needs for feelings of competence and self-determination their most successful development must require that these needs be met. If children growing up are encouraged to ignore their inner prompting and to respond primarily to extrinsic controls and demands, this attitude may become a habit and result in dissatisfied adults who are, moreover, very easily manipuated by others. Another possibility is that if intrinsic needs are not met in the educational settings of home and school, children may turn elsewhere for challenge, for example, to various forms of harmful or anti-social behaviour. Finally, the rapid rate of social and technological change makes it true that self-initiated interaction with the novel and mastery of challenge are not optional indulgences but important survival related abilities which educational institutions should endeavour to promote rather than to discourage.

8. Indications for Future Research

The findings of the study suggest research in three general areas, namely, teacher characteristics, pupil characteristics and ways of measuring intrinsic motivation toward school learning.

Approximately half the incidents of school life to which teachers are asked to respond in the 'Problems in Schools' questionnaire concern school achievement directly, while the others relate to social or moral aspects of the school situation. It would be extremely interesting to analyse the results of this questionnaire in terms of the kind of incident for which teachers believe an autonomy-oriented approach appropriate. Other areas which need investigation are the possible effect on teacher orientation of having pupils of one sex only and possible differences in teacher orientation in the same teacher as a result of the gender, age or social class of her pupils.

Since it appears likely that autonomy-oriented teachers enhance the intrinsic motivation of their pupils, more important studies, perhaps, would be to examine the role of variables such as personality factors, social class, type of training and amount of experience in relation to teacher orientation and to investigate the feasability of intervention to promote an autonomy orientation among teachers.

With regard to pupil characteristics, firstly, it seems important to ascertain to what extent the findings of the study would hold among pupils of different social, racial and cultural backgrounds.

Secondly, the relationship between motivational orientation, IQ and school achievement is worth investigating. An extremely interesting long-term study might include post-school achievement, which is quite frequently not well predicted by performance in school. Thirdly, further research could clarify the situation with regard to gender differences in the perception of classroom rewards.

Fourthly, the incidental finding of the study that Standard I pupils showed a strong preference for mathematics rather than language tasks requires attention. If this is in fact a general trend it is quite disturbing since reading and comprehension are the basic skills necessary for later academic achievement. It would be possible to devise a worksheet varying both the nature and the subject matter of the schoolwork, but it might be preferable to begin by discussing the matter with the pupils themselves at different age levels.

The value of any research is dependent on the quality of the measures employed, of whatever nature they may be. Modifications of the 'Classroom Questionnaire' in order to reduce or eliminate the influence of social desirability, together with reliability and validity studies over a large and wide-ranging sample of South African school children, would be useful. Since the pilot study attempt to support the validity of this scale by a comparison of the intrinsic motivation of pupils at a state school and at a supposedly 'free-er' private school was not successful, it might be advisable to reassess possible means of establishing validity. An alternative would be the development of a completely new self-report measure which allows for

different responses to different kinds of school learning and tasks. This may be desirable in assessing the intrinsic motivation of young children and is probably essential for any questionnaire to be used with older pupils.

The 'Activity Book' appears to have potential as a behavioural measure of intrinsic motivation toward school learning among young children, although its content requires modification. A pilot study using a revised version of the booklet under various conditions (in school, at home) might indicate that extensive reliability and validity studies were worth undertaking.

The suggestions for research outlined above have been confined to some of the many possibilities within the school situation since that is the main concern of the study. But the conceptualization of intrinsic motivation as an innate need for feelings of competence and self-determination and the theory that rewards which are perceived as controlling tend to diminish intrinsic motivation for a particular activity while those perceived as informational tend to enhance it have implications for many fields of human interaction. Useful research could, for example, be carried out in family, industrial and organizational settings.

9. Conclusion

Despite certain limitations, the findings of the study provide reasonable support for the research hypotheses concerning the effect of gender, developmental level and teacher orientation

on intrinsic motivation toward school learning. In each case, however, there is evidence that the effect of the variable may not be as straightforward and uncomplicated as was at first proposed. Nevertheless, since it is for several reasons important to foster intrinsic motivation in the classroom, use should be made of the insights gained in this and other studies and efforts continued to increase understanding by further research.

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APPENDIX I

'Problems in Schools' questionnaire

NAME: ..... SCHOOL:.....

DATE: ..... CLASS: .....

The "Problems in Schools" Questionnaire

On the following pages you will find a series of vignettes. Each one describes an incident and then lists four ways of responding to the situation. Please read each vignette and then consider each response in turn. Think about each response option in terms of how appropriate you consider it to be as a means of dealing with the problem described in the vignette. You may find the option to be "perfect", in other words, "extremely appropriate" in which case you would circle the number 7. You may consider the response highly inappropriate in which case you might circle the 1. If you find the option reasonable you would circle some number between 1 and 7. So think about each option and rate it on the accompanying scale. Please rate each of the four options for each vignette. There are eight vignettes with four options for each.

There are no right or wrong ratings on these items. People's styles differ, and we are simply interested in what you consider appropriate, given your own style.

Some of the stories ask what you would do as a teacher. Others ask you to respond as if you were giving advice to another teacher or to a parent. Some ask you to respond as if you were the parent. If you are not a parent, simply imagine what it would be like for you in that situation.

Please respond to each response option by circling one number on its rating scale.

1. David is an average student who has been working reasonably well. During the past two weeks he has appeared listless and has not been participating during reading group. The work he does is accurate but he has not been completing schoolwork tasks. A phone conversation with his mother revealed no useful information. The most appropriate thing for David's teacher to do is:

a. She should impress upon him the importance of finishing his schoolwork since he needs to learn this material for his own good.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Let him know that he doesn't have to finish all of his work now and see if she can help him work out the cause of the listlessness.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Make him stay after school until that day's schoolwork is done.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Let him see how he compares with the other children in terms of his schoolwork and encourage him to catch up with the others.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

2. At a parents' meeting last night, Mr. and Mrs. Greene were told that their daughter, Sarah, has made more progress than expected since the time of the last parents' meeting. All agree that they hope she continues to improve so that she does not have to repeat the standard (which the Greene's have been half expecting since Sarah's last report). As a result of the parents' meeting the Greene's decide to:

a. Increase her allowance and promise her a ten-speed if she continues to improve.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Tell her that she's now doing as well as many of the other children in her class.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Tell her what the teacher said, letting her know that they're aware of her increased independence in school and at home.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Continue to emphasize that she has to work hard to get better marks.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

3. Steven loses his temper a lot and has a way of agitating other children. He doesn't respond well to what you tell him to do and you're concerned that he won't learn the social skills he needs. The best thing for you to do with him is:

a. Emphasize how important it is for him to "control himself" in order to succeed in school and in other situations.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Put him in a specially organized class which has the structure and reward contingencies which he needs.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Help him see how other children behave in these various situations and praise him for doing the same.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Realize that Steven is probably not getting the attention he needs and start being more responsive to him.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

Your son is one of the better players in his junior soccer team which has been winning most of its games. However, you are concerned because he just told you that he failed his spelling test and will have to redo it the day after tomorrow. You decide that the best thing to do is:

a. Ask him to talk about how he plans to handle the situation.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Tell him he probably ought to decide to forego tomorrow's game so he can catch up in spelling.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. See if others are in the same predicament and suggest he do as much preparation as the others.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Make him miss tomorrow's game to study; soccer has been interfering too much with his school work.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

5. The Rangers spelling group has been having trouble all year. How could Miss Wilson best help the Rangers?

a. Have regular spelling bees so the Rangers will be motivated to do as well as the other groups.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Make them drill more and give them special privileges for improvements.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Have each child keep a spelling chart and emphasize how important it is to have a good chart.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Help the group devise ways of learning the words together (skits, games and so on).

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

6. In your class is a girl named Margy who has been the butt of jokes for years. She is quiet and usually alone. In spite of the efforts of previous teachers, Margy has not been accepted by the other children. Your wisdom would guide you to:

a. Prod her into interactions and provide her with much praise for any social initiative.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Talk to her and emphasize that she should make friends so she'll be happier.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Invite her to talk about her relations with other children, and encourage her to take small steps when she's ready.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Encourage her to observe how other children relate and to join in with them.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

7. For the past few weeks things have been disappearing from the teacher's desk and lunch money has been taken from some of the children's desks. Today Paul was seen by the teacher taking a souvenir coin from her desk. The teacher phoned Paul's mother and spoke to her about this incident. Although the teacher suspects that Paul has been responsible for the other thefts, she mentioned only the one and assured the mother that she'd keep a close eye on Paul. The best thing for the mother to do is:

a. Talk to him about the consequences of stealing and what it would mean in relation to the other children.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Talk to him about it, expressing her confidence in him, and attempting to understand why he did it.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Give him a good scolding; stealing is something which cannot be tolerated and he has to learn that.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Emphasize that it was wrong and have him apologize to the teacher and promise not to do it again.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

8. Your child has been getting average marks, and you'd like to see her improve. A useful approach might be to:

a. Encourage her to talk about her report and what it means for her.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

b. Go over the report with her; point out where she stands in the class.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

c. Stress that she should do better, she'll never get into university with marks like these.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

d. Offer her R1 for every A and 50c for every B on future reports.

1.....2.....3.....4.....5.....6.....7
very inappropriate — moderately appropriate — very appropriate

APPENDIX II

'Classroom Questionnaire'

CLASSROOM QUESTIONNAIRE

NAME ..... AGE: .....

TEACHER ..... CLASS: .....

DATE ..... GIRL OR BOY .....

Sample questions

Really true for me	Sort of true for me			sort of true for me	really true for me
☐	☐	Some children would rather play outdoors in their spare time	BUT Other children would rather watch TV	☐	☐
☐	☐	Some children like hamburgers better than hot dogs	BUT Other children like hot dogs better than hamburgers	☐	☐

	Really true for me	Sort of true for me				sort of true for me	really true for me
1.	☐	☐	Some children like hard work because it's a challenge	BUT	Other children prefer easy work that they are sure they can do	☐	☐
2.	☐	☐	When some children don't understand something right away they want the teacher to tell them the answer	BUT	Other children would rather try and work it out by themselves	☐	☐
3.	☐	☐	Some children work on problems to learn how to solve them	BUT	Other children work on problems because you're supposed to	☐	☐
4.	☐	☐	Some children like difficult problems because they enjoy trying to work them out	BUT	Other children don't like to work out difficult problems	☐	☐
5.	☐	☐	Some children do their schoolwork because the teacher tells them to	BUT	Other children do their schoolwork to find out things they've been wanting to know	☐	☐
6.	☐	☐	When some children make a mistake they would rather work out the right answer by themselves	BUT	Other children would rather ask the teacher how to get the right answer	☐	☐
7.	☐	☐	Some children would rather just learn what they have to in school	BUT	Other children would rather learn about as much as they can	☐	☐
8.	☐	☐	Some children read things because they are interested in the subject	BUT	Other children read things because the teacher wants them to	☐	☐
9.	☐	☐	If some children get stuck on a problem they ask the teacher for help	BUT	Other children keep trying to work out the problem on their own	☐	☐

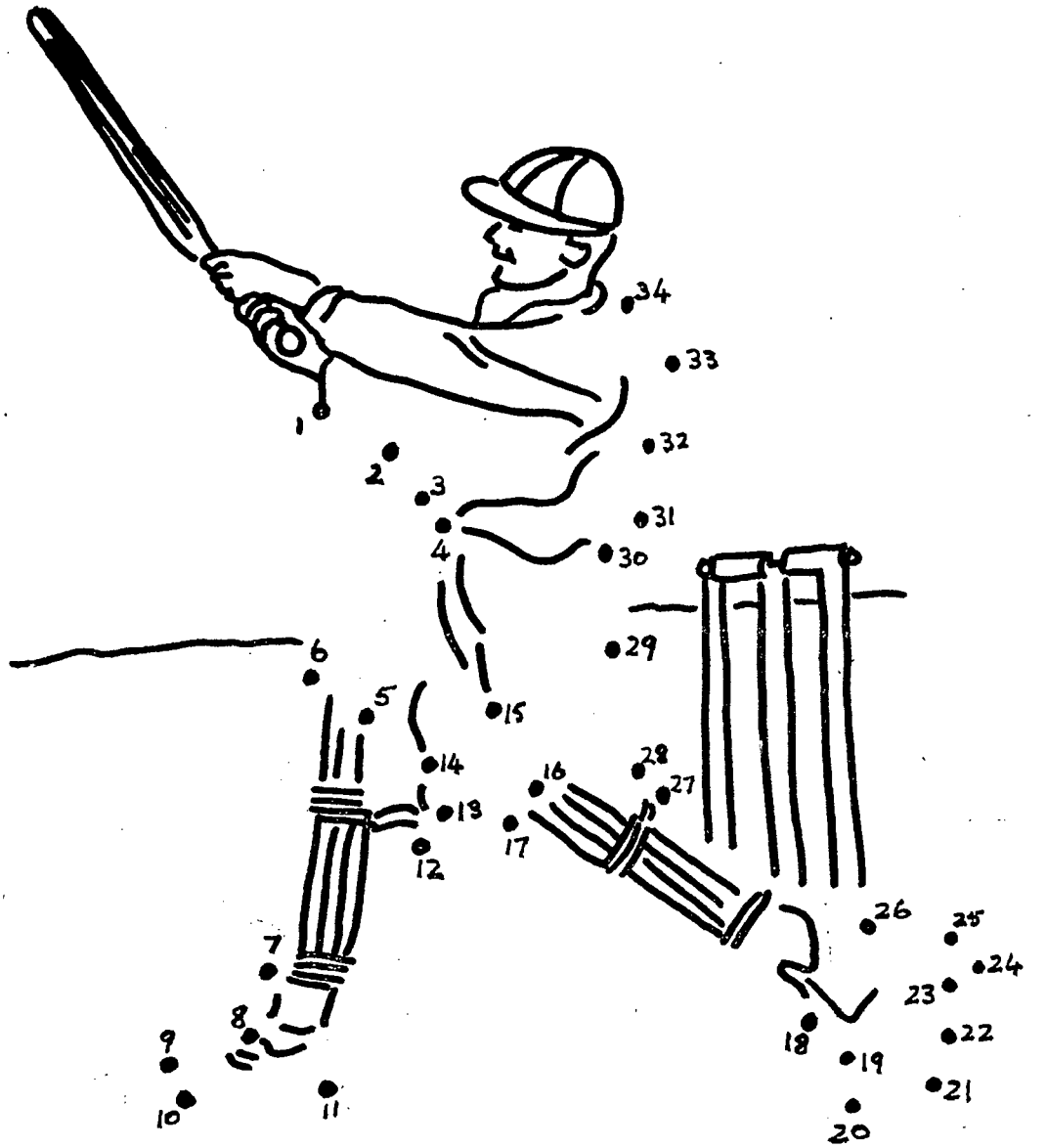
	Really true for me	Sort of true for me			sort of true for me	really true for me
10.	☐	☐	Some children like to go on to new work that's at a more difficult level	BUT	Other children would rather stick to work which is pretty easy to do	☐	☐
11.	☐	☐	Some children ask questions in class because they want to learn new things	BUT	Other children ask questions because they want the teacher to notice them	☐	☐
12.	☐	☐	Some children like the teacher to help them plan what to do next	BUT	Other children like to make their own plans for what to do next	☐	☐
13.	☐	☐	Some children like school subjects where it's pretty easy to just learn the answers	BUT	Other children like those school subjects that make them think pretty hard and work things out	☐	☐
14.	☐	☐	Some children like to try to work out how to do their school work on their own	BUT	Other children would rather ask the teacher how it should be done	☐	☐
15.	☐	☐	Some children do extra work because they want to get better marks	BUT	Other children do extra work because they learn about interesting things	☐	☐
16.	☐	☐	Some children don't like difficult schoolwork because they have to work too hard	BUT	Other children like difficult schoolwork because they find it more interesting	☐	☐
17.	☐	☐	Some children like to do their schoolwork without help	BUT	Other children like to have the teacher help them do their schoolwork	☐	☐
18.	☐	☐	Some children work really hard to get good marks	BUT	Other children work because they really like to learn things	☐	☐

APPENDIX III

'Activity Book'

ACTIVITY BOOK

NAME .....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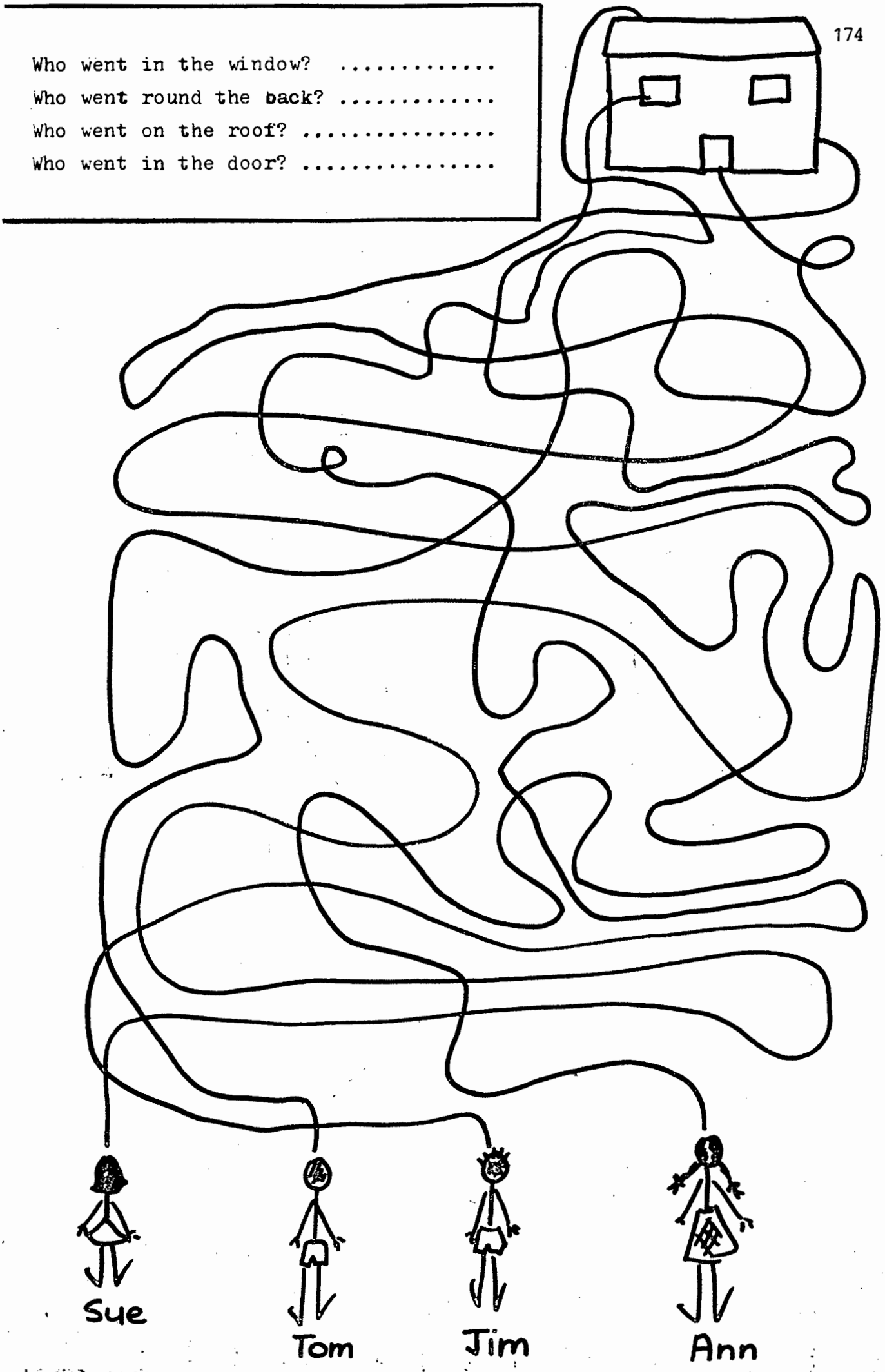
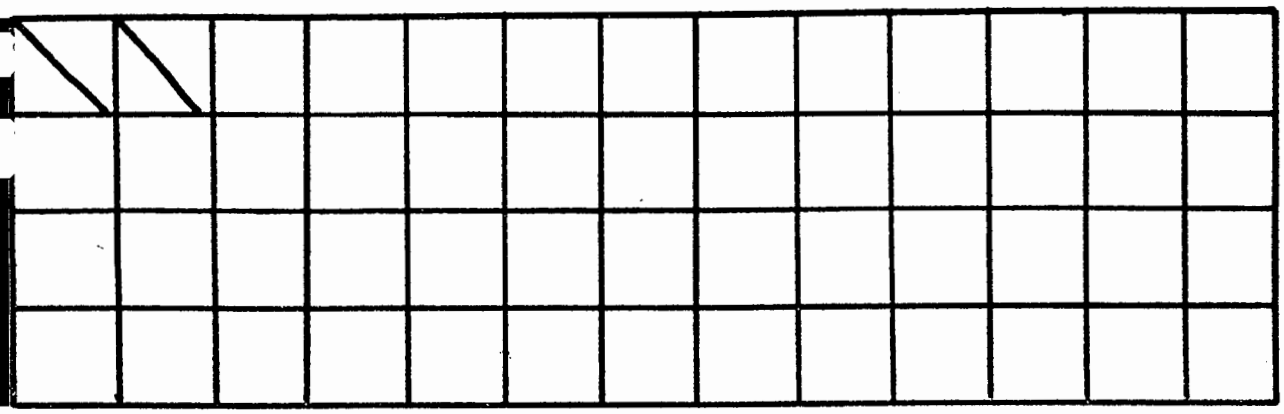
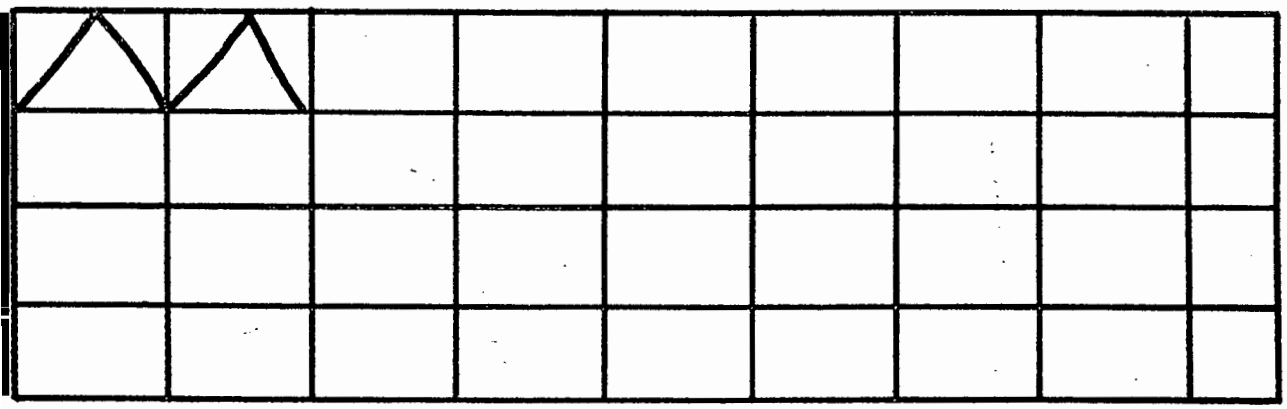
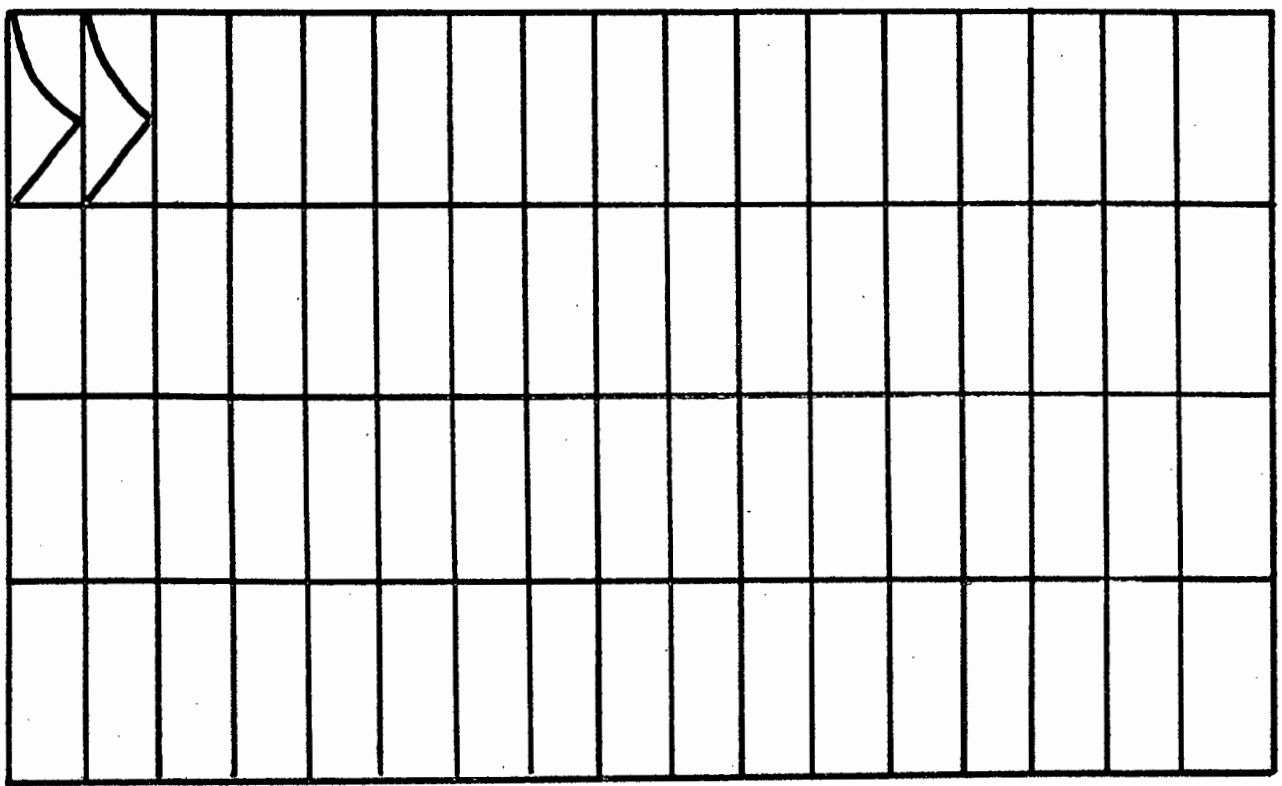
Who went in the window? .....
Who went round the back? .....
Who went on the roof? .....
Who went in the door? .....



Draw your own patterns







Draw any picture that you like

7 + 9 =	16 - 7 =
5 + 7 =	12 - 5 =
8 + 3 =	19 - 9 =
6 + 5 =	14 - 6 =
4 + 9 =	17 - 8 =
7 + 7 =	15 - 4 =

$\begin{array}{r} 23 \\ +\ 5 \\ \hline \end{array}$	$\begin{array}{r} 64 \\ +\ 3 \\ \hline \end{array}$	$\begin{array}{r} 41 \\ +\ 7 \\ \hline \end{array}$
$\begin{array}{r} 36 \\ +\ 22 \\ \hline \end{array}$	$\begin{array}{r} 43 \\ +\ 35 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ +\ 27 \\ \hline \end{array}$
$\begin{array}{r} 28 \\ +\ 31 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ +\ 72 \\ \hline \end{array}$	$\begin{array}{r} 60 \\ +\ 34 \\ \hline \end{array}$
$\begin{array}{r} 16 \\ +\ 29 \\ \hline \end{array}$	$\begin{array}{r} 25 \\ +\ 18 \\ \hline \end{array}$	$\begin{array}{r} 37 \\ +\ 24 \\ \hline \end{array}$

95 - 4 =

29 - 5 =

37 - 4 =

86 - 5 =

77 - 4 =

59 - 6 =

27 + 2 =

96 + 3 =

11 + 7 =

85 + 4 =

32 + 7 =

43 + 5 =

$$\begin{array}{r} 76 \\ -\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 45 \\ -\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 88 \\ -\ 4 \\ \hline \end{array}$$

$$\begin{array}{r} 25 \\ -\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 68 \\ -\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 47 \\ -\ 3 \\ \hline \end{array}$$

Write in words :

93 .....

61 .....

40 .....

18 .....

Fill in the missing numbers:

245 ..... 247 ..... 249 .....

196 .... 199 .....

111 ..... 113 ....

759 .... 762 764

..... 820 ..... 822 .....

A teacher gets 49 books for the classroom. 7 get lost. How many are left?

There are ..... books left.

There are 13 boys in a class and 15 girls. How many children are there altogether?

There are ..... children.

On a bus there are 38 people. 5 get off. How many are left?

There are ..... people left.

Fill in the correct word

The ..... is in the cup.

I rub the wood with a .....

This is a steep .....

The pot is on the .....

My ..... can dig deep.

I ride on my .....

This is a funny .....

I ..... in the sea.

I ..... with a cloth.

We sleep in the .....

WINE WANE

FILE FILL

SLOP SLOPE

STAVE STOVE

SPADE SHADE

BIKE BAKE

JACK JOKE

SLEEP SPLASH

WIPE WEEP

SNAKE SHACK

Underline the correct word

The boy new/knew that his mother was waiting outside.

The farmer sows/sews his seeds in the spring.

Tom was late because he missed/mist the bus.

The wicked old witch/which put a spell on the prince.

Sam felt a sharp pain/pane in his leg when the ball hit him.

A plain/plane can fly very fast.

Write these words in alphabetical order

car truck lorry boat plane train van steamer

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Alternative version

Fill in the correct word

The ..... is in the cup.	WINE WANE
I rub the wood with a	FILE FILL
This is a steep	SLOP SLOPE
The pot is on the	STAVE STOVE
My ..... can dig deep.	SPADE SHADE
I ride on my	BIKE BAKE
This is a funny	JACK JOKE
I ..... in the sea.	SLEEP SPLASH
I ..... with a cloth.	WIPE WEEP
We sleep in the	SNAKE SHACK

Fill in the missing word

WIDE	TIME	PIPE	LINE	KITE	BITE

That dog may ..... you.

The old man smokes a .....

You need a boat to cross this ..... river.

The children stand in a long .....

A ..... needs wind to make it fly.

A clock tells us the .....

Fill in these animal homes

A dog lives in a k.....

A bird lives in a n.....

A snail lives in a s.....

A horse lives in a s.....

A pig lives in a s.....

A rabbit lives in a h.....

Read carefully through the following passage.

THE RACING CAR

The boys first chose a soap-box for the body. They took four wheels from an old pram on a rubbish heap, found some long nails and a length of rope, and they were ready to begin building the racing car. There were many mistakes, and sore fingers, before the Silver Arrow was ready for its trial run. They hauled it to the top of a steep slope, climbed aboard and pushed off.

The car gathered speed and went rushing downwards. All was well for the first minute. Then, Jack gasped "The bend at the bottom!" Yes, they had forgotten all about the great curve. It was coming nearer, nearer. There was not the slightest chance of steering the Silver Arrow at that speed. With a screeching sound it left the road and burst through the wire fence.

Underline the answer which is true

1. The body of the car was made of:

a) an old pram
b) an empty soap-box
c) part of a real motor car

2. The parts were fastened together:

a) only with rope
b) with glue and nails
c) with rope and nails

3. The boys had sore fingers:

a) because they bit their nails
b) because they burnt their fingers
c) because they hit their fingers with the hammer

4. Jack suddenly remembered:

a) that there was a sharp bend
b) that he had to go home
c) that he did not know how to steer

5. The Silver Arrow:

a) crashed into a lorry
b) crashed into a fence on the side of the road
c) turned upside down

Alternative version

Read this passage carefully.

THE RACING CAR

Some boys wanted to made a racing car. They made the body out of a soap-box. Then they got four wheels from an old pram. They used long nails and rope to fix the car together. There were many sore fingers but at last the racing car was ready. The boys got on and pushed off from the top of a hill. But they forgot that there was a bend in the path. They could not steer the car because it was going too fast and so it left the path and crashed into a fence.

Underline the answer which is true

The body of the car was made of:

a) an old pram
b) a soap-box
c) part of a real motor car

The parts were fixed together:

a) only with rope
b) with glue and nails
c) with rope and nails

The boys had sore fingers:

a) because they bit their nails
b) because they burnt their fingers
c) because they hit their fingers with the hammer

The boys forgot:

a) that there was a bend
b) that they had to go home
c) how to steer

The car crashed:

a) into a lorry
b) into a fence
c) into some trees

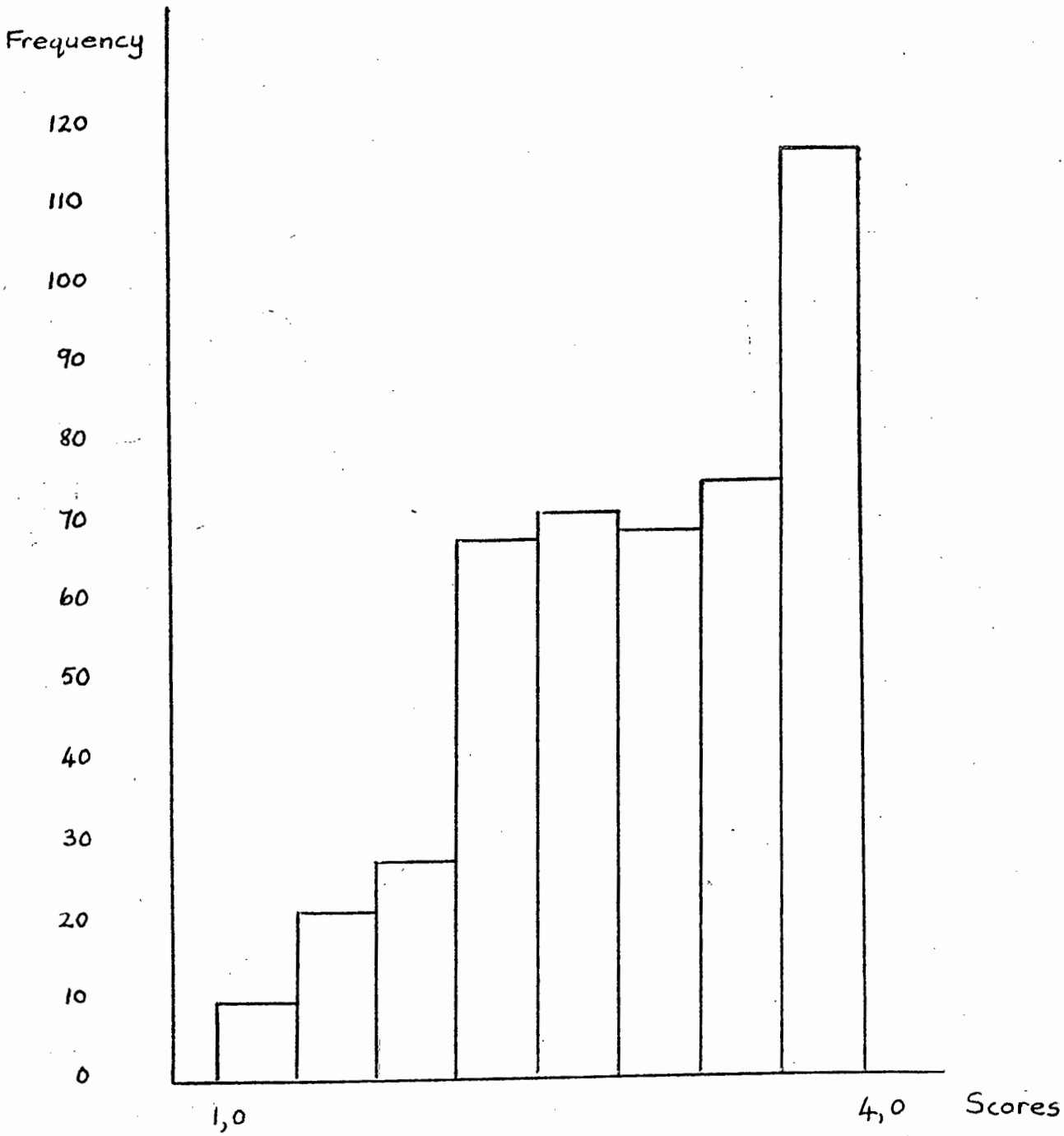
Write a story about what is happening in the picture.

APPENDIX IV

Distributions of 'Classroom Questionnaire' Scores for each Subscale

Frequency Distribution of Scores

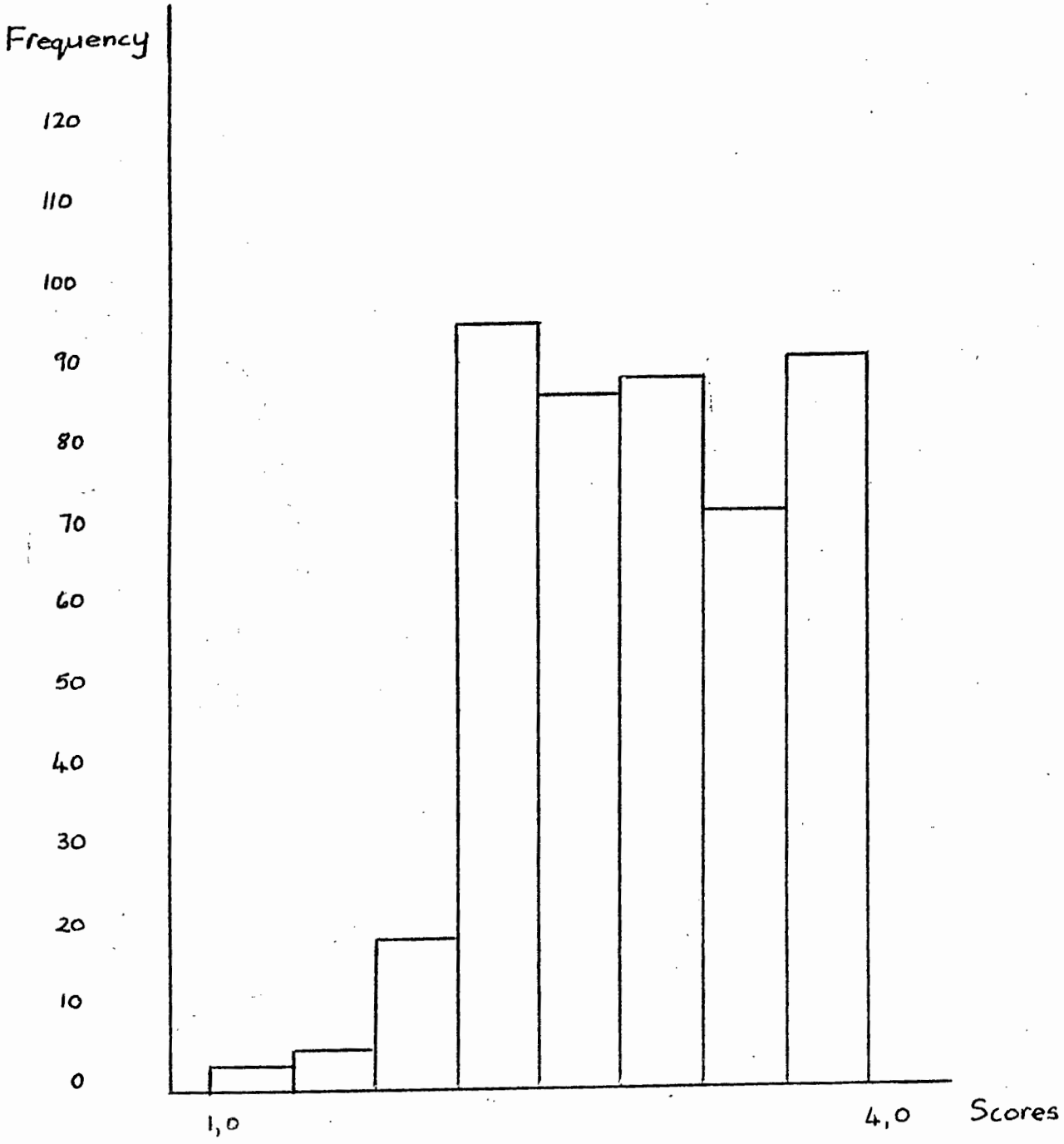
'Challenge' subscale



(equal intervals of 0,375 along horizontal axis)

Frequency Distribution of Scores

'Curiosity' subscale



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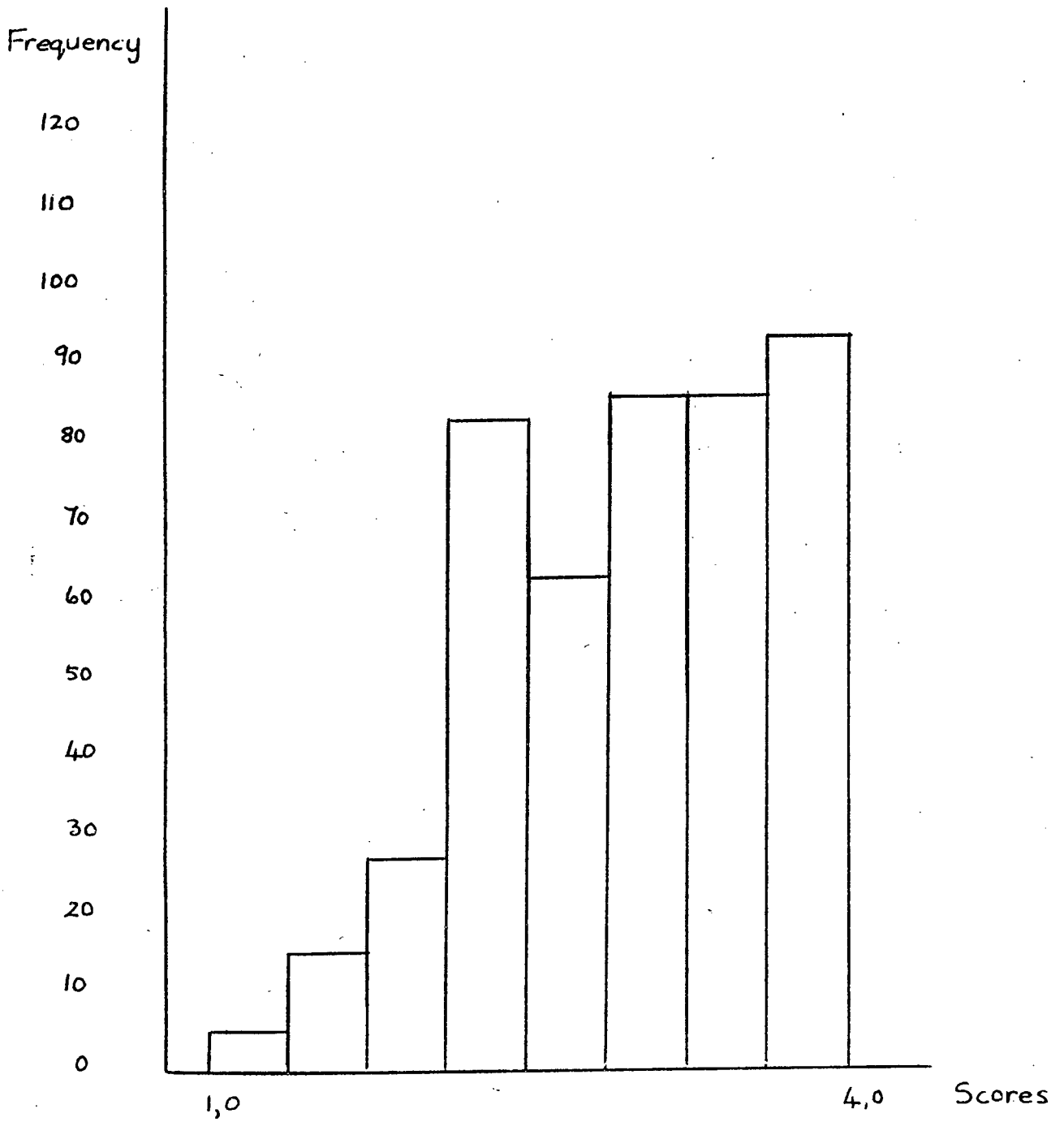
Frequency Distribution of Scores

'Independence' subscale



(equal intervals of 0,375 along horizontal axis)