A STUDY OF MORAL DEVELOPMENT
WITH SPECIAL REFERENCE TO PSYCHOLOGICAL NEEDS,
HUMAN RELATIONSHIPS AND STRUCTURES OF JUDGMENT

By

HING-KEUNG MA

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Nature is not always kind to us. Nevertheless, the warmth and inspiration that I felt deeply when I was being loved, pacified, encouraged, taken care of, and helped in one way or another by so many people from different countries have demonstrated to me the good and beautiful side of Nature. It is only with both love and universal justice that we shall ultimately be free from despair, hostility, jealousy, prejudice, and mental and physical illness; and thus we shall be able to self-actualize ourselves, that is, to be ourselves. It is only at that stage the human species as a whole will be able to comply with Nature in the most harmonious way. This is what I have learned from all of those who have kindly helped me in the past few years.

This study consists of two parts: the first part is the establishment of a theoretical model of moral development and the second part is an empirical study which includes the construction of a new psychological test called The Moral Development Test (MDT).

The proposed theory postulates the following three parameters to explain the fundamental nature of moral development: Basic Psychological Needs (Parameter N), Human Relationships (R) and Structures of Judgment (J). Different current theories are applied in the elaboration of the above three parameters: Humanistic Psychology particularly Maslow's Theory for N, Sociobiological Theory of Kinship for R and Cognitive-developmental theory for J. The theory is a 7-stage model. In addition, an attempt is made to employ the Chinese Tao Philosophy in the primitive establishment of a theoretical basis for the Ultimate Stage of Human Development i.e. Stage 7 in the theory. The derivation of the theory is mathematically oriented.

The MDT is constructed mainly for validating the above theoretical model. Each form of the MDT consists of five or six hypothetical dilemmas. The questions for each dilemma are divided into two parts. Part I is used to test the Parameters N and R and Part II the Parameter J.

It was found that the test-retest and internal consistency reliabilities of the major MDT indices (labelled as NRRJ and WNRRJ indices) were usually in the 0.80s to 0.90s. The face validity, convergent-divergent validity and the construct validity have been demonstrated to be good. In addition, results of cross-cultural analyses using the English (London) and Chinese (Hong Kong) samples also support the cultural universal hypothesis of the present theoretical model. Nevertheless, the MDT only explores features of moral development up to the fifth stage of the present 7-stage model.
# TABLE OF CONTENTS

**ACKNOWLEDGEMENTS** 2

**ABSTRACT** 4

**CHAPTER**

1. The Psychology of Moral Development: An Introductory Overview 7


3. A Theoretical Model of Moral Development 153

4. Fundamental Nature of Moral Development: An Objective Measure 166

5. The Present Study 226

6. Results 261

7. Discussion 329

8. Suggestions and Conclusions 374

**BIBLIOGRAPHY** 377

**APPENDIX**

1. Current Theories Which Have A Bearing On Moral Development (A Supplement to Chapter 1) 395

2. Supplementary Materials to Chapter 2 418

3. A Summary of the Notations Used in Chapter 3 450

4. A Derivation of the NRRJO1 and WNRRJO1 Indices 451
APPENDIX

5. (A) Moral Development Test (MDT)
   (i) Form A 453
   (ii) Form B 466
   (iii) 'Civil War' (Long Version) 478
(B) Differences Between the MDT Forms A(IS) and A 480
(C) MDT Form A(5): Chinese Version 482
(D) Kohlberg's Moral Judgment Instrument (MJI): Form A 496
(E) Rest's Defining Issues Test (DIT) 498
(F) Computer Codes for the MDT Indices and Some Important Variables 503

6.1 (A) MDT Part II Scoring Program 505
   (B) MDT Part II: Rate - Rank Consistency Check 507

6.2 to 6.7 Further Details Regarding the Empirical Results and Findings 511

MICROFICHES

1. APPENDICES *6.2 (E) TO 6.2 (I)*: London Study 534
2. APPENDIX *6.2 (J)*: MDT - DIT Study 537
3. APPENDIX *6.5*: Hong Kong Study 538
1. The Psychology of Moral Development: An Introductory Overview

The study of morality has long been a most important topic in philosophy. However, the systematic study of moral development in psychology only started in the past few decades, with rapid improvements in the past twenty years or so. In some sense, moral psychology is only in its stage of childhood at the present time.

The main objective of this chapter is to outline some of the common concepts of morality in psychology and to present an introductory overview of the current theories of moral development.

1.1. Some Common Concepts of Morality in Psychology

The concept of morality has been extensively studied by both Eastern and Western philosophers throughout history. Western philosophers such as Plato, Socrates, Aristotle, Kant, Bentham, Mill, etc. and Chinese philosophers such as Confucius, Mencius and many others have dealt with the concept of morality in detail and have given us many insights into the complexities of the problems involved.

*A substantial part of this Chapter is based on Chapters 1 and 2 of the author's M.A. dissertation (Ma, 1980). Chapter 2 of the author's M.A. dissertation appears as Appendix 1(A) in this thesis.
However, it is beyond the scope of this thesis to give a presentation of the philosophers' concept of morality. This study is predominantly a psychological one, therefore, it will focus more on the interpretation of the concepts of morality given by psychologists, although the work of the sociologist, Durkheim, will be considered because of his influence on cognitive developmental psychologists.

In the following paragraphs, some common concepts of morality will be discussed briefly. They will be elaborated in further detail in either Appendix 1(A) or Chapter 2.

(1) Psychoanalysts tend to define morality as a force that is negative to life and love; a force that causes mental illness and death. Gilligan (1976, p.145) defines morality as:

"action and thought motivated by a sense of compulsion or obligation rather than by love (spontaneous inclination or wish), and by a negative wish to avoid painful feelings (shame or guilt) rather than by a positive wish to express feelings of love".

(2) Behaviourists tend to link morality with social conditioning or social conformity. Eysenck (1976) defines conscience as a "conditioned reflex" in his Biological explanation of morality. He argues that:

"by calling a variety of actions bad, evil, or naughty, we encourage the child to identify them all in one category, and to react in the future with anxiety to
everything thus labelled." (Eysenck, 1976, p.109)

(3) The concept of morality in the Cognitive Developmental Approach is elaborated in detail by Kohlberg (1981, 1971, 1969). Basically speaking, the concept is constructed on Kant's moral philosophy and Rawl's (1971) theory of justice. A detailed explanation of this concept is given in Section 2.3.3.

(4) Morality can also be defined in terms of altruism and social norms or moral rules. Wright (1971) writes:

"moral rules are foundational in the sense that they are concerned with the maintenance of, for instance, trust, mutual help and justice in human relationship. .... Moral rules form the yardstick against which we evaluate the rules of any particular activity". (p.13).

It follows that

"moral behaviour consists of all the various things people do in connection with moral rules." (p.15)

A more detailed elaboration of the concept of morality in terms of empathy, altruism and social norms is given in Section 2.2.

(4) Durkheim (1925) argues that there are three elements of morality: (i) discipline - a spirit shared generally by members of the group (ii) attachment to those social groups of which one is a member and (iii) autonomy or
self-determination. He elaborates the last element as follows:

"We must have knowledge, as clear and complete as awareness as possible of the reasons for our conduct. This consciousness confers on our behaviour the autonomy that the public conscience from now on requires of every genuinely and completely moral being". (Durkheim, 1925, p.120)

In other words, such moral behaviour "must be freely desired, that is to say, freely accepted" (p.120).

1.2. An Overview of Current Theories which have a bearing on Moral Development.

The term 'theory' is used loosely here; any fairly systematic thoughts on moral development is regarded as a 'theory'.

18 current theories which have a bearing on Moral development are discussed in this thesis. Some of them are elaborated in Chapter 2 and some in Appendices 1(A) and 1(B). These theories are grouped in Figure 1.1 in three categories: (1) Feeling or Emotional aspect (2) Behavioural aspect and (3) Cognitive aspect. It is important to note that:

(i) the list is by no means exhaustive, the criterion for selection is basically a subjective one

(ii) Not all the theories in the list deal with moral development directly and explicitly. Some of them are placed here mainly because of their strong relevance
to the study of moral development.

(iii) The categorization of the theories is not entirely rigorous because of the complexity of the topic and the preliminary nature of development of some of the theories.

The following figure is constructed mainly to present a very rough and simple picture of the current theories listed in Table 1.1. The lines indicate the relationships between the various theories and the three basic aspects of moral development.

The present study seeks to establish relationships between parameters derived for the three fundamental aspects. The parameters are:

(i) Psychological Needs (labelled as Parameter N),
(ii) Human Relationships (Parameter R) and
(iii) Structures of Judgment (Parameter J) (See Chapter 3). These parameters are placed within a theoretical model (labelled as *TMD in Figure 1.1) which is tested in the empirical part of this study.
# TABLE 1.1

The 18 Current Theories

| 1. | Psychoanalytic Theory | Gilligan (1976) |
| 2. | Behaviouristic Theory | Eysenck (1976) |
| 4(a) | Social Learning Theory | Bandura (1977), Bandura & Walters (1963) |
| 7. | Sociobiological Theory of Kinship and Altruism | Wilson (1975); Trivers (1970); Hamilton (1964) |
| 12. | Socioanalytic Theory | Hogan et. al. (1978) |
| 17. | Social Exchange Theory | Blau (1964); Homans (1961, 1968); Thibaut & Kelly (1959) |

Notes:
(1) Theories 3, 5, 6, 7, 14, 17 and 18 are elaborated in Chapter 2; Theories 1, 2, 4, 8, 10, 11 and 16 in Appendix 1(A); and theories 9, 12, 13 and 15 in Appendix 1(B).
Figure 1.1 Current Theories Having a Bearing on Moral Development

Notes:
(1) ' ~ ' = Theory.
(2) For further details, see Table 1.1.

While the first chapter provides an overview of the major current theories of Moral Development, this chapter gives a more detailed review of the literature directly relevant to this study. The first three sections (2.1 - 2.3) give a background literature review for the theoretical model constructed in the next chapter. Section 2.1 describes the Humanistic Approach in the study of Psychological Needs, in particular, Maslow's theory of Human Motivation and the concept of self-actualization will be elaborated in detail. Section 2.2 gives a brief description of the concepts and origins of altruism and human relationships. Some emphasis is placed on the Evolutionary and Sociobiological Theories. In Section 2.3, the Cognitive Developmental Theory of Morality is reviewed in detail.

A primitive attempt to introduce Tao Philosophy in the study of the Ultimate Stage of Human Development is carried out in Section 2.4. Finally, Section 2.5 outlines the details of the Moral Judgement and Decision System of Man as a Value-driven system, which has a genetic origin.
2.1 Psychological Needs

Psychological studies of instincts, drives and needs have led to the establishment of a large number of theories of motivation (see, e.g., Weiner, 1980; Bolles, 1975; Madsen, 1974). However, the objective of this section is to provide the background literature review for the theory established in Chapter 3 and therefore the discussion will be limited to Maslow's theory of Human Motivation and his concept of self-actualization.

The existential philosophy and phenomenological approach in sociology influenced a group of psychologists in America in the 1950s. These psychologists were highly critical of Freud's negative view of human nature which was based mainly on his clinical studies of neurotic and psychotic subjects. On the contrary, they postulated that human nature is basically good or neutral (Maslow, 1965, p. 308-309) and that the study of those mentally ill is limiting. They argued that there should be an emphasis on the importance of studying mentally healthy people. Maslow, a major proponent of this approach, did this in his study of those people considered to be extremely mentally healthy and proposed a theory which includes the concepts of self-actualization, B-cognition, Metamotivation and Transcendence (Maslow, 1968, 1970, 1971).

Under the influence of the writings of K. Goldstein, K. Horney, E. Fromm, G.W. Allport, A. Maslow, C. Rogers
and many others, a "third force" in psychology, which is often called Humanistic Psychology was established. The humanistic psychologists usually take a 'holistic' approach in developing their theories and their research interests are probably best described by the statement of purpose of the Journal of Humanistic Psychology, which states that

"topics of special interest are authenticity, encounter, consciousness, self-actualization, self-transcendence, search for meaning, creativity, personal growth, humanistic psychotherapy, confluent education, values, identity and love."

2.1.1 Maslow's Theory of Human Motivation

I. Propositions

Maslow (1970, Chapter 3) puts forward 16 propositions for his theory of motivation. Some of these propositions are better regarded as scientific attitudes or arguments rather than as scientific propositions. In the following discussion, an attempt is made to rearrange 13 of Maslow's propositions into 5 general postulates. In order to simplify referencing, P1 to P16 are used to represent Maslow's 16 propositions in the order of his presentation (Maslow, 1970) Appendix 2.1(A) gives the full title of each proposition.
1. Gestalt Postulate of Individual (P1, P12)

In general, the individual is assumed to be an integrated, organized whole. However, Maslow is also aware of the fact that an individual sometimes does not behave as an integrated whole. He writes,

"Apparently the organism is most unified in its integration when it is successfully facing either a great joy or creative moment or else a major problem or a threat or emergency. But when the threat is overwhelming or when the organism is too weak or helpless to manage it, it tends to disintegrate."
(Maslow, 1970, p.30)

2. Universality of Ultimate Needs (P3, P4, P9)

The unconscious ultimate needs or desires of human being are universal, that is, similar in all people.

These ultimate needs form a sound fundamental base for the classification of motivational life.

3. Fundamental Nature of Motivation (P5, P6, P13)

Not all human behaviours are motivated. For those motivated behaviours, the underlying motivations are always multiple, fluctuating and complex.
4. Hierarchy of Needs and Drives (P7, P8)

Human needs are arranged in a hierarchy of prepotency. Similarly, drives are arranged in a hierarchy of specificity.

5. Environmental Influences on Motivation (P11, P14, P15)

Human motivation is actualized in behaviour under the influence of environment. For instance, people have been taught by experience to be realistic, that is, to "yearn consciously for that which might conceivably be actually attained" (Maslow, 1970, p.31). It is also postulated that reality exerts an influence on the unconscious impulses or motivations.

In addition, three of Maslow's propositions (P2, P10, and P16) described below are regarded as scientific attitudes or arguments rather than as scientific postulates:

(i) P2: The choice of hunger as a paradigm for all other motivational states is regarded as problematic. One main reason is that hunger is "different from other motivations in that it has a known somatic base, which is unusual for motivational states" (Maslow, 1970, p.20). In other words, the hunger drive is atypical rather than typical in human motivation.

(ii) P10: "Motivation theory must be anthropocentric rather than animalcentric" (P.27). That is,
the use of animal data as a base for theorizing human nature is debatable.

(iii) P16: The highest capacities of the healthy and strong people should be studied in parallel with those psychologically abnormal ones.

II. The Theory

1. Maslow's Hierarchy of Basic Needs

Maslow (1970) hypothesizes a hierarchy of Basic Needs as follows:

<table>
<thead>
<tr>
<th>Lower Needs</th>
<th>Physiological Needs</th>
<th>Degree of Prepotency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Needs</td>
<td></td>
<td>HIGHEST</td>
</tr>
<tr>
<td>Belongingness and Love Needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Esteem Needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Needs</td>
<td>Self-actualization Needs</td>
<td>LOWEST</td>
</tr>
</tbody>
</table>

A detailed description of the above basic needs by Maslow (1970) is given in Appendix 2.1(B).
Cognitive and Aesthetic Needs

In addition to the above five basic needs, Maslow (1970) also hypothesizes two other needs, namely, cognitive needs and aesthetic needs, of which he says that little knowledge is known. Cognitive needs refer to the desires "to satisfy curiosity, to know, to explain, and to understand" (p.38). He also argues that cognitive needs are similar to the above basic needs in the sense that they are themselves conative. Similarly, the aesthetic needs refer to the needs for beauty. He further elaborates: "The needs for order, for symmetry, for closure, for completion of the act, for system, and for structure may be indiscriminately assigned to either cognitive, conative, or aesthetic, or even to neurotic needs." (p.51)

2. The Emergence of New Needs

According to Maslow (1970), if all the basic needs are unsatisfied and the organism is dominated by physiological needs, then all the other needs are suppressed. On the other hand, if the lower needs are satisfied, higher needs will emerge. In other words, the above five basic needs are arranged in a hierarchy of relative prepotency. However, this does not mean that a need must be "100% satisfied" before another need emerges. (See Section 3.2). Maslow argues that people generally have a higher percentage
of satisfaction in lower needs and a lower percentage of satisfaction in higher needs. He also asserts that the hierarchy of Basic Needs is not necessarily a fixed order for all people. Exceptional cases are possible and "explainable" by other supplementary arguments. For example, some people may value 'self-esteem' as more important than 'love'. Maslow argues that such people are often strong, powerful, self-confident or aggressive. They "seek high esteem and its behaviour expressions more as a means to an end than for its own sake; they seek self-assertion for the sake of love rather than for self-esteem itself." (P.52)

3. The origin of Basic Needs

According to Maslow (1970), all basic needs are supposed to be instinctoid and innately given. That is, they "are in some sense, and to some appreciable degree, constitutional or hereditary in their determination". (P.88)

4. Universality of Basic Needs

Maslow argues that basic needs are "more ultimate, more universal, more basic than the superficial conscious desires, and makes a closer approach to common human characteristics" (p.54-55). In short, Maslow does not claim that basic needs are universal for all cultures.
and that the order of the hierarchy of basic needs is the same for all persons. Instead, he argues that the extent of such universalities is probably the highest in the field of motivational studies.

5. Higher and Lower Needs

The basic needs are divided into two categories: Growth Needs and Deficiency Needs. Growth needs refer to self-actualization needs and deficiency needs to all the others. In addition, Maslow calls those needs with a higher degree of prepotency in the hierarchy as lower needs (e.g. physiological and safety needs) and those with lower degree of prepotency higher needs (e.g. esteem needs and self-actualization needs.) He hypothesizes 16 propositions regarding the differences between higher and lower needs (Maslow, 1970, p.98-100). Only the first two of them are mentioned here, as they are concerned with the developmental aspects of basic needs. First of all, it is argued that the basic needs form a progressive evolutionary developmental pattern. The lower needs precede the higher needs in phyletic or evolutionary development. Maslow (1970) argues that "the higher the need the more specifically human it is" (p.98). Secondly, the basic needs form an ontogenetic developmental pattern with the lower needs developing first. That lower needs will develop in infancy and childhood; higher needs usually appear at a later age.
2.1.2 The Concept of Self-actualization

The concept of self-actualization is one of the central themes of Humanistic Psychology. Broadly speaking, self-actualization means one's desire or tendency to actualize or fulfill one's potential. K. Goldstein (1939) refers one's potential or capacities as one's "nature". He argues that the tendency "to actualize 'itself', is the basic drive, the only drive by which the life of the organism is determined" (p.196). An example of self-actualization given by Goldstein (1939) is the need to complete incomplete actions and the urge to perfection. Goldstein uses the terms "perfection" and "imperfection" in a very broad sense. He argues that the driving force underlying self-actualization "is given in the experience of imperfection - be it thirst, hunger or experience of being able to fulfill any performance which seems to be within our capacities - the goal is the fulfillment of the task". (Goldstein, 1939, p.205)

Inspired by Goldstein's work, Maslow develops a theory of self-actualization, which is the focus of discussion in this section.

Characteristics of Self-actualizing People

Maslow (1970, Chapter 11) proposes 15 characteristics of self-actualizing people. After extensive psycho-historical investigation, he composed a list.
public and historical figures that can be regarded as self-actualizers. Among the list of self-actualizers, there are "2 fairly sure historical figures (Lincoln in his last years and Thomas Jefferson)" and "7 highly probable public and historical figures (Einstein, Eleanor Roosevelt, James Addams, William James, Schweitzer, Aldous Huxley and Spinoza)" (Maslow, 1970, p.152).

In the following paragraphs, Maslow's 15 characteristics of self-actualizing people are summarized into 6 general features. (See also Appendix 2.1(C))

(Abbreviation used: SAP = Self-actualizing Person)

1. SAP as a social being (S1, S2, S5, S10, S13)

SAPs tend to have superior and efficient perception of reality, they have "an unusual ability to detect the spurious, the fake, and the dishonest in personality, and in general to judge people correctly and efficiently" (p.153). In addition, they can accept themselves and others "in the stoic style, with all its shortcomings, with all its discrepancies from the ideal image without feeling real concern." (p.155)

In general, they have deeper and more profound interpersonal relationships with others than non-SAPs. They show more concerns, greater love and more perfect identification. They also have a philosophical, unhostile or positive sense of humour. On the other hand, SAPs
tend to have a need for privacy, a need for detachment, a need for being alone and solitary without causing harm or discomfort to others.

2. SAP as a moral and democratic being (S11, S12)

SAPs are fair, democratic people who always know how to discriminate clearly between means and ends, and between good and evil.

3. SAP as a broad-minded humanistic being (S4, S6, S9, S15)

SAPs tend to show a deeper identification with human species as a whole. They have some mission in life; some tasks that "they must do or want to do". Their missions and tasks are largely concerned with the good of mankind in general. They tend to be more independent of the physical and social environment, that is, more independent of their cultural influences or show a higher degree of autonomy in thought and behaviour.

4. SAP as a creative being (S14)

ALL SAPs are highly creative in one way or the other, for example, in science, music, art, philosophy etc.
5. SAP as a child-hearted being (S3, S7)

SAPs always behave with a high degree of spontaneity, simplicity and naturalness, which are common in young children's behaviour. They have also "the wonderful capacity to appreciate again and again, freshly and naively, the basic goods of life, with awe, pleasure, wonder and even ecstasy ...." (p.163)

6. SAP as a peak experiencer (S8)

Peak experience - moments of self-actualization, states of being or transcendence of the self, is one of the important concepts in Maslow's theory.

Peak experience can be defined as moments during which most of the characteristics described above are experienced more fully. In other words, one feels more open, more creative, more humorous and more ego-transcending during such episodes. In Maslow's words, the SAP "becomes in these episodes more truly himself, more perfectly actualizing his potentialities, closer to the core of his being, more fully human." (Maslow, 1968, p.97). In general, SAPs show a much higher frequency of peak experience than non-SAPs.

According to Maslow, there are two types of SAPs: Transcending and non-Transcending ones. For further discussion, see Section 2.4.1.
Finally, it should be emphasized that SAPs are not entirely perfect people, there are moments during which SAPs are "boring, irritating, petulant, selfish, angry, or depressed." (Maslow, 1970, p.176).

**Self-actualization as a Process of Psychological Growth**

As mentioned before, the self-actualization need can be regarded as a growth need and the process of self-actualization is a process of psychological growth. But how does growth take place? Maslow (1968) argues.  

"Growth takes place when the next step forward is subjectively more delightful, more joyous, more intrinsically satisfying than the previous gratification with which we have become familiar and even bored...." (p.45)

That is to say, growth occurs simply because we subjectively like it to occur or we prefer the next step to the present one. In short, "the new experience validates itself rather than by any outside criterion. It is self-justifying, self-validating." (Maslow, 1968, p.45)

2.13 **Empirical Studies of Maslow's Theory**

I. **Maslow's Hierarchy of Basic Needs.**

An early review by Cofer and Appley (1964) concludes that only the two lower levels of Maslow's Hierarchy,
that is the Physiological and Safety Needs, are clearly supported by empirical evidence (p.684). More recently, in a review of ten factor-analytic and three ranking studies testing Maslow's Hierarchy, Wahba and Bridwell (1976) write,

"This literature review shows that Maslow's Need Hierarchy Theory has received little clear or consistent support from the available research findings. Some of Maslow's propositions are totally rejected, while other receive mixed and questionable support at best."

(p.2.33)

Indeed, there are very few empirical studies which lend support to the whole of Maslow's Hierarchy. Very often, experimental psychologists find difficulties in operationalizing Maslow's five basic needs and tend to regroup them into four or less categories. For example, Graham and Balloun (1973) grouped Maslow's five Basic Needs into four categories: Physiological, Security, Social, and Self-actualization needs and used three different methods of data collection in their study. They found that data collected by two of the three methods used supported Maslow's theory. Studies by Mathes and Edwards (1978) and Mathes (1981) suggest that Maslow's Hierarchy should be reduced to two or three levels or categories. Mathes (1981) suggests that Maslow's Hierarchy should be revised to "contain only three levels - physiological, belongingness, and self-actualization - with security and esteem as superfluous." (p.71) This suggestion is similar to Alderfer's (1972). As a result of little empirical
support for Maslow's Hierarchy, Alderfer (1972) proposes a hierarchy of three needs only: Existence, Relatedness and Growth needs. The theory is called E.R.G. theory. Alderfer (1972) argues that his theory is better than Maslow's theory on empirical grounds (p.53).

More recently, Goebel and Brown (1981) studied Maslow's Hierarchy of Needs by constructing a test called the Life Motivation Scale, which requires subjects to rank statements representing Maslow's five needs (Physiological, Security, Love, Self-esteem and Self-actualization needs). A sample of 111 subjects, aged 9 to 80 years old was used. Dividing the subjects into five age groups (children, adolescents, young adults, middle-aged adults, old adults), an analysis of variance (AGE x SEX) was performed. It was found that there were significant age differences for four needs. On the other hand, the results are said to give limited support to Maslow's Hierarchy as a developmental sequence because they do not show clear-cut and consistent developmental trends.

II. Maslow's concept of self-actualization

Apart from Maslow's own empirical work (see e.g. Maslow, 1970, Chapter 11; 1968, Chapter 6), the other important empirical study of self-actualization is probably Shostrom's (1964) Personal Orientation Inventory (POI). The POI consists of 150 two choice comparative
value judgements. Items were constructed based on the theoretical work of Maslow, Rogers, Fromm, Horney and many others. There are 12 scoring categories or dimensions, which include, for example, (i) Self-actualizing value: "Measures affirmation of a primary value of self-actualizing people" (Shostrom, 1964, p.209) (ii) Self-regard: "Measures affirmation of self because of worth or strength" (p.209) (iii) Self-acceptance. (Measures affirmation or acceptance of self in spite of weakness or deficiencies." (p.209) The measure is claimed to discriminate effectively self-actualizing subjects from non-self-actualizing ones. A large number of researches have been done using this test (See Shostrom, 1980).

One major defect of the POI as a measure of Maslow's concept of self-actualization is that it misses a number of important concepts in Maslow's theory. "For example, the POI fails to sample the ethical component of self-actualization or to reflect some of Maslow's five distinctions between appropriate and inappropriate (or realistic and unrealistic) forms of guilt, spontaneity, nonconformity, disregard for others and the expression of hostility" (Oakland et. al., 1978, p.76). Thus, it is difficult to say to what extent the POI measures Maslow's concept or in technical terms, the construct validity of the POI as a measure of Maslow's concept of self-actualization is probably low.
2.1.4. A Critical Discussion of Maslow's Theory

There are two major defects in Maslow's system:

(i) Vague Concepts

Many important concepts in Maslow's theory are vaguely or loosely defined or constructed. For example, the concept of need itself. Wahba and Bridwell (1976) write,

"It is not clear what is meant by the concept of need. Does need have a psychological and/or physiological base? Does a need come to existence because of deficiency only or does need always exist even if it is gratified? How can we identify, isolate and measure different needs?" (p.234)

Another example is the concept of self-actualization. Maslow likes to use lots of adjectives or loosely defined terms to elaborate a point or to describe a situation. This does not help other psychologists to understand or operationalize his concepts. It sometimes misleads them. Therefore, Cofer and Appley (1964) urge that the prerequisite for further development of the concept of self-actualization "is the formulation of the important ideas in language that is relatively precise." (p.692)

(ii) Problematic empirical methodology

Though Maslow elaborates his concepts in very refined detail, he has not established a scientific
empirical system to test or validate his theory. Very often, the data collected by him act as a source of stimulation for constructing theories rather than as a source of empirical facts testing his theory. This practice leads him to ignore occasionally the scientific strictness of empirical methodology. For example, (i) In a study of peak experience, Maslow (1968) writes, "No one subject reported the full syndrome. I have added together all the partial responses to make a 'perfect' composite syndrome" (p.71). (ii) Maslow's study of self-actualization using a group of historical and public figures as subjects is criticized for selecting a sample of people he admired and "eliminated people with gross pathology - the Dostoyevskis and Van Gogh" (Smith, 1973, p.24). This implies that Maslow's "empirical definition of psychological health or self-actualization thus rests, at root, on his own implicit values that underlie this global judgement." (Smith, 1973, p.24). In other words, the systematic biases in the sampling of his self-actualizing subjects in principle damages the universality of his concepts of self-actualization.

Unless the methodology is greatly improved, it is difficult to construct a scientific theory of man based on Humanistic Psychology in general and Maslow's Theory in particular.

Despite the above shortcomings, Maslow's theory is worthy of intensive study. It is highly original and it helps bridge the gap between philosophy and psychology; ideology and reality. Its influence on current psychologists is broad and profound.
2.2 Human Relationships and Altruism.

The objective of this section is limited to the exploration of a base for the construction of a hierarchy of Human Relationships in terms of altruism. In addition, an overview of different theoretical studies of altruism is also given.

Consider a person A interacting with another person B in a social situation S. It is argued that the moral behaviour of A depends on the relationship between A and B. For example, the probability of carrying out an altruistic act by A to B is much higher if B is the parent of A than if B is a stranger to A in similar social situation S. In other words, some people are more important to A than others. The problem is: who are important and who are not? Why is this so?

2.2.1 The Biological Basis of Human Relationships and Altruism.

Evolutionary theorists and Sociobiologists attempt to answer the problem in terms of natural selection.*

Sociobiology, as defined by Wilson (1975), is "the systematic study of the biological basis of all

* The following key terms relevant to the discussion in this section are explained briefly in Appendix 2.2: Altruism, Genetic Fitness, Genotype, Inclusive Fitness, Natural Selection, Phenotype, Social Evolution.
social behaviour." (P.4) Its central theoretical problem is "how can altruism, which by definition reduced personal fitness, possibly evolve by natural selection?" (Wilson, 1975, p.3) The answer provided by sociobiologists is kinship. In general, sociobiologists argue that

"When any behaviour under study reflects some component of genotype; animals should behave so as to maximize their inclusive fitness. In most cases this is achieved by maximizing the production of successful offspring."

(Barash, 1977, p.63)

The above quoted statements are tentatively called the Central Theorem of Sociobiology by Barash. More explicitly, the evolution of altruism is explained in terms of group selection, kin selection, parental manipulation and the development of reciprocal altruism.

(1) Group Selection and Kin Selection

The concepts of group selection and kin selection were originated by Charles Darwin in "The Origin of Species" for the explanation of the evolution of sterile workers castes of insect societies. If the sterile insects contribute significantly to the welfare of the fertile insects, then natural selection at the group level is possible and probably inevitable. If the group is a family, the selection is called kin selection. The concept of kin selection is often regarded as a more acceptable view than that of group selection "because of the
greater commonality of genetic makeup among close relatives" (Staub, 1978, p.27). According to Wilson (1978), "the closer the genetic relationship of the members of a group, the more stable and intricate the social bonds of its members." (p.73) In addition, sociobiologists also argue that the concept of kinship can be applied to all species. (Barash, 1977, p.85)

A central concept of kin selection is established by Hamilton (1964).

Consider a person A carrying out an altruistic act to another person B.

Define

\[ k = \frac{\text{Recipient B's benefit}}{\text{Altruist A's cost}} \]

\[ r = \text{Coefficient of relationship between altruist A and recipient B, summed for all recipients} \]

\[ = \text{Proportion of genes in A and B that are identical because of common descent.} \]

(For further explanation of r, see e.g., Wilson (1975) p.74-75; Barash (1977), p.85-87).

Hamilton argues that the genes for altruistic behaviour will be selected if \[ k > \frac{1}{r}. \]

Suppose B is a brother of A, that is \( r = \frac{1}{2} \), half of B's genes are identical to A by common descent,
and therefore $k > 2$. Suppose in extreme case the altruistic act causes $A$ to leave no offspring but the act "more than doubles the brother's personal representation in the next generation, it will ipso facto increase the one-half of the genes identical to those in the altruist, and the altruist will actually have gained representation in the next generation." (Wilson, 1975, p.118) In other words, the genes of the altruist $A$ is selected at family level. That is, altruistic behaviour in such cases is favoured in terms of natural selection because the inclusive fitness is increased rather than decreased.

The following table 2(A) is constructed based on Hardin (1977, p.13) and Barash (1977, p.316).

(2) Parental Manipulation

Consider an example given by Ruse (1979, p.47). A parent has five children; it is impossible for all of them to survive. However, if the parent tries to manipulate one of the children to act as an altruist who will eventually be self-sacrificed for the benefit of the other four children, then all the other four will survive. Sociobiologists claim that genes causing such parental manipulation are strongly favoured by natural selection. (see e.g., Barash, 1977, p.95; Alexander, 1974).

Kin Selection and Parental Manipulation are similar, however, there is a major difference between them. In Kin
**TABLE 2(A): Genetic Basis of Kin Altruism.**
(Source: Hardin (1977) and Barash (1977))

<table>
<thead>
<tr>
<th>Social Relationships in Primitive Human Cultures</th>
<th>Relationships</th>
<th>r</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td>Self; identical twins, members of same clone</td>
<td>1</td>
<td>GREATER</td>
</tr>
<tr>
<td>Identified Relatives</td>
<td>Parent and child; full sibs</td>
<td>1/2</td>
<td><em>Genetic relatedness</em></td>
</tr>
<tr>
<td></td>
<td>Grandparent and child; half sibs; uncle and nephew; aunt &amp; niece; double first cousins</td>
<td>1/4</td>
<td><em>Likelihood of reciprocation</em></td>
</tr>
<tr>
<td>Village members</td>
<td>First cousins</td>
<td>1/8</td>
<td><em>Power of group and/or kin selection</em></td>
</tr>
<tr>
<td>Tribe members</td>
<td>&quot;Unrelated&quot; members of the same species</td>
<td>Less than 1/4 and slightly greater than 0</td>
<td></td>
</tr>
<tr>
<td>Different tribes</td>
<td>Members of different species</td>
<td>Nearly 0</td>
<td>LESS</td>
</tr>
</tbody>
</table>

**Notes:**

1. r is the coefficient of relationship mentioned above. It is also referred as "Genetic kinship" by Hardin (1977, p.13).

2. It is obvious that no two members in the same species "can be absolutely unrelated", therefore the value of r for "unrelated" members of the same species is nearly but not exactly zero. (Barash, 1977, p.85)

3. Clone is defined as "A population of individuals all derived asexually from the same single parent". (Wilson, 1975, p.581)
Selection, a person A helps another person B because they are related, that is, B will pass on to the next generation the genes identical to those of A. On the other hand, in Parental Manipulation, A helps B because A is manipulated by his/her parent C to do so.

(3) Reciprocal Altruism

According to Trivers (1971), reciprocal altruism can be selected even when the recipient is not closely related with the altruist. That is, Kin Selection is not applicable in this case. In addition, sociobiologists argue that reciprocal altruism can operate between members of different species. Reciprocal altruism is selected if the performance of altruistic behaviour results in "a return of altruistic behaviour towards the original altruist such that the ultimate benefit in units of inclusive fitness is greater than the cost." (Barash, 1977, p.94) Consider a hypothetical example given by Trivers (1971, p.190):

A person X is drowning and another person Y is going to rescue X.

Chance of X being drowned to death = 1/2
Chance of Y being drowned to death if he tries to rescue X = 1/20

Suppose, in the later time, Y is drowning and X reciprocates, and suppose the risks of drowning remain the same, then it will benefit both of them if they play the role of rescuers because, with
reciprocal altruism, each of them reduces the chance of being drowned to death from $\frac{1}{2}$ to $\frac{1}{20} \times 2 = \frac{1}{10}$.

"A population at large that enters into a series of such moral obligations, that is, reciprocally altruistic acts will be a population of individuals with generally increased genetic fitness." (Wilson, 1975, p.120)

Similarly, the concept of reciprocal altruism can also be applied to explain one's general tendency to like others and to form friendships with those one likes. Trivers (1971) also argues, "Selection will favour liking those who are themselves altruistic" (p.213)

Strictly speaking, reciprocal altruism cannot be regarded as a kind of altruism similar to that involved in Kin Selection and Parental Manipulation because it is basically selfish.

The Debate of Sociobiology

As usual, any study of man is controversial; Sociobiology is no exception. There are numerous criticisms of sociobiology by anthropologists, psychologists and philosophers of different schools of thought. (see e.g., Montagu (Ed.) (1980, particularly the introduction by Montagu, p.3-14); Campbell (1975); Ruse (1979, particularly Chapter 9: Sociobiology and Ethics); Freedman (1979, particularly the first and last chapters); Caplan (Ed.)
(1978, particularly the debate between Marxists and Wilson, p.259-269 and p.280-303, and Ruse's paper, p. 355-375); Wilson (1975, particularly chapter 27: Man: From Sociobiology to Sociology); Wilson (1978)).

The debate (nature vs nurture or biology vs culture) is complex. In the following paragraphs, the claim of sociobiologists and the objections given by Montagu (1980) and Campbell are discussed briefly.

Sociobiologists claim that human social behaviour is genetically determined. (Wilson, 1978, p.19). Wilson (1978) writes:

"Can the cultural evolution of higher ethical values gain a direction and momentum of its own and completely replace genetic evolution? I (E.O. Wilson) think not. The genes hold culture on a leash. The leash is very long, but inevitably values will be constrained in accordance with their effects on the human gene pool."

(p.167)

Higher ethical values refer to, for example, Kohlberg's Stage 6 thinking. In short, Wilson (1975) argues that it is the right time to attempt to biologicize ethics now. (p.562)

Many anthropologists (see e.g., Montagu (Ed.) (1980); Sahlin, 1976; Cohen, 1972) disagree strongly with the sociobiologists' claim. Montagu (1980) argues that it is true
that human social behaviour has a genetic base but this does not mean that such behaviour is genetically determined. He also argues that the behaviour of an organism is developed through the interaction between the organism and environment and not between the genes and environment. "In short, it is the action of the environment upon the organism that influences and makes possible the functional expression of the genes." (Montagu, 1980, p.11)

In a study of intergroup conflict and altruistic behaviour, psychologist Campbell (1965) argued that an external threat to a society increases its ingroup solidarity and individuals' "ethnocentric self-sacrificial loyalty" and that the origins of altruism are based on both biological and sociocultural evolution. Later on, Campbell (1972, 1975) changed his original argument and proposed that human social behaviour is culturally determined rather than biologically determined. He argues that sociobiology explains altruism in humankind at a level which is "below the biosocial optimum, the level functionally adequate for society." (Staub, 1978, p.32) Campbell (1975) writes:

"Social evolution has had to counter individual selfish tendencies which biological evolution has continued to select as a result of the genetic competition among the cooperators." (p.1115)
On the other hand, a number of researchers (see e.g. Durham, 1978; Freedman, 1979) propose that human social behaviour is both biologically and culturally determined. In other words, they believe that the base of altruism is both biological (or genetic) evolution and social (or cultural or sociocultural) evolution.

2.2.2 The Psychological Study of Altruism and Human Relationships.

The study of altruism in psychology is quite extensive (see e.g., Wispe, Rosenhan and Bryan (Ed.), 1972; Macaulay and Berkowitz (Ed.), 1970; Krebs, 1970; Staub, 1978, 1979; Bar-Tal, 1976).

The psychoanalytic theorists attempt to explain altruistic behaviour in terms of attachment. It is argued that man has a strong tendency to form "deep and long-lasting attachments" (Wright, 1971, p.129) which greatly intensify altruistic tendencies. On the other hand, behaviourists argue that altruism is a habit or a product of social conformity, which is learned by conditioning process. Social leaning theorists (Aronfreed, 1968, 1969; Rosenhan, 1969; Rosenhan and London, 1968) explain altruistic acts in terms of modelling, positive experience and observational learning.

Recent works include the study of the development of empathy and altruistic motivation (Hoffman, 1976, 1977,
1978, 1979; see also reviews in Deutsch and Madle, 1975; Shantz, 1975). On the other hand, empirical psychological studies testing part of or the whole of the theory of Human Relationships or kin altruism (see Table 2(A)) as postulated by sociobiologists are not many. In general, these studies deal with a small part of the hierarchy (see e.g., Sawyer, 1966; Ma, 1980; reports in Freedman, 1979).

I. Theoretical Studies of Altruism

Basically, there are four major theoretical approaches in the study of altruism: (1) The origins of altruism: Biology vs Culture (see Section 2.2.1) (2) Social Exchange Theory. (3) Normative Approach (4) Emotional or Empathic Approach. The following discussion gives an overview of the last three approaches.

Social Exchange Theory

Social exchange is defined by Blau (1964) to be the "voluntary actions of individuals that are motivated by the returns they are expected to bring and typically do in fact bring from others." (p.91) Exchange theorists (Blau, 1964; Homans, 1961, 1968; Thibaut and Kelley, 1959) argue that when people interact, they tend to reciprocate with one another in a way so as to maximize rewards and minimize costs. In other words, altruism is a means
for future rewards or it is a type of "social investment."
On the other hand, Homans (1961) argues that if altruism forms part of one's value, one may gain self-satisfaction by acting altruistically. In this case, the reward is self-satisfaction and the cost is self-sacrifice or loss in the altruistic act. Homans (1961) writes, "so long as men's values are altruistic, they can take a profit in altruism too" (p. 79).

It can be argued that the social exchange theory in psychology and Trivers' theory of reciprocal altruism in sociobiology are quite similar in basic concepts; or to put it in another way, Trivers' theory can be said to form a genetic or biological basis for the Social Exchange theory.

**Normative Approach**

Social norms can be defined as "a set of expectations members of a group hold concerning how one ought to behave". (Bar-Tal, 1976, p. 42) Psychologist and sociologists have attempted to explain prosocial and altruistic behaviour by different social norms. Some of the major ones are briefly described as follows:

(1) Norm of Reciprocity

Gouldner (1960) argues that there is a norm of reciprocity which is universal and can be found in all
value systems. The norm of reciprocity is generally postulated to be: "(1) people should help those who have helped them, and (2) people should not injure those who have helped them." (Gouldner, 1960, p.171). In an experimental study, Wilke and Lanzetta (1970) found that "The amount of reciprocated help is a monotonic increasing function of the amount of prior help", which supports Gouldner (1960) and exchange theorists' models.

(2) Norm of Giving

In contrast with Gouldner's norm of reciprocity, Leeds (1963) proposes a norm of giving which takes into account of those people who may not be able to reciprocate, for example, "the very young, the very old and the very sick" (p.229). The norm of giving is a norm of altruism. According to Leeds (1963), it consists of three criteria (See also Appendix 2.2(A)) (i) The giver must treat the act of giving as an end in itself. That is, the giver must not expect rewards in future, (ii) The act is a voluntary one, (iii) The act "is doing good" (p.230-231).

(3) Norm of Social Responsibility

A major proponent of the Normative Approach is Berkowitz (1972; Berkowitz and Daniels, 1963, 1964)) who suggests that there exists a norm of social responsibility
which prescribe people "to aid those who are dependent upon them" (Berkowitz, 1972, p.68) In addition, people help others "not for tangible gains or social approval, but supposedly primarily for approval from themselves". (p.68) In other words, if they do not offer the help, they would have a feeling of guilty and dissonance because they violate the norms of social responsibility which is supposed to be part of their own moral code.

(4) Personal Norms

Schwartz (1973, 1977) proposes a theory of personal norms. The term "personal norms" refers to "the self-expectations for specific action in particular situations that are constructed by the individual". (Schwartz, 1977, p.227) The personal norms are closely related to the self-concept. If one acts against one's personal norms, one would feel self-depreciated and of course guilty too. According to Schwartz's theory, whether one would act altruistically in some specific situations would depend on "the intensity of moral (personal) obligation" (Schwartz, 1977, p.227). The feelings of such moral obligation may be generated "by the activation of the individual's cognitive structure of norms and values". Or "may be neutralized prior to overt action by defenses against the relevance or appropriateness of the obligation" (p.227)

A strong criticism of the Normative Approach is made by Darley and Latane (1970). According to this
critique, one major defect of the Normative approach is that it attempts to explain social behaviour by a number of different norms; "this diversity of norms seriously weakens their explanatory usefulness" (Darley and Latane, 1970, p.85) because almost any kind of behaviour can be regarded as normative - if it does not fit norm A, it would fit Norm B or some other norm. Another difficulty is that some norms appear to contradict one another and are often vague. (p.85-87) In addition, empirical studies do not always support the Normative Theory. In short, it is argued that altruistic or prosocial behaviour "is too complexly determined by situational factors to be accounted for by norms." (p.99)

Schwartz theory of personal norms can be said to be an attempt to overcome some of the major difficulties described by Darley and Latane. Further study is required for justification of Schwartz's approach.

Emotional or Empathic Approach

The emotional aspect of altruistic behaviour has generated lots of interests among psychologists (see e.g., review in Deutsch and Madle, 1975; Shantz, 1975; Hoffman, 1976). On the other hand, very few psychologists attempt to present a developmental theory of empathy. M.L.Hoffman (1976, 1978, 1979) is an exception. Hoffman's developmental theory postulates four hypothetical levels of
empathic response based on the cognitive development of a sense of the other by the child. According to Hoffman (1976), empathy is defined as "the involuntary, at times forceful, experiencing of another person's emotional state". (p.126) The following table 2(B) summarizes the essential points of Hoffman's theory. Selman's Social Perspective Stages are included for reference.

Very few empirical researches testing directly Hoffman's theory have been carried out. Thompson and Hoffman (1980) using semiprojective stories in the study of the development of guilt in children report that their results provide modest support for Hoffman's theory. On the other hand, Hoffman is regarded as having taken "a giant stride" in integrating the cognitive and affective aspects of empathy and altruism into a theoretical model. (Lickona, 1976, p.20)

II. Sex and Age Differences in Empathy and Altruism

Apart from the cognitive factor studies in, for example, Hoffman's theory of Empathy and Schwartz's theory of Personal Norms, individual differences in empathy and altruism can also be accounted for by sex, age, social class, personality etc. (see e.g. Krebs, 1970) In the following paragraphs, we describe briefly the sex and age differences.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Approximate age range</th>
<th>Development of a sense of the other (social role-taking)</th>
<th>Development of Empathy</th>
<th>Illustrative Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-1 year</td>
<td>Unable to differentiate between self and other</td>
<td>Unclear who is actually in distress; behave as though &quot;what is happening to the other is happening to them&quot; (Hoffman, 1978, p.182)</td>
<td>&quot;an 11-month-old girl, on seeing a child fall and cry, looked like she was about to cry herself and then put her thumb in her mouth and buried her head in her mother's lap, which is what she does when she is hurt&quot;. (Hoffman, 1979, p.962-963).</td>
</tr>
<tr>
<td>2</td>
<td>1-2 year</td>
<td>Person-Permanence; able to distinguish other as a physical entity</td>
<td>aware that it is the other person and not the self is in distress, however, no awareness of the other person</td>
<td>&quot;an 18-month-old boy fetched his own mother to comfort a crying friend, although the friend's mother was also present (Hoffman, 1979, p.963)</td>
</tr>
<tr>
<td>3</td>
<td>2 years to middle childhood</td>
<td>aware that other person's thought and feeling may be different from the self's; the</td>
<td>aware that the real world may be different from their perception and that other's inner states</td>
<td>&quot;By about 4 years most children respond with appropriate affect and can recognize...&quot;</td>
</tr>
<tr>
<td>Stage</td>
<td>Approximate age range</td>
<td>Development of a sense of the other (social role-taking)</td>
<td>Development of Empathy</td>
<td>Illustrative Examples</td>
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<tr>
<td>-------</td>
<td>-----------------------</td>
<td>-------------------------------------------------------</td>
<td>------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>4</td>
<td>Middle-childhood to Late childhood</td>
<td>early stage of role-taking (Approximately Selman's stage 0 &amp; 1*)</td>
<td>are independent of theirs; able to project their feelings to others or to imagine themselves in the other's position.</td>
<td>signs of happiness or sadness in others in simple situations&quot; (Hoffman, 1978, p.183)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>aware of self and others being different persons with their own histories and identities (Approximately Selman's Stage 2 &amp; 3)</td>
<td>able to &quot;respond empathically not only to others' transitory, situation-specific distress but also to what they imagine to be other's general condition&quot; (Hoffman, 1978, p.184)</td>
<td>Children at this stage may show more intensified empathic response to the chronic rather than transitory distress of another person.</td>
</tr>
</tbody>
</table>

*See Appendix 1(A)
(1) Sex differences

According to a review by Krebs (1970), most of the studies found no sex differences in altruism. Among the 12 studies which did find sex differences in altruism, as reviewed by Krebs, 5 of them favoured males and 7 of them favoured females. Similarly, Maccoby and Jacklin (1974) in a review of about 30 studies conclude that their "survey of research on attachment, affiliation, and positive interactions of all kinds has shown surprisingly little sex differentiation". (p.225) However, Hoffman (1977) in a review of studies on sex differences in empathy (vicarious affective arousal) found that all of them showed sex differences in favour of females. Hoffman (1977) suggests that this may due to the fact that females show greater tendency to imagine themselves in other's position while the males tend "to act rather than feel, even in the situations that call for feeling". (p.720). In addition, Hoffman and Levine (1976) argue that most of the studies reviewed by Maccoby and Jacklin (1974) used measures which are predominantly cognitive, for example, "judgements of other's feelings in different situations; communicative egocentrism" (p.558) They found that studies using affective empathy index did show sex differences in favour of girls.
(2) Age Differences

According to Krebs' (1970) review, studies comparing the incidence of altruism in children showed age differences. Because different studies used different tasks; explored different dependent variables and did not base their studies on a general school of thought, comparisons of different studies are often difficult and problematic. Nevertheless, most of these studies showed that older children tended to exhibit a larger number of incidences of altruism than the younger one.

Based on Krebs' (1970) review, we attempt to plot the results of three of the studies on the following graph:

Figure 2.1. Age Differences in Altruism

In addition, as mentioned before, Thompson and Hoffman (1980) found some developmental changes in children's reasons for guilt. They reported that "older
children exhibited more concern for the victim's welfare" (p.156) and more frequent use of internal justice principle whereas younger children paid more attention to detection and punishment.

III. Empirical Studies of Human Relationships or Kin Altruism.

As mentioned at the beginning of this section, there are very few psychological studies testing sociobiologists' theory of Human Relationships or kin altruism. We propose to call sociobiologists' theory, the theory of Human Relationships, because with Trivers' theory of reciprocal altruism, sociobiologists' theory can be generalized to deal with all human social interaction and hence involves all human relationships in general, kin altruism in particular.

In the following paragraphs, three relevant empirical studies of human relationships are described, two of them are unpublished.

(1) Sawyer (1966)

Sawyer (1966) established an altruism scale which "assesses the value one places upon the welfare of another in relation to his own". (p.407) He used two hypothetical situations and asked the subjects either to rank
their preferences for various outcomes for themselves and for the other or to estimate its value on a scale from -1.0 to +1.0 or both.

One hypothetical situation is to ask the subject to imagine that he/she and another student were attending a university course for credit. The assessment of the course is in terms of the grades A, B or C. The subject is asked (i) to indicate his/her preference for each of the combinations of grades for himself/herself and the other student (i.e. both A; self A, other B; self A, other C etc) and (ii) to estimate a value from -1.0 to +1.0 by tenths (e.g. +1.0: "I am equally interested in how good his grade is and in how good my grade is"; +0.5: "I am half as interested in how good his grade is as I am in how good my grade is" (p.412) etc.). The first measure is called preference Ranking and the second one the direct Scale Estimation. The Other Person is first supposed to be one of the subject's best friends; and then is altered to be a stranger and finally an antagonist.

Using a formula hypothesized by him, Sawyer calculated an index "a", which he called the measure of relative altruism (ranging from -1.0 to +1.0), from the subject's preference rankings. Multiplying "a" by 100 will give the "altruism value" of the subject by preference ranking method. Similarly, multiplying the value obtained by the Direct Scale Estimation will give another "altruism value" of the subject. An average of these two altruism values is called the "mean altruism" of the subject. Using 3
college groups (N = 122), Sawyer found that the mean altruism toward friend, stranger and antagonist is as follows: Friend (45); Stranger (12); and antagonist (-18).

Thus the result provides some support to the Sociobiologists' claim.

(2) Sebastian (1973)

In a study examining Trivers' theory of kin and non kin altruistic behaviour, Sebastian (1973; reported in Freedman, 1979, p.114-115 and p.208) used one of Kohlberg's story: "Heinz and the drug" with an alternation of the relationship between Heinz and the woman from Husband-Wife to (i) father-daughter and (ii) friends. 33 eighth grade children were tested. 79% of the subjects justified the stealing for case (i) and only 55% for case (ii). In addition it was found that subjects "felt stealing a lifesaving drug for a relative was morally justified, whereas a similar theft for a nonrelative was morally wrong" (reported in Freedman, 1979, p.114). It is argued that "with kin, the primary issue was saving a life; with nonkin, more often the issue was stealing" (In Freedman, 1979, p.208).

It is worthwhile to remark here that Freedman (1979, p.113-115; p.208-210 (Study No.46, 47 and 49) reported a number of unpublished studies done by university students on kinship and human relationships. Almost all these
studies provide substantial support for sociobiologists' claim of kin altruism.

(3) Ma (1980)

Ma (1980) attempted to study the differences between the first-person (self) and third-person (other) views of moral judgment by constructing a Moral Consistency Test based on five of the Kohlberg's Moral Dilemmas. The test consists of 23 questions, two of them are relevant to our discussion here. The questions are concerned with the story "Heinz (Philip) and the Drug" (For the content of the story, see Appendix 5(D)) (In Ma's study, the name Heinz was changed to Philip for the English Sample) and are as follows:

1. Suppose you were Philip. Would you break into the shop to steal the drug for your wife?

2. Suppose you were Philip and it was not your wife who was dying of cancer but it was someone listed below, would you break into the shop to steal the drug?

   (i) Your father/mother
   (ii) Your best friend
   (iii) A stranger.

Subjects are asked to rate on a 7-point scale ranging from Definitely YES to Definitely NO.

78 Chinese students in Hong Kong and 213 English students in London participated in the study. All of them were either fourth formers or sixth formers. Assuming
1 = Definitely YES, 2 = Strongly YES, 3 = Moderately YES, 4 = Can't Decide, 5 = Moderately NO, 6 = Strongly NO, 7 = Definitely NO, the results are as follows:

**TABLE 2(C)**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Relationship</th>
<th>Chinese Mean</th>
<th>(N = 78) Standard Deviation</th>
<th>English Mean</th>
<th>(N = 213) Standard Deviation</th>
<th>t-test between means</th>
<th>(signif.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wife</td>
<td>2.026</td>
<td>1.571</td>
<td>2.155</td>
<td>1.616</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(i)</td>
<td>Father/mother</td>
<td>1.949</td>
<td>1.115</td>
<td>2.061</td>
<td>1.614</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(ii)</td>
<td>Best friend</td>
<td>2.923</td>
<td>1.689</td>
<td>3.075</td>
<td>1.800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(iii)</td>
<td>Stranger</td>
<td>5.654</td>
<td>1.634</td>
<td>5.089</td>
<td>1.821</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

*Significant at 5% level.

Average rating

![Graph showing average ratings for different relationships.]

**Figure 2.2. A Cross-cultural Study of Human Relationships**

The results provide quite strong support for sociobiologists' claims of kin altruism.
2.3. Structure of Moral Judgment*

The study of moral judgment is probably the most popular research topic in the field of moral development. A number of theories have been proposed (see e.g., Piaget (1923), Kohlberg (1958, 1969, 1971, 1976, 1980), Bull (1969), Garbarino and Bronfenbrenner (1976)). The study of social cognition is also relevant in this case, see e.g., Damon (ed.) (1978b), Selman (1975, 1976), Lewis and Brooks-Gunn (1979).

The major objective of this section is to review the Cognitive Developmental Theory of Morality, which forms a basis of the theory established in the next Chapter. Thus, the discussion here is mainly concerned with Piaget, Kohlberg and Rest's work.

Although the major influence on the Cognitive Developmental Approach has been the early work of Piaget (1932), this approach has roots in the work of the theorists Durkheim (1925), M. Paul Fauconnet and M. Pierre Bovet (See Piaget, 1932, Chapter 4). Also, J. Dewey (1930, 1932) with his theory of conduct and experience, G.H. Mead (1934) with his theory of role-taking, J. Loevinger (1966) with her theory of ego development and J. Rawls (1971)

* This section is an extensively revised version of Chapter 3 of the writer's M.A. dissertation (Ma, 1980). Some long paragraphs which are slightly revised are put in Appendix 2.3 in order to save space here.
with his theory of justice have influenced more recent theoretical development by Kohlberg (1976, 1980) and Rest (1979b, in press). A forgotten pioneer in this field is Baldwin (1906a, 1906b) whose theory of genetic epistemology is fundamental and significant (see also Russell, 1978).

Other psychologists using the concept of stage in the study of moral development and behaviour are e.g. Hobhouse (1906), McDougall (1908), Peck and Havighurst (1960) and Kay (1970).

2.3.1 Basic Assumptions.

I. Basic Assumptions of Piaget's Theory

Piaget's theory of cognitive development forms a basic foundation for the Cognitive Developmental Theory of Morality. It is fair to say that the former is the mother-theory of the latter one. A set of assumptions of Piaget's theory of Cognitive Development is given in Appendix 2.3(A). Further details of Piaget's assumptions can be found in Brainerd (1978, Chapter 2), Flavell (1963, Chapter 1 & 2) and Piaget (1953, Chapters 1-3; 1971). A review of some major arguments on Piaget's basic assumptions is presented in Vuyk (1981, Chapters 12 and 23). A recent elaborated critique of Piaget's theory is given by Broughton (1981) in a series of five articles.
II. The Concept of Stage

The stage concept is one of the core concepts in Cognitive Developmental Approach. The characteristics of cognitive stages are summarized in Appendix 2.3(B). Further details can be found in Piaget (1971, p.16-18), and Kohlberg (1976, p.47).

In addition, there are two other important features of Piaget's concept of stage: (1) Preparation and achievement periods and (2) Horizontal and Vertical decalages (See e.g. Flavell, 1963, p.21-23; Brainerd, 1978, p.34-37).

Simply speaking, in the preparation period of any stage, the structures and content characteristics defining that stage are in the process of formation and organization and therefore are unstable. In the achievement period, these structures are developed fully and exist as the stable structure d'ensemble.

According to Brainerd (1978),

"in its most basic sense, decalage is simply a name for any invariant sequence between cognitive contents such that one content always appears earlier than the other" (p.36)

Horizontal decalages occur within stages and vertical decalages occur between stages. Specifically speaking, horizontal decalages "refer to invariant sequences in
two or more versions of a single cognitive content" and vertical decalages refer to "an invariant sequence between two different contents and the contents belong to different stages". (Brainerd, 1978, p.36). In general, different cognitive contents usually correspond to different levels of cognitive functionings. An example of horizontal decalage is the series of concepts of conservation. It is found that children tend to attain the concept of conservation of mass before conservation of weight (See e.g. Flavell, 1963, p.298-299). An example of vertical decalage is given by Flavell (1963, p.23) as follows: a child late in the sensory-motor period can move efficiently from A to B to C and then back to A, but it will be several years later before he can represent the above spatial relationships symbolically. In the two cases, namely the motor action and symbolic representation of the immediate surrounding, "there are clear similarities in the reality content and in the formal cognitive organization" (Flavell, 1963, p.23) but they are developed in different ages and stages.

III. Basic Assumptions of Cognitive Developmental Theory of Morality.

According to Kohlberg, moral judgment develops stage by stage. All the basic features of cognitive stage mentioned above also apply to moral stages. In addition, Kohlberg also postulates the following assumptions (Colby et al. 1979(I) p.2-3; Kohlberg, 1969, p.348-349; Kohlberg,
(1) Cognitive judgment is a component of moral action.

(2) Affective and cognitive aspects of moral development are parallel and inter-related. "They represent different perspectives and contexts in defining structural change" (Kohlberg, 1969, p.349)

(3) The basic motivation for moral development is a motivation for self-actualization, rather than for satisfying biological and safe needs.

(4) Major aspects of moral development are the same for all persons and cultures, "because all cultures have common sources of social interaction, role taking, and social conflict, which require moral integration". (Kohlberg, 1976, p.48).

(5) There exists a fundamental whole of personality organisation and ego or self development. "While there are various strands of social development (psychosexual development, moral development, etc.), these strands are united by their common reference to a single concept of self in a single social world". (Colby, et al. 1979(I), p.2)

(6) The formation of moral structures arises through one's experiences of role-taking or social interaction. Moral stage is characterised by the structures of interaction between the self and others.

(7) Environmental influences refer to the general pattern of cognitive and social stimulations
available to the child over the whole period of
his development, rather than some specific exper-
ences with his parents or other persons.

(8) Social or ego development is directed toward "an
equilibrium or reciprocity between the self's
actions and those of others toward the self".
(Colby et al. 1979(I), p.3). The most stable form
of equilibrium is characterised by Kohlberg's stage six
that is, the principle of justice.

IV. Two Stage Models of Moral Judgment

The following discussion attempts to outline the
main features of the two stage models of Moral Judgment
proposed by Rest (1979, Chapter 3). In order to simplify
the following discussion, mathematical expressions are
used as far as possible.

Let (1) \( S_i \) (i=1,2,3,...n) represent a set of
theoretical stages or types of moral judg-
ment hypothesized. \( S_n \) represents the highest
stage defined.

(2) \( P_i \) (i=1,2,3,...n) represent the probability
(or percentage, if multiplied by 100) of
using \( S_i \) by a subject. Thus \( 0 \leq P_i \leq 1 \) for
all i.

(3) \( T_k \) (k=1,2,3,...)represent the age (in years),
or the mean age of a certain time period
under consideration, of the subject, and
\( T_{k+1} > T_k \).
(A) Simple Stage Model

Using the above notation, Rest's (1979b, p.52-54) notion of the Simple Stage Model can be described as follows:

The developmental assessment (D) of a person's level of moral judgment is given by either $P_i$ or $(P_i, P_{i+1})$. That is, for a person of $T_k$ years old,

$$D(T_k) = P_i S_i + P_{i+1} S_{i+1}$$

with

(i) $1 \leq i \leq (n-1)$

(ii) $P_i + P_{i+1} = 1$

(iii) $0 \leq P_i \leq 1$

(iv) $S_i$ varies linearly with $T_k$ (i.e. $S_i$ increases linearly with, or is constant of, or decreases linearly with $T_k$ as $k$ increases)

A graphic representation of the Simple Stage Model given by Rest (1979b, Figure 3.1) is reproduced in Appendix 2.3(C).

It is argued that Kohlberg's measurement is based on this Simple Stage Model and that a number of empirical inconsistencies are found, for example, subject fluctuation. Rest (1979b) argues that although the test-retest reliability of Kohlberg's new scoring system: Standard Issue Scoring System (See Colby et al., 1979) is extraordinary
high (0.90s) (See also Colby et. al, in press, Table 7), about 30% of the subjects show changes in their major/minor stage scores over a two-week period. He concludes that "subjects are not simply "in" one moral stage or another, but fluctuate within a developmental range". (p.55). For details of other kinds of empirical inconsistencies, see Rest (1979b, p.55-63).

(B) Complex Stage Model

The "all or none" view or "the step by step development through the stages" argument of the Simple Stage Model is criticized as being inadequate and sometimes inconsistent on account of the evidence from empirical data. Rest (1979b) writes,

"The question of developmental assessment should not be, "what stage is a person in?" but rather, "To what extent and under what conditions does a person manifest the various types of organisations of thinking?"" (p.63)

In other words, developmental assessment should be probabilistic. This is exactly the main feature of the Complex Stage Model proposed by Rest (1979b, p.63-67).

Without loss of generality, assume that there are five theoretical stages which are called 'Types' by Rest (1979b, p.65), $S_1$ to $S_5$. 


The developmental assessment of a subject's level of moral judgment is given by

\[ D(T_k) = P_1 S_1 + P_2 S_2 + P_3 S_3 + P_4 S_4 + P_5 S_5 = \sum_{i=1}^{5} P_i S_i \]

with (i) \( P_1 + P_2 + P_3 + P_4 + P_5 = 1 \)

(ii) \( 0 < P_i < 1 \) for all \( i \)

(iii) \( S_i \) varies non-linearly with \( T_k \) as \( k \) increases.

An illustrative graphic representation of the Complex Stage Model given by Rest (1979b, Figure 3.2) is reproduced in Appendix 2.3(C).

It is obvious that the Complex Stage Model gives more precise and detailed information about a subject's level of moral judgment and Rest's DIT research is based on this model. Simply speaking, the Complex Stage Model tends to sketch out the refined details of a subject's whole pattern of moral judgment while the Simple Stage Model only deals with a subject's dominating stage or type of moral judgment. More research is required in order to justify the efficient and useful application of the Complex Stage Model in the field of Moral Development.

(It is noted here that the theoretical stages or types of moral judgment, \( S_i \) used in Rest's (1979b) discussion are explicitly and implicitly assumed to vary with \( T_k \) or \( D(T_k) \) or 'Development' in Rest's figures. This is indeed a major drawback of the Complex Stage...
Model because it means that the $S_i$ curves shown in Rest (1979b, Figure 3.2) are dependent on the characteristics of the sample used, or broadly speaking on the general social, cultural and educational background of the sample used.)

2.3.2 Piaget's Theory of Moral Judgment.

An early influential work in the field of moral development is Piaget's (1932) book: The Moral Judgment of the Child. In his book, Piaget set up a research paradigm in the study of children's structure of moral judgment. As usual, Piaget employed the clinical interview technique in this empirical study. Children were first read a story or a pair of stories about moral events involving other children and then were asked a few questions based on the stories.

According to Piaget, two major stages of moral judgment can be identified. The earlier stage which occurs before the age of seven or eight is called Heteronomy, Moral realism, or a morality of constraints. The later stage is called Autonomy or a morality of cooperation.

The studies of Piaget generated a great deal of research on moral judgment, which led to the establishment of the cognitive developmental theory of morality. On the other hand, his research also receive criticism.
One major criticism is that Piaget ignores the affective or non-cognitive aspects of moral development. This major defect of Piaget's theory was, however, explicitly acknowledged by him in the foreword of his book (1932):

"Readers will find in this book no direct analysis of child morality as it is practised in home and school life or in children's societies. It is the moral judgment that we propose to investigate, not moral behaviour or sentiments".

Generally speaking, most psychologists (e.g. Bull, 1969, p.151; Bloom, 1959, p.11; Wright, 1971, p.153) agree that Piaget's contribution is significant and outstanding.

For a complete and elaborated discussion of Piaget's theory of moral judgment and criticisms on Piaget's theory, see Appendix 2.3(D).

2.3.3 Kohlberg's Theory of Moral Development.

I. A Six-stage Theory of Moral Judgment

Based on Piaget's work, Kohlberg constructs an elaborated and well-known theory of moral development. He postulates a sequence of six distinct moral stages, which is invariant for all persons and cultures. Although, Kohlberg's theory is widely referred to as a theory of moral development, "it is more properly a description of the development of moral judgment". (Hersh, et al,
The following overview of Kholberg's three levels and six stages of moral judgment (Kohlberg, 1969, 1976) should be read in parallel with Appendix: 2.3(E).

Three Moral Levels

(1) **Preconventional Level** (Stages 1 and 2)

Most children are at this level. The individual is not concerned with the conventional or societal rules and expectations but only with the concrete or physical consequence of action. In other words, the individual takes a concrete individual perspective, in which "rules and social expectations are something external to the self". (Kohlberg, 1976, p.33).

(2) **Conventional Level** (Stage 3 and 4)

Most adolescents and adults are at this level. The individual conforms to conventional rules or expectations, or authorities. He takes a member-of-society perspective, in which "the self is identified with or has internalized the rules and expectations of others, especially those of authority". (p.33)
(3) Postconventional Level (Stage 5 and 6)

Only a minority of adults, usually above 20 years old, reaches this level. The individual, in general, accepts conventional or societal rules on the ground that he understands and agrees with the moral principle underlying these rules. In cases where the moral principle is in conflict with the societal rules, he would stick to his self-chosen moral principles rather than obeying the rules. That is to say, he holds a prior-to-society perspective.

The three moral levels are subdivided into six moral stages. Each level consists of two stages, the second is a more advanced and organised form of moral reasoning within each level.

Since the contents of stages 1 to 4 are explicitly and clearly expressed in Appendix 2.3(E), the following discussion concentrates on the elaborations of the higher stages.

The Stage 4 perspective is basically an authority oriented one, it is less autonomous and less basic principle oriented than the perspective of the Stage 5 and 6 because

"(a) it defines no clear obligations to persons outside the order (for example, the nation-state) or to persons who do not recognize the rules of one's own order; and (b) it provides no rational guides to social change, to the creation of new
norms of laws" (Kohlberg, 1971, p.200)

In the elaboration of Stage 5, Kohlberg (1971) refers to Constitutional Democracy and argues that it makes social law more attractive to a rational person because it puts one's basic rights prior to law and society. Generally speaking, Stage 5 can be seen as an outgrowth of the relativist perspective: all values, norms and morals are arbitrary and relative. The emphasis is on the principle of social contract. "The contract usually represents a compromise, but it allows each man to pursue his own interest without unduly interfering with the other's rights to pursue his interest". (Hersh, et al., 1979, p.78) In addition, contracts are neutral. It is regarded as morally invalid or bad only when it involves an abrogation of basic human right such as life and liberty. Apart from such human rights, a contract can be anything which is mutually agreed by members of your group. The laws and duties are based on "rational calculation of overall utility, 'the greatest good for the greatest number.'" (Kohlberg, 1976, p.35)

However, above this principle of social contract, there is a more fundamental, universal and prescriptive moral principle: the principle of justice which is the central theme of the Stage six. Kohlberg applies extensively Kant's moral philosophy and Rawl's theory of justice (1971) in the elaboration of his stage six. The major features of Stage six can be summarized as follows:
(1) Principle of Respect for Personality

Persons are regarded as ends and not means. They are of unconditional values.

(2) Principle of Justice

This principle defines individual justice as "the right of every person to an equal consideration of his claims in every situation, not just those codified into law" (Kohlberg, 1971, p.210)

(3) Universalistic Principle of Role-taking

This principle guides an actor in a dilemma situation to act and play a role in a way that "any rational agent in a similar situation" should do (p.211). It is argued that decisions governed by this principle are universalistic and reversible. According to Kohlberg (1971, p.213),

"a universalizable decision is a decision acceptable to any man involved in the situation who must play one of the roles affected by the decision, but does not know which role he will play".

The three principles defining the Stage 6 can be said to be content-free, self-chosen, and non-contingent upon any prior agreement or contract. The only assumption is that it applies to all human beings. In other words, in Stage 6 reasoning, all persons are treated as morally equal, and commutative justice is regarded as
reciprocity, contract and trust. Kohlberg argues that
this principle of justice satisfies the formalist's
requirement that "rational moral judgments must be
reversible, consistent and universalizable." (1973b, p.639)
In addition, he claims that "no principle other than
justice has been shown to meet the formal conception of a
universal prescriptive principle." (1971, p.221) and that
no other concept of morality is "stronger" and "more
positive" than this one.

Since his first work (Kohlberg, 1958), Kohlberg
has improved his theory and methodology a great deal. Kohlberg
(1973) reports that two of his longitudinal subjects
retrogress from stage 4 or 5 to stage 2. He argues that,
since both of these two subjects eventually reached Stage
5, there should exist an intermediate transitional stage
between stages 4 and 5. He calls it Stage 4½ and
defines it as "a no-man's land between rejection of
conventional morality and the formulation of non-
conventional or universal moral principles". (Kohlberg,
1976, p.43). In short, the stage 4½ person views matters
from a personal, subjective, arbitrary and outside-of-
society perspective.

More recently, Colby et. al. (in press, p.63), in
the longitudinal study of Kohlberg's data using Standard
Issue Scoring Method, still count the above two stage 4½
cases as a violation of the sequence of Kohlberg's six
stages.
In addition, each stage can further be subdivided into two substages: A and B. The social perspectives of both substages are the same and they are therefore said to belong to the same stage. On the other hand, "judgments at substage B are more equilibrated and reversible than their A counterparts" (Colby, et. al., 1979(1), p.71). A judgment is said to be reversible if it can be applied equally to any character in a moral situation. In other words,

"Type A makes judgments more descriptively and predictively, in terms of the given 'out there'. Type B makes judgments more prescriptively, in terms of what ought to be, of what is internally accepted by the self". (Kohlberg, 1976, p.40)

It is thus argued that the substage B is more natural, balanced, internal and universalistic than the substage A.

Kohlberg (1973a, 1974, 1981) also postulates a "Stage 7" which is beyond Stage 6, with a perspective on life's ultimate meaning. Further details are given in Section 2.4.1.

II. Methodology in Assessing Moral Judgment

Kohlberg uses a set of hypothetical moral dilemmas as a research instrument for testing his theory. The instrument is called Moral Judgment Instrument (MJI). There are three forms of the MJI. A copy of the MJI
Form A is given in Appendix 5(D). The MJI employs a person to person interview format. However, it is possible to modify the MJI into a written questionnaire so that it may be administered to a group of subjects simultaneously.

The original formulation of the hypothetical moral dilemmas was done in 1958. Since then, the scoring method has been improved. The old scoring method is called the Aspect-Scoring system and the new one the Issue-Scoring system.

(1) The Aspect-Scoring System

A system of 25 "aspects" grouped into 9 major sets: "rules, conscience, welfare of others, self's welfare, sense of duty, role taking, punitive justice, positive justice, and motives" is the basis for scoring. (Kohlberg, 1976, p.41; 1969; 1958). Each statement of a subject's response is scored by using a list of prototypical sentences on each aspect in each of the dilemma stories. Another method is to score each aspect of a subject's total response to a story by a story rating manual. In other words, the first method is sentence scoring by aspect and stage, and the second one is story rating also by aspect and stage. According to Kohlberg (1976, p.43-44) "the sentence unit had proven too large for analytic, as opposed to ideal, typological scoring". This disadvantage of the aspect
scoring system led to a radical change in the scoring method in early 1970s.

(2) **Intuitive Issue Scoring**

The term 'issue' is defined as "what the individual is valuing, judging or appealing to, rather than his mode of reasoning" (Kohlberg, 1976, p.43). Kohlberg constructs the following list of issues found in every society and culture: (1) Laws and rules (2) Conscience (3) Personal roles of affection (4) Authority (5) Civil rights (6) Contract, trust, and justice in exchange (7) punishment and justice (8) Value of life (9) Property rights and values (10) Truth (11) Sex and sexual love" (Kohlberg 1976, p.43). Each content issue may consist of a number of moral aspects. For example, the issue "laws and rules" involves moral aspects like role taking, duty, fairness, etc. The subject's whole idea about an issue in a story is regarded as a unit for scoring. A list of prototypical arguments for each issue at each stage is given in a scoring manual. This scoring method is called the Intuitive Issue Scoring and "is theoretically the most valid method of scoring, since it is instrument free, that is, applicable to any moral dilemmas". (Kohlberg, 1976, p.45)

(3) **Standardized Issue Scoring**

Since it is only possible for those thoroughly trained to achieve a high inter-rater reliability of 0.9 or above in Intuitive Issue Scoring, Kohlberg and his
associates have developed a scoring manual for standardized issue scoring (Colby, et al., 1979). For each dilemma, the standard manual focuses on the scoring of two dominant issues. For example, in the story: "Philip (or Heinz) and the drug", the life issue is an issue "pro" stealing while the law issue is one that"con" (against) stealing. Within each issue, a set of values used by the subject is called "norm" or moral norm. Each norm is further differentiated into a set of "elements".

A long list (more than 900 pages) of standardised statements called "Criterion Judgment" appears in the Standard Manual (1979). According to the manual, "criterion judgment represents the intersection of one norm and element as applied to a standard issue on a dilemma construed at a particular moral judgment stage". (Colby, et al. 1979 (I), p.47).

In general, the procedures for Standard Issue Scoring consist of: (Colby, et al. 1979 (I-IV);

(1) To determine which of the two standard issues is the subject's chosen issue.

(2) Read through all the subject's responses to the dilemma being scored. Differentiate the material in each response according to whether it falls under the chosen issue or the non-chosen issue.

(3) Make an initial guess of the likely stage of the material by comparing the subject's responses with the global issue stage description.
(4) Within each chosen issue, separate the material according to norm and element.

(5) Determine the stage of each moral judgment by matching to criterion judgments in the standard scoring manual.

(6) If clear and marginal matches in step (5) is not possible, try to guess the stage from the responses obtained.

(7) Repeat steps (4) to (6) for the non-chosen issue in the dilemma.

Based on the issue scores obtained for each of the dilemmas, the moral maturity score (MMS) can be calculated.
III. A Critical Discussion

(A) Theoretical Issues

(1) The Structure of Kohlberg's Six Stages

According to Kohlberg (1969, 1971, 1973, 1976), the following assumptions are made on the structure of the six-stage sequence:

(a) Structured wholeness

Following Piaget's conception of stage, Kohlberg postulates that each of his six stages forms a structured whole. This assumption is claimed to be empirically supported in two main aspects:

(i) The internal consistency reliability for the Standard Issue Scoring of Kohlberg's Moral Judgment Instrument is very high. According to Colby et al. (in press, p. 30), is 0.92 for Form A, 0.96 for Form B and 0.94 for Form C. Similarly, the alternate form reliability is also very high. It ranges from 0.82 to 0.95 (p.28).

(ii) Factor analysis of the correlations among stage scores on each of the issues across the dilemmas leads to a conclusion that "moral judgment as measured by the Interview Forms A, B, and C and scored using the Standard Form Scoring Manual, is a single, general domain". (Colby, et. al., in press, p.41)
It seems that the new empirical findings using the Standard Issue Scoring are good enough to clear much of the criticism given by philosophers and psychologists (see e.g. Locke, 1979, p.171-172; Bergling, 1981, p.20). Nevertheless, Rest (in press, p.77-78; 1979b, p.56-63) argues that Kohlberg's Simple Stage Model (See also Section 2.3.1 (IV)) is inadequate for accounting for subject's moral thinking. He also points out that

"the consistency of scores in Kohlberg's data is not a strong test of stage consistency in a person's moral thinking. Various scoring rules have been devised to weed out stage mixture and so the procedure is biased towards stage consistency." (Rest, in press, p.77)

(b) A Sequence with Cognitive and Moral Adequacy

Kohlberg (1971) claims that there is an inner logical order in the sequence of his six stages. That is, "a higher moral stage entails a lower moral stage, at least partly, because it involves a higher logical structure entailing a lower logical structure" (p.186). Kohlberg (1973b) also claims that a higher moral stage is more adequate than a lower moral stage according to certain moral criteria. These claims of cognitive and moral adequacy, particularly the latter one, have been criticized by many philosophers or critics (See e.g. Peters, 1971, 1978; Locke, 1979; Carter, 1980; Flanagan, 1982). All of them regard Kohlberg's claims of adequacy as unsound or unsatisfactory.
(c) Invariant Developmental Sequence

Kohlberg's assumptions of cognitive and moral adequacy are fundamentally developmental in nature. From a strict empirical point of view, the developmental sequence of Kohlberg's stage structures should be better studied by following subjects longitudinally.

Based on the analysis of his longitudinal data, Kohlberg and his colleagues claim that the six moral stages form an invariant sequence (Kohlberg and Kramer, 1969; Kohlberg, 1976, p.43; Colby et. al., in press, p.41-45).

Apart from the problem of retrogression (See Part (I) of this section), the claim of an invariant developmental sequence appears to be the most promising one. However, since the Standard Issue Scoring has only been recently refined for publication, it may be argued that more researches using the new scoring method are needed in order to offer strong support of this claim. (See also Colby et. al., in press, p.52-56, for a brief review of four longitudinal studies using the Standard Issue Scoring).

(2) The "Truth" of Kohlberg's stages

According to Kohlberg (1976), the criteria for his stages to be "true" are two-fold. The first is that the definition of the stage structure is operational or empirical. The second is that "the conceptual structure of the stages is not contingent on a specific psychological
theory. They are, rather, matters of adequate logical analysis." (p.47). In other words, "stage structure is not a hypothetical construct from which behavioural 'signs' are deduced; it is an abstraction of structure from an interview which always embeds structure in content." (Colby, et. al., 1979 (I), p.9). However, Trainer (1977) argues that Kohlberg's stages are "imaginative philosophical constructions deriving from sources other than empirical evidence". (p.46). Tomlinson (1979) also expresses his puzzlement about these stage structures. He writes, "using the Kohlberg manual, my students and I have often found ourselves asking: 'are things really so clean?"' (p.340)
Furthermore Kohlberg's theory has been criticised by philosophers such as Peters (1978) and Alston (1971) as inadequate and one-sided. Peters (1978) argues that Kohlberg's system does not deal with the affective aspects of development. (p.150). It accounts neither for the development of positive motivations such as sympathy and consideration for others nor the development of negative ones such as shame and guilt. (p.153)

Psychologist Wright (1971) also criticises that Kohlberg's stages over-emphasise the structure of moral reasoning and, to a large extent, neglects the importance of moral content in the understanding of moral development. He writes: "it is not unreasonable to suppose that why a person thinks an action wrong is much less important than that he thinks it wrong." (p.173)

Another method of testing the truth of Kohlberg's stages is to examine how good his stages are in the prediction of moral action. Kohlberg (1976) argues that "to act in a morally high way requires a high stage of moral reasoning. One can, however, reason in terms of such principles and not live up to them". (p.32). In addition, he claims that "moral stage is a good predictor of action in various experimental and naturalistic settings". (p.32). On the other hand, Mischel and Mischel (1976) argue that, according to their analysis, they do not justify Kohlberg's above claim. They point out that the "predictive validity from moral reasoning to moral behaviour does not appear to be better than the modest,
albeit often statistically significant, personality co-efficients (averaging 0.30) typically found in correlational personality research linking measures across diverse response modes." (p.101) In addition, Kurtines and Greif (1974), in a review of Kohlberg's theory, conclude:

"there is no clearly demonstrated connection between moral judgment, as measured by the Moral Judgment Scale, and moral action. Overall, predictive validity is minimal." (p.468).

(3) Cultural Universal Assumption

Kohlberg claims that his six stages are cultural-universal. That is, the sequence is invariant for all persons and cultures. He presents cross-cultural data collected in USA, Taiwan, Mexico, Turkey and Yucatan to support his claim (Kohlberg, 1969, 1971). In addition, according to Colby (in press, p.52-56), two cross-cultural longitudinal studies using the Standard Issue Scoring also support their cultural universal claim.

On the other hand, Simpson (1974) challenges Kohlberg's cross-cultural studies. She argues that Kohlberg's interview employs analytic and theoretical modes of thought and language such as "justice, equality and reciprocity at a high level of abstraction" (p.94), which are not valued by many cultures.
As Lickona (1976b, p.10) points out, Kohlberg can resolve the above problem by asking:

"(1) Can one logically test the universality of moral stages, defined in terms of value categories, without using the same value categories from one culture to another? (2) Can one logically require that all groups everywhere must demonstrate all levels in the moral hierarchy in order to establish its universality....?"

In an extensive review of cross-cultural studies of Kohlberg's stages, Edwards (1981) concludes that the first three moral stages "are found in a wide variety of cultural settings". (p.533) On the other hand, he argues that "the greatest problem arises with respect to Kohlberg's highest stages, which seem to be found much more commonly in complex than in simple societies". (p.523). Similarly, Bergling (1981), in an analysis of 12 cross-cultural studies carried out in 9 countries (p.64) comes to the conclusion that Kohlberg's Stages 1-4 are empirically supported in western industrialized countries but "findings from the Bahamas and British Honduras fail to support even a Stage 4". (p.84)

(4) Uniqueness and Scope of Kohlberg's Theory

(a) Uniqueness

Kohlberg (1976) claims that "anyone who interviewed children about moral dilemmas and who followed them
longitudinally in time would come to our six stages and no others." (p.47) On the other hand, Bull (1969, p.29-35) presents an alternative scheme of moral judgment development with empirical support. In addition, Garbarino and Bronfenbrenner (1976) also postulate a typological theory of socialization of moral judgment with three developmental levels.

(b) Scope

There are two major problems in the scope of Kohlberg's theory:

(i) Philosophical basis of the six stages

Simpson (1974) argues that there are biases in Kohlberg's moral principles which are based solely on western philosophy. She thinks that it is inadequate to explain the concept of morality without reference to non-western philosophies. The present writer agrees with Simpson's point. The elegant Chinese and Indian philosophies of morality have been influencing the behaviour of about one-half of the human population on earth; they should not be neglected. See Section 2.4 for an attempt to apply Chinese Tao Philosophy in the establishment of a basis of the ultimate stage of human development.

(ii) Male-female differences

Gilligan (1977) finds that the female structure of moral thinking is, in some aspects, different from
Kohlberg's structure which is derived mainly from longitudinal study of male subjects. For example, females emphasize responsibility more rather than rights and they are in general more affective and affiliative oriented than males. Similarly, Holstein (1976) also argues that there is some sex bias in Kohlberg's scoring standards. Flanagan (1982, p.508) regards the male-female differences as one of the major defects of Kohlberg's theory.

(B) Empirical Issues

In a critique of Kohlberg's theory and measurement, Kurtines and Greif (1974) argue that (i) the general meaningfulness of the six intuitively derived moral stages is not yet clear. In addition, the administration and scoring of Kohlberg's measurement has not been standardized. (ii) The reliability of Kohlberg's test instrument is not convincing and needs to be demonstrated. (iii) The predictive validity from moral reasoning, as measured by Kohlberg's test, to moral action is minimal (iv) the actual construct validation for the test is small.

On the other hand, Broughton (1978), in a defence of Kohlberg's theory, argues that Kurtines and Greif's "queries turn out to be generated not only by lack of familiarity with the literature, but also by a broad misunderstanding of Kohlberg's theory, which derives from a research paradigm and a conception of science and the human mind quite at odds with Kohlberg's" (p.81). He argues that it is conceptually wrong to regard Kohlberg's
measurement as a projective psychometric scale. Furthermore, "criticisms of Kohlberg's measurement procedure do not necessarily imply criticisms of Kohlberg's theory. The theory could be correct, and we (Broughton and his associates) could still debate the best way to bring a measure instrument to bear on it." (p.82)

With the new Standard Issue Scoring, many of the defects of Kohlberg's Moral Judgment Instrument pointed out by Kurtines and Greif (1974) have been eliminated or improved. Nevertheless, the following remarks on the new scoring system should also be considered carefully:

(i) The scope of the Criterion Judgments is far from exhausted. In other words, guessing instead of matching is unavoidable in the scoring process (particularly in the scoring of cross-cultural data). It is doubtful that one can make an exhaustive list of all judgments given by subjects of all cultures in an open-ended interview on moral reasoning. In addition, no criterion judgment is given for stage 6 in the manual.

(ii) The process of matching the subject's judgment with the Criterion Judgment is sophisticated and subjective, especially in the case of marginal matching.

(iii) It is obvious that those who understand Kohlberg's scheme quite well can always score, according to his scheme (say, by Intuitive Issue Scoring), with a high inter-rater reliability.
On the other hand, those who do not quite understand Kohlberg's theory and measurement and hope to increase their scoring reliability by sticking closely to the 1000+ page manual would be struggling in vain. In other words, as far as the scoring of Kohlberg's Moral Judgment Scale is concerned, experienced moral psychologists do not need to use the manual, while most inexperienced people may not be capable of using it.

On the whole, the new scoring system should be praised on at least two major aspects:

(i) It demonstrates how a complex open-ended psychological test instrument can be standardized in a fairly objective and scientific way.

(ii) It offers other moral psychologists a set of operationally well-defined criterion judgment statements which are extremely valuable reference materials for constructing tests of moral and social development.

In short, there is no doubt that the Standard Issue Scoring is a significant contribution to the empirical study of moral judgment development.

An Appraisal of Kohlberg's Contribution

Many psychologists (e.g. Wright, 1971, p.167; Lickona, 1976a, p.240; Tomlinson, 1979, p.354; Hersh, et. al., 1979, p.44-45) regard Kohlberg as an outstanding pioneer in moral development research. Hersh et. al., (1979, p.45) write:

"in a sense, Kohlberg has helped finish Piaget's unfinished work; but in the process, he has greatly expanded and revised Piaget's original findings."
2.3.4 Objective Assessment of Moral Judgment: 
Rest's Defining Issues Test (DIT)

1. The Theoretical Background of the DIT

According to Rest (1975a; 1976b, p.76-86), there are two basic methods in the assessment of moral judgment:

(a) A questionnaire or an interview format is prepared and the subject is asked to write or talk about his/her moral thinking in a free-response manner. Subjects may be asked to write essays or to talk on abstract and philosophical topics such as "How do you define morality?" "What are rights and wrongs?" etc. Or subjects may be presented some hypothetical moral dilemmas and are asked to decide what should be done and why. Kohlberg's Moral Judgment Instrument (MJI) is of this type. Another method originally used by Piaget (1932) is to present subjects two stories and ask them to compare the acts of the actors in the stories (See also Section 2.2).

(b) A set of prototypic statements representing the scoring categories is prepared and the subject is asked to choose among them. Such stage prototypic statements may be written in two different ways:
   (i) The statements represent "arguments or justifications for a course of action". (Rest, 1979b, p.84) For example, in Kohlberg's Heinz Story, statements
can be written to give reasons for stealing or not stealing the drug. (ii) The statements represent or define the crucial issues in a moral dilemma. That is, for example,

"What is the most important question a subject thinks a person should ask himself or herself in making a decision in the Heinz story? Is the issue whether Heinz might get caught and sent to jail? Is the issue whether a loving husband would care so much for his wife that he'd stoop to do a dastardly deed? Is the issue how the law and order of a community are going to be maintained?" (Rest, 1979, p.84)

Obviously, methods (i) and (ii) are closely related. However, method (i) is a more specific and concrete way of representing arguments for and against an action or decision in a moral dilemma while method (ii) is regarded as a more structural and general way of representing arguments in making a decision in a moral dilemma. The DIT employs Method (ii) in its construction. The basic empirical assumption of the DIT is that "developmental stages of moral judgment involve distinctive ways of defining social-moral dilemmas and of evaluating the crucial issues in them". (Rest, 1979b, p.85) On the other hand, the theoretical basis of the DIT is Kohlberg's six-stage theory. In short, Rest's (1975a) general assumptions in the use of prototypic statements in the assessment of moral judgment consist of (1) Kohlberg's stage characteristics can be specified (2) Prototypic statements expressing clearly
the stage characteristics can be constructed (3) "Subjects who are advanced enough in their own development can appropriately recognise stage characteristics in statements." (p.91) (4) Subjects can meaningfully rate or rank the statements.

II. The Test Format and Specific Characteristics of the DIT statements

A sample of the DIT is given in Appendix 5(E). In order to illustrate the test procedure and format, let us consider the story I: Heinz and the drug. The subject is first asked to read the dilemma story. Then she/he should make the decision whether Heinz should steal the drug or not. After that, she/he rates the importance of each of the twelve issue-statements. That is, in making the decision on whether Heinz should steal the drug or not, how important are the issue-statements presented? Finally, the subject is asked to rank the four most important issue-statements in order of importance. The scoring process can be done by computers. The original DIT consists of six stories, three of them are based on Kohlberg's Moral Judgment Instrument.

In the writing up of the issue statements, the following points are taken into account: (Rest, 1975a, p. 77-78; Rest, 1976, p.204-205; Rest, 1979b, Chapter 4). (1) "The underlying stage structure of each issue statement is emphasized so that higher-stage statements appear
stark and abstract and do not lend themselves to being interpreted as fancier ways of stating a lower-stage idea". (Rest, 1976, p.204).

(2) Distractor items which are called meaningless statements are included.

(3) The word length, syntactic and semantic features of the issue sentences at various stages are carefully considered.

(4) In each of the DITs, several items, with different stage orientations, of a stage are set to fit different types of subjects.

III. Methods of Scoring

Four DIT indices are compared in Davison (1979), three of them are constructed by using the subject's ratings and one by rankings. Two of these four indices are elaborated as follows:

(a) P-index

Scores are calculated by the following scoring criterion for any of the Stage 5A, 5B or 6 statements ranked as one of the top four most important statements in a moral dilemma: a score of 4, 3, 2, 1 is given to a statement ranked as first, second, third and fourth most important respectively. The sum of all the scores gained by a subject in a DIT is called the P-score or raw P-score.
Dividing the raw P by the possible maximum P and multiplied by 100 gives the percentage P-score.

(b) **Simple Sum of Item Responses (SS)**

Define 5 = Most Importance Rating to 1 = Least (i.e. No) Importance Rating, and DJK = Average rating of all the Stage k statements, where k = 2,3,4,5A,5B,6.

The simple sum of item response is defined as

\[
SS = (DJ5A + DJ5B + DJ6) - (DJ2 + DJ3 + DJ4)
\]

The other two DIT indices are constructed by (i) a theoretically weighted sum of item responses (TS) and (ii) an empirically weighted sum of item response (ES), which is also called Davison 'D' index. It has been found that the ES index "provides the most desirable measure of overall development" (Davison, 1979, p.244).

IV. **The Psychometric Properties of the DIT**

The following discussion is based on Davison's article in Rest (1979b, p.223-245) and other DIT studies.

(A) **The Internal Structure of the DIT**

According to Davison (1979), it has been found that (i) the DIT stage score variables displays a simplex-like structure. (ii) the principal component analysis of the
stage score variable correlations produces two factors with characteristic roots greater than one, and a set of factor loadings supporting the stage order predicted. (iii) the results of the metric multidimensional scaling analysis also support the predicted order of stages.

In short, it is argued that the above findings support Kohlberg's six-stage sequence, except with a minor reversal of the Stage 5A and 5B (Davison, 1979, p.232-234).

(B) Reliability and Validity of the DIT

The DIT is a fairly new test instrument, which was established in 1972. Since then, the reliability and validity of this test has been studied extensively by Rest and his associates (Rest, 1975a, 1975b, 1976, 1979b; Rest et. al., 1974; Rest etl. al., 1978; Davison, 1979). The major findings consist of:

(1) The test-retest reliabilities for the P and D indices are generally in the high 0.70s or 0.80s (Davison, 1979, p.240). The internal consistency reliabilities for the P and D scores are 0.77 and 0.79 respectively for the DIT Six-story version (Davison, 1979, p.239).

(2) In a review of a number of longitudinal studies, Rest claims that the DIT has high longitudinal validity (Rest, 1979a, p.6.5; 1979b, Chapter 5). Cross-sectional studies indicate that "the correlation of age with DIT
(rate P) was 0.66, and with DIT (rank P) was 0.62" 
(rest, 1976, p.215)

(3) The correlations of Kohlberg's measure of moral stage 
with the DIT score are around 0.70s for the heterogeneous samples and around 0.40s for the homogeneous samples. The correlations of the DIT with other cognitive developmental measures range from 0.10s to 0.40s. (Rest, 1979b, 153-154).

(4) The correlations of achievement and IQ-type tests with DIT score are usually in the range of 0.20s to 0.50s. (Rest, 1979b, p.146-153).

In short, it is concluded that the DIT is a reliable test with good construct validity.

V. A Critical Discussion

In an argument against those people who think that it is too early to attempt an objective assessment of moral judgment, Rest (1975) replies:

"those who argue that DIT research is premature either must claim that studies using prototypic statements have also been premature or must show why having subjects rank statements is such a crucial extension of established precedents" (p.91).

In the following paragraphs, a number of issues on the DIT research are discussed.
(A) A Comparison of the DIT with Kohlberg's MJI

(1) Methodological advantages of the DIT

As Rest (1975a, p. 76) points out, the fundamental weak points of Kohlberg's measurement of moral judgment are: (i) The subjects' responses cannot, strictly speaking, be compared from subject to subject. (ii) There are interviewer and scorer biases. (iii) Subjects' differences in verbal expressiveness may influence stage scores (iv) The interview and the other scoring process is very time consuming. A number of other weak points such as low test-retest and alternate form reliabilities mentioned by Rest (1975a) have been greatly improved with the establishment of the Standard Issue Scoring (See Section 2.3). On the other hand, Rest (1975a, p. 77) claims the following methodological advantages of the DIT: (i) The subjects' responses can be compared because of the highly structured test format. (ii) The variance in stage scores due to the subjects' differences in verbal expressiveness can be minimized. (iii) The DIT is scored objectively either by computers or by hand. Hence it saves time and eliminates scorer bias. (iv) Progressive refinement of the test can be done by item analysis.

(2) Differences Between the MJI and DIT

One empirical study by Froming and McColgan (1979) reports that the correlation of Kohlberg's MJI with DIT
score is 0.61. However, if the age variable is partialed out, the correlation falls to 0.31. This implies that (i) the age variable contributes largely to the observed MJI-DIT correlation (ii) the two approaches, MJI and DIT, may measure moral judgment development quite differently.

While both Kohlberg's MJI and Rest's DIT are test instruments constructed within the domain of Cognitive Developmental Approach, they differs in two major aspects:

(i) MJI: Simple Stage Model vs DIT: Complex Stage Model

The basic rationale underlying these two Stage Models has been discussed in Section 2.3.1.

(ii) MJI: Spontaneous Production of Moral Judgments vs DIT: Comprehension and Preference of Moral Judgments

The MJI uses an open-ended interview format and attempts to assess spontaneous production of moral judgments, while the DIT uses a close-ended format and attempts to assess recognition, comprehension and preference of a set of prototypic statements constructed by the test constructor.

The above basic differences leads Kohlberg (1979) to conclude that the MJI (Harvard test) is better than the DIT (Minnesota test)

"if one wishes to test implications of simple stage theory, since the test was constructed and validated according to the criterion of the simple stage construct. Insofar as one wishes to research the
implications of the general cognitive-developmental theory underlying both tests, there is no reason to claim the Harvard test is better." (p.xi)

In addition, Colby et. al., (in press, p.76) argue that the development of moral judgment as a whole "may be too broad a scope for what Rest calls the "Simple Stage Model"". They also argue that a full developmental account of an individual's moral judgment may require scores of other moral judgment tests such as the DIT in addition to Kohlberg's MJI score.

(B) The Fakability of the DIT

Psychological tests using hypothetical dilemmas are liable to faking responses. In moral psychology, it is common that subjects tend to 'fake good' in their responses. In a fakability study of the DIT, McGeorge (1975) found that subjects did not increase their P score significantly when instructed to 'fake good' but they did decrease their P score significantly when instructed to 'fake bad'.

In another study, Yussen (1976) asked his subjects to respond to the DIT three times, once for each of the social roles of self, average policeman and average philosopher. He found that the average P score in the case of an average philosopher is the highest in all age groups and that in the case of an average policeman is the lowest in the Grade 10, 12 and College groups. Though
the findings are likely to be due to the different type of test instructions and different social perspectives of others, they might well reflect some problems on the fakability of the DIT.

In addition, Mischel and Mischel (1976) also argue that Kohlberg's measurement is not able to distinguish clearly the competence in moral reasoning from performance or preference. They write:

"One cannot be sure from the test, for example, whether a "Stage 3" subject who displays a dominant "good boy" orientation does not know more abstract principles which go beyond approval seeking, or whether he may "have" such concepts but prefer not to verbalize them when reasoning about moral dilemmas". (Mischel and Mischel, 1976, p.88)

The above criticism might well be applied to Rest's DIT.

(C) Cross-cultural Study of the DIT

There is no mention of cross-cultural study in Rest (1979b). On the other hand, Ma (1980) found that the cross-cultural indices of the DIT P and D scores using English and Hong Kong Chinese samples are fairly low, 0.30s for the F.4 subjects and 0.60s for the F.6 subjects. (For an explanation of the cross-cultural index, see Section 6.6) This may indicate that the DIT may not be appropriate for cross-cultural studies in its present form. One of the main reason may be due to the culturally biased contents of some of the DIT stories ("Student Take-over", 'Webster' and Newspaper') which are
also highly politically oriented. It is argued that the present DIT requires a basic modification in contents before it can be used for proper cross-cultural studies.

An Appraisal of Rest’s Contribution

The DIT research has generated a lot of research on the objective assessment of moral judgment. Some of them use the DIT format or DIT methodology. For examples, the Moral Content Test (Boyce and Jensen, 1978) and the Environmental Issues Test (Iozzi and Paradise-Maul, 1980) both use the DIT format directly, and the Ethical Reasoning Inventory (Bode and Page, 1980) employs similar DIT methodology. It is likely that more objective tests of moral and social development will be constructed under the influence of the DIT research.

Rest’s outstanding work can indeed be regarded as a milestone contribution to the empirical study of moral development.
2.4 Stage 7: The Ultimate Stage of Human Development

For convenience and consistency with the system of notation used in Chapter 3, Stage 7 is defined as the Ultimate Stage of Human Development encompassing all aspects of human development, for example, moral, social, cognitive, personality and psychosexual development. Stage 7 represents a unique stage at which the individual fuses himself/herself with Nature as a whole and thus transcends all things, whether emotion, cognition, desires or morality into one harmonious integrated whole. This does not mean that people who are young or at a lower stage of development do not act as integrated wholes. It simply means that these people are not able to 'comply with Nature naturally' and therefore do not act as a harmonious integrated whole.

Since stage 7 is assumed to be the ultimate stage of all aspects of human development, it is possible, and more economical and more theoretically elegant to investigate all the aspects as a whole, rather than separate them into different categories, that is stage 7 morality, stage 7 cognition, stage 7 social development etc. It is only at the initial and final stages of human development that we can explore in this way without causing logical and theoretical inconsistency or problems.

In section 2.4.1, some of the explorations beyond the Moral Stage 6 are briefly mentioned. The focus of this section is an attempt to investigate Stage 7 in terms of
Tao philosophy which is then described in Section 2.4.2.

2.4.1. Towards Stage 7


Maslow's theory (1968, 1971) of self-actualization, B-cognition and Meta-motivation will be used in the next Chapter as a basis for Stage 6, one stage below the Ultimate Stage. In addition, part of Maslow's theory of Transcendence (1971, Chapter 21) can well be regarded as something beyond Stage 6. (For example, paragraphs or points 1, 2, 3, 4, 8, 9, 10, 25, 26, 27, 28 in Maslow, 1971, Chapter 21) As constantly mentioned by Maslow himself, a substantial part of his theory can be regarded as Taoistic. Nevertheless, Maslow's theory of Transcendence is not a completely Stage 7 one. For example, he distinguishes two types of self-actualizing people: transcending and non-transcending ones (1971, p.283). He argues that, "For the transcenders, peak experiences and plateau experiences become the most important things in their lives, the high spots, the validators of life, the most precious aspect of life". (1971, p.283). This can only be Stage 6 because a completely transcended (Stage 7) person treats everything and opinions as equally good and important so long as they are natural, or comply with Nature. (see Section 2.4.2)
Maslow (1971) elaborates the concept of transcendence by 35 features (p.281-292) and ends up with the following definition:

"Transcendence refers to the very highest and most inclusive or holistic levels of human consciousness, behaving and relating, as ends rather than as means, to oneself to significant others, to human beings in general, to other species, to nature and to the cosmos.". (p.292)

Further details of Maslow's theory of Transcendence will not be entered into, instead, the elaboration of the whole, in terms of Tao philosophy will be dealt with in Section 2.4.2.

II. L. Kohlberg: Ultimate Faith

In the discussion of moral development and faith, Kohlberg (1974) mentions a stage beyond his Stage 6 and he calls it Stage 7 (p.14). According to Kohlberg, the essential of Stage 7 "is the sense of being a part of the whole of life and the adoption of cosmic, as opposed to a universal humanistic 'Stage 6' perspective" (p.15). The main difference between Stage 6 and Stage 7 is that the former one has a finite perspective while the latter one has an infinite and cosmic perspective (p.15). Such infinite or cosmic perspective is necessary in the resolution of, for example, the despair of facing death. For further details of Kohlberg's Stage 7, see Kohlberg, 1981, p.344-372.
In addition, Erikson's (1963) psycho-social Stage 8: Ego Integrity vs Despair and Gilligan's (1976) concept of love relationships also touch some aspects which can be regarded as at or beyond Stage 6 in our system.

2.4.2. Tao Philosophy as a Basis of Stage 7

In the following paragraphs, we attempt to explore a theoretical base for Stage 7 in terms of Tao Philosophy. A general background of Chinese Philosophy, especially Tao Philosophy is assumed. (For general introduction of Chinese Philosophy, see e.g. Fung, 1948, 1952, 1953; Lin, 1949; Chai and Chai, 1975; Suzuki, 1914; Creel, 1929. For Tao Philosophy, see e.g. Fung, 1933; Ch'en, 1977; Lin, 1958; Creel, 1970).

Tao Philosophy is fundamentally simplistic naturalism (see e.g. Ch'en, 1977, p.34; *Chang, 1958, p.14-15) and there are two main characters in Tao Philosophy:

1. Books written in Chinese are indicated by "*", e.g. *Chang, 1958.

2. The following formats of quotation are used for quoting paragraphs from books by Lao Tzu and Chuang Tzu.

   (i) Lao Tzu (or Chuang Tzu) said, "..." (/Name of Translator etc., *i) (i=1, 2, 3, ... etc.)

   (ii) "..." (Lao Tzu or Chuang Tzu/Name of Translator, *i)

   The original Chinese quotations and their sources are given in Appendix 2.4. and follows the numbering system *i.

3. The translation of Lao Tzu: Tao Teh King (or Tao Te Ching) is difficult. According to *Wong (1979, p.551), more than 100 versions in English translation have been published. For all the quotations from Lao Tzu, two versions in English translation are given - one in the main text, the other in Appendix 2.4. The one by A.J. Bahm (1958) is a free translation. He interprets Tao as Nature and Teh as intelligence. The other by D.C.Lau (1963) is a direct translation.
Lao Tzu and Chuang Tzu. According to Lin (1949, p.23 and P. 66), Lao Tzu was most probably born about 570 B.C. and Chuang Tzu fourth century B.C. The discussion of Tao Philosophy in this section will be restricted to these two philosophers.

In the following discussion, the author attempts to elaborate and interpret freely Lao Tzu and Chuang Tzu's philosophy from a developmental psychological point of view. The interpretation is exploratory and subjective; it may distort the original meaning of Lao Tzu and Chuang Tzu's view. Some other ways of interpretation of Tao Philosophy can be found in the references given above.

Features of Stage 7: Tao Philosophy

I. Great Intelligence

According to Lao Tzu, two types of intelligence and wisdom can be identified: (i) Common intelligence and general wisdom, and (ii) Great Intelligence and Ultimate Wisdom. Lao Tzu condemns common intelligence because it often misleads us and makes life complicated and sophisticated.

Lao Tzu Said,

"When cleverness emerges, there is great hypocrisy"
(Lau, 1963, p.74, *1)
"If we ignore intricate learning and knowledge of petty distinctions, we shall be many times better off." (/Bahm, 1958, p.25, *2)

On the other hand, Lao Tzu praises Great intelligence, Ultimate and true wisdom - Intelligence that helps us to understand and comply with Nature; Intelligence that helps us to lead a simple, tranquil, natural and absolutely free life.

'Great intelligent' people tend to understand everything in a simple and perhaps metaphysical way without the motive to disturb others and with the least dependence of external environment. Lao Tzu describes these great intelligent people in this way:

"Without going out-of-doors, one can know all he needs to know.
Without even looking out of his window, one can grasp the nature of everything.
Without going beyond his own nature, one can achieve ultimate wisdom.
Therefore the intelligent man knows all he needs to know without going away,
And sees all he needs to see without looking elsewhere,
And does all he needs to do without undue exertion."
(/Bahm, 1958, p.46, *3)

In other words, great intelligent people are self-dependent, self-fulfilling and self-validating.
Another elaboration of great intelligent people can be found by looking at Lao Tzu's categorization of different types of rulers or leaders. He writes,

"The most intelligent leaders bring about results without making those controlled realize that they are being influenced. The less intelligent seek to motivate others by appeals to loyalty, honor, self-interest, and flattery. Those still less intelligent employ fear by making their followers think they will not receive their rewards. The worst try to force others to improve by condemning their conduct."

(Bahm, 1958, p.24, *4)

Taoistic way of ruling gives ordinary people the highest degree of freedom and causes them the least disturbance. It rules in a way as though the government were not existing yet everyone in the society behaves themselves.

Modern civilization of science and technology cannot be regarded as Great intelligence or Ultimate wisdom because it damages our peace and life as much as it benefits us. Religious and philosophical thought such as Buddhism can be regarded as true and ultimate wisdom and Buddha is certainly a Great Intelligent person. In other words, Tao Philosophy condemns the progress of civilization along the complex, artificial/non-natural, conquering/aggressive, and materialistic-oriented direction. It emphasizes on civilization towards
simplicity and naturalness, that is, civilization that helps us to be in accord with Nature or to fuse with Nature as a whole.

II. Few Desires

As mentioned before, Maslow argues that self-actualizing people tend to have additional needs and motivations. He calls these needs and motivations the metaneeds and metamotivations. Self-actualizing people tend to gratify both the basic and growth or metaneeds. However, this stage of metaneeds and metamotivation is not the ultimate stage of development. Beyond this stage, the person would have a "quantum drop" of needs and desires. He/she would now have one desire only: to live happily and freely with as few desires as possible. The supreme and ultimate stage of development is to transcend oneself so that one becomes desireless mentally. In short, one develops from few desires in infancy (or initial stage) to lots of desires in the stage of metamotivations, and finally transcends from lots of desires to very few desires again. Thus, the ultimate stage resembles the initial stage in many way except with a new perspective and life experience.

The less one desires, the easier one achieve the psychological state of harmony. Lau Tzu said,
"If nothing appears to arouse envy, one will remain satisfied with things as they are."
(/Bahm, 1958, p.15, *5)

"Excessive devotion to chasing about and pursuing things agitates the mind with insane excitement. Greed for riches ensnares one's efforts to pursue his healthier motives."
(/Bahm, 1958, p.19, *6)

In other words, if one can transcend the overwhelming and greedy desires for lots of social and materialistic rewards into a minimal number of necessary needs, one would be able to achieve a peaceful and tranquil state of mind easily.

III. Non-valuative Judgment

While children cannot distinguish clearly right from wrong, Great Intelligent people do not classify things into right and wrong ones. In general, they accept and treat everything, every opinion and every habituation in their own rights or in their natural states as equally good and right. In other words, they interact with others and environment in a non-valuative way. Chuang Tzu elaborates,

"If a man sleeps in a damp place, he gets lumbago and dies. But how about an eel? And living up in a tree is precarious and trying to the nerves. But how about monkeys? Of the
man, the eel, and the monkey, whose habitat is the right one, absolutely? Human beings feed on flesh, deer on grass, centipedes on little snakes, owls and crows on mice. Of these four, whose is the right taste, absolutely? ...
In my opinion, the doctrines of humanity and justice and the paths of right and wrong are so confused that it is impossible to know their contentions."
(Lin, 1949, p.80-81, *7)

The argument is that all kinds of rational values and judgments are problematic, sophisticated, biased, subjective and confusing, and hence non-natural. The ultimate criterion governing our behaviour, whether it is moral or non-moral, is our unconscious emotion (see also Section 2.5) and not the rational values. It is argued that the unconscious emotion is the least conditioned or affected by external environment and therefore is always in its most accord with Nature. That is to say, so long as the behaviour is natural or complies with Nature, it is totally acceptable and equally good or right. Following this argument, one may say that death is not worse than life; ugliness is not worse than beauty; loss is not worse than gain; bad luck is not worse than good luck; etc. Thus, "Let it be" and "Take it easy", one will be much more peaceful and tranquillier.

IV. Simple Human Relationships.

Tao Philosophy emphasizes on simple human relationships and denies complex social interaction. The Taoistic
living should be simple, quiet and tranquil. This in some sense can easily be achieved in small intimate society. Lao Tzu writes,

"The ideal state is a small intimate community where all the necessities of life are present in abundance.
There everyone is satisfied to live and die without looking around for greener pastures.
Even if they have cars or boats, they do not use them for travelling abroad.
Even if they have police and fortifications, these are never put to use.
Business transactions are simple enough to be calculated on one's fingers rather than requiring complicated bookkeeping.
The people are satisfied with their food,
Contented with their clothing,
Comfortable in their dwellings,
Even though neighboring communities are within sight,
And the crowing of the neighbor's cocks and barking of the neighbor's dogs are within hearing,
They grow old and die without ever troubling themselves to go outside of their own communities."

(/Bahm, 1958, p.68-69, *8)

The Human relationships and social interaction in large and highly civilized societies are complicated and sophisticated. People are constrained by a complex system of social norms to behave in some prescribed ways. They are not free to act as themselves. In contrary, they often have to act in the way what other people think what
they should act. This very often damages one's naturalness, personal liberty and self-actualizing tendency. Lao Tzu suggests a method mentioned above to resolve this problem. However, it may be quite difficult to lead a taoistic life in a modern society which emphasizes on materialistic and social rewards. Some further research is necessary to interpret Tao philosophy in modern sense.

V. Natural Characters

As mentioned in III, one of the main themes in Tao Philosophy is naturalness and complete acceptance of everything in its original and natural state. Thus, Taoistic characters are natural characters. Fung (1933) elaborates, "Everything has its own Te, or virtue. Everything has its own proper nature. Everything is happy, if it is allowed to be in accordance with its own nature". (p.8) It is argued that sophisticated or unnatural characters which do not comply with Nature often give people painful suffering. Chuang Tzu said,

"For duck's legs though short, cannot be lengthened without dismay to the duck, and a crane's legs, though long, cannot be shortened without misery to the crane. That which is long in nature must not be cut off, and that which is short in nature must not be lengthened. Thus will all sorrow be avoided." (/Lin, 1949, p.105, *9)
We briefly mention below three of the natural characters described in Tao Philosophy.

(1) Child-hearted Character

Nothing is more natural than those exhibited by a small child or nursing infant. Except not being intelligent, the heart of a child is true, natural and beautiful. Lao Tzu said,

"He who is intelligent is like a little child."
(/Bahm, 1958, p.51, *10)

Similar description of this kind of child-hearted or natural character can also be found in Maslow (1970, p.157-159) or Section 2.1.2.

(2) Softness

According to Lao Tzu, softness and weakness imply living; hardness and toughness mean death. He said,

"At birth, a man is soft and weak - yet capable of living the whole life ahead of him. At death, he is hard and tough - yet unable to live for even a minute longer. All things, whether plants or animals, while living, are soft and weak. But, when dead, are hard and tough. Thus hardness and toughness are allied with death, while softness and weakness
are interrelated with life". (/Bahm, 1958, p.65, *11)

People at the Ultimate Stage of Development are those who tend to cause least disturbance or harm to others. To be strong, to win or to conquer is certainly one of the most harmful things one can do to others. In addition, the softer we are, the easier we would be able to get adapted in different environments and hence the easier we could comply with Nature. However, one may query that if we are soft and weak, is it likely that we would be easily conquered or destroyed by others, by environment or by Nature? The answer is negative, for the soft and weak in Lao Tzu's sense overcomes the strong. Lao Tzu argues,

"Nothing is weaker than water; Yet, for attacking what is hard and tough, Nothing surpasses it, nothing equals it. The principle, that what is weak overcomes what is strong, And what is yielding conquers what is resistant, Is known to everyone. Yet few men utilize it profitably in practice." (/Bahm, 1958, p.66-67, *12)

In other words, the soft and the weak in Lao Tzu's sense is the fittest for survival. Those who try to be strong, tough or aggressive are in contrary easily to be injured or destroyed.
(3) Tranquillity

People with few desires tend to have a tranquil character. Tranquillity implies peace, harmony and least disturbance. Lao Tzu said,

"Being without avarice through being tranquil, 
The world will be consolidated of its own accord."  
(Ch'en, 1977, p.186, *13)

Tranquillity means self-sufficiency and non-agitative; it does not mean inactive and stagnant. According to Ch'en's (1977) interpretation, tranquillity means "waiting patiently for the course of natural development to bring the problem and the solution to light without initiating elaborate measures to deal with a non-existent difficulty". (p.29) That is to say, people with a tranquil character only act when everything is ready and prepared.

VI. Complete Transcendence

The ultimate stage of development is a stage of complete transcendence in which one entirely forgets oneself, completely transcends oneself or fuses oneself with Nature to form one whole. At this stage, one becomes absolutely free - free to self-actualize oneself, free to do whatever one likes to do; free from illness, temptations, greedy desires, social pressures, despair of facing death, psychological dependance of others etc.
Chuang Tzu calls these people the perfect men, the divine man, the true Sages, the great supreme or simply the true men. Chuang Tzu elaborates the characteristics of these true men as follows:

"The true men of old did not override the weak, did not attain their ends by brute strength, and did not gather around them counsellors. Thus, failing they had no cause for regret; succeeding, no cause for self-satisfaction."

(//Lin, 1949, p.96, *14)

"The true men of old did not know what it was to love life or to hate death. They did not rejoice in birth, nor strive to put off dissolution. Unconcerned they came and unconcerned they went. That was all."

(//Lin, 1949, p.96, *15)

"Such men are free in mind and calm in demeanour, with high foreheads. Sometimes disconsolate like autumn, and sometimes warm like spring, their joys and sorrows are in direct touch with the four seasons, in harmony with all creation, and none know the limit thereof."

(//Lin, 1949, p.96, *16)

"The true men of old appeared of towering stature and yet could not topple down. They behaved as though wanting in themselves, but without looking up to others. Naturally independent of mind, they were not severe. Living in unconstrained freedom, yet they did not try to show off...."

(//Lin, 1949, p.97, *17)
Chuang Tzu also said,

"... thus it is said, "The perfect man ignores self; the divine man ignores achievement; the true sage ignores reputation." (Lin, 1949, p.72, *18)

It is concluded that in order to be absolutely free and to transcend oneself completely, one should have great intelligence, few desires, a non-valuative life philosophy and leads a simple and tranquil life.

The introduction of Tao Philosophy as a basis of the Ultimate Stage of Human Development (Labelled as Stage 7) is primitive and limited in scope in the above brief discussion. The main objective here is to initiate an exploration of oriental thought in the study of moral development. It is hoped that future study on introducing Indian Philosophy, Buddhism and Western Philosophy as bases of Stage 7 will be carried out soon.

It should be emphasized that though the above discussion of Tao Philosophy is believed to form a part of the universal structure of Stage 7, it does not, however, cover the all possible forms (structures) of Stage 7. It is likely that a more complete description of Stage 7 can only be constructed by exploring and integrating a number of major philosophies, Eastern and Western.
2.5. Moral Judgment and Decision: A Cybernetic Approach

Pugh (1977) develops a value-driven decision model of the Human Decision System. His theory is rooted in Sociobiology, Cybernetics and Decision Science. According to Pugh, the function of a value-driven decision system is similar to that of a human brain. "It compares alternative courses of action and selects one that seems 'best' in terms of a built-in system of values." (Pugh, 1977, p.6; see also Appendix 2.5(A), No.1).

The main purpose of this section is to sketch out the Moral Judgment and Decision System (MJDS) as a value-driven decision system. The basic concepts come from Pugh (1977). Since Pugh's classification of the built-in values is similar to Maslow's Hierarchy of Basic Needs, the structure of the built-in values in the following model is based on Maslow's Hierarchy (see Sectio 2.1) rather than Pugh's classification. For a review of Pugh's book (1977), see Marley (1978).

In general, the input and output processes of the MJDS are described in terms of Boradbent's model (1958, 1971). The Central Judgment and Decision Process is based on Pugh (1977) and Rest (in press). The model can be called the Cybernetic Approach of Moral Judgment and Decision.
2.5.1 Basic Concepts of a Value-Driven Decision System

A basic assumption in Cybernetic is that "biological systems operate within the same laws of information theory and system design that apply to artificial systems". (Pugh, 1977, p.35) Artificial systems refer in general to any computerized decision systems. The designer of a machine is man and the design objective is to use the machine to carry out some specific tasks for us. Similarly, Pugh argues that the designer of biological decision systems is biological evolution and the evolutionary design objective is the survival of the species.

There are two fundamental concepts in the Value-Driven Decision Model:

(1) Limited Capacity of Finite Decision Systems and Innate Human Values

"All biological decision systems and all computerized decision systems are finite data-processing systems. They have limited capacity for data input, data storage, and data analysis." (Pugh, 1977, p.26) However, the external environment can be very complex and "may involve almost unlimited variability." (p.27) For a finite system of limited capacity to deal with an environment of infinite variability, it is unavoidable to introduce compromises in its design. Based on the evolutionary design objective (Survival of the Species), a set of quite complex and
variable innate human values is incorporated to biological
decision systems as a design compromise. The innate
human value structure "is not an ideal or perfect appro-
ximation to the evolutionary objective. It is simply
the best compromise the evolutionary process has been
able to produce" (p.31). These innate values can be regar-
ded as substitutes or "surrogates for the ultimate evolu-
tionary objective" (p.34). They are sometimes called
Primary or 'Instinctive' Values.

Some major features of Primary Values are:

(a) The primary values are the biological decision system's
"ultimate criteria for evaluating decisions" (Pugh,
1977, p.7). They are the major determinants of human
behaviour.

(b) These values are "simply inherited decision criteria
that were built into the human species during the pro-
cess of evolution" (p.29). They are part of the built-
in system hardware.

(c) They include emotions, biological drives and valuative
sensations, such as "tactile pleasure or pain, comfort
or discomfort, joy or sorrow, and good or bad taste".
(p.30)

(d) They change with time and circumstances in accordance
with some complex, built-in nonrational rules. For
example, "the hunger sensation is an innate response
to a deficiency in nourishment, pain is an innate
response to dangerous heat or physical pressure...." (p.31)

In addition to primary values, human behaviour is also influenced by a set of secondary values, which are based on primary values. Some major features of Secondary Values are:

(a) They are learned as a result of interaction with the environment. In other words, they are "developed individually and culturally as an outgrowth of more basic innate human values:" (p.29).

(b) They are developed as a practical aid to problem-solving, they tend to simplify the decision-making process and hence "help the decision system to make decisions more efficiently or more reliably". (p.33)

(c) The secondary values "can take the form of rules of thumb, wise proverbs, social conventions, moral or ethical principles, and even habit." (p.33)

(d) They are usually developed as a result of rational thinking.

Further details concerning the Primary and Secondary Values are given in Appendix 2.5(A), No.2.

(2) The World Model

The World Model is a conceptual representation of the external world in a biological decision system. The
innate values are incorporated as a natural part of the world model through the model-building and refinement process. "The 'models' may be as unsophisticated as a child's model of his mother, which he uses to predict her response, or as sophisticated as quantum mechanics or general relativity." (Pugh, 1977, p.104-105) In the judgment and decision process, the model is used to "identify possible courses of action and to predict the consequences of the possible action alternatives". (p.105)

In general, the secondary values refer to some general moral principles or guidelines while the World Model is a conceptual representation for the environment. The World Model includes certain refined details of the environment and is based on the organism's primary and sometimes secondary values. For example, when we interact with our parents, we use a conceptual model of them, rather than a set of secondary values regarding parent-son/daughter interaction. That is, we know what they like and dislike, and that they love and care us. In other words, we can predict fairly accurately their reaction when we interact with them. On the other hand, when we interact with a stranger in a certain special situation, we always start with our secondary values as a guiding principle. It is obvious that the use of secondary values in decision-making requires more cybernetic resources than the use of the World Model unless some major model refinements are necessary, because in the former case, the system has to construct a model of the environment based on his/her secondary (and primary)
values, while in the latter case, the model has been constructed and is being stored in the Memory System.

2.5.2. The Moral Judgment and Decision System (MJDS)

(A) A Block Structure of the MJDS.

![Diagram of the Moral Judgment and Decision System (MJDS)](image)

Figure 2.3. Moral Judgment & Decision System (MJDS): A Block Diagram

The MJDS presented here is a hypothetical model based on current studies in Decision Science, and Pugh's Value-driven decision model. It should be emphasized that the model is a heuristic one which has not strong empirical support and many of the refined details are not known.
There are two basic characteristics affecting the functions of the MJDS:

(1) **Built-in System Hardware**

The built-in system hardware is incorporated with a set of primary values as a result of biological evolution. The hardware is represented in Fig. 23 by a net of black lines showing that the whole process leading to moral action is affected by the structure of this built-in system hardware. In general, the system hardware of the MJDS refers to the inborn biological structure of the human brain and the nervous system. It determines the basic characteristics and functions of the MJDS. On the other hand, the proper and full function of the "built-in" or "genetically determined" system hardware is not completely inborn, it depends to a large extent on one's normal psychological development. (Pugh, 1977, p.103-104) In general, members of a species possess very similar or exactly the same structure of the built-in system hardware.

(2) **Instantaneous Physiological and Psychological State**

Physiological and psychological state ($\psi$) refers to the state of basic needs and general condition of the organism. The classification of basic needs follows that of Maslow's Hierarchy of Basic Needs. (Maslow, 1970 (1954)). Instantaneous state is the state of the organism when the
input stimulus is being processed by the MJDS to give action. In other words, whether the organism is in healthy condition; in emoted state; or satisfied with food and water etc. during its functioning will affect its outcome.

In the last section, the state of basic needs is related to the primary values described by Pugh (1977), therefore \( \psi \) is also dependent on the primary values. According to Pugh (1977, p.71-78), the primary values of an organism is time dependent, thus \( \psi \) is also changing with time. In general, \( \psi \) takes the form of a periodic function of time. For example, the need for food drops to a very low level after taking a meal and rises to a high level just before the time of next meal.

(B) The Basic Functions of MJDS

Broadbent (1958, 1971) attempts to analyse "human function in terms of the flow of information within the organism." (1971, p.7) He starts with the concept of information in telephone and radio engineering and formulates a model based on "laboratory studies of simple functions such as the ability to detect a faint light occurring at unexpected times, or to remember a telephone number." (1971, p.3) Since his model is derived from empirical evidence, it lays a strong scientific foundation for further development. The input and output processes of our MJDS is based on Broadbent's model. (For a brief
There are many models concerning the Central Judgment and Decision Process (See e.g., Kaplan and Schwartz (1975, 1977), Hogarth (1980)). The basis of the present model comes from Rest (in press) and Pugh (1977).

Figure 2.4. The Basic Structure of MJDS

The basic functions of the MJDS can be divided into three major parts:

I. Input Process.

Our senses act as the receptor of incoming data. Part of these data will be stored in a buffer or temporary store so that any excess incoming information not immediately processed by the Central processor can be held for
a time not longer than a second. Because of the limited
capacity of the system, it is necessary for it to focus
its attention on some specific incoming information and
to ignore all the others. The selection of incoming
information is done by the Selective filter based on some
built-in rules.

II. Central Judgment and Decision Process

The Central Judgment and Decision Process (CJDP) is
garried out by the Control System and Central Processor,
which are incorporated with a Memory System. In Broadbent's
Model, the Memory System is called the Store of Conditional
probabilities of Past Events, while the Central Processor
and Control System are represented by his "Limited Capacity
Channel" and "System for Varying Output Until Some Input
is Selected" (Broadbent, 1971, p.10). The functions of
the Control System include:
(i) "allocating the cybernetic resources of the system",
(ii) assigning "tasks to be accomplished by other components",
and
(iii) controlling "the flow of information between compo-
nents". (Pugh, 1977, p.144) The Central Processor
refers to the main parts of the Human Brain which processes
the operation. Further details concerning the nature, and
biological and mechanical functions of the Central Proces-
sor and Control System in human brain can be found in
chapter 6 of Pugh (1977).
There are many theoretical models in Decision Science which describe the strategy in decision-making. We attempt to illustrate some aspects of the Central Judgment and Decision Process by introducing a model proposed by Rest (in press) which concerns mainly the process of moral judgment and decision. The details of the researches cited in the following discussion will not be mentioned here. Many of them have been discussed in Chapters 1 and 2. Further reviews of these researches can also be found in Rest (in press) and Staub (1978, 1979).

The Central Judgment and Decision Process consists of:

(1) **Interpreting the Stimulus and Identifying the Problem**

The incoming information passing through the Selective filter are interpreted by the organism. The interpretation may "include inferring the intentions, values, and needs of the people involved in the situation; the probable direction of their activities; and the effect of their activities on each other's welfare." (Rest, (in press) p.7). Researches on Bystander Reactions to Emergencies (Darley and Latane, 1968) and Empathy and Distress (Hoffman, 1975, 1976, 1979) are related to this process. A moral problem can only be raised if the actor realizes that "something he does would affect the welfare of someone else," (Rest, in press, p.7). In this aspect, research on Social Cognition (See, e.g., Damon, 1978; Selman, 1976) is relevant.
(2) Formulating an Ideal Plan of Moral Action

After the moral problem has been identified and structured, the next step is usually to formulate an ideal plan of action which satisfies one's moral ideals, or secondary values or World Model. Some researches in social psychology attempt to investigate how the social norms affect the formulation of a plan of moral action (See, e.g., Rest, in press, p.20-21). On the other hand, cognitive developmentalists are more interested in the study of the structures of moral judgment which act as a basis for an individual to formulate a plan of action.

(3) Evaluating Alternatives and Making Decision

Parallel to Step (2), the actor will identify and evaluate all possible alternatives. It is quite common that the first possible action an individual thinks of is not a moral one or an ideal one. The evaluation of alternatives normally includes the assessment of the consequences of each alternative action and the uncertainties involved in it. Very often, people choose not to act according to their ideal plan of moral action. It may be due to one or more of the following factors: one's primary values and instantaneous psychological state, the nature of the action, and one's secondary values. Relevant researches include: (a) Decision-making models (see e.g., reviews by Rapoport and Wallstan, 1972; Kaplan

The last (i.e. the fourth) component of Rest's model: 'executing and implementing a moral plan' is incorporated as a part of the Output Process.

III. Output Process

According to Broadbent (1971, p.10), the output action is implemented by a set of effectors. It is obvious that the effect of the initial output action will be fed back into the organism in order to modify its further action. The reasons why people very often cannot implement a moral plan successfully is quite complicated; researches on ego strength, delay of gratification and self-regulation (See, e.g., Mischel and Mischel, 1976) are relevant.

Apart from the emphasises on the formulation of an ideal plan of moral action, the main themes of Rest's model are similar to those of other decision-making models (See, e.g., Pugh, 1977, p.102-107: Hogarth, 1980, Chapter 8). Obviously, the model is not a linear one. Rest (in press) writes:
"Although the four components have a logical order (interpretation, then formulation of a moral course of action, then decision, then execution and implementation), the framework is not presented as a linear decision-making model, because there is ample evidence of interaction among the components...." (p. 38)

A detailed bibliography and more details of the above cybernetic model is given in Rest (in press), Pugh (1977) and Broadbent (1971).
3. A Theoretical Model of Moral Development

3.1. Introduction

The model describes the fundamental nature of moral development and behaviour. It is postulated that moral development and behaviour depends on the following fundamental parameters:

(1) Psychological Needs (N)

The physiological and psychological needs (N) form an underlying fundamental factor which affects all human behaviour. It is hypothesized that the development of N forms a major component of moral development. In this aspect, the theoretical base is predominantly Humanistic Psychology. (See literature review in Section 2.1)

(2) Human Relationships (R)

When two persons A and B interact with each other, the moral decision and action of A in any event depends largely on the relationship between A and B.

The above simple idea will be elaborated in more refined details in a later section. This approach can be called "common-sense" approach or "naive" approach. (See literature review in Section 2.2)
(3) Structure of Moral Judgment (J)

The development of moral judgment or reasoning is another fundamental factor of moral development. The cognitive developmental theory of morality established by Piaget and Kohlberg provides basic ideas for the theoretical model. (See literature review in Section 2.3)

The exposition of the theory is given mainly in mathematical terms.


In this section, Maslow's Theory of Human Motivation (See Section 2.1) is extended to include the Needs for fusion with Nature (see Section 2.4.2(9)). It is postulated that Maslow's Hierarchy of Basic Needs and the Need for fusion with Nature form a single hierarchy as follows:

\[
\begin{align*}
N_1 &= \text{Physiological Needs} \\
N_2 &= \text{Safety Needs} \\
N_3 &= \text{Belongingness and love needs} \\
N_4 &= \text{Need for esteem from other people} \\
N_5 &= \text{Non-transcending Self-actualization needs} \\
N_6 &= \text{Transcending self-actualization needs} \\
N_7 &= \text{Need for fusion with Nature}
\end{align*}
\]

A Hierarchy of Psychological Needs

An important assumption in Maslow's theory can be put in this way:
If $N_1, N_2, \ldots, N_{i-1}, N_i$ are "relatively well gratified", then $N_{i+1}$ emerges.  

(3.2-1)

Consider two examples:

(i) If the physiological needs ($N_1$) are relatively well gratified, then safety needs ($N_2$) emerge. (Maslow, 1970, p.39).

(ii) "If both the physiological ($N_1$) and safety ($N_2$) needs are fairly well gratified, there will emerge the love and affection and belongingness needs ($N_3$)...." (p.43, the notations $N_1, N_2$ and $N_3$ are ours)

Consider a person of age $T_k$ years, the general state of psychological needs of the person is given by

$$N = \sum_{i=1}^{7} a_{ik} N_i$$

(3.2-2a)

where $a_{ik}$ = psychological coefficient defining the degree of gratification or satisfaction of $N_i$ by the person of age $= T_k$ years.

Without loss of generality, the range of $a_{i}$s are defined as:

$$0 \leq \alpha_{ik} \leq 1 \text{ for any } k \quad (3.2-2b)$$

and $1 \leq i \leq 7$

where $\alpha_{ik} = 0$ means completely deficient of $N_i$ needs

$\alpha_{ik} = 1$ means completely gratified of $N_i$ needs.
It is assumed that $\alpha_{ik}$ is time-dependent, that is $\alpha_{ik} = \alpha_{ik}(t)$ where the value of $t$ is often small. It is of course always possible to express $t$ in terms of the age variable $T_k$ but since for some $i$, $t$ may be very small - as small as 1 or 2 days or even a few hours, it is more convenient to refer $t$ to a fixed frame of reference set by the observer. Consider, e.g., $i = 1$, in general, $\alpha_{ik}(t)$ becomes a large value when $t = \text{time just after a meal}$ and a small value when $t = \text{time just before a proper meal}$. In this case, $\alpha_{ik}(t)$ may be said to be a certain periodic function of $t$.

There are three types of gratification coefficients.

1. $\alpha_{ik}(t) = \text{Instantaneous value of the coefficient of gratification of } N_i \text{ needs of a person of age } T_k \text{ years at a time } t \text{ in a frame of reference set by an observer.}$

2. $\bar{\alpha}_{ik} = \alpha_{ik} = \text{Average value of } \alpha_{ik}(t) \text{ over a sufficiently large time } t_0, \text{ which is equal to one period of time in case } \alpha_{ik}(t) \text{ is a periodic function.}$ (As an illustration, assume $\alpha_{ik}(t)$ is an integrable function for $0 \leq t \leq t_0$, then

$$\alpha_{ik} = \bar{\alpha}_{ik} = \frac{1}{t_0} \int_0^{t_0} \alpha_{ik}(t) dt/t_0.$$}

3. $\alpha^0_{ik} = \text{Threshold value of } \alpha_{ik}. \text{ It is the minimum average value above which } N_i \text{ can be regarded as } "\text{relatively well gratified}."$
It is postulated that:

(i) If \( a_{ik} \geq a_{ik}^0 \) for \( n \geq i > 1 \)

then \( a_{n+1k} \geq 0 \) \hspace{1cm} (3.2.3)

(ii) \( a_{ik}^0 \geq a_{i+1k}^0 \) for \( 6 > i > 1 \)

(\text{i.e., } a_{ik}^0 \geq a_{2k}^0 \geq a_{3k}^0 \geq \cdots \geq a_{6k}^0 \geq a_{7k}^0) \hspace{1cm} (3.2.4)

(In order to be consistent, the age variable \( T_k \) should be defined as the mean age over a sufficiently large time \( t \).)

In addition, \( a_{ik} \) possesses two other basic characteristics:

(a) For the majority of people, as \( i \) increases beyond three, \( a_{ik}^0 \) decreases very rapidly to zero.

(b) In general, the values of \( a_{ik}^0 \) are different for different individuals. The smaller the \( i \) is, the smaller the differences of the values of \( a_{ik}^0 \) are among different individuals.

Equation (3.2.4) is consistent with Maslow's argument that "a more realistic description of the hierarchy would be in terms of decreasing percentages of satisfaction as we go up the hierarchy of prepotency" (Maslow, 1970, p.54). According to Maslow, the emergence of a new need "is not a sudden, saltatory phenomenon, but rather a gradual emergence by slow degrees from nothingness." (p.54) In the
following figure, we try to sketch out the concept of emergence of a new need. The figure also serves to illustrate the development of $N$.

Figure 3.1 A Developmental Pattern of Psychological Needs ($N$)

The above figure is an illustration only. Each solid curve represents a possible and stable developmental pattern at age $= T_k$ years. The dotted curve represents the threshold values of $\alpha_i$'s.

Mathematically, the general feature of the development of $N$ can be expressed as follows:

$$N = N(T_k) = \sum_{i=1}^{7} \alpha_{ik} N_i$$

(3.2-5a)

With $0 \leq \alpha_{ik} < 1$ for any $k$ and $1 \leq i \leq 7$
and
\[ a_{ik} > a_{i+1k} \quad \text{for} \quad 1 \leq i \leq 6 \quad (3.2-5b) \]

For \( T_{k+1} > T_k \), it is postulated that

(i) \[ a_{ik+1} > a_{ik} \quad \text{for} \quad 7 \geq i \geq 1 \quad (3.2-5c) \]

(ii) \[ a_{ln} > a_{ln}^0 \quad \text{for any age} = T_n \quad (3.2-5d) \]

(iii) and in general

either (a) \[ a_{ik} > a_{ik}^0 \quad (\text{for} \quad 7 \geq i > 2) \quad (3.2-5e) \]

or (b) there exists a number \( n \) such that

\[ a_{ik} > a_{ik}^0 \quad \text{for} \quad 1 \leq i \leq n \quad (3.2-5f) \]

and

\[ a_{ik} < a_{ik}^0 \quad \text{for} \quad 7 \geq i > n \]

with \( a_{nk} \gg a_{n+1k} \gg a_{n+2k} \gg a_{n+3k} \quad \ldots \quad \text{etc.} \)

(In other words, for that part of the curve underneath the dotted curve, the \( a_{ik} \)'s decrease rapidly as \( i \) increases).

Though (3.2-5)(a to f) describes a general pattern of the development of \( N \), in theory, for most people; it does not exclude other possible stable patterns. Three possible patterns not obeying (3.2-5) are illustrated as follows.
3.3. Human Relationships: A Naive Approach

Human interaction is defined as the total interaction between an actor and his/her environment, which may consist of other people, living things (e.g., a cat or a tree) and non-living things (e.g., a block of wood or a diamond ring). For simplicity and without loss of generality, the discussion is focused on the interaction between an actor and other people, that is, social interaction. When an actor (A) interacts with another person (P) in a social situation, one major factor affecting A's course of action is the relationship between A and P. This relationship forms part of the World Model in the MJDS of the actor. (See Section 2.5) In Pugh's (1977) terms,
the World Model of P conceptualized or constructed by A determines A's action. Since the World Model is dependent on the secondary and basically primary values, the Human Relationship also bears a direct relation with the secondary values (i.e. levels of moral judgment, \( J_i \) and coefficients \( \gamma_i \)) and primary values (i.e. Psychological Needs, \( N_i \) and coefficients \( \alpha_i \)). Common Statements such as "Blood is thicker than water" (Kinship); "Your scratch my back and I'll scratch yours" (Reciprocal altruism or Social Exchange); "Mind your own business" (Stranger-Stranger interaction) etc. are relevant.

The relationship between an actor, A and a person, P is defined as the importance of P valued by A in an interaction. The assignment of the values of importance by A to different people is often emotional, rather than rational. It is argued that the assignment of these values of importance has a genetic or biological origin (See Section 2.2). One method to express the values of importance or Human Relationship is to use the concept of altruism in psychology. Since there is no universally accepted definition of altruism in psychology, the common one provided by Bar-Tal (1976) based on the work of Berkowitz (1972) and Krebs (1970) is adopted here: "altruistic behaviour 1. Must be carried out voluntarily 2. Must aim to benefit another 3. Must be carried out without expectation of a reward." (Bar-Tal, 1976, p.5) (See also Appendix 2.2(A)).
Based on consensus of opinions (See also Carter, 1980), the following hierarchy of Human Relationship is therefore constructed:

\[ (R_0 = \text{Self}) \]
\[ R_1 = \text{First kins; close relatives} \]
\[ R_2 = \text{Best friends/intimates} \]
\[ R_3 = \text{Neighbours, peer group, colleagues (e.g., club, political party, company or organization, school)} \]
\[ R_4 = \text{People of your country} \]
\[ R_5 = \text{People of other countries} \]
\[ R_6 = \text{Someone you dislike or enemies} \]
\[ R_7 = \text{Other living things (e.g. animals and plants)} \]
\[ \text{and non-living things}. \]

A Hierarchy of Human Relationships

A few remarks about the above hierarchy are:

(1) Based on the assumption that "Human life is more important than the life of any other things", the "other living things and non-living things" are grouped into \( R_7 \), which is put at the bottom of the hierarchy.

(2) The hierarchy is a general one, which exists in most rational people.

(3) Each \( R_i \) represents a domain of interaction for the actor. In general, the whole domain of interaction
of an actor \[ R = R_0 + R_1 + \cdots + R_7 = R_D \]

(4) The above division of the whole domain of interaction of an actor is arbitrary but the order of the hierarchy: Kins - friends - strangers - enemies - other living things - non-living things is invariant of the methods of division. It should be noted that the position of \( R_0 = \text{self} \) in the hierarchy is not defined at this stage. It will be discussed in further details in Section 3.3.5.

(5) For each \( R_1 \), it is always possible to subdivide it into a sub-hierarchy. For example: for \( R_1 \), we may subdivide it into:

- \( R_{11} = \text{parents; sons/daughters; husband/wife} \)
- \( R_{12} = \text{brothers/sisters} \)
- \( R_{13} = \text{first cousins} \)
- \( \text{etc.} \)

However, the rationale underlying such sub-division is quite complex, and since the main interest is to establish the fundamental nature of Human Relationship, the refined sub-division of \( R_1 \)'s is left for possible future research.

(6) \[ R_1 \ R_2 \ R_3 \ R_4 \ R_5 \ R_6 \ R_7 \]

Value of importance: Greatest \( \cdots \) increase \( \cdots \) Smallest
Mathematically, Human Relationship is expressed as:

\[ R = \sum_{i=1}^{7} \beta_i R_i \]  

(3.3-1)

Where \( 0 \leq \beta_i \leq 1 \) (for \( i = 1, 2, ..., 6, 7 \))

\( \beta_i \) = coefficient of Human Relationship between an actor (A) and a member of \( R_i \), (P)

As mentioned before, it is possible to define the values of importance of others given by an actor in terms of the concept of altruism, therefore \( \beta_i \) is defined as the importance of a member of \( R_i \) (P) as valued by an actor (A) or the probability of carrying out altruistic act towards P by A. Hence

\( \beta_i = 1 \) implies that maximum altruism or minimum selfishness will be executed by A towards P.

\( \beta_i = 0 \) implies that minimum altruism or maximum selfishness will be executed by A towards P.

In general

\( \beta_1 \geq \beta_2 \ldots \geq \beta_7 \)

or

\( \beta_i \geq \beta_j \) for \( 1 \leq i \leq j \)  

(3.3-2)
Theoretically speaking, (3.3-2) means that if P belongs to any $R_i$ ($i = 1, 2, 3, \ldots, 7$), and the same or equivalent social situations occur between the actor (A) and P, then the probability of carrying out an altruistic act by A towards P obeys $\beta_i \geq \beta_j$ for $i < j$. While the meaning of "the same and equivalent social situations" is theoretically acceptable, it may be difficult to define it in empirical studies, and individual researchers may have to construct specific operational definitions for their own purposes.

Basically, the developmental pattern of $\beta_i$ is postulated to be similar to that of $\delta_i$. The ultimate goal of development of R is to be altruistic to all others in the world; that is to develop universal love and friendship.
Mathematically, the development of $R$ can be expressed as follows:

Consider a person of age $= T_k$,

$$R = R(T_k) = \sum_{i=1}^{7} \beta_{ik} R_i$$

where $\beta_{ik} =$ Coefficient of Human Relationships at age $T_k$.

By (3.3-2),

$$\beta_{ik} \geq \beta_{i+1,k} \quad \text{for} \quad 6 > i > 1$$

(This is same as: $\beta_{ik} \geq \beta_{jk}$ for $1 < i < j$)

At age $T_{k+1} > T_k$,

$$R = R(T_{k+1}) = \sum_{i=1}^{7} \beta_{ik+1} R_i$$

and $\beta_{ik+1} \geq \beta_{i+1,k+1} \quad \text{for} \quad 6 > i > 1$

Now, it is postulated that

$$\beta_{ik+1} = h_i \beta_{ik}$$

(3.3-3)

with $h_i \geq 1$ for $i = 1,2,\ldots,7$

(or $\beta_{ik+1} \geq \beta_{ik}$ for $1 \leq i \leq 7$)

It should be noted that the derivation of (3.3-3) is similar to that of (3.2-7).
Excluding $R_7$, the ultimate goal of the development of Human Relationship: to be altruistic to all others is also consistent with the human ultimate evolutionary objective: survival of species because altruism, on the whole, favours group and species survival. (See Section 2.2). The theme underlying altruism towards members of $R_7$ is philosophical, religious and idealistic. It will not be elaborated here. (See also Section 2.4.2)
The structure of moral judgment is another major determinant of moral behaviour. Kohlberg's six-stage theory of moral development (See Section 2.3) and the Stage 7 described in Section 2.4 are combined to form a single theoretical hierarchy.

\[ J = \sum_{i=0}^{7} \gamma_i J_i \]  

(For \(J_1 \) to \(J_6\), see Kohlberg (1976, 1971, 1969))

The stage of Moral Judgment of a person is given by:

\[ J = \sum_{i=0}^{7} \gamma_i J_i \]  

(3.4-1)

Where \(0 \leq \gamma_i \leq 1\) and \(\gamma_i\) = coefficient of moral judgment
As mentioned before, the stage of moral judgment of a person is seldom a pure and clear-cut one, therefore it is necessary to introduce a complex stage model in the following discussion (See also Section 2.3.1) In general, the $\gamma_i$ expresses the percentage of the use of $J_i$, or the probability of using $J_i$ by a person in his moral judgment or reasoning.

The study of the development of $J$ has been well established by Piaget, Kohlberg, Rest and many others (See Section 2.3). The following figure is an illustration of the probabilistic model of $J$-development. (Not in proportion)

![Figure 3.5 A Developmental Pattern of Structure of Judgment ($J$)](image)
Mathematically, the probabilistic Model of J-development can be expressed as follows:

Consider an actor of age \( T_k \)

\[
J = J(T_k) = \sum_{i=0}^{7} \gamma_{ik} J_i \tag{3.4-2a}
\]

where \( \gamma_{ik} \) = coefficient of Moral Judgment at age \( T_k \).

\( \gamma_{ik} \) obeys the following two conditions:

(i) \( \sum_{i=0}^{7} \gamma_{ik} = 1 \) \tag{3.4-2b}

(ii) \( \gamma_i \leq \gamma_{i+1} \) for \( 0 \leq i \leq m \) \tag{3.4-2c}

and \( \gamma_i \geq \gamma_{i+1} \) for \( i > m \)

Condition (ii) implies:

\[
\gamma_0 \leq \gamma_1 \leq \cdots \leq \gamma_{m+1}
\]

and

\[
\gamma_{m+1} \geq \gamma_{m+2} \geq \cdots \geq \gamma_7
\]

That is,

\[
\gamma_{m+1} = \text{Maximum of } \{ \gamma_0, \gamma_1, \cdots, \gamma_6, \gamma_7 \}
\]

At age \( T_{k+1} > T_k \)

\[
J = J(T_{k+1}) = \sum_{i=0}^{7} \gamma_{ik+1} J_i \tag{3.4-3a}
\]

With \( \sum_{i=0}^{7} \gamma_{ik+1} = 1 \) \tag{3.4-3b}
\[ \gamma_{ik+1} < \gamma_{i+1 k+1} \text{ for } 0 \leq i \leq n \]  
\[ \gamma_{ik+1} > \gamma_{i+1 k+1} \text{ for } i > n > 7 \]

In general, \( n \geq m \). 

(3.4-3c)

and it is postulated that (without loss of generality, assume the curves \( T_k, T_{k+1} \) intersect at \( T_{m+1} \))

\[ \gamma_{i k+1} = a_i \gamma_{ik} \text{ for } a_i \leq 1 \]  
\[ \text{and } 0 \leq i \leq (m+1) \]

(3.4-4a)

(or \( \gamma_{i k+1} \leq \gamma_{ik} \text{ for } 0 \leq i \leq (m+1) \))

and

\[ \gamma_{i k+1} = b_i \gamma_{ik} \text{ for } b_i > 1 \]  
\[ \text{and } i > (m+1) > 7 \]

(3.4-4b)

The values of \( a_i \) and \( b_i \) (\( i=0, 1, 2, \ldots, 7 \)) may vary to a large extent among different individuals. More refined empirical studies are required in order to develop the theoretical relations underlying \( a_i \)'s and \( b_i \)'s.

It has been found that the correlation between moral judgment and moral action is not very high (See Section 2.3). Indeed, a person tends to reason about a moral issue or a dilemma situation at a much higher level when he/she is not directly involved in the particular situation. It is postulated that there are two levels of moral judgment in an individual:
J' = Optimal Level of moral judgment
J = Ordinary Level of moral judgment

J' refers to the maximum level of moral judgment achieved by a person of age (T). It is often used by the person to reason about hypothetical moral issues or social situations, particularly those third-personal and less emotional ones. The moral stages studied by most cognitive developmentalists are obviously J's. On the other hand, J is used by a person to reason and make decisions for actions in real-life situations. The relation between J and J' is given by the following equations.

Consider a person of age = T_k,

\[ J = J(T_k) = \sum_{i=0}^{7} \gamma_{ik} J_i \]

with

(i) \( \gamma_i \leq \gamma_{i+1} \) for \( 0 \leq i \leq m \)

(ii) \( \gamma_i > \gamma_{i+1} \) for \( i > m > 7 \)

and

\[ J' = J'(T_k) = \sum_{i=0}^{7} \gamma'_{ik} J_i \]

with

(i) \( \gamma'_{ik} = C_i \gamma_{ik} \) where \( C_i \leq 1 \) and \( 0 \leq i \leq (m+1) \)

(or \( \gamma'_{ik} < \gamma_{ik} \) for \( 0 \leq i \leq (m+1) \))

(ii) \( \gamma'_{ik} = d_i \gamma_{ik} \) where \( d_i > 1 \) and \( i > (m+1) > 7 \)

(or \( \gamma'_{ik} > \gamma_{ik} \) for \( i > (m+1) > 7 \))
Further discussion on the differences between J and J' will be found in the next chapter.

3.5. Fundamental Nature of Moral Development

The basic postulates underlying the fundamental nature of Moral Development have been discussed in previous paragraphs. They are summarized as follows:

Postulate 1: Primary Postulates of Moral Development

(A) The Development of Psychological Needs

If \[ \overrightarrow{N_k} = N(T_k) = \sum_{i=1}^{7} \alpha_i(T_k) N_i \]

then (i) \[ 0 < \alpha_{ik} < 1 \] for any \( k \) and \( 1 \leq i \leq 7 \) (3.5-1a)

(ii) \[ \alpha_{ik} > \alpha_{i+1k} \] for \( 1 \leq i < 6 \) (3.5-1c)

(iii) For \( T_{k+1} > T_k \),

\[ \alpha_{ik+1} = a_i \alpha_{ik} \text{ with } a_i > 1 \] (3.5-1d)

(or \( \alpha_{ik+1} \geq \alpha_{ik} \))
(B) The Development of Human Relationships

If \( \mathbf{R}_k = R(T_k) = \sum_{i=1}^{n} \beta_i(T_k) \mathbf{R}_i = \sum_{i=1}^{n} \beta_{ik} \mathbf{R}_i \) (3.5-2a)

then

(i) \( 0 \leq \beta_{ik} \leq 1 \) for any \( k \) and \( 1 \leq i \leq 7 \) (3.5-2b)

(ii) \( \beta_{ik} > \beta_{i+1,k} \) for \( 1 \leq i \leq 6 \) (3.5-2c)

(iii) For \( T_{k+1} > T_k \), \( \beta_{ik+1} = b_i \beta_{ik} \) (3.5-2d)

with \( b_i > 1 \) and \( 1 \leq i \leq 7 \)

(or \( \beta_{ik+1} > \beta_{ik} \))

(C) The Development of Moral Judgment

If \( \mathbf{J}_k = J(T_k) = \sum_{i=0}^{7} \gamma_{ik} \mathbf{J}_i \) (3.5-3a)

then

(i) \( \sum_{i=0}^{7} \gamma_{ik} = 1 \) (3.5-3b)

(ii) There exists (at least) a number \( m \) such that

\( \gamma_{ik} \leq \gamma_{i+1,k} \) for \( 0 \leq i \leq m \) (3.5-3c)

and \( \gamma_{ik} \geq \gamma_{i+1,k} \) for \( i > m \geq 7 \)

(iii) For \( T_{k+1} > T_k \) (without loss of generality, assume the curves \( T_k, T_{k+1} \) intersect at \( T_{m+1} \))

\( \gamma_{ik+1} = C_i \gamma_{ik} \) (or \( \gamma_{ik+1} \leq \gamma_{ik} \) for \( C_i \leq 1 \) and \( 0 \leq i \leq (m+1) \) (3.5-3d)

and
\[ y_{ik+1} = d_i y_{ik} \quad \text{(or } y_{ik+1} \geq y_{ik} \text{)} \] for

\[ d_i \geq 1 \quad \text{and } i > (m+1) > 7 \quad (3.5-3d) \]

(D) Define

\[ \overrightarrow{M_k} = M(T_k) = \text{The Stage of Moral Development} \]

(or in general Human Development)

of a person of age, \( T_k \).

\[ \overrightarrow{M_k} = \overrightarrow{N_k} + \overrightarrow{R_k} + \overrightarrow{J_k} \quad (3.5-4) \]

For convenience, the matrix representation is used.

Let

\[ \{\alpha_{jk}\} = (\alpha_{1k}, \alpha_{2k}, \alpha_{3k}, \ldots, \alpha_{7k}) \]

\[ \{\beta_{jk}\} = (\beta_{1k}, \beta_{2k}, \beta_{3k}, \ldots, \beta_{7k}) \]

\[ \{\gamma_{jk}\} = (\gamma_{0k}, \gamma_{1k}, \gamma_{2k}, \ldots, \gamma_{7k}) \]

\[ \overrightarrow{n} = \begin{bmatrix} N_1 \\ N_2 \\ \vdots \\ N_7 \end{bmatrix}, \quad \overrightarrow{r} = \begin{bmatrix} R_1 \\ R_2 \\ \vdots \\ R_7 \end{bmatrix}, \quad \overrightarrow{j} = \begin{bmatrix} J_0 \\ J_1 \\ \vdots \end{bmatrix} \]

Equations (3.5-1a), (3.5-2a) and (3.5-3a) can be written as:
\[ \mathbf{N}_k = \{a_{jk}\} \mathbf{n} \]  \hspace{0.5cm} (3.5-5a)

\[ \mathbf{R}_k = \{\beta_{jk}\} \mathbf{r} \]  \hspace{0.5cm} (3.5-5b)

\[ \mathbf{J}_k = \{\gamma_{jk}\} \mathbf{j} \]  \hspace{0.5cm} (3.5-5c)

Let

\[
\begin{align*}
\mathbf{M}_{1k} &= \mathbf{N}_k \\
\mathbf{M}_{2k} &= \mathbf{R}_k \\
\mathbf{M}_{3k} &= \mathbf{J}_k
\end{align*}
\]

\[ \Rightarrow \mathbf{M}_k = \sum_{i=1}^{3} \mathbf{M}_{ik} \]  \hspace{0.5cm} (3.5-6)

and

\[
\begin{align*}
\mathbf{M}_1 &= \mathbf{n} \\
\mathbf{M}_2 &= \mathbf{r} \\
\mathbf{M}_3 &= \mathbf{j}
\end{align*}
\]  \hspace{0.5cm} (3.5-7)

and \( m_{1jk} = \alpha_{jk} \)

\[ m_{2jk} = \beta_{jk} \]  \hspace{0.5cm} (5.5-8)

\[ m_{3jk} = \gamma_{jk} \]

Combining (3.5-4) and (3.5-5a, b & c); we get

\[
\mathbf{M}_k = \{a_{jk}\} \mathbf{n} + \{\beta_{jk}\} \mathbf{r} + \{\gamma_{jk}\} \mathbf{j}
\]

\[
= \{a_{jk}\} \mathbf{M}_1 + \{\beta_{jk}\} \mathbf{M}_2 + \{\gamma_{jk}\} \mathbf{M}_3 \hspace{0.5cm} \text{by (3.5-7)}
\]

\[
= \{m_{1jk}\} \mathbf{M}_1 + \{m_{2jk}\} \mathbf{M}_2 + \{m_{3jk}\} \mathbf{M}_3 \hspace{0.5cm} \text{by (3.5-8)}
\]
\[ \overrightarrow{M}_k = \sum_{i=1}^{3} \{m_{ijk}\} \, \overrightarrow{M}_i \]  

(3.5-9)

Since \( \hat{M}_1 = \overrightarrow{n} = \begin{pmatrix} N_1 \\ \vdots \\ \vdots \\ \vdots \\ N_7 \end{pmatrix} \)

write: \( \hat{M}_{1j} = N_j \) for \( 1 \leq j \leq 7 \)

\[ \overrightarrow{M}_2 = \overrightarrow{r} = \begin{pmatrix} R_1 \\ \vdots \\ \vdots \\ R_7 \end{pmatrix} \]

Similarly \( \hat{M}_2 = \overrightarrow{r} = \begin{pmatrix} R_1 \\ \vdots \\ \vdots \\ R_7 \end{pmatrix} \)

With

\[ \hat{M}_{2j} = R_j \] for \( 1 \leq j \leq 7 \)

and

\[ \overrightarrow{M}_3 = \overrightarrow{j} = \begin{pmatrix} J_0 \\ \vdots \\ \vdots \\ J_7 \end{pmatrix} \]

with

\[ \hat{M}_{3j} = J_j \] for \( 0 \leq j \leq 7 \)

For simplicity and without loss of generality, \( J_0 \) is absorbed in \( J_1 \).
Thus,

\[ \hat{M}_3 = \begin{pmatrix} J_1 \\ \vdots \\ \vdots \\ J_7 \end{pmatrix} \]

\[ \hat{M}_{3j} = J_j \text{ for } 1 \leq j \leq 7 \]

Thus,

\[ \hat{M}_k = \sum_{i=1}^{3} \sum_{j=1}^{7} m_{ijk} \hat{M}_i \]

\[ = \sum_{i=1}^{3} \sum_{j=1}^{7} m_{ijk} \hat{M}_i \]

(3.5-10)

Though Equation (3.5-10) is mathematically elegant, it may be less obvious for "non-mathematicians", therefore Eq. (3.5-1), (3.5-2) and (3.5-3) will used in the following discussion.

Since \( \hat{N}_k \), \( \hat{R}_k \) and \( \hat{J}_k \) are all age-dependent and hence time-dependent, we may write:

\[ \hat{N}_k = f(T) \quad \hat{R}_k = g(T) \quad \hat{J}_k = h(T) \]

\[ \therefore \hat{M}_k = M(T_k) = f(T) + g(T) + h(T) \]

(3.5-10)

According to (3.5-11), \( N, R, J \) are developing in parallel.

In order to study the interaction between \( J \) and \( R, N \), we define:
\[ N(J_k) = N\{J(T_k)\} = \text{The Stage Pattern of } N \text{ of a person in terms of his/her stage of moral judgment, } J_k \]

Similarly, \( R(J_k) = R\{J(T_k)\} \)

Also write:
\[
\begin{align*}
N(J_k) &= \sum_{i=1}^{7} \alpha_i(J_k) N_i \tag{3.5-12a} \\
R(J_k) &= \sum_{i=1}^{7} \beta_i(J_k) R_i \tag{3.5-12b}
\end{align*}
\]

Postulate 2: Secondary Postulates of Moral Development

(A) The Development of Psychological Needs in terms of Moral Judgment Development

(i) \( 0 \leq \alpha_i(J_k) \leq 1 \) for any \( k \) and \( 1 \leq i \leq 7 \) \( \tag{3.5-13a} \)

(ii) For a fixed \( J_k \),
\[ \alpha_i(J_k) > \alpha_{i+1}(J_k) \text{ for } 1 \leq i \leq 6 \] \( \tag{3.5-13b} \)

(iii) For a fixed \( i \), \( \alpha_i(J_k) \leq \alpha_i(J_{k+1}) \) with \( J_k = J(T_k) \) and \( J_{k+1} = J(T_{k+1}) \); \( T_{k+1} > T_k \)

(B) The Development of Human Relationship in terms of Moral Judgment Development

(I) \( 0 \leq \beta_i(J_k) \leq 1 \) for any \( k \) and \( 1 \leq i \leq 7 \) \( \tag{3.5-14a} \)
(ii) For a fixed $J_k$,

$$\beta_i(J_k) > \beta_{i+1}(J_k) \text{ for } 1 \leq i \leq 6 \quad (3.5-14b)$$

(iii) For a fixed $i$, and $1 \leq i \leq 7$,

$$\beta_i(J_k) < \beta_i(J_{k+1}) \text{ with } T_{k+1} > T_k \quad (3.5-14c)$$

In addition, it is always possible to establish similar relations for $\beta_i(N_k)$, $\gamma_i(N_k)$, $\alpha_i(R_k)$, and $\gamma_i(R_k)$.

Figure 3.6: The Interaction of N, R and J
From Equation (3.5-14c), a person exhibits more altruism in similar social situations as his/her $J_k$ increases. In other words, with a higher stage of moral judgment, one would show more altruism and higher degree of self-sacrifice to others. Thus, one would rate others more important than before. In this way, the position of $R_0 = \text{self}$ in the Hierarchy of Human Relationships (R) tends to shift slowly from the top (maximum value of importance) downward.

Let $R_0(J_k)$ = position of self in the R-Hierarchy when the moral judgment stage of the person is $J_k$.

$$J_k = J(T_k) \quad ; \quad T_{k+1} > T_k \quad ; \quad J_{k+1} > J_k$$

In the sense that the dominant of $J_{k+1}$ is in general higher than or equal to that of $J_k$.

$$R_0(J_0) \quad R_0(J_1) \quad R_0(J_2) \quad R_0(J_3) \quad R_0(J_4)$$

In order to elaborate the meaning of $R_0(J_k)$, let us consider a person $P$ with $R_0(J_k) = R_i$ and without loss of generality, take $i = 3$, i.e., $R_0(J_k) = R_5$. This means that the person $P$ and all members of $R_i$, $1 \leq i \leq 3$
form a whole group or body. In general, P would treat all others in this group \((R_i, 1 \leq i \leq 3)\) as equally important as or even more important than himself/herself, particularly in emergency or dilemma situations.

3.6 The Evolution of Human Morality

According to Pugh (1977), the Primary Values, which are related to \(N_1, N_2\) and part of \(N_3; R_0\) and \(R_1\), were built into our system hardware (structure of brain and nervous system) by evolutionary process. (See Section 2.5) It is our basic assumption that the direction of evolution is to produce humankind with built-in system hardware which are incorporated with large values (tending to say, 0.7, 0.8 or even one) of \(\alpha_i^0\) and \(\beta_i\) for \(1 \leq i \leq 7\).

Let \(G_k = \text{kth Generation of Evolution}\)
\((G_k \text{ is earlier than } G_{k+1})\)

\[G_k \{\alpha_i^0\} = \text{a set of built-in values } \alpha_i^0, 1 < i < 7, \text{ in the kth Generation of Humankind.}\]

\[G_k(\alpha_i^0) = \text{the built-in value, } \alpha_i^0 \text{ in the kth Generation of Humankind.}\]

Similarly, \(G_k\{\beta^0\}\) and \(G_k(\beta^0)\) are defined.

It is postulated that

(i) \(G_k(\alpha_i^0) \geq G_k(\alpha_{i+1}^0)\) for \(1 \leq i \leq 6\)

\(G_k(\beta_i) \geq G_k(\beta_{i+1})\)
(ii) \( G_k(\alpha_i^0) \leq G_{k+1}(\alpha_i^0) \)

for \( 1 \leq i \leq 7 \)

\( G_k(\beta_i) \leq G_{k+1}(\beta_i) \)

The following graph illustrates the above inequalities.

![Graph illustrating the above inequalities](image)

Figure 3.7. *An Evolutionary Pattern of Human Morality*

The direction of human evolution is towards self-actualization, freedom and universal love.

### 3.7 General Remarks

The whole chapter merely gives a primitive sketch of the fundamental nature of moral development. Most
of the refined details have yet to be discovered and elaborated. The behavioural aspects of moral development were not discussed explicitly in terms of the fundamental parameters N, R and J.

Generally speaking, the main objectives of our theoretical model are: (1) To study the development of human morality in an elegant scientific manner. (2) To incorporate some of the major psychological approaches in the model (3) To investigate the ultimate goal of human development. The following paragraphs attempt to elaborate these objectives in further details.

(1) Scientific Study of Moral Development

The major tasks include: (1) To introduce a scheme of mathematical symbols and terminologies into the study of Moral Development. This will provide a basic framework for further extension and elaboration. (ii) To establish a set of basic postulates (iii) To carry out deductions in a logically consistent manner. In this way, most of the deductions and equations are in the form of inequalities and summations at this stage. However, this rule does not prevent the use of graphical figures and sophisticated mathematical expressions as illustrations of the arguments. (iv) To incorporate findings in Natural Science (e.g., Biology and Sociobiology) into the model.
(2) Incorporation of Current Psychological Approaches

As mentioned elsewhere in this chapter, different current approaches are employed in the deduction of our model. Two major ones are: (i) Humanistic Psychology for the discussion of the development of Psychological Needs, and (ii) Cognitive Developmental Theory of Morality for the discussion of the development of moral judgment. In addition, Evolutionary Theory and Sociobiology form a base for the discussion of the concepts of Human Relationships and Evolutionary Development of morality.

(3) Ultimate Goal of Development

It has been emphasized that the ultimate goal of individual development is towards self-actualization, freedom, universal love, and universal justice. The fittest person for survival is the person with most free-freedom - freedom to self-actualize, to be oneself, to satisfy all basic needs, to love and be loved etc. In short, the fittest is the freest. Similarly, the ultimate goal of human evolution is towards freedom and universal love. The fittest group for survival is the group with all or most people enjoying freedom, showing universal love and practising universal justice.
4. Fundamental Nature of Moral Development: An Objective Measure

4.1. The Construction of a New Test of Moral Development.

In order to test some of the essential hypotheses of the theory established in Chapter 3, an objective measure called the Moral Development Test (MDT) was constructed.

The MDT consists of a number of hypothetical dilemma situations and two different forms of the MDT were prepared, with an extension of Form A (called Form $A^*$) for adults (see Appendix 5(A)).

<table>
<thead>
<tr>
<th>Form A</th>
<th>Form B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A Lost Bag</td>
<td>1. The Young Robber</td>
</tr>
<tr>
<td>2. The Sinking Boat</td>
<td>2. Freedom of Speech</td>
</tr>
<tr>
<td>3. A Doctor's Dilemma</td>
<td>3. Car Accident</td>
</tr>
<tr>
<td>5. The Criminal</td>
<td>5. Civil War</td>
</tr>
</tbody>
</table>

**TABLE 4.1. Two Different Forms of the MDT**

Notes on the different forms of the MDT:

(1) The item "Car Accident" appears in both Forms A and B.
(2) The item "Civil War" has two versions. The one used in Form B is a shorter version. The longer version used in Form A⁺ includes 7 item responses instead of 6 in Part I and 15 statements instead of 9 in Part II. (For details, see Appendix 5(A)). The longer version of the item "Civil War" is combined with the 5 items in Form A to form the MDT Form A⁺.

The MDT Form A⁺ is intended for adult subjects who are likely to be able to cope with the more difficult situation described in the item "Civil War" (long version). Another reason for asking the adult subjects to answer one more item than the adolescents is that more information can be obtained from the adult group.

(3) In common with other objective measures, the MDT can be scored and analysed by computer.

4.2. General Features of the Moral Development Test (MDT)

1. Hypothetical Dilemma Situations

Each MDT item describes a hypothetical dilemma situation and the subject is asked to imagine himself/herself in the situation. Most of these hypothetical situations are extreme and in general rarely occur in the daily-life of most people. However, all MDT situations were written based on the principle that such situations are definitely possible in real-life.
The use of hypothetical dilemma situations is a common technique in moral research (e.g. Kohlberg's Moral Dilemma Instrument; Rest's DIT and many others; See Section 2.3). On the other hand, it generates an important research issue, namely, is it meaningful to use hypothetical situations in moral research? Two relevant points can be made:

(i) Two similar arguments criticizing the use of hypothetical dilemmas are as follows:
(a) It is often argued that since the test is based on hypothetical situations, it is little to do with moral behaviour in reality.

(b) A number of subjects told the researcher that what they answered on the questionnaire might not reflect exactly what they would act if they situation did really happen in their lives in the future because in such real-life situations, they would be much more emotional and might be completely irrational. In addition, real-life situations are more complicated than the hypothetical situations in the test.

Both arguments are quite sound but the first one denies, in principle, the functions of all psychological tests. It is true that hypothetical situations are different from real situations; controlled experimental situations are different from natural ones. However, they are not unrelated; the stronger the relations between them, the better the test or experiment is. The major objective of empirical data of
all sorts is not only to provide the very limited (but extremely important) support for the researcher's hypothesis, but to give some insights for inducing general laws or principles and to establish new theories.

Thus the meaningfulness of using hypothetical dilemma situations in moral research depends on (a) whether there is a strong relation between the subject's responses to the test and their actual moral action and/or (b) whether the empirical data collected by such hypothetical dilemmas help the researcher to induce and establish general laws of moral behaviour, which can then be tested by some other empirical methods.

It should be noted that answering a questionnaire is also a real-life action and in so doing goes through the full process of the Moral Judgement and Decision System (See Section 2.5). A good hypothetical dilemma situation should catch a subject's attention, disturbs him/her emotionally and generate responses not very much different from those involved in similar real-life situations.

(ii) The use of hypothetical dilemma situations is an economic and practical way for the exploration of the whole pattern of moral development. It is so because (a) the data collection procedure does not require complicated or sophisticated research facilities. Hence, it is less expensive than many other methods
such as experimental or observation methods.

(b) This form of data collection procedure in general does not cause the subjects too much trouble.

2. Test Format.

The test format of the MDT is based on Rest's (1979a) Defining Issues Test (DIT).

The following paragraphs should be read in parallel with the sample copies of the MDT in Appendix 5(A).

Each MDT item describes a hypothetical dilemma situation and is followed by sets of questions in two parts. Part I consists of a set of persons or a set of specified conditions denoted by $X_1, X_2, X_3 \ldots$ etc. Subjects are asked to rate each $X_i$ on a 7-point scale (From "Definitely YES" to "Definitely NO") and to select the top three choices from the $X_i$s and put them in order. Part II is similar to the DIT; it consists of a set of 9 statements with the exception of the item "Civil War" (long version) which consists of 15 statements. Subjects are asked to rate on a 5-point scale (From "Very Great Importance" to "No Importance") how important each of the statements would be in deciding their answers in Part I. They are also asked to put their top three statements in order of importance.

Further explanation of the details and rationale of this kind of Test Format is reviewed in Section 2.3."
3. Judgement and Decision.

The Part I questions of the MDT tend to explore the emotional aspect of moral development by asking the subjects to make decisions under certain specified conditions. Subjects are instructed to give the first answers that come into their mind. On the other hand, the Part II questions tend to explore the rational aspect of moral development, namely, the general structures of moral judgement. Subjects are asked to answer Part I questions before doing the Part II ones. Thus, subjects are asked to make decisions first and then to judge or rationalize what they have decided. However, as mentioned in Section 2.5, most decision theories assert that people judge the situation before they decide on how to act. Is there a contradiction between our test design and general decision theories?

The answer is no. First of all, the MDT is designed primarily for investigating the general structures underlying both the rational and emotional aspects of moral development; it is not used to trace the actual process of the Moral Judgement and Decision System (MJDS). In other words, the present MDT design follows a research strategy which aims at the study of the Ordinary Level of Judgment and Emotional aspect of moral development. It starts with asking subjects to give their decisions first, which are supposed to be emotional and are sensitive
to external stimulus (i.e. easily changed or affected by external stimulus) before asking them to judge rationally the hypothetical situations and their decisions. Thus, the emotional responses given in Part I are mainly direct projective ones ("gut" feeling type) and subjects are presented with minimal interaction with testing materials which may disturb or affect their own decisions. However, this does not mean that when subjects answer the Part I questions, they do not think and judge. Indeed, they go through the whole process of MJDS to arrive at a decision but the time used is usually short - a few seconds to a few minutes. After answering Part I questions, subjects are asked to judge or think rationally their decisions and answer Part II questions. This would of course mean that subjects' judgment in Part II may be greatly affected by their Part I responses. Such a design, it is hypothesized, will generate responses which are more closely related to actual moral action than any other current test designs in moral researches. In addition, it is found that the present MDT design is a natural one, which most of the subjects find it easy to follow and answer, except those who are at a cognitive level below that required for understanding the verbal meaning of the questionnaire.

Now, an important problem arises: To what extent the order of the Part I (emotional decision) and Part II (rational judgment) questions affects the subjects' responses? Most probably, changing the present order of Parts I and II will lead to slightly different response patterns
among similar samples of subjects. It is assumed that subjects answering Part II first tend to judge at a level which is a little bit higher than those answering Part II after Part I. Nevertheless, this does not mean that using the present MDT with a change of the order of Parts I and II questions will generate responses which give the subjects' Optimal Level of Judgment because (i) MDT is designed so that there is an extensive and deep interaction between Parts I and II questions (ii) the design is a first-personal one and it allows in general subjects a high degree of free imagination and projection in giving their responses. For the study of the Optimal Level of Judgment, Kohlberg's Moral Judgment Instrument and Rest's Defining Issues Test are probably the best test instruments.

In short, the effect of the order of, and the interaction between Parts I and II questions on the subjects' responses is one of the crucial topics in the future research of MDT.

4. First Person View.

Let FPV = a subject's moral judgment about a set of hypothetical dilemmas in First-Person View

TPV = a subject's moral judgment about a set of hypothetical dilemmas in Third-Person View.

Ma (1980) argues that there are differences between FPV and TPV. TPV is supposed to be "rational, objective
and less personal and affective" (p. 57-58). On the other hand, FPV is said to be "more concerned with the affective aspect of a person's morality and hence will predict better the moral action of the person" (p. 58).

In general, FPV is suitable for investigating the Ordinary Level of Moral Judgment while TPV is good for the Optimal Level. Hence, MDT is designed in First-Person View.

5. Degree of Imagination

In order to test effectively the emotional aspect of moral development of a subject, the MDT situations constructed in a way so as to provide the subjects the highest degree of freedom in projecting and imagining themselves in the situations.

The degree of imagination of a MDT item is defined as the degree of easiness the subjects can imagine themselves in the hypothetical situations or project themselves onto the hypothetical characters concerned in the situations and Part I choices (i.e., $X_i$s).

Let $f_1 =$ degree of imagination of the hypothetical situation (described by paragraphs just before the Part I questions)

$f_2 =$ degree of imagination of the choices of Part I

$f = f_1 + f_2.$
(i) \( f_1 \) is higher (denoted by \( f_1 = * \)) if the personal
details (e.g. sex, age, occupation, educational back-
ground etc) of the main character concerned in the
hypothetical situation are not explicitly or impli-
citly described. Otherwise, \( f_1 \) is low and is denoted
by \( f_1 = 0 \).

(ii) \( f_2 \) is high (denoted by \( f_2 = * \)) if the \( X_i \)'s in Part I
are concerned only with general personal details (e.g.
sex, age, occupation, relationships with the subject
etc.) and do not involve any specific situational
details like \( X_i \) is near death from a rare disease or
\( X_i \) wants to buy a luxurious car. Otherwise \( f_2 \) is low
and is denoted by \( f_2 = 0 \).

<table>
<thead>
<tr>
<th></th>
<th>( f_1 )</th>
<th>( f_2 )</th>
<th>( f = f_1 + f_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Lost Bag</td>
<td>*</td>
<td>0</td>
<td>*</td>
</tr>
<tr>
<td>The Sinking Boat</td>
<td>*</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>A Doctor's Dilemma</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Car Accident</td>
<td>*</td>
<td>*(1)</td>
<td>**</td>
</tr>
<tr>
<td>The Criminal</td>
<td>*</td>
<td>0(2)</td>
<td>*</td>
</tr>
<tr>
<td>The Young Robber</td>
<td>*</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>Freedom of Speech</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bank Robbery</td>
<td>*</td>
<td>0</td>
<td>*</td>
</tr>
<tr>
<td>Civil War</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**TABLE 4.2: Degree of Imagination of the MDT items**
Notes: (1) In "Car Accident", "X₁ = a medical doctor who is on emergency case" is quite situationally specific, therefore $f_2$ of this item should in fact be a little bit smaller than ",".

(2) It should be noted that the $X_i$s of "The Criminal" are specified by five different sets of situational details (Situations 1 to 5). Similarly, the $X_i$s of "Bank Robbery" are specified by two situations. Therefore, the $f_2$ of both items are low.

6. Comparing MDT with Kohlberg's MJI and Rest's DIT.

The following table summarizes the general features of MDT, Kohlberg's Moral Judgment Instrument (MJI) and Rest's Defining Issues Test (DIT).

<table>
<thead>
<tr>
<th></th>
<th>MDT</th>
<th>MJI</th>
<th>DIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hypothetical Dilemma Situations.</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>2. Test Format</td>
<td>Closed</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>3. First-Person View (FPV) or Third-Person View (TPV)</td>
<td>FPV</td>
<td>TPV</td>
<td>TPV</td>
</tr>
<tr>
<td>4. Degree of Imagination</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>5. Systematic Study of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Structures of Moral Judgment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Human Relationships and Psychological needs</td>
<td>V</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Notes: "V" = Yes        "X" = No

TABLE 4.3 Comparing MDT with MJI and DIT.
4.3. The Use of MDT as a Test of the Theory

MDT is designed as an instrument for testing the theory established in Chapter 3. The MDT items are constructed in a way such that the Part I questions test the levels of N (Psychological Needs) and R (Human Relationships) and Part II statements generate responses which give the Ordinary level of J (Judgment) of the subject. The methodology and research problems underlying Parts I and II are different and therefore they will be described separately.

In general, the paragraphs describing the hypothetical dilemma situation are referred to as the "hypothetical situation" or simply "the Situation"; the $X_1$, $X_2$, $X_3$ etc. in Part I to be "Item responses" or "$X_i$s" or "Part I Choices" or "Part I questions". The statements in Part II are called "Part II statements" or "Part II questions".

4.3.1. Part I Questions

1. Central Theme Analysis of N.

It is extremely difficult, if not entirely impossible, to construct situations and item responses ($X_i$s) with a theme representing purely and uniquely a particular $N_i$ only. Indeed, such situations may not exist in psychological reality.
Moreover, it is true in principle that any particular situation of $X_i$ encounters all the $N_i$s (i.e. $N_1$ to $N_7$) to some extent with some $N_i$s emphasized more strongly than the others. On the other hand, it is difficult and probably impossible at this stage to account theoretically a hypothetical situation of a $X_i$ in terms of all $N_i$s ($N_1$ to $N_7$). Therefore, we would hypothesize a central theme $N_i$ for each situation and each $X_i$. Or put it in other way, when the items were constructed, the writer attempted to express the central themes of each situation and $X_i$ as clearly and naturally as possible. However, it should be emphasized that these central themes are subjectively set or assigned by the writer and may therefore be debatable in some cases. Nevertheless, subject's ratings will be interpreted in terms of these central themes.

2. **Relativistic Value.**

Let us consider a particular MDT item with the central theme of the situation denoted by $N_k$. In general, each Part I question $X_i$ also has a (central) theme, say, $N_i$. The subject is usually asked to make a choice between $N_i$ and $N_k$ and shows his/her extent of positiveness or negativeness for $N_i$ with respect to $N_k$.

In the construction of the theoretical hierarchies of $N$ and $R$, the frame of reference or the baseline is
implicitly and obviously set on $N_1$ and $R_0$ respectively. Thus, the levels of $N_p$ and $R_p'$ (where $P = 2, 3, \ldots 6, 7$, and $P' = 1, 2, 3, \ldots 6, 7$) are clearly defined with respect to $N_1$ and $R_0$ respectively. On the other hand, in the MDT items, the subjects are asked to make choices between, say $N_i$ and $N_k$ (or $R_i$ and $R_k$), where $N_k$ (or $R_k$) is not necessary $N_1$ (or $R_0$). Thus, their ratings are concerned with $N_i (R_i)$ with respect to $N_k (R_k)$ rather than $N_i (R_i)$ with respect to $N_1 (R_0)$.

Let $N_i(k) = \text{The evaluation of the importance of } N_i \text{ with respect to } N_k$.

$N_i(1) = \text{The evaluation of the importance of } N_i \text{ with respect to } N_1$

The $N_i$ used in Chapter 3 is the $N_i(1)$ defined above. It is obvious that

$N_i(k) \neq N_i(1) \quad \text{for } k \neq 1.$

(Similarly for $R$, $R_i(k) \neq R_i(0) \quad \text{for } k \neq 0$)

Theoretically speaking, the base or reference level $N_k$ of $N_i(k)$ does not have any effect on the original order of the theoretical hierarchy. The base level is just like the zero-point in a temperature scale. Different temperature scales have different zero-points. For example, the freezing point of water in Centigrade Scale is $0^\circ C$ but in Fahrenheit Scale is $32^\circ F$. Nevertheless, the physical law underlying the concept of temperature is not affected at all by such differences in the temperature scale.
However, the comparisons of empirical data of \( N \) (or \( R \)) with reference to different base levels are difficult and problematic because (i) the subjective assignment of the central themes to a situation or \( X_i \) may not be accurate and may oversimplify the situation. For example, a hypothetical situation or \( X_i \) may have two or more equally important central themes (ii) The psychological distances between \( N_i \)s (\( R_i \)s) have not been accurately worked out.

Thus, it must be very careful to add or operate data across situations or \( X_i \)s with different central themes.

3. **The Interaction between \( N \) and \( R \).**

In reality, the fundamental parameters \( N \), \( R \) and \( J \) are not completely orthogonal, that is, they are not strictly or mutually independent of each other. (See Section 3.5). One difficulty in the empirical study of \( N \) and \( R \) is that it is difficult to construct MDT items with \( N \) being kept constant for different \( R_i \)s. For example, in the item "The Sinking Boat", the central theme of the hypothetical situation is obviously self-survival (\( N_1 \)) and all the item responses \( X_i \) are in terms of persons. It seems that \( N \) is being kept constant at \( N_3 \) for all \( X_i \)s. However, the case is not so simple because as \( R \) varies, \( N \) usually varies too. Consider \( X_4 \) = your brother or sister and \( X_5 \) = someone you don't like or an enemy. In the \( X_4 \) case, the theme is \( N_3 \) (Belongingness and love
needs) while in $X_5$, the theme may be said to be $N_5$ or $N_6$
for subjects of high $J$.

In short, subjects' ratings in Part I reflect both
the parameters $N$ and $R$ in one setting. In addition,
our theoretical categorization of the hierarchies of $N$ and
$R$ often simplifies reality considerably, empirical data
may throw some light on the refined subdivision of
these hierarchies.

4. The Central Themes of MDT Items.

The following notations and notes are relevant to
the discussion in this section:

(i) $R_4$ is tentatively subdivided into three sub-groups:

$$R_{41} = \text{The weakest, the youngest and the oldest strangers}$$
$$R_{42} = \text{People of high social status or reputation, e.g. famous scientists.}$$
$$R_{43} = \text{All other types of strangers.}$$

(ii) We also define,

$$N_3(R_{41}) = \text{a need for helping and showing affection or sympathy to people in } R_{41}.$$ 

Thus $\alpha_3(\beta_{41})$ is particularly good for the study of empathy and altruism.

(iii) For each MDT item, a theoretical hierarchy of the ratings of $X_i$'s is postulated.
Assuming Definitely YES = 1 to Definitely NO = 7,

\[ X_i < X_j \] means that the rating of \( X_i \) is predicted
to be smaller than that of \( X_j \).

\( \{ X_i, X_j, X_k \} \) means that the ratings of \( X_i, X_j \) or \( X_k \)
are predicted to be equal.

(iv) The assignments of central themes (deonted by \( T \)) to
the situations and \( X_i \)'s of MDT items are based on the
theory established and empirical data collected in the
Pilot Study. These assignments are subjective and
provisional; they are subjected to future revision
when more researches have been done.

(v) In the following discussion, we would constantly refer
to subjects of two different types: (1) Subjects of
high \( N \) (i.e. \( \alpha_i \)'s are generally high even for \( i>4 \))
(2) subjects of low \( N \) (i.e. \( \alpha_i \)'s are high only for
\( i<3 \) and low for \( i>4 \)). Subjects of high \( N \) are potential
self-actualizing person.

(1) A Lost Bag.

(a) The Situation : \( T = N_4 \)

The central theme is whether the social laws that
"one must not steal" should be upheld or not. Thus it
concerns with social recognition or esteem from others.
(b) Part I (only some of the $X_1$s are elaborated)

\[ X_1: T = N_6 + N_4 \approx N_4 \]

It is supposed that both the self-actualization or the fulfillment of one's potential and social recognition or social status are the central themes. However, $N_4$ is slightly predominant over $N_6$ because of the illegal action, therefore, $T$ is set to be $N_4$.

\[ X_5: T = N_5 + N_4 \approx N_4 \]

It concerns with one's self-esteem and esteem from one's best friend. The promise is not a legal one but a kind of social contract - thus it is at a level higher, or a little bit higher than $N_4$ but still lower than $N_5$.

\[ X_6: T = N_x \]

For subjects of high $N$, there is no such need for desire to do $X_6$ (denoted by $N_x$) because it is a meaningless, childish or harmful (both to oneself or others) act. Hence, it should be valued as the least importance. On the other hand, for subjects of low $N$, it is concerned with mainly a need for "showing off" or a need for esteem from others.

(c) Theoretical Hierarchy of Ratings (T.H.R.).

For subjects of High $N$: $X_3 < X_2 < X_4 < X_5 < X_1 < X_6$ \hspace{1cm} (4-1)

For subjects of Low $N$: \{ $X_3, X_2$ \} < \{ $X_4, X_5, X_1, X_6$ \}\hspace{1cm} (4-2)
For subjects of high \( N \), it is argued that one would act altruistically and rates \( X_3 \) slightly important than \( X_2 \).

For subjects of low \( N \), the discrimination is not so refined as those of high \( N \), it is hypothesized that two clusters will be formed: \( \{X_3, X_2\} \) and \( \{X_4, X_5, X_1, X_6\} \).

(2) The Sinking Boat

(a) The Situation: \( T = N_1 \)

(b) Part I.

\( X_7 \): For subjects of particularly high \( N \), e.g. self-actualizing persons, the dilemma is concerned with a \( N_5 \) or \( N_6 \) level of self-actualization and universal love. For other subjects, \( X_7 \) will be treated as an antagonistic person and it is "socially right" not to sacrifice for or help people like \( X_7 \). It is obvious that, apart from \( N_4(R_7) \), \( N_4(R_6) \) (e.g. \( X_7 \)) is supposed to have the least positiveness given by a subject in the \( N_4 \) level.

(c) T.H.R.

All subjects: \( \{X_4, X_9\} < X_5 < X_8 < X_2 < X_3 < \{X_1, X_6\} < X_7 \)

(4-3)
(3) A Doctor's Dilemma

(a) The Situation: \( T = N_5 \) (or \( N_6 \))

For high \( N \) subjects, the theme is self-actualization, that is, the fulfilment of one's ideal and potential to help people in underdeveloped countries. For low \( N \) subjects, the situation may, however, be interpreted as a socially recognized "right or good" act.

(b) Part I.

\[ X_1 : T = N_3 - N_5 \]  
(Negative sign means negation of the needs concerned)

The theme is both love and self-esteem needs. However, for some subjects, \(-N_5\) may be a little bit dominate over \(N_3\) in this case because Peter's action hurts Susan's self-esteem and damages her process of self-actualization. Though both \(X_1\) and \(X_2\) involve, to a large extent, \(N_3\) needs; \(X_2\) is supposed to have a strong theme of \(N_3(R_1)\) but \(X_1\), a weak \(N_3(R_1)\). It is so because Peter is supposed to be the very person who understands and loves Susan. That is to say, Peter is expected to help Susan to achieve the State of Self-actualization. On the other hand, Susan's mother's request in this case is most probably regarded as "normal and reasonable". Young subjects may think that mother is a person who loves them and therefore should be loved; but she is not the person who is expected to understand...
them thoroughly especially in matters of ideal like this case. Therefore, Susan's mother's act is not supposed to hurt Susan at all.

(c) T.H.R.

The test stimulus (the contents of the situation and X₁'s) may exert a greater effect on the subjects' ratings or responses in this case because the item offers subjects a low degree of freedom in projecting or imagining themselves in the situation. In addition, the theme of being altruistic and nice to deprived people may also tempt the subjects to show a higher degree of altruism in their ratings.

For all subjects: \( X₂ < \{X₅, X₃, X₄, X₆\} < X₁ \)  \( (4-4) \)

The basis for this theoretical hierarchy is quite complex. Let us consider the N & R of each X₁:

\[
\begin{align*}
X₁ &= N₃(R₁) - N₅(R₁) \\
X₂ &= N₃(R₁) \\
X₃ &= N₅(R₃) \\
X₄ &= N₂(R₅) \\
X₅ &= N₅(R₅) \\
X₆ &= N₄(R₄)
\end{align*}
\]

Based on the \( N₁(Rₖ) \) levels, the predicted hierarchy is likely to be:

\( X₂ < X₁ < \{X₃, X₅, X₆\} \)  \( (4-5) \)

\( (X₄ : \text{floating, highly dependent on subjects' degree of altruism and J level}) \)
(A very rough general guide to establish the predicted hierarchy is to add the level numbers, i.e. \( i \) & \( j \) of \( N_i(R_j) \). The smaller the sum, the more positive the ratings should be. However, this method is not supposed to be a theoretically elegant one at the present stage because we have not established the necessary refined details of \( N_i \) & \( R_j \). Furthermore, the \( J \) level is not also considered in this case).

In principle, \( X_4 \) should be in a position near or even above (i.e. smaller than or "<") \( X_2 \). However, in this case, subjects tend to undervalue the safety needs with respect to the self-actualization needs. In other words, subjects tend to show a much higher degree of altruism or self-sacrifice if the situation involved is a clear-cut "moral or right or good or ideal" act. The position of \( X_1 \) is predicted to be at the bottom of the hierarchy in (4-4) instead of second to \( X_2 \) in (4-5) mainly because of the emotional disturbance aroused by Peter's "selfish" act.

The difficulty in constructing the theoretical hierarchy in this item is due to the fact that the ranges of \( N_i \) and \( R_j \) levels are particularly large; \( N \) is from \( N_2 \) to \( N_5 \) and \( R \) is from \( R_0 \) to \( R_5 \).

(4) Car Accident.

(a) The Situation: \( T = N_4 \)

The situation looks apparently to be a simple one but the underlying theme of the dilemma is sharp and
and extreme. The first stranger rescued is used as a testing person to see whom the subjects would rate higher and whom lower. However, the situation is complicated by one variable, namely, justice or fairness in treating the first stranger whom the subject is supposed to rescue in the first place.

(b) T.H.R.

For all subjects: \( X_1 < X_6 < \{X_7, X_4\} < \{X_9, X_8\} < \{X_2, X_3\} < X_5 \)

(4-6)

(5) The Criminal

(a) The Situation: \( T = N_4 \)

The general central theme underlying the 5 situations is \( N_4 \). In addition, there is also a different secondary central theme underlying each situation:

Situation 1: This is a testing situation; it is concerned predominantly with \( N_4 \). The ratings of this situation can be used as a baseline to see what additional needs would make a subject rate the situation higher or lower than this one.

Situation 2: It emphasizes on the role of a police officer, which is supposed to defend social law.

Situation 3: The secondary theme here is \( N_3(R_{41}) \).
Situation 4: The additional theme is $N_1(R_o)$ - self survival.

Situation 5: Again the secondary theme is $N_3(R_{41})$ but the number of people involved is a few thousand in this case while only 1 person is involved in Situation 3. On the other hand, the person concerned in S3 is a son of $X_i$, thus bears some relation with the subject, but the people involved in Situation 5 are assumed to have no close relationship with the subject.

For all subjects: $S_2 < S_1 < \{S_3, S_5\} < S_4$. (4-7)

The exact order of $X_i$'s is left for empirical exploration.

(6) The Young Robber.

(a) The Situation: $T = N_2 + N_4 \approx N_2$.

The central theme is concerned with one's safety ($N_2$) and the social norm of responsibility ($N_4$) or mutual help in face of criminal events. It is assumed that for Low N subjects, $N_2$ dominates, while for high N subjects, $N_4$ is more desired; this difference will be shown in the ratings of $X_i$'s. Nevertheless, the theme of the situation is supposed to be dominated by $N_2$.

(b) T.H.R.

For all subjects: $\{X_3, X_8\} < X_4 < X_2 < X_5 < \{X_1, X_7\} < X_6$. (4-8)
(7) Freedom of Speech

(a) The Situation: \( T = N_4 + N_{5/6} \) for low N subjects
\( T = N_{5/6} \) for high N subjects

For high N subjects, Mr. Young's act may be interpreted as something concerned with human rights, democracy and universal justice. But low N subjects tend to regard Mr. Yong's act as a socially right or moral one.

(b) Part I

\[
X_3 : T = N_3 + N_4 \approx N_4 \\
X_4 : T = N_3 + N_4 \approx N_4 \\
X_5 : T = N_3 + N_4 \approx N_3
\]

The themes underlying \( X_3 \), \( X_4 \) and \( X_5 \) are both the affection for one's family and one's esteem from others. However, for \( X_3 \) and \( X_4 \), \( N_4 \) is assumed to be a little bit predominant over \( N_3 \); while for \( X_5 \), the theme emphasized is \( N_3 \) rather than \( N_4 \).

(c) T.H.R.

For all subjects: \( \{X_1, X_2\} \prec X_6 \prec \{X_3, X_4, X_5\} \) (4-9)

One special feature of this item is worthwhile for discussion here. The hypothetical situation and \( X_i \)'s are likely to stir up the emotion of particularly young or low N subjects who would then tend to focus on emotional
"retaliation" rather than the underlying theme of the situation, namely, Freedom of Speech. The ratings of these subjects will in general be dependent on the amount of loss described by \( X_i \). The larger the loss, the more desperate one would be and therefore the stronger is one's motivation to fight against the government. Consider the following example: \( X_1 (T = N_2) \) and \( X_4 (T = N_4) \), it is supposed in (4-9) that the ratings on \( X_1 \) should be more positive than those of \( X_4 \) but subjects may feel very emotional about the paralysis of the two legs in \( X_1 \) and insist on opposing the government, hence they would rate the strongly or Definitely No for \( X_1 \). On the other hand, cases like \( X_4 \) are less emotional or disturbing and the ratings may be less extreme and are most probably around the middle. Thus, the outcoming response appears to be \( X_4 \) more positive than \( X_1 \) which seems to contradict our theoretical prediction. Actually, the situation is complicated by two other factors: (i) The J level of the subjects, which may influence their ratings, has not been considered in the construction of (4-9). It should be noted that any situation is dependent on three fundamental parameters, N, R & J. In cases involving high N, the J factor may be more crucial. For example, in this case, subjects of low J may tend to emphasize physical loss or harm. (ii) The theoretical prediction given in (4-9) is based on the average values \( \alpha_{ik} \) or \( \bar{\alpha}_{ik} \). For situations involving extreme desperation and emotion of "retaliation", the instantaneous values \( \alpha_{ik}(t) \) defined in Section 3.2 may
be more appropriate for explaining the decision and action. It is understandable that occasionally the pattern of instantaneous values $\alpha_{ik}(t)$ deviates considerably, for a short episode, from the average pattern of $\alpha_{ik}$ due to emotional variables.

(8) **Bank Robbery.**

(a) The Situation: $T = N_4$

For $X_1$ to $X_4$, the theme is mainly the defense of social law. For $X_5$ to $X_8$, subjects of high $N$ would still maintain that the theme is $N_4$ with perhaps a deep groan of hard luck; on the other hand, subjects of low $N$ may blame on $X_i’s$ for damaging his/her safety needs and tend to react angrily to them by "revenge" - to report them to police.

(b) T.H.R.

Subjects of High $N$ : $\{X_4, X_8\} < \{X_3, X_7\} < \{X_2, X_6\} < \{X_1, X_5\}$

\[(4-10)\]

Subjects of Low $N$ : $X_8 < X_7 < \{X_3, X_4, X_5, X_6\} < X_2 < X_1$

\[(4-11)\]
(9) Civil War

(a) The Situation: \[ T = N_1 (R_0 + R_1) + N_3(R_1) \approx N_1(R_0 + R_1) \]
\[ \approx N_1(R_0) \]

The general theme is the survival of self and the family. It also concerns with one's affection for one's family.

(b) Part I.

In this particular item, it is better to add the central theme of the situation to that of each \( X_i \) in the following discussion because of the complexity of the item. It is assumed that positive ratings implies a favour of needs with positive signs and a negation of needs with negative signs, and vice versa.

\[ X_1: T = N_1(R_0 + R_1) + N_3(R_1) - N_5(R_0) \]

To force one's daughter to marry someone she dislikes is supposed to damage one's self-esteem \( (N_5) \).

\[ X_2: T = N_1(R_0 + R_1) + N_3(R_1) - N_4(R_0) \]

Mr A is supposed to take care of his family by all means. "To do nothing but to - " is assumed to negate slightly this norm of responsibility in this case.

\[ X_3: T_1 = N_1(R_1) + N_3(R_1) + N_6(R_0) - N_2(R_0) - N_1(R_0) \]
The act in $X_3$ is supposed to be a self-actualizing one. It saves one's family at the expense of one's safety, comfort and esteem.

$X_4$: $T = -N_1(R_0)$

To commit suicide is regarded as an act highly negating one's $N_1$ needs.

$X_5$: $T = N_1(R_0 + R_1) + N_2(R_1) - N_4(R_0)$

To rob others' food in this case is also against social norm. It is regarded as a slightly selfish and immoral act.

$X_6$: $T = N_1(R_0) - N_3(R_1) - N_4(R_0)$

To forsake one's family in this case is a selfish act which is both negative to $N_3(R_1)$ and $N_4$.

$X_7$: $T = N_1(R_0 + R_1) + N_3(R_1) - N_4(R_0)$

The theme is concerned with social norm ($N_4$) which forbids us to eat human flesh. It also involves a mixed feeling of affection for one's family and the dead body.
**The major theme of \( X_i \), assuming the theme of the situation is \( N_1(R_o + R_1) \) and \( N_3(R_1) \)

**TABLE 4.4 The Central Theme of the Item Responses of "Civil War"

(c) T.H.R.:

\[
X_3 < X_7 < (X_2, X_5) < X_1 < X_6 < X_4
\]  \hspace{1cm} (4-12)

Table 4.5 summarizes the central themes of all MDT items in terms of \( N \) and \( R \).
### TABLE 4.5: The Central Themes of MDT Items

<table>
<thead>
<tr>
<th>The Situation</th>
<th>X₁</th>
<th>X₂</th>
<th>X₃</th>
<th>X₄</th>
<th>X₅</th>
<th>X₆</th>
<th>X₇</th>
<th>X₈</th>
<th>X₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) A Lost Bag</td>
<td>N₄(R₀) (+)</td>
<td>N₁</td>
<td>N₃</td>
<td>N₄</td>
<td>N₄</td>
<td>N₅</td>
<td>N₆</td>
<td>N₆</td>
<td>N₇</td>
</tr>
<tr>
<td>(2) The Sinking Boat</td>
<td>N₁(R₀) (+)</td>
<td>N₃</td>
<td>N₃</td>
<td>N₄</td>
<td>N₃</td>
<td>N₃</td>
<td>N₄</td>
<td>N₅/₆</td>
<td>N₃</td>
</tr>
<tr>
<td>(3) A Doctor's Dilemma</td>
<td>N₅/₆(R₀) (+)</td>
<td>N₃</td>
<td>N₃</td>
<td>N₅</td>
<td>N₂</td>
<td>N₅</td>
<td>N₄</td>
<td>R₁</td>
<td>R₂</td>
</tr>
<tr>
<td>(4) Car Accident</td>
<td>N₄(R₀) (+)</td>
<td>N₃</td>
<td>N₄</td>
<td>N₃</td>
<td>N₄</td>
<td>N₃</td>
<td>N₄</td>
<td>N₄</td>
<td>N₄</td>
</tr>
<tr>
<td>(5) The Criminal Situation No.</td>
<td>N₄(R₀)(-)</td>
<td>X₁</td>
<td>X₂</td>
<td>X₃</td>
<td>X₄</td>
<td>X₅</td>
<td>X₆</td>
<td>X₇</td>
<td>X₈</td>
</tr>
<tr>
<td>1.</td>
<td>N₄(R₀)</td>
<td>R₃</td>
<td>R₂</td>
<td>R₁</td>
<td>R₄₃</td>
<td>R₃</td>
<td>R₂</td>
<td>R₁</td>
<td>R₃</td>
</tr>
<tr>
<td>2.</td>
<td>N₄(R₀)</td>
<td>R₃</td>
<td>R₂</td>
<td>R₁</td>
<td>R₄₃</td>
<td>R₃</td>
<td>R₂</td>
<td>R₁</td>
<td>R₃</td>
</tr>
<tr>
<td>3.</td>
<td>N₃(R₁)</td>
<td>X₁₁</td>
<td>X₁₂</td>
<td>X₁₃</td>
<td>X₁₄</td>
<td>X₁₅</td>
<td>X₁₆</td>
<td>X₁₇</td>
<td>X₁₈</td>
</tr>
<tr>
<td>4.</td>
<td>N₁(R₀)</td>
<td>N₃</td>
<td>N₄</td>
<td>N₃</td>
<td>N₄</td>
<td>N₃</td>
<td>N₄</td>
<td>N₃</td>
<td>N₄</td>
</tr>
<tr>
<td>5.</td>
<td>N₃(R₁)</td>
<td>R₁</td>
<td>R₄₃</td>
<td>R₃</td>
<td>R₂</td>
<td>R₁</td>
<td>R₃</td>
<td>R₂</td>
<td>R₁</td>
</tr>
<tr>
<td>(6) The Young Robber</td>
<td>N₂(R₀) (+) R₁ R₂ R₃ R₄ R₅/₆ R₆ R₄₃ R₁</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>(7) Freedom of Speech</td>
<td>N₅/₆(R₀) (+) R₀ R₁ R₂ R₃ R₄ R₅ R₆ R₄₃ R₁</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) Bank Robbery</td>
<td>N₄(R₀) (-) R₁ R₂ R₃ R₄ R₅ R₆ R₄₃ R₁</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) Civil War</td>
<td>N₁(R₀) -N₅ R₀ R₀ R₅/₆ R₄ R₅ R₁ R₀</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

(1) For details of this item, see main text and Table 4.4.

(2) (+) means that positive rating in general favours or values Xᵢ needs rather than the theme of the Situation, and negative rating values Situation theme rather than Xᵢ theme.

(-) : opposite meaning of (+).
4.3.2. Part II. Questions

The Part II Questions of MDT are constructed based on Rest's (1979a) Defining Issues Test (DIT). One major difference between MDT and DIT is that MDT tends to investigate the Ordinary Level of Judgment while DIT explores Optimal Level.

The dominant J themes of most MDT Part II Statements are clearly expressed. In the following paragraphs, only a small number of statements are elaborated because of their complexity or apparently ambiguous meaning.

Notation used: \( J_D \) = Dominant J Level of the Statement
\( S \) = Statement Number
\( M \) = "Meaningless" Statement.

(1) **A Lost Bag.**

\( S9 : J_D = M \)

The statement is regarded as meaningless because if one took away the bag of money, one in some sense stole money from others, whether it is from the firm or from the Insurance company.

(2) **The Sinking Boat.**

\( S5 : J_D = M \)
The main issue in this item is: who is going to sacrifice, that is, one of the two persons in the boat is going to die. Thus, the statement that everyone should protect life by all means is not relevant in this case. However, it turns out that many of the subjects in the Pilot Study rate this item as quite or very important, probably because they did not carefully link the statement with the central issue of the hypothetical situation.

S6 and S8: \( J_D = 5 \)

The right to decide whether to be rescued at the expense of others' life and the right to decide whether or not to sacrifice for someone else in this case are basically human rights (rights for life, liberty and dignity), which should be respected by everyone in the society. Though social norm may presuppose or reinforce certain action in this case, the above basic human right is above the social norm or majority's opinion.

(3) A Doctor's Dilemma

S4: \( J_D = 5B \)

The statement is concerned with one's attitude or value in dealing with such important life dilemma. It emphasizes on one's consistency of decision and action with one's moral belief or philosophy or value or attitude toward life and human interaction.
(4) Car Accident

S3 and S6 : $J_D = 4(5) = 4$

The right of the first stranger and that of "I" in this case is regarded as the social right. It is slightly different from the basic human right involved in S6 and S8 in "The Sinking Boat". In other words, the right to decide whether to rescue someone or not without causing danger to one's life is slightly different from the right to decide whether or not to sacrifice oneself for others. The former one emphasizes more on social and legal right, while the latter one on basic human right.

The argument for S9 in "The Young Robber" is similar.

(5) Bank Robbery.

S6, S7 and S8 : $J_D = 2$

All these three statements emphasize on one's personal interests and benefits.

The $X_5$ to $X_8$ (second half of the item) is constructed mainly to differentiate low J subjects from high J ones. It is supposed that high J subjects tend to give similar responses in both the 1st ($X_1$ to $X_4$) and 2nd ($X_5$ to $X_8$) halves. Low subjects tend to give more positive ratings in the 2nd half.
(6) Civil War

S7 : \( J_D = \frac{4}{5} \approx 5 \)

While the right for life is clearly a fundamental one, which is above the social law; the right for death is more complicated, it concerns with the social law, social responsibility and personal liberty. In this case, the emphasis is on Mr. A's personal right to decide on whether to commit suicide or not. It is argued that the statement expresses a judgment involved both social responsibility \((J_4)\), and social contract, personal liberty and dignity \((J_5)\).

The following table summarizes the dominant J level of all MDT Part II Statements.
### TABLE 4.6. The Dominant J Level of MDT Part II Statements.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Lost Bag</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>M</td>
</tr>
<tr>
<td>The Sinking Boat</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>M</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>A Doctor's Dilemma</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>5B</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Car Accident</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>5B</td>
<td>3</td>
</tr>
<tr>
<td>The Criminal</td>
<td>4</td>
<td>M</td>
<td>3</td>
<td>5B</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>The Young Robber</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>M</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Freedom of Speech</td>
<td>4</td>
<td>M</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Bank Robbery</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Civil War</td>
<td>S1*</td>
<td>S2*</td>
<td>S3</td>
<td>S4*</td>
<td>S5</td>
<td>S6*</td>
<td>S7*</td>
<td>S8</td>
<td>S9*</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>M</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>S10*</td>
<td>S11*</td>
<td>S12*</td>
<td>S13*</td>
<td>S14</td>
<td>S15*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5B</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. S = Statement Number
2. M = Meaningless Statement
3. Civil War (Short Version) includes the following statements in the above list: S1, S2, S4, S6, S7, S9, S10, S11, and S12. (All marked with "*").
TABLE 4.7: A Distribution of Part II Statements by J Levels

<table>
<thead>
<tr>
<th>Total No. of Statements</th>
<th>Dominent J Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>Form A</td>
<td>45</td>
</tr>
<tr>
<td>Form B</td>
<td>45</td>
</tr>
<tr>
<td>From A*</td>
<td>60</td>
</tr>
</tbody>
</table>
4.4. Methods of Scoring and Analysis

The empirical data collected in this study not only provide a direct test of the theory established in Chapter 3, but also generate a set of scores which can be used for the study of individual differences in Moral Development.

Two major theoretical or heuristic methods of scoring are adopted: (i) Relevant ratings are added, with or without weightings, to give a set of scores or indices. (ii) Criteria based on the theory established are used for scoring part of the subjects' ratings and rankings. In addition, Inductive or Empirical Methods of scoring can also be designed after the data have been computed and analysed, for example, a set of scores can be generated by the factor analysis of the data.

The methods of scoring and analysis are very primitive and crude at this stage. As mentioned in Section 4.3.1., the addition of ratings is sometimes problematic. Our strategy is to generate as many as possible of the theoretical indices or scores. These scores would then be cross-validated by empirical data. The result is probably that some of these scores may have to be discarded or modified later on.

4.4.1. Part I.

1. Direct Addition of Ratings.

In order to simplify the following discussion, a set of notation is introduced in Table 4.8.
TABLE 4.8. Ratings and Rankings of the MDT:

<table>
<thead>
<tr>
<th></th>
<th>PART I</th>
<th>PART II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RATINGS</td>
<td>RANKINGS</td>
</tr>
<tr>
<td></td>
<td>VARIABLE</td>
<td>NOTATION</td>
</tr>
<tr>
<td>(A) A Lost Bag</td>
<td>$X_1$</td>
<td>AA01</td>
</tr>
<tr>
<td></td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td></td>
<td>$X_6$</td>
<td>AA06</td>
</tr>
<tr>
<td>(B) The Sinking Boat</td>
<td>$X_1$</td>
<td>BA01</td>
</tr>
<tr>
<td></td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td></td>
<td>$X_9$</td>
<td>BA09</td>
</tr>
<tr>
<td>(C) A Doctor's Dilemma</td>
<td>$X_1$</td>
<td>CA01</td>
</tr>
<tr>
<td></td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td></td>
<td>$X_6$</td>
<td>CA06</td>
</tr>
<tr>
<td>(D) Car Accident</td>
<td>$X_1$</td>
<td>DA01</td>
</tr>
<tr>
<td></td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td></td>
<td>$X_9$</td>
<td>DA09</td>
</tr>
<tr>
<td>(E) The Criminal</td>
<td>$X_1$</td>
<td>EA01</td>
</tr>
<tr>
<td></td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td></td>
<td>$X_{19}$</td>
<td>EA19</td>
</tr>
</tbody>
</table>
TABLE 4.8 (Continued)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>NOTATION</th>
<th>PART I</th>
<th>RATING</th>
<th>NOTATION</th>
<th>PART II</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>(F) The Young Robber</td>
<td>X₁</td>
<td>FA01</td>
<td>1st C</td>
<td>FB01</td>
<td>S₁</td>
<td>FC01</td>
</tr>
<tr>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td>X₈</td>
<td>FA08</td>
<td>3rd C</td>
<td>FB03</td>
<td>S9</td>
<td>FC09</td>
<td>3rd I.S</td>
</tr>
<tr>
<td>(G) Freedom of Speech</td>
<td>X₁</td>
<td>GA01</td>
<td>1st C</td>
<td>GB01</td>
<td>S₁</td>
<td>GC01</td>
</tr>
<tr>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td>X₆</td>
<td>GA06</td>
<td>3rd C</td>
<td>GB03</td>
<td>S9</td>
<td>GC09</td>
<td>3rd I.S</td>
</tr>
<tr>
<td>(H) Bank Robbery</td>
<td>X₁</td>
<td>HA01</td>
<td>1st C</td>
<td>HB01</td>
<td>S₁</td>
<td>HC01</td>
</tr>
<tr>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td>X₈</td>
<td>HA08</td>
<td>3rd C</td>
<td>HB03</td>
<td>S9</td>
<td>HC09</td>
<td>3rd I.S</td>
</tr>
<tr>
<td>(K) Civil War</td>
<td>X₁</td>
<td>KA01</td>
<td>1st C</td>
<td>KB01</td>
<td>S₁</td>
<td>KC01</td>
</tr>
<tr>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
<td>To</td>
</tr>
<tr>
<td>X₇</td>
<td>KA07</td>
<td>3rd C</td>
<td>KB03</td>
<td>S9</td>
<td>KC15</td>
<td>3rd I.S</td>
</tr>
</tbody>
</table>

Notes:

1. C = Choice; S = Statement; I.S. = Most Important Statement

2. K instead of I or J is used for "Civil War" in order to avoid confusion.
I.1. Central Theme (CT) Scores.

As discussed in Section 4.3., each MDT item has a central theme of $N$, the average of all the ratings in a MDT item is called the Central Theme (CT) Score.

<table>
<thead>
<tr>
<th>CT EQUATION</th>
<th>EQUATION NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Lost Bag CTA = ( \frac{(AA01+AA02+AA03+AA04+AA05+AA06)}{6} )</td>
<td>4-13</td>
</tr>
<tr>
<td>The Sinking Boat CTB = ( \frac{\sum_{P=01}^{09} BA_p}{9} )</td>
<td>4-14</td>
</tr>
<tr>
<td>A Doctor's Dilemma CTC = ( \frac{\sum_{P=01}^{06} CA_p}{6} )</td>
<td>4-15</td>
</tr>
<tr>
<td>Car Accident CTD = ( \frac{\sum_{P=01}^{09} DA_p}{9} )</td>
<td>4-16</td>
</tr>
<tr>
<td>The Criminal CTE = ( \frac{\sum_{P=01}^{19} EA_p}{19} )</td>
<td>4-17</td>
</tr>
<tr>
<td>The Young Robber CTF = ( \frac{\sum_{P=01}^{08} FA_p}{8} )</td>
<td>4-18</td>
</tr>
<tr>
<td>Freedom of Speech CTG = ( \frac{\sum_{P=01}^{06} GA_p}{6} )</td>
<td>4-19</td>
</tr>
<tr>
<td>Bank Robbery CTH = ( \frac{\sum_{P=01}^{08} HA_p}{8} )</td>
<td>4-20</td>
</tr>
<tr>
<td>Civil War (Short Version) CTK1 = ( \frac{(KA01+KA02+(8-KA03)+(8-KA04)+KA05+KA06)}{6} )</td>
<td>4-21</td>
</tr>
<tr>
<td>Civil War (Long Version) CTK2 = ( \frac{6*CTK1+KA07}{7} )</td>
<td>4-22</td>
</tr>
</tbody>
</table>

**TABLE 4.9:** Central Theme (CT) Scores
The interpretation of these CT-scores is as follows:

(i) If the sign of the item is positive, i.e. (+), then small CT-score would in general imply a negation of the central theme of the situation. On the other hand, large CT, positive for the central theme.

(ii) If the sign of the item is (-), then Small CT ⇒ for the Central theme of the Situation.

Large CT ⇒ against the central theme of the Situation.

(iii) In the "Civil War" item, the ratings of $X_3$ and $X_4$ have to be reversed in order to be consistent with other $X_i$s.

1.2. $N(R)$ indices.

A few general remarks about the $N(R)$ indices are noted as follows:

(i) $N(R)$ indices are formed by averaging the subject's ratings of the relevant item responses in each MDT. $N_i(R_j)$ index indicates the degree of positiveness towards one's $N_i$ needs when $R_j$ people are concerned. For example, $N_3(R_1)$ index shows the extent of a subject's positive evaluation of his/her $N_3$ needs in the interaction with people in $R_1$ category, that is, first order kin or close relatives.
(ii) The value of a $N_i(R_j)$ index is given by the relevant coefficient $\alpha_i(\beta_j)$. In other words, $N_i(R_j)$ index is coefficient $\alpha_i(\beta_j)$ calculated based on the subject's ratings in a MDT.

(iii) Different forms of MDT (i.e. A, B, and $A^+$) generate different sets of indices.

(iv) $N(R)$ indices calculated from a subject's ratings are called Case or Person Indices, while those calculated by averaging all the subjects' ratings in a sample or group are called Group Indices.

(v) Some ratings are needed to be converted before they can be added consistently. The conversion formula is

$$*Y = 8 - Y$$

where $Y = $ original rating

and $*Y = $ converted or new rating.

In principle, each item response $X_i$ can appear in two different ways in a set of $N(R)$ indices, one with a positive sign, the other with a negative sign (i.e. with a "*" sign).

(vi) The range of each $N_i(R_j)$ index is from 1 (Definitely YES or definitely for $N_i(R_j)$ needs) to 7 (Definitely No or definitely against $N_i(R_j)$ needs).
1.2. \( N_i(R_j) \) Indices.

1.2.1. MDT Form A.

The following notes apply to Table 4.10:

(1) Most of the indices in Table 4.10 will be studied empirically. The appropriate computer codes are inserted for reference.

(2) For convenience of discussion, \( N_3(R_j) \) and \( N_4 \) are further subdivided:

\( N_{31}(R_j) \) : The affection for \( R_j \) when \( R_j \) faces a heavy deficiency in \( N_1 \) or \( N_2 \) needs.

\( N_{32}(R_j) \) : General affection for \( R_j \) excluding cases described by \( N_{31}(R_j) \)

\( N_{41} \) : A need for defending or obeying social law, rules and regulations

\( N_{42} \) : A need for esteem or positive reinforcement from others. It emphasizes on the Norms of Giving and Norms of Patriotism.

(3) The item response BA09 is not included in any of the indices because most of our subjects are not married.

(4) The item responses BA01 and BA06 are not included in \( a_{42}(b_{43}) \) because not many people think that one should sacrifice oneself for a stranger.
### TABLE 4.10

$N_1(R_j)$ Indices of MDT (A)

<table>
<thead>
<tr>
<th>INDEX</th>
<th>COMPUTE CODE</th>
<th>N(R) EQUATION</th>
<th>EQ. NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_1(R_1 + R_2)$</td>
<td>N11</td>
<td>$\alpha_1(\beta_1 + \beta_2) = (BA04 + BA05)/2$</td>
<td>4-23</td>
</tr>
<tr>
<td>$N_1(R_{41})$</td>
<td>N12</td>
<td>$\alpha_1(\beta_{41}) = (BA02 + BA08)/2$</td>
<td>4-24</td>
</tr>
<tr>
<td>$N_1(R_{42} + R_{43})$</td>
<td>N13</td>
<td>$\alpha_1(\beta_{42} + \beta_{43}) = (BA01 + BA03 + BA06)/3$</td>
<td>4-25</td>
</tr>
<tr>
<td>$N_1(R_6)$</td>
<td>N14</td>
<td>$\alpha_1(\beta_6) = BA07$</td>
<td>4-26</td>
</tr>
<tr>
<td>$N_1(R_0)$</td>
<td>N15</td>
<td>$\alpha_1(\beta_0) = AA02$</td>
<td>4-27</td>
</tr>
<tr>
<td>$N_1$</td>
<td>N16</td>
<td>$\alpha_1 = (AA02 + \sum_{p=0}^{1} BA_p)/9$</td>
<td>4-28</td>
</tr>
<tr>
<td>$N_{31}(R_1)$</td>
<td>N31</td>
<td>$\alpha_{31}(\beta_1) = (AA03 + BA04 + DA01)/3$</td>
<td>4-29</td>
</tr>
<tr>
<td>$N_{31}(R_2)$</td>
<td>N32</td>
<td>$\alpha_{31}(\beta_2) = (BA05 + DA06)/2$</td>
<td>4-30</td>
</tr>
<tr>
<td>$N_{31}(R_{41})$</td>
<td>N33</td>
<td>$\alpha_{31}(\beta_{41}) = (BA02 + BA08 + DA04)/3$</td>
<td>4-31</td>
</tr>
<tr>
<td>$N_{31}$</td>
<td>N34</td>
<td>$\alpha_{32}(\beta_1) = (CA02 + EA03 + EA07 + EA11 + EA15 + EA18)/6$</td>
<td>4-32</td>
</tr>
<tr>
<td>$N_3$</td>
<td>N35</td>
<td>$\alpha_3 = (3\alpha_{31}(\beta_1) + 2\alpha_{31}(\beta_2) + 3\alpha_{31}(\beta_{41}))/8$</td>
<td>4-33</td>
</tr>
<tr>
<td>$N_3$</td>
<td>N36</td>
<td>$\alpha_3 = (8\alpha_{31} + 6\alpha_{32}(\beta_1))/14$</td>
<td>4-34</td>
</tr>
<tr>
<td>INDEX</td>
<td>COMPUTE CODE</td>
<td>N(R) EQUATION</td>
<td>EQ.NO.</td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>$N_{41}(R_0)$</td>
<td>N421</td>
<td>$\alpha_{41}(B_0) = (*AA01 + *AA02 + *AA04 + *AA06)/4$</td>
<td>4-35</td>
</tr>
<tr>
<td>$N_{41}(R_1)$</td>
<td>N428</td>
<td>$\alpha_{41}(B_1) = (*AA03 + EA03 + EA07 + EA11 + EA15 + EA18)/6$</td>
<td>4-36</td>
</tr>
<tr>
<td>$N_{41}(R_2)$</td>
<td>N429</td>
<td>$\alpha_{41}(B_2) = (*AA05 + EA02 + EA06 + EA10 + EA14 + EA17)/6$</td>
<td>4-37</td>
</tr>
<tr>
<td>$N_{41}(R_3)$</td>
<td>N426</td>
<td>$\alpha_{41}(B_3) = (EA01 + EA05 + EA09 + EA13 + EA16)/5$</td>
<td>4-38</td>
</tr>
<tr>
<td>$N_{41}(R_{43})$</td>
<td>N427</td>
<td>$\alpha_{41}(B_{43}) = (EA04 + EA08 + EA12 + EA19)/4$</td>
<td>4-39</td>
</tr>
<tr>
<td>$N_{42}(R_{42} + R_{43})$</td>
<td>N414</td>
<td>$\alpha_{42}(B_{42} + B_{43}) = (BA03 + CA06 + DA07 + DA08 + DA09)/5$</td>
<td>4-40</td>
</tr>
<tr>
<td>$N_{41}$</td>
<td>N413</td>
<td>$\alpha_{41} = (4\alpha_{41}(B_0) + 6\alpha_{41}(B_1) + 6\alpha_{41}(B_2)$</td>
<td>4-41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$+ 5\alpha_{41}(B_3) + 4\alpha_{41}(B_{43})]/25$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$= (6*CTA + 19CTE)/25$</td>
<td></td>
</tr>
<tr>
<td>$N_{4}$</td>
<td>N415</td>
<td>$\alpha_{4} = (25\alpha_{41} + 5\alpha_{42}(B_{42} + B_{43})]/30$</td>
<td>4-42</td>
</tr>
<tr>
<td>$N_{5}$</td>
<td>N51</td>
<td>$\alpha_{5} = (BA07 + 6*CTC)/7$</td>
<td>4-43</td>
</tr>
</tbody>
</table>
1.2.2. MDT Form A

For simplicity, only the N(R) equation for the item "Civil War" (Long Version) is established here. The N(R) equation for the whole MDT(A) can easily be derived by combining the following equations with those in Table 4.10.

Civil War (Long Version)

N_1(R_0) Index:
\[ \alpha_1(\beta_0) = \frac{(KAO1+KAO2+KAO3+KAO5+KAO6+KAO7)}{7} \]  
(4-44)

N_31(R_1) Index:
\[ \alpha_{31}(\beta_1) = \frac{(KAO3+KAO5+*KAO6+KAO7)}{5} \]  
(4-45)

N_41(R_1) Index:
\[ \alpha_{41}(\beta_1) = KAO5 \]  
(4-46)

N_5 Index:
\[ \alpha_5 = KAO3 \]  
(4-47)

1.2.3. MDT Form B

In the following derivations, the item response FA08 is not included because most of the subjects are not married. Thus,
\[ CTF = \sum_{p=1}^{7} FA_p / 7 \]
### TABLE 4.11

<table>
<thead>
<tr>
<th>INDEX</th>
<th>COMPUTER CODE</th>
<th>N(R) EQUATION</th>
<th>EQ. NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_1$</td>
<td>BN15</td>
<td>$\alpha_1 = (KAO1 + KAO2 + KAO3 + KAO5 + KAO6)/5$</td>
<td>4-48</td>
</tr>
<tr>
<td>$N_2$</td>
<td>BN29</td>
<td>$\alpha_2 = (FAO1 + FAO2 + FAO3 + FAO4 + FAO5 + FAO6 + FAO7 + GA01 + GA06)/9$</td>
<td>4-49</td>
</tr>
<tr>
<td>$N_31 (R_1)$</td>
<td>BN31</td>
<td>$\alpha_{31}(\beta_1) = (DA01 + FAO3 + GA02 + GAO5 + KAO3 + KAO5 + KAO6)/7$</td>
<td>4-50</td>
</tr>
<tr>
<td>$N_31 (R_2)$</td>
<td>BN32</td>
<td>$\alpha_{31}(\beta_2) = (DA06 + FA04)/2$</td>
<td>4-51</td>
</tr>
<tr>
<td>$N_31 (R_{41})$</td>
<td>BN33</td>
<td>$\alpha_{31}(\beta_{41}) = (DA04 + FA02)/2$</td>
<td>4-52</td>
</tr>
<tr>
<td>$N_32 (R_1)$</td>
<td>BN34</td>
<td>$\alpha_{32}(\beta_1) = (HA01 + HA05)/2$</td>
<td>4-53</td>
</tr>
<tr>
<td>$N_32 (R_2)$</td>
<td>BN35</td>
<td>$\alpha_{32}(\beta_2) = (HA02 + HA06)/2$</td>
<td>4-54</td>
</tr>
<tr>
<td>$N_{31}$</td>
<td>BN36</td>
<td>$\alpha_{31} = (7a_{31}(\beta_1) + 2a_{31}(\beta_2) + 2a_{31}(\beta_{41}))/11$</td>
<td>4-55</td>
</tr>
<tr>
<td>$N_{32}$</td>
<td>BN37</td>
<td>$\alpha_{32} = (2a_{32}(\beta_1) + 2a_{32}(\beta_2))/4$</td>
<td>4-56</td>
</tr>
<tr>
<td>$N_3$</td>
<td>BN38</td>
<td>$\alpha_3 = (11a_{31} + 4a_{32})/15$</td>
<td>4-57</td>
</tr>
<tr>
<td>$N_{41} (R_0)$</td>
<td>BN41</td>
<td>$\alpha_{41}(\beta_0) = (*KAO5 + 7CTF)/8$</td>
<td>4-58</td>
</tr>
<tr>
<td>$N_{41} (R_1)$</td>
<td>BN42</td>
<td>$\alpha_{41}(\beta_1) = (HA01 + HA05)/2$</td>
<td>4-59</td>
</tr>
<tr>
<td>$N_{41} (R_2)$</td>
<td>BN43</td>
<td>$\alpha_{41}(\beta_2) = (HA02 + HA06)/2$</td>
<td>4-60</td>
</tr>
<tr>
<td>$N_{41} (R_3)$</td>
<td>BN44</td>
<td>$\alpha_{41}(\beta_3) = (HA03 + HA07)/2$</td>
<td>4-61</td>
</tr>
<tr>
<td>$N_{42} (R_{42})$</td>
<td>BN45</td>
<td>$\alpha_{42}(\beta_{42}) = (DA07 + DA08 + DA09)/3$</td>
<td>4-62</td>
</tr>
<tr>
<td>$N_{41}$</td>
<td>BN46</td>
<td>$\alpha_{41} = (8a_{41}(\beta_0) + 2a_{41}(\beta_1) + 2a_{41}(\beta_2) + 2a_{41}(\beta_3))/14$</td>
<td>4-63</td>
</tr>
<tr>
<td>$N_4$</td>
<td>BN47</td>
<td>$\alpha_4 = (14a_{41} + 3a_{42})/17$</td>
<td>4-64</td>
</tr>
<tr>
<td>$N_5$</td>
<td>BN51</td>
<td>$\alpha_5 = (FA06 + 6*CTG + KAO3)/8$</td>
<td>4-65</td>
</tr>
</tbody>
</table>
II. Direct Addition of Ratings with Weightings.

This method attempts to widen the psychological distances between the first three or four choices ranked by the subjects by introducing a formula to adjust the ratings of the first three or four item responses ranked before the above N(R) equations are operated. The underlying idea of this method is that, very often, some or all of the ratings of the first three or four choices get tied and it becomes necessary to adopt a consistent method to discriminate them.

Consider a MDT item asking subjects to rank their first three choices:

1st Choice = X_h with rating Y_h
2nd Choice = X_i with rating Y_i
3rd Choice = X_j with rating Y_j

These ratings are adjusted by the following formula:

\[
\text{New ratings} = \begin{align*}
Y_h' &= Y_h - 0.75 \\
Y_i' &= Y_i - 0.50 \\
Y_j' &= Y_j - 0.25
\end{align*}
\] (4-66a)

The general adjusting formula is:

\[
\text{New rating} = \text{Old rating} - \left( \frac{r-S+1}{r+1} \right)
\]

\[
= \text{Old rating} - (1 - \frac{S}{r+1})
\] (4-66b)
where \( r \) = no. of ranks asked

\( S = \) rank of the choice.

Take an example:

An item of 6 \( X_i \)s, all are rated as strongly YES with 1st Choice = \( X_3 \), 2nd Choice = \( X_2 \), 3rd Choice = \( X_5 \)

<table>
<thead>
<tr>
<th>Original Rating</th>
<th>New Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_1 )</td>
<td>2</td>
</tr>
<tr>
<td>( X_2 )</td>
<td>2</td>
</tr>
<tr>
<td>( X_3 )</td>
<td>2</td>
</tr>
<tr>
<td>( X_4 )</td>
<td>2</td>
</tr>
<tr>
<td>( X_5 )</td>
<td>2</td>
</tr>
<tr>
<td>( X_6 )</td>
<td>2</td>
</tr>
</tbody>
</table>

\[ \text{New Rating} = \text{Original Rating} \times (1 - \frac{1}{4+1}) \]

The new ratings are obviously more discriminative and they are generated based on the subject's own responses.

For MDT item with 4 ranks:

1st Choice = \( X_i \) with rating \( Y_j \)

2nd Choice = \( X_j \) with rating \( Y_i \)

3rd Choice = \( X_j \) with rating \( Y_j \)

4th Choice = \( X_k \) with rating \( Y_k \)

New ratings are:

\[ Y_{h}^{' } = Y_{h} - (1 - \frac{1}{4+1}) = Y_{h} - 0.80 \]
\[ Y_{i}^{' } = Y_{i} - 0.60 \]
\[ Y_{j}^{' } = Y_{j} - 0.40 \]
\[ Y_{k}^{' } = Y_{k} - 0.20 \]
III. Ranking Scoring Method

The first 3 or 4 ranks of each MDT item, hypothesized by the theory established, are used as criteria for scoring the ranking data.

TABLE 4.12: First 3 of 4 Ranks of the T.H.R. of MDT Items.

<table>
<thead>
<tr>
<th>MDT Item</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Lost Bag</td>
<td>X₁</td>
<td>X₂</td>
<td>X₄</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Sinking Boat</td>
<td>X₄  = Xᵮ</td>
<td>X₅</td>
<td>X₈</td>
<td>X₂</td>
<td></td>
</tr>
<tr>
<td>A Doctor's Dilemma</td>
<td>X₂</td>
<td></td>
<td>X₄  = X₅</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car Accident</td>
<td>X₁</td>
<td>X₆</td>
<td></td>
<td>X₇</td>
<td></td>
</tr>
<tr>
<td>The Criminal</td>
<td>S₂</td>
<td>S₁</td>
<td></td>
<td></td>
<td>S₄</td>
</tr>
<tr>
<td>The Young Robber</td>
<td>X₃  = X₈</td>
<td></td>
<td>X₂</td>
<td></td>
<td>X₅</td>
</tr>
<tr>
<td>Freedom of Speech</td>
<td>X₁  = X₂</td>
<td></td>
<td>X₆</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank Robbery</td>
<td>X₄  = X₈</td>
<td></td>
<td></td>
<td>X₇</td>
<td></td>
</tr>
<tr>
<td>Civil War</td>
<td>X₃</td>
<td>X₁</td>
<td></td>
<td></td>
<td>X₅</td>
</tr>
</tbody>
</table>

Notes: 1. Xᵢ's marked with an asterisk are for married subjects only. For unmarried subjects (who are supposed to leave these Xᵢ's blank), these Xᵢ's are not counted.

2. If \(Xᵢ = Xⱼ\) then "Xᵢ then Xⱼ" or "Xⱼ then Xᵢ" is regarded as correct. In other words, the rank orders of the Xᵢ's in the bracket { } are regarded as equal.
For the item "the Criminal", the test instruction of the ranking section in Part I has been proved to be too complicated for a large number of subjects. A lot of inconsistent ranking data in this item has been found. It is therefore decided that the rating instead of the ranking are used for scoring. Let S1 to S5 denote the Situations 1 to 5 respectively, define:

\[
\begin{align*}
S_1 &= X_1 + X_2 + X_3 \\
S_2 &= X_5 + X_6 + X_7 \\
S_3 &= X_9 + X_{10} + X_{11} \\
S_4 &= X_{13} + X_{14} + X_{15} \\
S_5 &= X_{16} + X_{17} + X_{18}
\end{align*}
\]

\[
\begin{align*}
S_6 &= \frac{(S_2 + S_1)}{2} \\
S_7 &= \frac{(S_3 + S_5)}{2}
\end{align*}
\]

In Eq. (4-7), it is hypothesized that

\[
S_2 < S_1 < \{S_3, S_5\} < S_4 \\
S_6 < S_7 < S_4
\]

Three ratings (acquaintance, best friend, brother or sister) instead of one (Best friend) in each situation one used to order to give better discriminative effect.

The Ranking Scoring Method consists of the following steps:

(i) Disregarding the order of the ranks, each \(X_i\) correctly ranked as one of the 1st 3(or 4) ranks is given a score of 1.
(ii) For 3-choices MDT item, a "bonus" score of 1 is given if the first 2 ranks are correctly placed in order.

(iii) For 4-choices item:

1st 3 ranks correctly placed in order, additional score = 2
1st 2 ranks correctly placed in order, additional score = 1

(iv) A special scoring criterion is used for the item "The Criminal":

\[
\begin{align*}
S_6 &< S_7 < S_4 & \text{Score} = 3 \\
S_6 &< \{S_7 = S_4\} & \text{Score} = 2 \quad (i.e. \ S_6 < S_7, \ S_6 < S_4 & S_7 = S_4) \\
S_6 &< S_4 < S_7 & \text{Score} = 1 \\
\text{All other combinations} & \text{Score} = 0
\end{align*}
\]

The sum of all the ranking scores in a MDT will give a new score called Consistency (C) Score. C-Score expresses the degree of consistency of the subject's rankings/ratings with our T.H.R. Since our T.H.R. is constructed from the perspective of a high N subject, high C-Scores may be interpreted as high N people.

4.4.2. Part II.

(a) J-Score generated by Ranking Data

Let \( J_i \) = Hypothetical Moral Judgment level of Part II statements where \( i = 2, 3, 4, 5/6 \).
Without loss of generality, we write $J_5$ to denote $J_{5/6}$ (i.e. $J_5$ or $J_6$ in its original meaning).

A criterion for scoring:

<table>
<thead>
<tr>
<th>RANK</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Most Important)</td>
<td>3</td>
</tr>
<tr>
<td>2 (2nd Most Important)</td>
<td>2</td>
</tr>
<tr>
<td>3 (3rd Most Important)</td>
<td>1</td>
</tr>
</tbody>
</table>

For "Civil War" (Long Version):

<table>
<thead>
<tr>
<th>Rank</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

(i) Define:

$$S_i = \text{Sum of scores of all } J_i \text{ statements ranked as one of the top 3 important choices (for "Civil War" (Long Version): top 5 Choices).}$$

In this case, the $S_5$ score is identical to the "P" score (Principled Morality Score) in Rest's DIT (see Rest's 1979a).

(ii) Define

$$S = 2S_2 + 3S_3 + 4S_4 + 5S_5 \quad (4-71)$$

The "S" score is the Moral Judgment stage score generated by ranking data.
Let $R' = \text{Possible Minimum of } S$

$R'' = \text{Possible Maximum of } S$,

\[ \text{Approximate Moral Judgment} \]

\[ \begin{array}{cccc}
\text{Stage} & 1 & 2 & 3 & 4 & 5/6 \\
R' & (R'+R'')/2 & R''
\end{array} \]

(B) J-Score generated by Rating Data.

\[ \gamma_i = \text{Coefficient of } J_i \\
= \text{The Mean of the subject's ratings of all } J_i \]

\[ \text{statements,} \]

\[ \text{where } i = 2, 3, 4, 5/6. \]

(Note: $J_5$ is defined to include both $J_5$ & $J_6$ in this case)

A subject's J-level is given by:

\[ J : (\gamma_2, \gamma_3, \gamma_4, \gamma_5) \]

Though the above expression gives more details about the J-level of a subject, it is sometimes more convenient to assign a simplified dominating stage of J to a subject. The following discussion illustrates a simple method for assigning dominating J-stage to a subject.

Assume $\gamma_2$ is the largest, a new set of $\gamma_i'$ is calculated by the following formula:
\[ \gamma'_1 = \frac{\gamma_1}{\gamma_2} \times 100 \]

\[ \gamma'_2 = 100 \]

\[ \gamma'_3 = \frac{\gamma_3}{\gamma_2} \times 100 \]

\[ \gamma'_4 = \frac{\gamma_4}{\gamma_2} \times 100 \]

In other words, \( \gamma'_1 = \frac{\gamma_i}{\gamma_k} \times 100 \) for \( i = 2, 3, 4, \) & \( 5 \)

and \( \gamma_k = \) the largest of all \( X_i \)'s.

**TABLE 4.13: Dominating J-Stage**

<table>
<thead>
<tr>
<th>( (\gamma'_2-\gamma'_1) )</th>
<th>2</th>
<th>2(3)</th>
<th>2(1)</th>
<th>2/3</th>
<th>2/1</th>
<th>2(1,3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( (\gamma'_2-\gamma'_3) )</td>
<td>( k_1 )</td>
<td>( k_1 )</td>
<td>( k_2 )</td>
<td>( k_2 )</td>
<td>( k_3 )</td>
<td>( k_2 )</td>
</tr>
<tr>
<td>( (\gamma'_2-\gamma'_4) )</td>
<td>( k_1 )</td>
<td>( k_1 )</td>
<td>( k_1 )</td>
<td>( k_2 )</td>
<td>( k_2 )</td>
<td>( k_1 )</td>
</tr>
</tbody>
</table>

Notes:

(i) \( k_1 > k_2 >> k_3 \).

\( k_1, k_2 \) & \( k_3 \) are to be fixed or determined empirically.

(For purpose of illustration, say, \( k_1 = 50, k_2 = 25, k_3 = 10 \)).

(ii) \( 2(1,3) \) means that the dominating stage 2 is not clearly defined in this case; there are two sub-stages, namely 1 & 3.

(iii) The cut-off values, \( (k_1, k_2, k_3) \) should be chosen such that most of the subjects can be assigned a dominating J-stage by this method.
4.5. Simple MDT Scores

A set of simple MDT scores is constructed based on the subjects' ratings.

1. Part I Ratings.

Define NR scores as:

\[ a_{01} = (a_4 + a_5) - (a_1 + a_3) \]  (4-72a)
\[ a_{02} = (a_4 + 1.5 a_5) - (a_1 + 1.5 a_3) \]  (4-72b)
\[ a_{03} = (a_4 + 2a_5) - (a_1 + 2a_3) \]  (4-72c)

\[ a_{11} = (a_4 + a_5) / (a_1 + a_3) \]  (4-72d)
\[ a_{12} = (a_4 + 1.5 a_5) / (a_1 + 1.5 a_3) \]  (4-72e)
\[ a_{13} = (a_4 + 2a_5) / (a_1 + 2a_3) \]  (4-72f)

The reason for putting weightings on \( a_3 \) and \( a_5 \) is that \( a_3 \) is anticipated to be the least discriminative index, therefore a weighting on \( a_3 \) is necessary in order to increase the discriminative power of NR scores. In order to balance the weighting assigned to \( a_3 \), an equal weighting must be put on either \( a_4 \) or \( a_5 \). The \( a_5 \) is chosen to be weighted so that symmetry in the above equations can be restored.

For MDT Form B, the mean of \( a_1 \) and \( a_2 \) is taken to be \( a_1 \) in the above calculation.

The computer code for \( a_{01} \) to \( a_{13} \) is NR01 to NR13. More details on the computer code of the MDT indices can be found in Appendix 5(F) or Tables 4.10 and 4.11.
II. Part II. Ratings

Define J1, J2, J3, J4 and J5 to be the average ratings of the relevant Part II statements. (See Table 4.6) All statements with Dominant J level at 5, 5B and 6 are used to generate the average rating J5.

Define J-scores as:

\[ \gamma_{01} = (J4+J5) - (J2+J3) \]  
(4-73a)

\[ \gamma_{02} = (J4+1.5 J5) - (J2 + 1.5J3) \]  
(4-73b)

\[ \gamma_{03} = (J4+2J5) -(J2+2J3) \]  
(4-73c)

\[ \gamma_{11} = (J4+J5) / (J2+J3) \]  
(4-73d)

\[ \gamma_{12} = (J4+1.5J5) / (J2+1.5J3) \]  
(4-73e)

\[ \gamma_{13} = (J4+2J5) / (J2+2J3) \]  
(4-73f)

The computer code for \( \gamma_{01} \) to \( \gamma_{13} \) is RJ01 to RJ13.

III. Parts I and II as a whole

The following indices are defined by simply adding the NR and RJ indices with appropriate weightings.

\[ \text{NRRJ01} = \text{NRO1} + \text{RJO1} \]
\[ \text{NRRJ02} = \text{NRO2} + \text{RJO2} \]
\[ \text{NRRJ03} = \text{NRO3} + \text{RJO3} \]
\[ \text{WNRRJ03} = \text{NRO1} + 1.5*\text{RJO1} \]
\[ \text{WNRRJ02} = \text{NRO2} + 1.5*\text{RJO2} \]
\[ \text{WNRRJ03} = \text{NRO3} + 1.5*\text{RJO3} \]
The indices NRRJ11 TO NRRJ13 and WNRRJ11 TO WNRRJ13 are similarly defined. A straightforward derivation of the NRRJ01 and WNRRJ01 indices is illustrated in Appendix 4.

The above indices express a subject's responses to the MDT Parts I and II as a whole.

Finally, it should be noted that not all the scoring methods mentioned in this chapter will be used in the empirical part of this study.
5. The Present Study

The major aim of this research project is to explore a new approach in the study of Moral Development. A theory of Moral Development (hereafter labelled as *TMD) is established in Chapter 3. A new psychological test called the Moral Development Test (MDT) has been constructed and described in Chapter 4.

Broadly speaking, the basic objectives of the present empirical study are as follows:

(1) (a) To validate the test MDT, and
    (b) To test the major theoretical hypotheses of *TMD.

(2) To investigate the characteristics of the MDT in its own right, that is, to investigate the specific features of MDT which are not explicitly described by *TMD.

(3) To perform a cross-cultural study of MDT in two or three countries.

Because of the financial problem and the difficulty in getting subjects, the research strategy was to validate the MDT in London by the author himself. A cross-cultural study was subsequently performed in Hong Kong and Malaysia with the help of his colleagues.

The difficulty in getting subjects to answer a long and personal questionnaire not only made the randomization of the samples impossible but also damaged the original
experimental design considerably. This means that special care must be taken with the generalization of the results and findings reported here at this stage. It should be emphasized that further research is required to substantiate or modify the findings here.

5.1. Hypotheses

I. The Test of Theoretical Hypotheses.

Based on *TMD, a set of hypotheses is proposed. The hypotheses are operationalized in terms of the item responses of MDT form A wherever appropriate in the following discussion. A similar argument can be developed for item responses for the MDT form B.

1 (A). The Hierarchical Structure of Psychological Needs (N) and Human Relationships (R)

The operational hypotheses can be set in terms of:
(i) "N only" (Testing theoretical hierarchy in Section 3.2).
(ii) "R only" (Testing theoretical hierarchy in Section 3.3).
(iii) N(R) (See Section 4.3).

Since all the item responses in Part I of the MDT and all real situations are more satisfactorily analysed in terms of N(R) structures rather than the "N only" or
"R only" structures, the major analysis here concentrates on N(R) structures.

**H.1.1.** The \( X_i \)'s in each MDT item when arranged in the order postulated in Section 4.3 show a fixed hierarchical sequence as predicted.

The \( X_i \)-patterns of the items "The Sinking Boat" and "Car Accident" can be used to study the R-Hierarchy over a range of \( N_i \)'s. On the other hand, relevant \( X_i \)'s of the item "The Criminal" test the N-Hierarchy at certain fixed \( R_i \). For example, \((X_3, X_7, X_{11}, X_{15}, X_{18})\) tests the N-Hierarchy (in this case, the \( N \) varies across different sub-situations (1 to 5) with \( R_i \) being fixed at \( R_1 \) (brother/sister).

**H.1.2.** The \( \alpha_i (\beta_j) \) indices of \( N_i (R_j) \) constructed in Section 4.4 obey a fixed hierarchical sequence as hypothesized.

In this case, the position of \( \alpha_i (\beta_j) \) in the sequence is not theoretically predicted because of the complex interaction between empathy, altruism and survival needs (See Section 3.5).

It should be emphasized that the hierarchies described in H.1.1. and H.1.2. are internally structured as discussed in Section 3.2 and 3.3. They are postulated to be true for persons of all ages.

**1(B). The Hierarchical Structure of Moral Judgment (J)**

It should be noted that the \( J \) described here is defined as the Ordinary Level of Judgment while Kohlberg's
J' is referred to as the Optimal Level of Judgment. For their differences, see Section 3.4. Nevertheless, their internal structure is postulated to be similar. As mentioned in section 2.3.3. (See also Kohlberg, 1971, 1976; Colby et. al., in press), this internal structure can only be adequately investigated by longitudinal study; since the present study is a cross-sectional one, no hypothesis regarding the J-structure is made here.

2. The Structure-wholeness of N(R) and J

H.2.1. The N(R)-J structures form structured wholes.
H.2.2. The N(R) structures form structured wholes.

Two methods will be used for testing the above hypotheses:

(i) Internal Consistency Reliability

Support of the above hypotheses would require the internal consistency reliability of all the major indices of $\alpha (N)$, $\beta (R)$, $\alpha(\beta) (N(R))$ and $\gamma (J)$ to be reasonably high.

(ii) Factor Analysis

The results of the factor analysis of the above-mentioned major indices should give a consistent picture showing structured-wholeness of N(R) and J.

Another method testing the above hypotheses is the Alternate Form Reliability. However, as the MDT Forms A
and B are not alternate forms, this method cannot be used here (See Section 5.4).

3. **The Developmental Nature of N(R) and J.**

H.3.1. Individuals develop N(R) according to the pattern postulated in Section 3.2 and 3.3.

H.3.2. Individuals develop J according to the pattern postulated in Section 3.4.

This means that the major $\alpha_i(\beta_j)$ indices and $\gamma$ scores (for example, the $S$ score mentioned in Section 4.4.2) correlate positively and significantly with age, or show significant trend in the direction of increasing age.

4. **The Relationship Between N(R) and J.**

H.4. There is a significant positive relation between N(R) and J.

This would mean that the correlation between the major indices of N(R) and the $\gamma$-scores should be significant and positive.

5. **The Universality of N(R) and J.**

H.5. The above hypotheses (H.1.1., H.1.2., H.2.1., H.2.2., H.3.1., H.3.2. and H.4) are true in all cultures.
II. Other Empirical Hypothesis

H.6. There is a positive relation between the major indices of $N_i(R_j)$ and $J_i$ measured by the MDT and the scores generated by Kohlberg's MJJ and/or Rest's DIT.

It is expected that the MDT $\gamma$-scores bear a stronger positive relation with the MMS or DIT scores than the major indices of $N_i(R_j)$. It is argued that $\alpha_i(\beta_j)$ indices are emotion (or affection) oriented, $\gamma$-scores emotion-rationalization oriented and MMS and DIT scores rationalization oriented. Thus, the correlations are probably:

<table>
<thead>
<tr>
<th>$\alpha_i(\beta_j)$</th>
<th>$\gamma$</th>
<th>MMS/DIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_i(\beta_j)$</td>
<td>HIGH</td>
<td>LOW</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>LOW</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>MMS/DIT</td>
<td>MEDIUM</td>
<td>-</td>
</tr>
</tbody>
</table>

At this stage, there is no hypothesis regarding the effects of sex, intellectual development, personality etc. on the values of $\alpha_i(\beta_j)$ or $\gamma$ indices. These effects are to be found empirically.

4.2. Instrumentation and Methods of Scoring

I. Moral Development Test

The details of the MDT construction and its
scoring system are discussed in details in Chapter 4.

(A) **English Version**

Two forms and four versions of the MDT have been used in the Main Study:

(1) (a) Form A (IS)
    (b) Form A
    (c) Form A+

(2) Form B

The details of MDT Forms A, A+ and B are given in Section 4.1. A copy of the MDT Forms A, B and the item "Civil War" (long version) is given in Appendix 5(A). The MDT Form A(IS) was used only for English Form six subjects. It differs from Form A in a small number of item responses. For details, see Appendix 5(B).

In the data analysis, the sample using Form A(IS) is combined with the samples using Form A with the following arrangement:

(i) Part I item responses.

The $X_9$ in "The Sinking Boat" of both Forms A(IS) and A is deleted from the analysis. The original $X_2$ (a highly respected religious leader) in the "Car Accident" of Form A(IS) is also deleted and replaced by $X_{10} = a$ postman.
(ii) Part II statements

The following five statements of Form A(IS) are deleted from analysis: AC03, AC04, BCO2, BC05 and DC06.

Only Form A was used extensively in the Main study. Very few work has been done on Form B. The research strategy is to study Form A thoroughly and uses Form B for studying special topics, for example, the study of \( \alpha_2 \) \( (N_2) \) and extremely emotional situations (second portion of "Bank Robbery", and "Civil War").

(B) Chinese Version.

When the main study in London was nearly completed, the MDT Form A was translated into Chinese by the author. The translation was checked and refined by two colleagues in London and one in Hong Kong. All of them completed their postgraduate studies in England. They are fluent in both English and Chinese. The Chinese MDT was then used in five Hong Kong (Chinese) samples. Because of a mistake in the printing and the stapling of the Chinese MDT by the author's colleagues in Hong Kong, the first three samples used a Chinese MDT (labelled as Form A(4)*) which is different from the one used by the fourth and fifth samples (labelled as Form A(5)*) in the following aspects:

1. The order of the items in Form A(4) is exactly the reverse of that in Form A(5). In other words, the order of the items in Form A(4) is:

* The number in the bracket refers to the Computer code of the different MDT versions.
"The Criminal", "Car Accident", "A Doctor's Dilemma", "The Sinking boat" and finally "A Lost Bag".

(ii) The ranking section of Part I of the item "A Doctor's Dilemma" was missed in Form A(4) but not in Form A(5).

The contents of all items in Forms A(4) and A(5) are the same.

In addition, the contents and test format of the Chinese MDT Form A(5) are exactly the same as that of the English MDT Form A except that both the Chinese MDT Forms A(4) and A(5) do not include the ranking section of Part I of the item "The Criminal". The reason for dropping this ranking section in the Chinese MDT is due to the fact that a lot of young English subjects found particular difficulty in answering this ranking section.

In the data analysis, it is assumed that the order of the items in the MDT does not affect the subject's responses.

A copy of the Chinese MDT Form A(5) is given in Appendix 5(c).

II. Test Instruments Used in the Validity Study.


Form A of Kohlberg's MJI (Colby et. al., 1979) was used. Instead of interviewing subjects, a written
form of the MJI was used. Subjects were asked to write down their answers in their own words. A copy of the MJI is given in Appendix 5(D). Further details about the characteristics of this test and its scoring method can be found in Section 2.3.3. See also Colby et. al. (1979) and Ma (1980, Appendix B.3).

2. Rest's Defining Issues Test (DIT)

Four stories of Rest's DIT (Rest, 1971a) were used. A copy of the test used is given in Appendix 5(E). The general feature, scoring system and psychometric properties etc. of the DIT are discussed in detail in Section 2.3.5. It should be noted that the D score is calculated by using a set of empirical weightings which are derived from a Standardized American Sample (Rest, 1979a, p.4.2-4.5). Thus, it has to assume that this set of empirical weightings can be applied to our English sample if the D score is to be calculated. Such assumption is problematic to some extent. The P score will be used more frequently in the discussion.

3. Science Reasoning Tasks (SRT)

The Science Reasoning Tasks are Cognitive Development tests which were "developed by the team 'Concepts in Secondary Maths and Science' at Chelsea College, University of London in the period 1973/78 in order to investigate
the relationship between the optimum Piagetian Level at which a pupil can function and the understanding of Science which he or she can achieve." (Kuchemann, 1979, Task III, p.1) According to the General Guide (Wylam and Shayer, p.8-11), there are seven such tasks. Each task forms a test. Task III: "The Pendulum" of the SRT was used in our study.

In general, a series of short experiments using a simple pendulum were performed in front of the subjects with the help of one or two of the students. The subjects were asked to answer a number of questions after each experiment. All answers were to be written on the test booklet provided. Further details about the test and its scoring system can be found in Kuchemann (1979) and Wylam and Shayer (1980).

4. Raven's Standard Progressive Matrices (RPM) and Junior Eysenck Personality Test (JEPI)

Since both RPM and JEPI are popular psychological tests, their details will not be given here. For a full description of these two tests, see Raven et. al (1978) and S.B.G. Eysenck (1978).

5. Bergling's Thinking Test (TT)

Bergling's Thinking Test is a short multiple choice test constructed based on Piaget's theory. The test
attempts to measure a subject's level of logical thinking (pre-operational thinking, concrete operational thinking, formal operational thinking). It consists of 7 items and each item has 5 choices. Subjects were asked to choose one of the 5 choices in each item as their answers. They usually took about 15 to 20 minutes to complete the test. Several scoring methods have been studied by Bergling. The one used here is called the Reasoning Level Test Score. For further details about the test, see Bergling (1974).

It is remarked here that Bergling (1974) studied the psychometric properties of his test by using a sample of primary school children, aged 10 years 0 month to 10 years 11 months. It may be difficult to demonstrate the developmental property of the test by using a sample of such narrow age range. Nevertheless, Bergling's study shows that the test is good for investigating young children's science thinking ability. In addition, the test is easy to administer.

5.3. Sample

I. English (London) Sample

All the secondary school subjects used in this study were drawn from one single school labelled as School E. The School E had kindly consented to let all its F.2, F.4 and Lower F.6 pupils participate in our Pilot or Main Studies. They also provided us some F.3 and a
few Upper F.6 students.

School E is a mixed comprehensive school in London. It has about one thousand and six hundred pupils, aged 11-18.

On the other hand, our adult samples in the Main Study was composed of subjects from different sources:

(i) 29 PGCE (Postgraduate Certificate in Education) and 4 M.A. (Ed.) students from the Institute of Education.
(ii) 8 PGCE or undergraduate students from a College of Education in London.
(iii) 4 M.A. (Medical Sociology) and 6 Undergraduate students from University of London.
(iv) 3 other persons: a housewife, a clerk and a secondary school teacher.

All subjects mentioned in this section are native English or immigrants, unless indicated by an asterisk "*".

The details of the sample used are given as follows:

(A) Pilot Study

<table>
<thead>
<tr>
<th>CLASS</th>
<th>SEX</th>
<th>F.2</th>
<th>F.4</th>
<th>F.6</th>
<th>ADULTS</th>
<th>Non-English</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td></td>
<td>20</td>
<td>38</td>
<td>14</td>
<td>8</td>
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<td></td>
<td>FEMALE</td>
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<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
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<tr>
<td></td>
<td></td>
<td>28</td>
<td>48</td>
<td>23</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

TABLE 5.1. Sample Used in Pilot Study
F.2 (Form Two) and F.4 (Form Four) refer to the Second and Fourth Year Classes respectively in the secondary school. Generally speaking, Lower F.6 and Upper F.6 are approximately equivalent to the Grade 12 and grade 13 (or First Year Undergraduate) respectively in the American Educational System.

17 non-English adults from over 10 countries were added in order to increase the size of the adult sample in the Pilot Study. A total of 132 subjects, 115 of them were English, participated in the Pilot Study.

(B) Main Study

1. Subjects Taking MDT Forms A/A'/A(IS)

<table>
<thead>
<tr>
<th>SEX</th>
<th>FORM</th>
<th>COUNT</th>
<th>FORM</th>
<th>FORM</th>
<th>FORM</th>
<th>ADULT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ONE</td>
<td>TOT PCT</td>
<td>TWO</td>
<td>THREE</td>
<td>FOUR</td>
<td>SIX</td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>67</td>
<td>32</td>
<td>35</td>
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<td>214</td>
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<tr>
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<td>14.6</td>
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</tr>
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Notes:
(1) M = Missing case(s).
(2) The number of missing cases is not included in the Column and Row totals.
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<th>ROW PCT</th>
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<td>58.5</td>
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<td></td>
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<td></td>
<td>5.0</td>
<td>5.9</td>
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</tr>
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<td>1.5</td>
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<td>0.7</td>
<td>0.0</td>
</tr>
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<td>0.3</td>
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</tr>
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<td>0.0</td>
</tr>
</tbody>
</table>

**Notes:**

1. M = Missing case(s).
2. The number of missing cases is not included in the Column and Row Totals.
The following remarks should be noted:

(i) The F.6 (Lower Form Six in this case) subjects took MDT Form A(IS). For difference between Forms A(IS) and A, see Section 5.2.

(ii) Most of the English adults (N=50) took Form A; only 4 of them took Form A.

(iii) Three groups of F.2 subjects and 4 F.3/4 subjects took both Forms A and B. 23 of them (22 F.2 and one F.4 subjects) took Form A after completing Form B; they are not included in the above sample.

All analyses of MDT (A) are based on the sample described in Table 5.2.

2. Subjects Taking MDT Form B

A total of 94 subjects completed MDT Form B. Table 5.4.1 shows the analysis of the sample. 57 out of the 94 subjects took Form B only or Form B before taking Form A; the details are tabulated in Table 5.4.2. The remaining 37 subjects took Form B after completing Form A, their details are given in Table 5.4.3.
### TABLE 5.4.1. Subjects Taking Form B

<table>
<thead>
<tr>
<th>CLASS</th>
<th>SEX</th>
<th>F.2</th>
<th>F.3</th>
<th>F.4</th>
<th>Total</th>
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<td>36</td>
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</tr>
<tr>
<td></td>
<td>FEMALE</td>
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<td>6</td>
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</tr>
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<td></td>
<td></td>
<td>64</td>
<td>1</td>
<td>29</td>
<td>94</td>
</tr>
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</table>

### TABLE 5.4.2. Subjects Taking Form B only OR Form B Before Form A.

<table>
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<tr>
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<th>F.3</th>
<th>F.4</th>
<th>Total</th>
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</thead>
<tbody>
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<td>20</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>FEMALE</td>
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<td>0</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
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<td></td>
<td>31</td>
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<td>26</td>
<td>57</td>
</tr>
</tbody>
</table>

### TABLE 5.4.3. Subjects Taking Form B After Form A.

<table>
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<th>CLASS</th>
<th>SEX</th>
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<th>F.3</th>
<th>F.4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE</td>
<td>18</td>
<td>1</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>FEMALE</td>
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<td>0</td>
<td>15</td>
</tr>
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<td></td>
<td>33</td>
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<td>37</td>
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</tbody>
</table>
3. Subjects Taking Both Forms A and B.

<table>
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<tr>
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<th>A then B</th>
<th>B then A</th>
<th></th>
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</thead>
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</tr>
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</tr>
<tr>
<td></td>
<td>37</td>
<td>23</td>
<td>60</td>
</tr>
</tbody>
</table>

**TABLE 5.5. Subjects Taking Both Forms A & B**

The 55 F.2 subjects taking both Forms A and B are used in the study of inter-relation between the two different forms of MDT.

Since the item "Car Accident" appears in both Forms A and B, subjects were normally asked to respond to this item in their first MDT.

(II) Chinese (Hong Kong) Sample

The Chinese subjects were drawn from 5 institutions labelled as C1, C2, C3, C4 and C5.

Schools C1, C2 and C3 are co-education secondary schools. C1 has about 560 pupils and C3 about 1200. The student population of C2 is not known. The academic standard of these three schools is regarded as average.
C4 is classified as a post-secondary college in Hong Kong. It offers courses similar to the university courses in U.K. and America. It has about 3300 students.

C5 is a Catholic secondary school. It admits girls only. The academic standard of the students is regarded as average. The student population of C5 is about one thousand.

<table>
<thead>
<tr>
<th>CLASS</th>
<th>SCHOOL</th>
<th>F.4</th>
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<th>F.6</th>
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<td>0</td>
<td>75</td>
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<tr>
<td></td>
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<td>0</td>
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</tr>
<tr>
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<td>C3</td>
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<td>0</td>
<td>71</td>
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<tr>
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<td></td>
<td>C5</td>
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<td>43</td>
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<td></td>
<td>74</td>
<td>172</td>
<td>40</td>
<td>26</td>
<td>312</td>
</tr>
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</table>

**TABLE 5.6. Chinese (H.K.) Sample**

Subjects from C1, C2 and C3 took the Chinese MDT Form A(4) while subjects from C4 and C5 took Form A(5).

Since C5 sample consists of subjects from a girl school, it is decided to excluded it from the major analyses so that the sample used would not be heavily biased with respect to sex. However, this sample is used for studying special topics, for example, the effect of sex on various MDT indices.
Tables 5.7 and 5.8 show further details of the Chinese Sample which consists of subjects from Schools C1, C2, C3 and C4.

### TABLE 5.7 Analysis of the Hong Kong Sample: EDUC BY SEX

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<tr>
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<tr>
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<td>47.9</td>
<td>47.9</td>
<td>47.9</td>
</tr>
</tbody>
</table>

| ADULT   |        |      |       |

Notes: (1) M = Missing case(s). The number of missing cases is not included in the Column and Row totals.

### TABLE 5.8 Analysis of the Hong Kong Sample: EDUC BY AGE

<table>
<thead>
<tr>
<th>AGE</th>
<th>15+ TO</th>
<th>16+ TO</th>
<th>17+ TO</th>
<th>18+ TO</th>
<th>20+ TO</th>
<th>22+ TO</th>
<th>24+ TO</th>
<th>26+ TO</th>
<th>28+ TO</th>
<th>30+ TO</th>
<th>32+ TO</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOUR</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>FIVE</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td>65.4</td>
<td></td>
</tr>
<tr>
<td>SIX</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>ADULT</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td></td>
</tr>
</tbody>
</table>

| COLUMN  | 263    | 263    | 263    | 263    | 263    | 263    | 263    | 263    | 263    | 263    | 263    |       |
| TOTAL   | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  |       |
(III) Malaysian Sample

This sample is included here merely for reference purposes. It is a heavily biased sample which consists of students from the top stream. The sample was drawn from three secondary schools in Malaysia, two of them run by Malaysia Government and one by a Catholic Church. Each of the schools has about 1500 to 2000 pupils. Great difficulty was experienced in obtaining subjects in this country.

This is the only sample used here which did not take MDT in their mother language. All subjects in this sample answered the English MDT Form A. All the results and findings concerning this sample will be put in the Appendix 6.6, except some of the cross-cultural findings which will be put in parallel with the English and Chinese ones in Appendix 6.7.

<table>
<thead>
<tr>
<th>AGE (Yrs)</th>
<th>17+-18</th>
<th>18+-19</th>
<th>19+-20</th>
<th>20+-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>5</td>
<td>22</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>FEMALE</td>
<td>8</td>
<td>33</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>55</td>
<td>25</td>
<td>1</td>
</tr>
</tbody>
</table>

TABLE 5.9. Malaysian Sample
All subjects are either fourth formers or sixth formers. No information regarding the exact form or class of the subjects was provided. In addition, five Malaysian adults also took the MDT Form A, their data will be grouped with the 14 non-English adults subjects who participated in our study in London to form a small sample for cross-cultural comparison.

<table>
<thead>
<tr>
<th></th>
<th>MDT Forms</th>
<th>Secondary School Subjects</th>
<th>Adult Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONDON</td>
<td>Pilot Study</td>
<td>99</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Main Study (A/A+/A(IS))</td>
<td>408</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Main Study (B)</td>
<td>57</td>
<td>0</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td>564</td>
<td>70</td>
</tr>
<tr>
<td>HONG KONG</td>
<td>A(4) / A(5)</td>
<td>286</td>
<td>26</td>
</tr>
<tr>
<td>MALAYSIA</td>
<td>A</td>
<td>94</td>
<td>5</td>
</tr>
<tr>
<td>OTHER</td>
<td>Pilot Study</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Main Study (A/A+)</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>954</td>
<td>132</td>
</tr>
</tbody>
</table>

**TABLE 5.10. Summary of the Samples**
Two school children in the Pilot Study were identified as immigrants to London but they were included in our Pilot analysis.

However, since it is not known at this stage whether there is a cultural effect on the MDT indices or not, we attempt to use samples of the same or similar cultural background in our main study. Thus, subjects who emigrated recently to London are not included in the main analysis. There are 10 such new immigrants (3 in F.2, 2 in F.3 and 5 in F.4 classes). In general, these subjects showed some difficulty in understanding the English-written questionnaire.

5.4. Pilot Study

Generally speaking, there are three phases in the production of a MDT:

Phase I: Design of the Test and Item Construction.

A very vague idea of the theoretical model was developed first.

The ideas for some of the items (e.g., "The Sinking Boat", "A Lost Bag" and part of "The Criminal") were formed in the Spring of 1979. With the ideas of these items in mind, different types of test design and test format were considered. As the theory developed, it was decided that the questions for each item should be split
into two parts: the first part asked for decisions or choices and the second part tested judgment. The DIT format was found to be most suitable for the Part II questions. As for Part I, the present format with the use of an algebraic symbol "X" was considered to be the most effective and the least ambiguous; though it was anticipated that subjects at very low stage of cognitive development might require additional explanation or help in the understanding of the test instructions.

When the test format was fixed, more items were then constructed. The presentation of the MDT Part II statements was heavily influenced by Rest's DIT prototypic statements and the Criterion Judgment statements in Colby et. al. (1979).

Phase II: Consulting Subjects

An interview format for each of the potential MDT items was drafted and many people were invited to talk in a free style with the author on some of these items. Eight of them, all postgraduate students at the Institute of Education, were interviewed for at least one hour. They were chosen as the Consulting Subjects, who offered valuable help in the construction of MDT. They discussed with the author their own choices and judgment. In addition, they also gave opinions on the design and contents of the test. On average, each of them spent about 1½ to 2 hours with the author.
On the whole, their discussion was very helpful, for examples, the sub-situation 5: 'Earthquake' of the item "The Criminal" was constructed from a suggestion by a female subject, and Part I questions of the item "A Doctor's Dilemma" were greatly modified after listening to the opinions of some of the Consulting Subjects.

Eight items were finally constructed and three Pilot forms of the MDT (labelled as PA, PB and PC) were composed, each of them consists of 5 items. An additional item "Civil War" (Long version) was constructed later on; it was added to each of the MDT for adult subjects only.

<table>
<thead>
<tr>
<th>PA</th>
<th>PB</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car Accident</td>
<td>Car Accident</td>
<td>Car Accident</td>
</tr>
<tr>
<td>The Young Robber</td>
<td>The Young Robber</td>
<td>The Young Robber</td>
</tr>
<tr>
<td>The Sinking Boat</td>
<td>The Sinking Boat</td>
<td>Freedom of Speech</td>
</tr>
<tr>
<td>A Lost Bag</td>
<td>A Doctor's Dilemma</td>
<td>The Sinking Boat</td>
</tr>
<tr>
<td>(Civil War)*</td>
<td>(Civil War)*</td>
<td>Bank Robbery</td>
</tr>
<tr>
<td>The Criminal</td>
<td>The Criminal</td>
<td>(Civil War)*</td>
</tr>
</tbody>
</table>

* For adult subjects only.

TABLES 5.11 Pilot Forms of the MDT
At that time, it was thought that each of the Pilot forms of the MDT could act as a complete test by itself. three items: "Car Accident", "The Young Robber" and "The Sinking Boat" were regarded as crucial ones; they were supposed to be part of a final MDT. (It turned out to be not)

Phase III: Pilot Study of the MDT

The above three pilot forms of the MDT were tested by 125 subjects. (For details of the sample, see Section 5.3) Another 7 adult subjects, one English and 6 non-English, were tested with Form A(IS) in the latest stage of the Pilot Study. Therefore, the total number of subjects used in the whole Pilot study should be 132.

<table>
<thead>
<tr>
<th>Pilot Form</th>
<th>PA</th>
<th>PB</th>
<th>PC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.2</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>F.4</td>
<td>10</td>
<td>15</td>
<td>23</td>
<td>48</td>
</tr>
<tr>
<td>Lower and</td>
<td>11</td>
<td>12</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Upper F.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult*</td>
<td>8</td>
<td>11</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>38</td>
<td>30</td>
<td>125</td>
</tr>
</tbody>
</table>

* Another 7 adults took Form A(IS)

TABLE 5.12. Pilot Study of the MDT
All subjects were invited to give their opinion on the design and contents of the test. Only a few adults gave comments but about half of the school-children did write a few lines commenting on the test design or recounting their feeling about the testing. In addition, small groups of pupils in each class were requested to give their opinions and comments on the test in a short interview with the author.

The data were then computed and a preliminary analysis was carried out. After reviewing the whole situation, some item responses in Parts I and II were deleted or modified. Five items were chosen to form a proper MDT (i.e. Form A(1S) /A) with the item "Civil War" (Long Version) being added for adult subjects only. It was felt strongly that it would be a pity to drop the other three items from the present study. Finally, this dilemma was resolved by composing a second form of the MDT (Note: not an alternate form) by using the further three items, a short version of the item "Civil War" and the item "Car Accident" from Form A. The second form is called Form B. It was decided that Form B would be studied with less than 100 school-children.

5.5. Main Study

1. London Study

Owing to a request from School E, the lower F.6 subjects in the main study had to be tested at a time
about six weeks before the expected date, it was thus ne-
cessary to construct an Intermediate Form of the MDT (i.e
A(IS)) for this particular group of subjects because
there was not sufficient time to go through
all the analyses of the Pilot data. The differences
between the Intermediate and Final Forms of the MDT (A)
are described in Section 5.2. Some analyses of the data
of these F.6 subjects were carried out before the final
form was completely constructed, thus the findings of
this sample also contributed to the development of the
final form.

(A) Experimental Design

The original experimental design was constructed
with the purpose to study:

(1) Test-retest reliability of MDT (A)
(2) The relation between the Scores of MDT and those of
   (a) MJI
   (b) DIT
   (c) Science Reasoning Task
   (d) Standard Progressive Matrices
   (e) JEPI

The design also attempted to "randomise" the test
order effect.

However, the following practical problems prevent
the full accomplishment of the whole experimental design
satisfactorily:
(1) Some subjects in one F.3 and two or three F.4 classes were on a study trip to Germany during the first period of the testing sessions.

(2) Classes were not of approximately equal size and the attendance rates of different classes sometimes varied considerably.

(3) Subjects in a few classes were not willing to take the tests.

Nevertheless, the actual experiments did cover a substantial part of the original design.
<table>
<thead>
<tr>
<th>Class/Group Code</th>
<th>1st Test</th>
<th>2nd Test</th>
<th>3rd Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Code</td>
<td>N</td>
<td>Code</td>
</tr>
<tr>
<td>21</td>
<td>A</td>
<td>24</td>
<td>MJI</td>
</tr>
<tr>
<td>22</td>
<td>A</td>
<td>30</td>
<td>RPM</td>
</tr>
<tr>
<td>23</td>
<td>A</td>
<td>24</td>
<td>SRT</td>
</tr>
<tr>
<td>24</td>
<td>A</td>
<td>13</td>
<td>B</td>
</tr>
<tr>
<td>25</td>
<td>A</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>RPM</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>27</td>
<td>SRT</td>
<td>23</td>
<td>A</td>
</tr>
<tr>
<td>28</td>
<td>MJI</td>
<td>30</td>
<td>B</td>
</tr>
<tr>
<td>31</td>
<td>A</td>
<td>25</td>
<td>MJI</td>
</tr>
<tr>
<td>32</td>
<td>A</td>
<td>24</td>
<td>RPM</td>
</tr>
<tr>
<td>33</td>
<td>MJI</td>
<td>9</td>
<td>A</td>
</tr>
<tr>
<td>41</td>
<td>SRT</td>
<td>28</td>
<td>A</td>
</tr>
<tr>
<td>42</td>
<td>A</td>
<td>32</td>
<td>A</td>
</tr>
<tr>
<td>43</td>
<td>A</td>
<td>13</td>
<td>SRT</td>
</tr>
<tr>
<td>44</td>
<td>A</td>
<td>12</td>
<td>MJI</td>
</tr>
<tr>
<td>45</td>
<td>RPM</td>
<td>13</td>
<td>A</td>
</tr>
<tr>
<td>46</td>
<td>DIT</td>
<td>8</td>
<td>A</td>
</tr>
<tr>
<td>47</td>
<td>A</td>
<td>8</td>
<td>RPM</td>
</tr>
<tr>
<td>48</td>
<td>A</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>B</td>
<td>17</td>
<td>RPM</td>
</tr>
<tr>
<td>50</td>
<td>MJI</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>60</td>
<td>A(IS)</td>
<td>67</td>
<td>DIT</td>
</tr>
<tr>
<td>81</td>
<td>A-A+</td>
<td>4-28</td>
<td>DIT</td>
</tr>
<tr>
<td>82</td>
<td>DIT</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>
The following notes apply to Table 5.13:

(1) All the symbols and notations used are explained in Appendix 5(F). For easy reference, the details of the Class/Group Code are listed as follows:

<table>
<thead>
<tr>
<th>Class/Group Code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 to 28</td>
<td>F.2 Classes</td>
</tr>
<tr>
<td>31 to 33</td>
<td>F.3 Classes</td>
</tr>
<tr>
<td>40 to 49</td>
<td>F.4 Classes</td>
</tr>
<tr>
<td>60</td>
<td>F.6 Class</td>
</tr>
<tr>
<td>81-82</td>
<td>Adult Sample</td>
</tr>
</tbody>
</table>

(2) "1st Test" means the first test taken by the subjects. It usually lasted for one and a half class period (1 class period = 35 minutes). Those who did not appear in the first testing period but appeared in the second and third (or fourth for some F.2 classes) periods were asked to join the group for the 2nd/3rd tests only. Therefore, it is possible that the N for the 2nd or 3rd test in some classes are larger than the N for the 1st test.

(3) Though most of the data described in Table 5.13 are good for analysis, a few of them have to be discarded because of large amount of missing data. The actual N being analysed will be given alongside with the results and findings.

TABLE 5.14. Validity Study using the London Sample described in Table 5.2

<table>
<thead>
<tr>
<th>CLASS TEST CODE</th>
<th>F.2</th>
<th>F.3</th>
<th>F.4</th>
<th>F.6</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>MJI</td>
<td>15</td>
<td>24</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DIT</td>
<td>0</td>
<td>11</td>
<td>46</td>
<td>26</td>
<td>49</td>
</tr>
<tr>
<td>SRT</td>
<td>31</td>
<td>0</td>
<td>35</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RPM</td>
<td>28</td>
<td>10</td>
<td>19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>JEPI</td>
<td>66</td>
<td>31</td>
<td>56</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TT</td>
<td>7</td>
<td>0</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
(B) Experimental Procedures

B.1. School E

(1) Four classes of F.2 (21, 22, 27 and 28) were given two Double periods (1 period = 35 minutes), the whole F.6 group was given one Double period and all the rest were given three periods (either one Double plus one Single, or three Single periods). The time interval between two successive testing periods was normally one week.

(2) Before the testing, the class teachers were consulted. Information on the characteristics and general academic standard of the class was provided. The class teachers were given a copy of the test and were told how the test would be administered.

(3) The teacher introduced the author or his colleague to the class at the start of the testing and read the following introduction;

"A group of researchers from the University of London Institute of Education are trying to find out what opinions young people have about some social situations. That is, how you would act or do things when you have decisions to make where other people are concerned.

You may wonder why they are doing a study like this. One reason is to compare replies from young people from different countries (Britain, Hong Kong and Malaysia); young
people who may have quite different backgrounds from you. They want to carry out this study quite confidentially so that you can feel quite free in giving your replies."

The teacher and the researcher also answered any questions asked by the students. Then the teacher went through the whole test instructions with the class in detail.

(4) Subjects were not compelled to complete the tests. On the whole, less than 10% of them showed reluctance to complete the tests.

(5) In general, there was no strict time limit for completing any of the tests. A few of them who did not complete the major parts of the tests are dropped from the sample.

(6) Some of the subjects in Class 33 and all the F.6 subjects were allowed to take the tests home for completion. F.6 subjects only took DIT home. All other subjects in School E completed the tests during their class periods.

(7) F.2, F.3 and F.4 subjects were given the JEPI or TT if they finished the assigned tests before the end of the time allocated. Similarly, some of the F.3 and F.4 subjects were given the DIT if there were
plenty of time left.

(8) Classes 21, 22 and 42 were used for studying test-retest reliability.

B.2. Adult Subjects

It was found that it was extremely difficult to ask adults to fill in such a long and personal questionnaire. Only a small number of them were willing to do so.

Subjects were given a written introduction and two tests (MDT Form A°/A and DIT) with clear instructions for completing which test first. Except eight subjects, all of them took the tests home, completed them and returned to us. The return rate was estimated to be about 25%.

(C) Practical Problems

(1) Classes 25 (N = 15) and 47 (N = 8) were described by their teachers as classes of very low academic ability. Some of them could not read properly. They were given additional help in the understanding of the test instructions and the meaning of the test contents. These two classes were asked to answer only Part I of the MDT. Since their number is so small, they are also included in the major sample.

(2) While most of the subjects exhibited a high degree
of good conduct and co-operation, a few of them did show disciplinary problems. It should be emphasized that many of these unwilling subjects showed reluctance only in the last testing period, most probably because they felt bored at being tested for such a long time. According to the testing record, the testing atmosphere of the following testing sessions was rated as bad:

<table>
<thead>
<tr>
<th>Class</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Retesting of MDT (A)</td>
</tr>
<tr>
<td>25</td>
<td>MDT (A)</td>
</tr>
<tr>
<td>32</td>
<td>RPM</td>
</tr>
<tr>
<td>48</td>
<td>MDT (A)</td>
</tr>
<tr>
<td>40</td>
<td>MJI and MDT (B)</td>
</tr>
</tbody>
</table>

The above data were anticipated to have much more noise than the rest and thus some of these data may have to be discarded completely.