MEANING IN LIFE AMONG
ADOLESCENT LEADERS, NON-LEADERS, AND DEVIANTS

by

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ABSTRACT

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This study compares meaning in life scores of leader, non-leader, and deviant adolescents. Two thousand nine hundred and forty-nine secondary school students took the Purpose in Life Test. The students were divided into groups according to their behavior, their level of academic achievement, their sex, and grade level.

Results: The leader group had the highest meaning in life score, the non-leader group had the second highest meaning in life score, and the deviant group had the lowest meaning in life score. The higher achieving group did not have higher meaning in life score than did the lower achieving group. Male and female students did not have significantly different meaning in life scores. Grade eight and nine students had higher meaning in life scores than did grade ten, eleven, and twelve students.

These findings provide empirical evidence in support of several inferences based on Frankl’s theory of meaning in life. First, a higher level of social and athletic involvement is associated with high meaning in life and a sense of usefulness and identity. Secondly, existential vacuum underlies deviant behavior of students who isolate themselves by violating the rules and sanctions of the school. Thirdly, academic success or subject matter mastery was not related to high meaning in life. Fourthly, questioning the meaning of life is most apt to occur during the later stages of adolescent development, namely, during grades ten, eleven, and twelve. Replication of this study would
determine whether or not these findings and inferences are true of adolescents in general.
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A variety of contemporary scholars have pointed out that man in the middle decades of the twentieth century is confronted by a psychological condition known variously as emptiness (May 1953), value illness (Maslow 1968), hopelessness and boredom (Fromm 1955, 1968), purposelessness (Allport 1968), and existential vacuum (Frankl 1955, 1963, 1967, 1969). This condition is different from that of the previous decades.

At the beginning of the twentieth century, the most common cause of anxiety as May (1953) has pointed out was the person's difficulty of accepting the instinctual side of life and the resulting conflict between sexual impulses and social taboos. In the 1920's Otto Rank wrote that the underlying roots of the psychological problems of his generation were feelings of inferiority, inadequacy, and guilt. The focus of psychological conflict shifted again in the 1930's. Karen Horney (1937) wrote of the hostility between individuals and groups, often connected with competitive feelings.

With the 1940's a concern over the problem of generalized anxiety appeared. May (1950) clearly recognized anxiety as a generalized character state in many patients. The theme of "Anxiety" for the 1949 annual convention of the American Psychopathological Association also expressed this concern.

Beginning in the 1950's, a different psychological condition was described. May (1953), Erikson (1950), and Alan Wheebs (1958) spoke of emptiness, powerlessness, and
feelinglessness. People no longer knew how they felt about themselves and others. They no longer knew what they believed in and felt swayed and uncertain about their own values and beliefs.

This uncertainty about values and beliefs, Maslow (1968) called valuelessness. Adults are uncertain about their values; young people are more severely affected and defenses against the resulting anxiety emerged in the form of anomie, apathy, hopelessness, and cynicism.

Gordon Allport (1968) believed that uncertainty, which can at least be partially attributed to the collapse of the traditional social stabilizers, accounts for the present-day anxieties and existential despair especially among the youth. Young people are forced into the position of having to determine and choose their own values and goals in order to find direction to their lives.

Erich Fromm (1955, 1968) argued that people who live a materially comfortable life are more susceptible to feelings of intense boredom. He maintained that boredom and apathy result from man's passiveness and these psychological ailments are signs that man no longer relates actively to his environment. He is like a cog in a production machine; he is left with little sense of accomplishment and self-identity; he feels powerless, lonely, and anxious. His passivity engenders in him a feeling of hopelessness, the inability to act or plan for life.

Victor Frankl (1967) stated that approximately one-half of the general population is affected by a psychological condition
which he calls existential vacuum, existential frustration, or
noogenic neurosis. He described this condition as a feeling of
emptiness, purposelessness, and meaninglessness which is the
product of the machine age and its attendant loss of individual
initiative. What threatens many individuals is that life no
longer has any meaning: there is no reason for living; life is
vacuous, empty. The manifestations of this existential vacuum
are boredom and apathy; boredom being the incapacity to take an
interest in something and apathy the incapacity to take initia-
tive.

The consensus that has emerged from the writings of a num-
ber of contemporary authors is that the psychological condition
of the last two decades is different from the previous decades.
It is characterized by the dull and empty feelings of boredom,
apathy, hopelessness, powerlessness, and meaninglessness.
These feelings result from an absence of chosen values,
beliefs, goals, and meaning in life. The resulting behavior is
aimless, planless, disorganized, passive, impersonal, and spo-
radic.

A similar psychological condition may be identifiable in
secondary schools. As Gordon Allport (1968) observed, we
should not overlook the fashionable flavor of existential
despair, boredom, and apathy among youth. Modern-day counsell-
ors must take seriously the present-day anxieties of the
younger generation. School authorities have become alarmed by
the increasing use of drugs. Research has been commissioned to
study the causes of student unrest and student dropouts.
Campaigns have been mounted to convince secondary students to remain in school. Despite these efforts drugs are in use, some students quit school, and others remain in school but effectively "drop out" or withdraw from organized academic and social activities.

This thesis has endeavoured to relate Victor Frankl's theoretical formulations explaining the present-day psychological condition of meaninglessness to accounts of observable behavior in school. More specifically, the objective of this research was to test whether Frankl's theoretical construct of meaning in life as measured by the Purpose in Life Test is related to social behavior, achievement, sex, and grade level. The Purpose in Life Test (PIL) is a validated rating scale based on the concepts of Frankl's logotherapy and developed by Crumbaugh and Maholik (1964, 1968) to measure the degree of meaning in life experienced by an individual. Several studies are reported in the literature and reviewed in later sections.

The primary and underlying proposition in this thesis was the following: Meaning in life, or its converse meaninglessness is a relevant psychological construct if it can be related to observable behaviors and academic performance in school. In order to test this proposition a summary of Frankl's concept of man and theory of meaning in life as they relate to contemporary human living and human motivation was necessary. This summary permitted an examination of the Purpose in Life Test to determine whether its underlying assumptions were similar to logotherapy's description of man and motivation orientation. Three behavior
patterns and two achievement levels were selected in order to design a situation where Frankl's theoretical construct of meaning in life could be measured and evaluated in a school environment. PIL scores of students exhibiting deviant behavior were compared to students who exhibited leadership behavior and students who exhibited normal and acceptable behavior. If behavior is a manifestation of the degree that meaning in life is experienced then there should have been a significant difference between the scores of these student groups. From Frankl's viewpoint, as described later, it seemed logical that students who actively participated in school organizations should have higher meaning in life scores than students who withdrew from interaction with others. Social interaction and success should be associated with meaning in life, whereas, existential frustration should be associated with withdrawing behavior. Similarly, higher achieving students should have higher meaning in life scores than students with lower academic achievement. Academic achievement indicates the degree of success in student tasks. Mastery of life tasks bring fulfillment and meaning in life. Finally, the study compared student PIL scores according to the students' grade level and sex in order to test whether or not there was a relationship between their age and their sex and the degree that they experienced higher or lower meaning in life.
CHAPTER II  FRANKL'S THEORY OF LOGOTHERAPY

The theoretical position giving major direction to the development of both the research instrument and the hypotheses of this thesis is Victor Frankl's theory of logotherapy. A summary of his theory is provided as a basis for the formulation of hypotheses.

It should also be clear that the measuring instrument used in this thesis is based upon Frankl's notions of man and his society.

Logotherapy and Existentialism

Victor Frankl is an internationally known psychiatrist who has addressed himself to the psychological condition of contemporary man. As a professor of psychiatry and neurology at the University of Vienna, he now leads what has become known as the Third Viennese School of Psychotherapy. His writings and lectures place him in the camp of existential therapies and existential psychologies. Theories of this group Allport (1968) has said, deal with the person's orientation to his future. Man participates in his own destiny. He is free to choose his own path. The existential movement according to Maslow (1968) has two main emphases:

First, it is a radical stress on the concept of identity and the experience of identity as a sine qua non of human nature and of any philosophy or science of human nature. Secondly, it lays great stress on starting from experiential knowledge rather than from systems of concepts or abstract categories or a prioris. Existentialism rests on phenomenology, i.e., it uses personal, subjective experience as the foundation upon which abstract knowledge is built. (p. 9)
Existentialist writers, says Maslow (1968), stress the ultimate aloneness of the individual. The concepts of decision, responsibility, choice, self-creation, autonomy, and identity receive special attention from existential writers. Sahakian (1969) adds that another existential concern is the dimension of seriousness and profundity of living, or perhaps a "tragic sense of life", contrasted with the shallow and superficial life. Man is viewed as Dassein, a special quality of existence peculiar to man alone. Hence, the human characteristics of man are of paramount importance. The analysis of Dassein reveals him to be an existential being, constantly in a state of process. Through freedom and choice man creates his own life. Accordingly, each individual is responsible for the personality which he has decided to become. Through choice and the awareness of accepting the responsibility for his decisions, a person transcends himself, chooses that personality which he wants to become and gains authentic selfhood. The individual who has lost life's meaning for himself is a victim of existential neurosis.

As a student of existential thought Frankl had ample opportunity to test the theoretical propositions of existentialism in the Nazi concentration camps. He emerged from the concentration camp with the conviction that freedom still exists even when man is physically enslaved; the freedom to choose attitudes toward fate, attitudes that in many cases determined personal survival. Life is meaningful even in suffering and in death. Frankl named his system "Logotherapy". Logotherapy,
said Ungerma (1966):

is both analysis where this form of treatment is appropriate and also psychotherapy for the treatment of neuroses but also concerned with the whole gamut of difficulties that the average psychotherapist of whatever orientation is called upon to face ... Existential logotherapy aims at helping people who are troubled with doubts, despairs, the meaning of life, and similar difficulties. They may also be people with no illness of body or mind, but still suffer - from what is called in logotherapy, existential frustration - despair over a meaningless life, and a lack of knowledge of what makes life worth living. (p. 18)

Self-Transcendence

Frankl (1969) believes that to be human, life must be lived transcendentally.

It means living in the polar field of tension established between reality and ideals to materialize. Man lives by ideals and values. Human existence is not authentic unless it is lived in terms of self-transcendence. (p. 52)

Man is a self-transcendent being; his fulfillment comes through directing his energies outside of himself. Values, ideals, and goals form the menu of his strivings. They are "out-there" and the individual reaches out of himself to attain them. A person is not a closed system; but rather, is open to and influenced by the world outside. Frankl's belief in man's self-transcendence is the foundation for his concept of man. Man's freedom, responsibility, and attainment of meaning in life are corollaries to self-transcendence. Frankl (1969) suggested that logotherapy is based on three specific formulations of the self-transcending nature of man:

Logotherapy's concept of man is based on three pillars, the freedom of the will, the will to meaning, and the meaning of life. (p. 16)
Freedom

The first pillar of logotherapy is the belief that man is free. This freedom does not mean freedom from the everyday conditions of life such as hunger, climatic conditions, or the demands of others. Man is limited by the situations and circumstances of his environment. He is a finite being. However, man is free to take a stand on whatever conditions might confront him. To take a stand, said Frankl (1969), is the human capacity for self-transcendence and self-detachment:

By virtue of this capacity man is capable of detaching himself not only from a situation but also from himself. He is capable of choosing his attitude toward himself. By so doing he really takes a stand toward his own somatic and psychic conditions and determiners. For seen in this light, a person is free to shape his own character, and man is responsible for what he may have made out of himself. (p. 17)

Spiritual Nature of Man

This ability in man to decide on an attitude toward his own character, drives, and instincts implies a type of psychic activity which is different from the somatic and psychic dimensions. This is the noetic or noological dimension. Frankl (1963) defines the noological dimension as the spiritual dimension of man:

It must be noted that within the framework of logotherapy, "spiritual" does not have a primarily religious connotation but refers to the specifically human dimension .... In fact, "logos" in Greek means not only "meaning" but also "spirit". Spiritual issues such as man's aspirations for a meaningful existence, as well as the frustration of this aspiration, are dealt with by logotherapy in spiritual terms. (p. 160)

Spiritual is a broad anthropological term. Spiritual or noetic, according to Ungersma (1963, p.22) refers to that class of
psychic activity, specifically human, which is exemplified in moral decisions; groping for meaning, option or choice, responsibility; the ability to objectify oneself or oppose oneself; the ability to conceptualize the world; the capacity of not being completely dependent upon instinctual drives, but the ability to sublimate them; the exercise of free will; and the recognizing of, and the deciding upon values. The spiritual life of man is also deeply rooted in the prerational emotional sphere.

Freedom and Responsibility

Freedom and responsibility follow logically from the noetic perspective. Man has freedom; he is capable of making decisions. The two are always associated in Frankl's mind. Each person is responsible for attaining the utmost meaning that can be fulfilled in his life, through the course of which he is also responsible for realizing specific values. Therefore, the spiritual or noetic dimension is the typically human dimension of man which underlies his capacity for self-detachment, freedom, decision-making, and responsible action.

Will to Meaning

The second pillar of Logotherapy, the "will to meaning", is another specific formulation of the self-transcending nature of man. The will to meaning is an inborne, innate, deeply rooted searching for a meaning in life. It is the primary motivational force in man. It is a constant tension, pulling man outside of himself. Frankl (1967) uses the analogy of the magnetic field to describe this motivational force:
Like iron filings in a magnetic field, man's life is put in order through his orientation toward meaning. Thereby a field of tension is established between what man is and what he ought to do. By this dynamic man is pulled rather than pushed; instead of being determined by meaning, he decides whether his life is to be structured by the demand quality of meaning to his existence. (p. 22)

According to Frankl (1969) this field of tension is necessary and not something to avoid unconditionally. The resulting field of tension of meaning to fulfill is indispensable for mental well-being. A strong meaning orientation is health-promoting and life-prolonging, if not a life-preserving agent. A meaning orientation sets the pace of life. Existence falters unless it is lived in terms of transcendence towards something beyond itself. Frankl (1967) believes that meanings can be challenged or confronted by other meanings or by other people:

Once meaning orientation turns into meaning confrontation, that stage of maturation and development is reached in which freedom - that concept so much emphasized by existentialist philosophy - becomes responsibleness. Man is responsible for the fulfillment of specific meaning of his personal life. But he is also responsible before something, or to something, be it society, or humanity, or mankind, or his own conscience, or someone. (p. 12)

Meaning in Life

The third pillar of Frankl's concept of man is called meaning in life. Maslow (1968) has recognized a similar construct which he calls the "cognitive need to understand":

The state of being without a system of values is psychopathogenic. The human being needs a framework of values, a philosophy of life, a religion-surrogate to live by and understand by, in about the same way that he needs sunlight, calcium, or love ... . We need a validated, usable system of human values that we can believe in and devote ourselves to and willing to die for ... . This I have called the "cognitive need to understand". (p. 50)

Allport (1968) speaks of a guide, a generic attitude, a central
motive state and a constructive world view which will serve ... 

"... as a gate or general schema to select our responses to life, to people, and to situations." (p. 129)

An individual, said Allport (1968), has a constructive world view when he perceives and chooses meanings and values:

Values, as I use the term, are simply meanings perceived as related to self ... he experiences value whenever he knows that a meaning is warm and central to himself. Values, to borrow Whitehead's term, are "matters of importance" as distinct from mere matters of fact. (p. 164)

Chosen values may be tentative but they enable the individual to commit himself to great causes with courage even though he lacks certainty. Commitment then, presupposes an acquired system of motivation. Commitment to values leads to functional autonomy where tensions and risks are no longer overpowering but growth-producing.

Perception of Meanings

Crumbaugh and Maholick (1963) pointed out that finding meaning is akin to Gestalt perception. It is a will to perceive, to read meaning into the environment, to interpret, to organize stimuli into meaningful wholes. This organizational tendency is an innate property of the mind which has survival value. Man has a greater chance of adaptive manipulations if he can comprehend and interrelate a greater range of stimuli. The Gestalt laws of organization are subsumed under the greater law of "pragnanz" or filledness. (Koffka 1935, Kohler 1947)

This greater law represents an unlearned striving to construct meaningful, unified "Gestalten" from all the elements of experience. It follows that if innate tendencies toward perceptual
organization exist, it may be claimed that they manifest a
striving toward organization of experience into ontologically
significant patterns. This represents a striving to find pur-
pose in one's own existence, to find a cause or sense of mis-
sion that is uniquely one's own and that gives direction to
life and makes it understandable.

Integration of Perceptions

Perceptual organization which gives direction to life is
similar to what Rollo May (1953) called integration:

The human being not only can make choices of values and
goals, but he is the animal who must do so if he is to
attain integration. For the value - the goal he moves
toward - serves him as a psychological center, a kind of
core of integration which draws together his powers as the
core of the magnet draws the magnet's lines of force
together ... . The mark of a mature man is that his
living is integrated around self-chosen goals: he knows
what he wants, no longer simply as the child wants ice
cream but as the grown person plans and works toward a
creative love relationship or toward business achievement
or what not. (p. 175)

Man's innate, perceptual capacity of organization and his
seeking of integration around self-chosen goals are like
Frankl's concept of meaning in life. Meaning in life is the
product of the organizational tendency of man to read, inter-
pret, and organize stimuli into ontologically significant pat-
terns and meaningful wholes. Stimuli are outside the subject
and their interpretation are subjectively organized from a per-
sonal perspective. Frankl (1969) prefers the term "trans-sub-
jective".

This trans-subjectiveness has really been presupposed all
along whenever we spoke of self-transcendence. Human
beings are transcending themselves toward meanings which
are more than mere expressions of their selves, more than
mere projections of these selves. Meanings are discovered but not invented. (p. 60)

Meanings are Objective and Unique

Frankl's (1967) understanding of meanings is that they are not mere self-expressions, nor are they invented, they are objective:

This implies a certain degree of objectiveness, and without a minimum amount of objectiveness, meanings would be never worth fulfilling. We do not just attach and attribute meanings to things, but rather find them; we do not invent them, we detect them. (p. 16)

In a sense meanings are also subjective because they are unique for each individual. Each man is unique in that no one can repeat that man's life. Each situation is unique for each individual. Each moment is unique. One must concede, however, that situations have something in common and therefore some meanings are shared by human beings across the society. These shared meanings are called values. And since values may conflict or rather, they may have to be ranked and chosen according to a hierarchy of values, the individual is not spared decision-making. He is free to accept or reject a value in any given situation. This means that values or meanings must be chosen responsibly.

The uniqueness of meaning, said Frankl (1969), is relevant to our contemporary society of crumbling traditions and values:

Even if all universal values disappeared, life would remain meaningful, since the unique meanings remain untouched by the loss of traditions. To be sure, if man is to find meanings even in an era without values, he has to be equipped with the full capacity of conscience ... . The foremost task of education, instead of being satisfied with transmitting traditions and knowledge, is to refine the capacity which allows man to find unique meanings ...
the ability to make independent, authentic decisions. (p. 64)

Creative, Experiential, and Attitudinal Values or Meanings

This valuing process, or this search for meaning, according to Frankl (1969), occurs in the contexts of three life situations common to all individuals:

The first is what he gives to the world in terms of his creations; the second is what he takes from the world in terms of encounters and experiences; and the third is the stand he takes to his predicament in case he must face a fate he cannot change. This is why life never ceases to hold meaning, for even a person who is deprived of both creative and experiential values is still challenged by a meaning to fulfill, that is, by the meaning inherent in the right, in an upright way of suffering. (p. 70)

The discovered meanings become creative, experiential, and attitudinal values.

Creative values are actualized in the form of accomplishments that bear on the community. Creative values are in the forefront of the life tasks and their actualization usually coincides with a person's work. Work usually represents the area in which the individual's uniqueness stands in relation to society and acquires meaning and value as a contribution to society. In return the community confers existential meaning upon persons by recognizing their uniqueness and singularity. Thus, the meaning of the human person as a personality points beyond its own limits, toward community; in being directed toward community the meaning of the individual transcends itself.

In addition to creative values there are values which are realized in experience. Experiential values are realized in
the attitude of receptivity toward the world — for example, in a discovery of the beauty of nature or art. A single moment of knowledge or exhilaration can decide the meaningfulness of a life. Life is worth living if only to experience that ecstatic moment. Experiencing in love or friendship the uniqueness of another person adds to existential meaning. To be loved by another is to become indispensable and irreplaceable. In loving and in being loved, said Frankl (1955), there is enchantment and a discovery of values:

Thus in his surrender to the thou, the lover experiences an inner enrichment which goes beyond; for him the whole cosmos broadens and deepens in worth, glows in the radiance of those values which only the lover sees. For it is well-known that love does not make one blind but seeing — able to see values. (p. 107)

A third category of values encompass a man's attitude toward the limiting factors upon his life. Frankl (1955) expressed his belief that attitudinal values are present whenever a person finds himself confronted by a destiny or by restraints upon his potentialities toward which he can act only by acceptance:

The way in which he accepts, the way in which he bears his cross, what courage he manifests in suffering, what dignity he displays in storm or disaster, is the measure of his human fulfillment. (p. 36)

The addition of attitudinal values to the list of life's realizable values makes it evident that human existence can never be intrinsically meaningless. No matter how sparse the possibilities for realizing values may be, the individual can always have the recourse to attitudinal values.
Existential Frustration

The preceding summary of Logotherapy's concept of man can help us understand Frankl's (1963) description of the following psychological and spiritual ailments: existential frustration, noogenic neurosis, and existential vacuum.

Man's will to meaning can also be frustrated, in which case Logotherapy speaks of "existential frustration":

The term "existential" may be used in three ways: to refer to existence itself, i.e., the specifically human mode of being; the meaning of existence; and the striving to find a concrete meaning in personal existence, that is to say, the will to meaning. (p. 159)

Existential frustration can also result in neurosis called "noogenic neurosis", in contrast to neurosis in the usual sense of the word, i.e., psychogenic neurosis. Frankl (1967) believes that noogenic neurosis has its origin not in the psychological but rather the noological or meaning dimension of human life. It emerges from conflicts between various values, in other words, from moral conflicts or spiritual problems, and not from conflicts between drives and instincts, or such psychic components as the id, ego, and superego:

They are rather rooted in collisions between different values, or in the unrewarded longing and groping of man for that hierarchically highest value - an ultimate meaning to his life. To put it simply, we are dealing with the frustration of the will to meaning. (p. 43)

Existential Vacuum

Frustration of the will to meaning through conflicts of values results in existential frustration. This contrasts with "existential vacuum" which does not result from conflicts but rather from an inner void, an absence of meaning in life. The
etiology of the existential vacuum is a consequence of man's situation. Frankl (1969) said that drives and instincts do not tell man everything that he must do. In contrast to former times, in contemporary society there are no conventions, traditions, and values which tell man what he should do; and often he does not even know what he basically wishes to do. This brings about an inner state of emptiness and a sense of meaninglessness, a loss of feeling that life is meaningful. It is an absence of matters of importance, of perceived meanings related to the self and of experiences warm with meaning that are central to the individual. There is no purpose in life or a mission that is uniquely one's own giving direction or making life understandable. The main manifestations of existential vacuum are boredom and apathy. Boredom is the incapacity to take interest in something. Apathy is the incapacity of taking the initiative. This paralysis of feeling and initiative is evident amongst the youth, among workers who are facing increasing leisure, among the pensioners and the aging, and even among apparently successful businessmen. (Frankl 1963)

Existential frustration and existential vacuum may eventually deteriorate into noogenic neurosis. The classification of neuroses in logotherapy is as follows: Firstly, there are psychogenic neuroses arising from psychic conflicts. Here logotherapy often operates on the same level as conventional psychotherapy. Secondly, there are somatogenic neuroses arising from endocrine disorders, i.e., endogenous depression. Here drugs are indicated in combination with existential analysis.
Thirdly, there are noogenic neuroses which result from spiritual problems and moral conflicts. The proper place to begin treatment is in the sphere of the noetic where the sickness originates. And fourth, there is existential frustration which is a condition of spiritual distress and not a psychic illness. The existence of such a condition is not pathological or symptomatic of mental disease. But it may eventually deteriorate into noogenic neurosis and therefore must be treated. (Frankl 1967, p. 76)

Summary

The underlying theory of Logotherapy which includes a theory of the nature of man has been described. Man is a self-transcendent being directed toward goals, ideals, and meanings to fulfill. This concept of man is based on three pillars: freedom of the will, the will to meaning, and the meaning of life. Man is free to take a stand toward whatever conditions might confront him; he is capable of choosing an attitude toward himself, toward his environment, and toward any limiting situations of life. Within each man there is an inborn, innate, and deeply rooted searching for meaning in life; this is the primary motivational force in man. Finding meaning in life is reading meaning into the environment; interpreting and organizing stimuli into meaningful wholes. Finding meaning in life is integrating one's life around perceived and self-chosen goals and values that are unique to each person. Values which give meaning and direction to one's life are either creative, experiential, or attitudinal values. Creative values are lived
in the form of accomplishments that bear on the community and through which persons are recognized in their uniqueness and singularity. Experiencing love and friendship brings inner enrichment or an inner glow in the light of which the whole cosmos deepends in worth. Beauty and knowledge become exhilarating. Finally, acceptance of one's limits, suffering, and death can enhance meaning to life.

When man's will to meaning is frustrated, that is, when conflicts between various values are not resolved, he suffers from existential frustration. When creative, experiential, or attitudinal values are not discovered, when there is a loss of feeling that life is meaningful; there is a resulting inner void and emptiness. As a result, man is the victim of an existential vacuum of which the main manifestations are boredom and apathy. Finally, existential frustration and vacuum can deteriorate. Unresolved conflicts between values and a prolonged feeling of meaninglessness in one's life can become the underlying dynamics of a neurosis, the noogenic neurosis.
CHAPTER III RELEVANT RESEARCH

The previous chapter summarized the main theoretical constructs of Logotherapy. This chapter has four objectives. The first objective is to establish whether or not there is empirical evidence to support Frankl's thesis. The second objective is to determine whether or not the construct known as meaning in life is related to mental health. Another task is to review the literature regarding the relationship between meaning in life and social behavior, academic achievement, educational level, and sex. The fourth objective is to formulate and state hypotheses.

Existential Vacuum, A Contemporary Psychological Condition

Frankl (1969) has stated that the existential vacuum is increasing and that approximately one-half of the general population is affected by this psychological condition. A survey questionnaire conducted by Frankl (1969) among students at the University of Vienna showed that forty percent of the Austrian, West German, and Swiss students knew the existential vacuum in their own experience while among American students the reported level was eighty percent. Kratochvil (1961, 1966) reported that the existential vacuum was making itself felt in Communist countries and that approximately twenty percent of the neuroses he encountered in his college mental health clinic were noogenic in nature. Werner (1961) in London and Longen and Volhard (1953) in Germany had previously reported a similar prevalence of noogenic neuroses in their mental health clinics. In America, Eddy (1959) arrived at the
conclusion that on almost every campus from California to New England, student apathy and boredom was the main topic of conversation. It was the one subject mentioned most often in his discussions with both faculty members and students.

**Noogenic Neurosis and Traditional Diagnostic Categories**

There is also some evidence to support Frankl's belief that noogenic neurosis is different from the traditional diagnostic categories. James C. Crumbaugh and Leonard T. Maholik (1964, 1968, 1969) developed a twenty-item rating scale to measure the degree of meaning in life experienced by individuals. The Purpose in Life Test (PIL) and the Minnesota Multiphasic Personality Inventory (MMPI) were administered to one hundred psychiatric outpatients and ninety-three college undergraduate non-patients. Crumbaugh (1968) reported that the correlations between the PIL scores and the MMPI scale scores for fifty outpatients revealed only two significant relationships: There were moderate correlations between PIL scores and the MMPI scales Psychasthenia and Depression. In a similar sample of fifty outpatients in Crumbaugh and Maholik's earlier study, however, only the Depression and the K-scales showed significant relationships with the PIL scores. Thus only Depression had maintained a consistent relationship. When the D scores of the ninety-three college undergraduate non-patients were combined with the scores of the fifty outpatients the negative correlation increased from -.44 to -.65, showing a considerable effect of adding the full range of scores from "normal" to psychiatric. Nyholm (1966) reported a similar negative
relationship among thirty-four mental patients and thirty-four non-patients on the same factors. On the basis of these results Crumbaugh (1968) concluded that what the PIL measured was not directly identifiable with any conventional mental syndrome, except perhaps depression. This relationship of PIL scores to D scale scores on the MMPI lent some support to Frankl's observation that a highly depressed state of mind can be the manifestation of a loss of meaning in life. In other words, on the basis of the low relationship between the PIL and MMPI scores there is some evidence to support the existence of existential vacuum as a psychological construct apart from the traditional diagnostic categories.

**Meaning in Life and Mental Health**

While there are as yet no definitive answers, some beginnings have been made. Kotchen (1960) developed a questionnaire which purported to measure meaning or purpose in life. He found that it discriminated significantly between five groups of subjects in the same order into which they fell on the basis of commonly accepted pragmatic criteria of degree of mental health, such as being a patient in a lock-ward, being a parole patient and so forth.

Crumbaugh and Maholik (1964) extended Kotchen's research by developing a summated rating scale, the Purpose in Life Test (PIL). The results from 225 subjects confirmed the predicted differences between clinical and "normal" populations. Crumbaugh (1968) reported the results of a second validation study among 1,151 subjects. The order of mean PIL scores
corresponded perfectly to the prediction made about four "normal" populations in descending order from successful and motivated business and professional personnel, to active Protestant parishioners, to college undergraduates, and to indigent hospital patients not mentally ill. The order of PIL means also corresponded to the prediction made about four groups of psychiatric patients in descending order from outpatient neurotics, to hospitalized neurotics, to hospitalized alcoholics, and to hospitalized psychotics. The "normal" subjects scored higher than the mental patients.

Meaning in Life and Social Participation

Crumbaugh (1968) reported higher PIL scores among the leading business and professional men in the community who were all members of the Kiwanis Club, Elks, Rotarians, and Chamber of Commerce and the leading men and women of Protestant congregations. Lower PIL scores were reported among hospitalized indigents and alcoholics. The fact that the higher PIL scores were reported among groups of people involved in leadership roles in the church and community, and the fact that lower PIL scores were reported among the more socially withdrawn, the social casualties of the community, seemed to lend some support to the theory that social participation and leadership behaviors were related to a sense of meaning and purpose in life and that social withdrawal was associated with existential vacuum.

This association of a sense of meaning in life with a higher level of social participation agrees with Frankl's (1955) suggestion that persons who find meaning in life are
involved in community oriented tasks. Persons involved in community affairs and organizations and youth who are active in clubs and who take part in community athletics know how to lend interest to life and obtain meaning from it. Doerries' (1970) study examined the relationship between participation in campus and community organizations and a sense of purpose and meaning in life among college students. He hypothesized that PIL scores would be related to participation in formal organizations. As predicted, college students who were active in two or more organizations had significantly higher scores than students in one or less organizations. Doerries concluded that a sense of meaning in life was related to higher level of social participation, whereas, social withdrawal was associated with existential vacuum.

Meaning in Life and Academic Achievement

Frankl (1955) has suggested that a person who becomes discouraged in a task will fail to discover meaning in it. On the basis of this it might be assumed that success and achievement in one's work or study is related to a sense of meaning in life. Thus, students who achieve well in school should find greater meaning in their studies than academically unsuccessful students. The research literature does not report studies which might shed light on this hypothesized relationship.

Meaning in Life, Sex Differences, and Grade Levels

A survey of research does not report consistent findings concerning the relationship between grade level, sex, and PIL scores. Crumbaugh and Maholik (1964) did not report any
significant differences between PIL scores of males and females. Crumbaugh (1968) reported significantly higher scores among males but he explained that this difference was probably due to the large proportion of males among the higher purpose group of successful businessmen and professionals. College undergraduate women in Doerries' study scored significantly higher than college undergraduate males. Nyholm (1966) and Crumbaugh (1968) both reported very low correlations between educational level and PIL scores. Snively (1963), however, reported that among a sample of forty college students the freshmen had scored significantly higher on the PIL than seniors.

**Summary**

In reviewing the research literature related to meaning in life as defined by Frankl one is struck by the small number of studies and the large gaps that remain. Only one research instrument has been validated. Most of the empirical evidence presented in this chapter is related to PIL validation studies conducted by Crumbaugh and Maholik and a few graduate students seeking to replicate previous results. College students and mental patients have been the subjects in most of the studies reported. The literature does not report studies conducted at the secondary school level. This investigation probably is the first to consider a high school population.

While keeping in mind the limitations expressed above, it can be assumed on the basis of previous research that (1) the studies reported suggest that Frankl's concepts can be
empirically identified; (2) there is some research evidence to support Frankl's thesis that the existential vacuum and noogenic neurosis are psychological constructs different from the traditional diagnostic categories, except perhaps depression and anomie; (3) on the basis of higher PIL scores among "normal" populations and the lower PIL scores among the psychiatric populations it is reasonable to conclude that a sense of meaning and purpose in life is related to mental health; (4) social participation and leadership are positively related to a sense of meaning and purpose in life, whereas, social withdrawal is negatively related to a sense of meaning in life; (5) there should be a positive relationship between academic success and higher meaning in life; and that (6) the number of years of education and the sex differences among the subjects reported in the literature were not related to significantly different PIL scores.

Hypotheses

The above assumptions can be stated in hypothesis form as follows:

I Students in Group 1 (Leadership group), in Group 2 (Normal group), and in Group 3 (Deviant group) will score significantly different on the Purpose in Life Test.
   a) Group 1 students will score significantly higher than either Group 2 or Group 3 students.
   b) Group 2 students will score significantly higher than Group 3 students.

II Students with higher levels of achievement will score
significantly higher on the Purpose in Life Test than students with lower levels of achievement.

a) Students within Group 1 (Leadership group) who achieve C+ or better will score significantly higher on the Purpose in Life Test than leadership students who achieve below C+.

b) Students within Group 3 (Deviant group) who achieve higher than D will score significantly higher on the Purpose in Life Test than Deviant students who achieve D or less.

III Male and female students will not have significantly different scores on the PIL.

IV Students in grade levels 8, 9, 10, 11, and 12 will not have significantly different scores on the PIL.
CHAPTER IV  DESIGN OF THE INVESTIGATION

The first chapter is a review of the literature concerned with the psychological condition described by Frankl as existential vacuum. Various contemporary writers have addressed themselves to this condition which seems to characterize large proportions of society. In order to investigate the validity of these concerns it was decided to study the relationship that might exist between meaning in life scores of groups of secondary school students and their behavior.

Chapter II and III summarize the theory and the research associated with meaning in life.

This chapter presents the design of the study. The first section discusses the criteria and the method employed to select subjects for the experimental groups. The second section describes the research instrument used in this investigation. The third section describes the procedures of test administration. And the fourth section delineates the statistical procedures.

Criteria and Procedures Used to Establish the Groups

The study was conducted by testing all the students in the West Vancouver Secondary School System, grades 8 to 12. The total number of students tested was 2949.

The groups were established in the following manner:

Group 1 (a): Student leaders who had C+ or better in fifty percent or more of their courses.
Group 1 (b): Student leaders who had C or less in fifty percent or more of their courses.

Group 2: Non-leaders who did not exhibit leadership or deviant behaviors.

Group 3 (c): Deviant students with higher than D in fifty percent or more of their courses (passing grades).

Group 3 (d): Deviant students with D or less in fifty percent or more of their courses (failing grades).

1) **Placement into Group 1 (Leadership Group)**

The assumption underlying the selection of subjects for the leadership group was based on Frankl's (1969) suggestion that a high level of social participation is usually associated with high meaning in life. That is to say, people who are involved in community oriented tasks have high meaning in life. Young people who are active in youth clubs, athletics, and student organizations are discovering meaning in life.

To be placed in Group 1, the students had to hold an executive position in a club, team, organization, or student council within the school. This placement was determined by having each student answer a questionnaire (Appendix v). The questionnaire was administered by the teachers during a homeroom period and presented as if it was a regular school matter. The researcher then went through the questionnaires and identified the students who qualified as leaders. Twelve student questionnaires were rejected after consulting staff members on some of the questionable responses.

After the leader group (Group 1) was established, the
administration made available the marks of each student in the leader group. The marks supplied were provided on the basis of recorded achievement for the period from September 1969 to the end of January 1970. Students with C+ or better in fifty percent or more of their courses were placed in Group 1 (a) and those students who had less than this average were placed in Group 1 (b).

2) **Placement into Group 2 (Non-Leader Group)**

The selection of subjects for the non-leader group rests on the assumption that this group represents an intermediate level of social interaction. Leaders were considered to be involved at a high level of social interaction. Deviants were considered to be involved at a low level of social interaction. Non-leaders have demonstrated their capacity for coping successfully in the school environment and yet they have not distinguished themselves among other students either as leaders or as deviants.

In order to qualify for placement into Group 2 students had to be judged as behaving satisfactorily by school officials. They could not hold executive positions in school clubs, organizations, and student councils.

3) **Placement into Group 3 (Deviant Group)**

Deviant students were considered to be involved at the lowest level of social participation. A deviant is usually defined as an individual who consistently breaks the rules of society. These rules reflect the social sanctions which govern the society. An individual who consistently defies these rules
and sanctions demonstrates by his actions that he rejects them and in so doing he isolates himself. In the school community, there are rules and sanctions which, if not followed by the student, result in alienation from the school system. In this study deviant students have been defined as those students who disobey school rules and regulations in a manner and frequency that are unacceptable to the school community.

The most important, common violations among deviant students were in the area of attendance: skipping school or classes, tardiness, and unjustified absenteeism. The second area of violation was concerned with general acting out behavior. That is to say, students were considered deviant when they disrupted normal school activities and classroom procedures to the extent that they were referred to the vice-principal's office when the teacher no longer felt able to cope with the situation. Both types of violations, attendance violations and acting out behaviors, were judged to be the most prominent types of deviant behaviors.

In short, the criteria employed were the following:
1. Referrals to the vice-principal for behavior problems (acting out behavior) from at least two different staff members or other school personnel, between the beginning of September 1969 to the end of December 1969. Two referrals from different staff members were required because of variation among staff members.
2. Eight or more lates between the beginning of September 1969 to the end of December 1969.
3. Two instances of truancy from class or school between the beginning of September 1969 to the end of December 1969.

4. More than ten days absences except with bona fide sickness or legitimate holiday permission between the beginning of September 1969 and the end of December 1969.

The Deviant group thus established was further divided into two sub-groups: Group 3 (c) included those students who had received a higher mark than D in fifty percent or more of their courses and Group 3 (d) which included those students who received a lower mark than D in fifty percent or more of their courses. As in the leader group, the marks were supplied for the period from September 1969 to the end of January 1970.

It should be noted, however, that whenever a student qualified for both the Group 1 and Group 3 criteria he was assigned to Group 3. Fifteen students were involved. In such cases it was found that those fifteen students only minimally qualified for Group 1, that is, they listed only minor positions such as co-captain in sports activities, or assistant class representative in the student council.

Instrument

The Purpose in Life Test is a twenty-item scale designed to evoke responses which relate the degree of purpose in life experienced by individuals. Each item is rated on a seven-point scale from one extreme feeling to another.

The scale measures attitudes indirectly by having the subject respond to statements about his life. The technique is similar to the Likert method except that the quantitative
extremes of each item are set by descriptive phrases. The score is simply the sum of individual ratings assigned to each item.

A careful scrutiny of the twenty items reveals the logotherapeutic orientation. Items 13, 14, 17, and 18 (See appendix I) are reflections of existentialism's emphasis on freedom and responsibility. Items 1, 2, 5, 9, and 19 attempt to measure the general tone of feeling; whether the person experiences the excitement of living or the boredom and apathy of a purposeless life. Items 7, 8, 10, 17, and 19 are based on the contention that man discovers meaning in life through the achievement of self-chosen goals and creative endeavors that have a relationship to the community. Whether the individual experiences values, meaningful life patterns, and a sense of personal identity is assessed by items 3, 4, 12, and 20. The final group of items, 6, 11, 15, 16, are based on Frankl's contention that an individual can experience meaning in death, illness, suffering, and guilt; that is, attitudinal values can contribute to a greater meaning in life.

Validity is measured against an operational criterion. Construct (or concurrent) validity has been confirmed by the instrument's discrimination, in the order of means, of healthy and psychiatric populations and by its discrimination of subgroups among patient and non-patient populations. Differences between PIL means of normal and psychiatric populations were significantly different (P < .001).
Criterion validity was evaluated by two measures: correlation of PIL scores with therapists' and ministers' ratings and with Frankl's own thirteen-item questionnaire. The relationship between the ministers' and the therapists' ratings and the scale yielded Pearson Product-Moments of .47 and .38. Crumbaugh Maholik (1964) found a correlation of .68 between the PIL scale and Frankl's questionnaire. The odd-even reliability test yielded a Pearson Product-Moment of .85.

The administration of the Purpose in Life Test is simple. Directions are easily understood by adults and adolescents.

For the purposes of this research project an adapted version of the PIL was used. It had to be adapted for computer scoring which limited the rating scale for each item to five instead of seven. This destroyed any possibility of comparing the results with the established norms. Fortunately, this comparison is unimportant in this study as long as the instrument discriminates the populations as predicted. Guilford (1956) and Cronbach (1960) agree that both five and seven-point rating scales are equally effective.

Test Administration

At the request of the West Vancouver School Board student anonymity had to be safeguarded. In order to identify groups the IBM answer sheets had to be coded. They were coded inconspicuously at the back. The code identified behavior groups, achievement, grade, sex, and school (Appendix iv). This was
done by placing the score sheet face down on a transparent, illuminated glass. Inconspicuous red ink dots were placed in the appropriate spaces of the identification section. After the test administration the answer sheets were marked in pencil in the appropriate spaces of the identification section according to the position of the red dots at the back following the same procedure of illuminating the answer sheet as above. A removable name tag was attached to each answer sheet in order to be certain that the students of the corresponding groups recorded their answers on the designated answer sheets. This procedure also enabled the researcher to keep an accurate count of those students who did not answer the inventory due to absenteeism or for other reasons. The students were asked to remove the name tags before returning the answer sheets as a further assurance of anonymity.

The Purpose in Life Test was administered by the staff in each school. The entire student body of each school wrote the test at one sitting and at the same time. Standard procedures and formal instructions for answering the instrument were read over the intercom in all three schools and in the same manner (Appendix iii). Each staff member was provided with a copy of the same instructions to enable them to answer any questions from students about procedures. The only difficulty experienced in the administration of the instrument arose in the first school tested. Some students saw the code and assumed that it identified them as individuals. For this reason further clarification had to be given. The students were assured that the
code identified them according to grade, sex, and school only. This problem arose in the first school only as modified instructions were supplied to the other schools before administration (Appendix iii).

Statistical Procedures

Following Edwards (1964) and Kerlinger (1964) one-way analysis of variance was used to test the statistical hypotheses about the significance of the differences between the PIL means of the various groups.

There are three assumptions behind the use of analysis of variance: normality of the population, homogeneity of variance and continuity, and equal intervals of measures. It is assumed that the populations in the groups are normally distributed because they are sufficiently large to approach normality. The variances within the groups are assumed to be homogeneous from group to group, within the bounds of random variation. Finally, it is assumed that the measure is a continuous measure with equal intervals. That is to say, it is assumed there were not gross departures from normality, homogeneity of variance, and equality of intervals which would vitiate the use of the F test.

Analysis of variance was carried out by the use of Program BMDX64 of the University of British Columbia Computer Centre. This program is explained in Appendix xii.
Summary

The first section presented a summary of the assumptions and methods used to form the groups. The second section described the measuring device, the Purpose in Life Test. The third section reported the test administration procedures. A final section discussed the statistical procedures used to analyze the data.
CHAPTER V  FINDINGS

The previous chapters have set the stage for the analysis of data. Chapters 1, 2, and 3 presented a statement of the problem, established the theoretical framework within which the investigation was conducted, and provided a résumé of the related research literature. Chapter 4 provided an explanation of the research methods and techniques needed to gather the data and test hypotheses.

This chapter presents an analysis of data, including tables. Each hypothesis was evaluated on the basis of significant F scores which determined whether it was supported or rejected. Four hypotheses were evaluated in this manner.

**Hypothesis I**

Table I: PIL Means, S.D.'s, and F scores for Leader, Normal, and Deviant Students.

<table>
<thead>
<tr>
<th>Leaders (Group 1)</th>
<th>Non-Leaders (Group 2)</th>
<th>Deviants (Group 3)</th>
<th>F Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. 375</td>
<td>2380</td>
<td>194</td>
<td>30.601**</td>
</tr>
<tr>
<td>M. 72.74</td>
<td>69.86</td>
<td>64.76</td>
<td></td>
</tr>
<tr>
<td>S.D. 9.20</td>
<td>11.06</td>
<td>11.97</td>
<td></td>
</tr>
</tbody>
</table>

Group 1 vs Group 2  21.862**
Group 1 vs Group 3  60.984**
Group 2 vs          13.867**

* Significant at .01
** Significant at .001

As is shown in Table I, the hypothesis that leaders, non-
leaders, and deviants would have significantly different PIL scores was supported ($F = 30.601; p < .01$). The hypothesis that leaders would score significantly higher on the PIL than would the non-leader group was supported ($F = 21.862; p < .01$). The hypothesis that leaders would score significantly higher than the deviant group was supported ($F = 60.984; p < .01$). The hypothesis that non-leaders would score significantly higher than the deviant group was also supported ($F = 13.867; p < .01$).

**Hypothesis II**

Table II: PIL Means, S.D.'s, and F score for High and Low Achievement among Leaders.

<table>
<thead>
<tr>
<th>Higher than C+ Achievement</th>
<th>Less than C+ Achievement</th>
<th>F Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. 229</td>
<td>146</td>
<td>0.4142</td>
</tr>
<tr>
<td>M. 72.95</td>
<td>72.34</td>
<td></td>
</tr>
<tr>
<td>S.D. 9.65</td>
<td>8.75</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .01  
** Significant at .001

As shown in Table II, the hypothesis that the higher achieving leader group would score significantly higher on the PIL than would the lower achieving leader group was not supported ($F = 0.4142; p > .01$).
Table III: PIL Means, S.D.'s, and F score for High and Low Achievement in the Deviant Group.

<table>
<thead>
<tr>
<th>Passing Achievement</th>
<th>Failing Achievement</th>
<th>F Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. 117</td>
<td>73</td>
<td>1.1482</td>
</tr>
<tr>
<td>M. 64.71</td>
<td>64.75</td>
<td></td>
</tr>
<tr>
<td>S.D. 12.20</td>
<td>11.90</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .01
** Significant at .001

As shown in Table III, the hypothesis that the higher achieving deviant group would score significantly higher on the PIL than would the lower achieving deviant group was not supported (F = 1.1482; p > .01).

HYPOTHESIS III

Table IV: PIL Means, S.D.'s, and F score of Male and Female Students of the Total Population.

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
<th>F Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. 1524</td>
<td>1425</td>
<td>2.760</td>
</tr>
<tr>
<td>M. 68.99</td>
<td>69.38</td>
<td></td>
</tr>
<tr>
<td>S.D. 10.48</td>
<td>11.19</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .01
** Significant at .001

As shown in Table IV, the hypothesis that male students would not score significantly different on the PIL than would female students was supported (F = 2.760; p > .01).
HYPOTHESIS IV

Table V: PIL Means, S.D.'s, and F score of Students for Each Grade Level.

<table>
<thead>
<tr>
<th>Grades</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>F Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.</td>
<td>650</td>
<td>624</td>
<td>573</td>
<td>568</td>
<td>534</td>
<td>21.0281++</td>
</tr>
<tr>
<td>M.</td>
<td>71.29</td>
<td>70.51</td>
<td>67.91</td>
<td>66.44</td>
<td>68.87</td>
<td></td>
</tr>
<tr>
<td>S.D.</td>
<td>10.71</td>
<td>11.01</td>
<td>10.82</td>
<td>10.23</td>
<td>9.49</td>
<td></td>
</tr>
</tbody>
</table>

+ Significant at .01
++ Significant at .001

As shown in Table V, the hypothesis that students in grades 8 - 12 would not have significantly different scores on the PIL was not supported (F = 21.0281; p< .01).

Table VI: F Ratios of Differences between Student PIL Scores in Grades 8, 9, 10, 11, and 12.

<table>
<thead>
<tr>
<th>Grade</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 vs</td>
<td>2.060</td>
<td>52.835++</td>
<td>43.841++</td>
<td>26.316++</td>
</tr>
<tr>
<td>9 vs</td>
<td></td>
<td>33.897++</td>
<td>26.637++</td>
<td>13.867++</td>
</tr>
<tr>
<td>10 vs</td>
<td></td>
<td>0.442</td>
<td></td>
<td>3.582</td>
</tr>
<tr>
<td>11 vs</td>
<td></td>
<td></td>
<td></td>
<td>1.588</td>
</tr>
</tbody>
</table>

+ Significant at .01
++ Significant at .001

Table VI indicates the following pattern of scoring among students in grades 8 - 12:

Grade 8 students did not score significantly higher on the PIL than did grade 9 students (F = 2.060; p< .01). Grade 8 students scored significantly higher on the PIL than did students
in grades 10, 11, and 12 (F's = 52.84, 43.84, 26.32; p < .01).

Grade 9 students scored significantly higher on the PIL than students in grades 10, 11, and 12 did (F's = 33.90, 26.64, 13.87; p < .01). The PIL scores of grade 10 students were not significantly different from the scores of grade 11 and 12 students (F's = 0.44, 3.58; p > .01). Grade 11 student PIL scores were not significantly different from the scores of grade 12 students (F = 1.59; p > .01).

A discussion of the results is found in Chapter VI.
CHAPTER VI CONCLUSIONS AND IMPLICATIONS

This chapter will provide an evaluative discussion of the findings. The discussion concerns itself with the four areas explored by the hypotheses and makes several inferences based upon the investigation's theoretical framework. The chapter also concerns itself with research limitations and implications for future investigations.

Conclusions

Briefly, the conclusions of the study can be stated as follows:

1) The hypothesis that students who held leadership positions would have higher meaning in life scores than would students who were in the non-leader group \( (F = 21.862, p < .01) \) and students who were in the deviant group \( (F = 60.984, p < .01) \) was confirmed.

2) The hypothesis that students who were in the non-leader group would have higher meaning in life scores than would students who were in the deviant group was confirmed \( (F = 13.867, p < .01) \).

3) The hypothesis that students who had higher academic achievement would have higher meaning in life scores than would students who had lower academic achievement was not supported \( (F = 0.414, p > .01) \).

4) The hypothesis that there would not be any significant differences between meaning in life scores of students in grades 8 to 12 was not supported \( (F = 21.028, p < .01) \).
Grade 8 and 9 students had higher meaning in life scores than did students in grades 10, 11, and 12.

5) The hypothesis that male and female students would not have significantly different meaning in life scores was supported ($F = 2.759, p > .01$).

Inferences and Implications

This section concerns itself with the relationship of meaning in life to social participation, leadership and deviant behaviors, academic achievement, and sex and grade level differences. These inferences are based upon Frankl's notions regarding the development of meaning in life. In some respects, however, the inferences are an extension of Frankl's theory.

1) **Leadership, Social Participation, and Meaning in Life**

It was assumed that students who held executive positions in the school were more involved in social and athletic activities than students who did not hold executive positions, namely, the non-leader and the deviant groups. It was predicted that students who were more involved in social and athletic activities would have high meaning in life scores. Thus the leadership group would be expected to have a higher meaning in life score than the non-leader and deviant groups. As predicted, the leadership group had a higher meaning in life score than did the non-leader group and the deviant group. This finding provides empirical evidence in support of the assumption that a higher level of social and athletic participation is associated with high meaning in life. This finding supports Frankl's theory that
whenever adolescents reach out to others they experience a greater sense of usefulness and identity, and as a result, they have a greater sense of meaning in life. This finding also suggests that when leaders are chosen, their peers recognize their uniqueness and singularity, a condition which again seems associated with high meaning in life.

2) Deviancy, Social Participation, and Meaning in Life

Deviant students were considered to be involved at the lowest level of social participation. That is to say, by violating rules and sanctions they isolated themselves from the school community. In this study, students who were involved at a low level of social and athletic participation were predicted to have low meaning in life. As predicted, the deviant group had the lowest meaning in life scores. This finding provides empirical evidence in support of the assumption that a lower level of social and athletic participation is associated with low meaning in life. Furthermore, low meaning in life scores of deviant students provide support for Frankl's (1963, p. 169) statement that low meaning in life or existential vacuum underlies deviancy. He has said that people who suffer from existential vacuum have the symptoms of boredom, apathy, aimlessness, and confusion and they tend to see themselves as irresponsible individuals who are bound by limitations set by others.

3) Academic Success and Meaning in Life

The findings did not support the prediction that academic success is associated with high meaning in life. It
was assumed that high marks indicated mastery of subject matter. It was predicted that mastery of subject matter was associated with a feeling of competence and well-being, a condition which seemed to be related to high meaning in life. This finding suggests that academic success, subject matter mastery, and feelings of competence and well-being might not be related to high meaning in life.

4) Grade Level Differences and Meaning in Life

The finding that grade 8 and 9 students had higher meaning in life scores than did grade 10, 11, and 12 students suggests that young adolescents experience higher meaning in life than older adolescents. That is to say, young adolescents in grades 8 and 9 appear to be less confused, tend to feel more worthwhile, and find life more exciting and meaningful than the older adolescents in grades 10 to 12. In relationship to Frankl's (1955, p. 33) statement that urgent questioning of the meaning of life is most likely to occur during adolescence, and assuming that low meaning in life scores are related to this questioning stage, this finding suggests that adolescents question the meaning of life at a later stage of adolescent development, namely, in grades 10, 11, and 12. This finding also suggests exploring the relationship between meaning in life and curriculum content, teaching methods, vocational planning, and home and community expectations.

5) Sex Differences and Meaning in Life

As had been hypothesized, male and female students did
not have significantly different meaning in life scores. It would appear that a sense of meaning in life was not the prerogative of one sex over the other.

Implications for Further Research

Some of the conclusions and inferences of this thesis suggest possibilities for further research.

1) The first study suggested by the findings is a replication of this investigation among adolescent populations of other localities. Representative samples of adolescents in other school districts would determine whether or not the above findings are true of other secondary school populations.

2) The conclusion that high meaning in life scores were not associated to high academic achievement was based on scores of the leadership and deviant groups only. Another project could investigate the relationship between meaning in life scores and academic success among students in the non-leader group in order to determine whether or not the results would be similar.

3) A third project is suggested by the differences between meaning in life scores of students in various grade levels. A replication of this thesis using a sample of adolescents from other localities would establish whether or not this relationship was nested in school variables specific to West Vancouver or whether or not it is characteristic of the adolescents generally. Thus a replicate of this study would determine whether or not meaning in life score differences are due to stages in adolescent development; to differences
in curriculum content and teaching methods; to poor vocational planning; or to home and community expectations.

4) Assuming that deviant adolescents in and out of school exhibit similar behaviors we should also study adolescents who are in legal custody. This study would determine whether or not deviant adolescents who are attending school and deviant adolescents who are in correctional centres and in drug treatment facilities have similar meaning in life scores.

5) Finally, there is the possibility of setting up a remedial help program for deviant adolescents. This program would involve faculty, student leaders, and deviants in small groups and in a work experience alternative. Bringing together faculty, student leaders, and deviants in small group instruction and discussion would involve the deviants in an intellectual and communal experience where they could learn to develop a higher level of social involvement as they clarify their beliefs and values through exposure to the ideas and behaviors of their peers and significant adults. The work experience component would help the deviant adolescents translate into real life situations the concepts, techniques, and methods that they have learned. Deviants would have a chance to clarify meanings and values through exposure to additional knowledge by way of field projects which could involve helping slow learners in elementary grades; organizing recreation programs for mentally retarded and physically handicapped children and adolescents; and
visiting senior citizens. The involvement of deviant adolescents with adolescent leaders would take advantage of the natural influence of peers in developing healthy attitudes toward school and learning and in reinforcing desirable behaviors. Adolescent leaders would provide the recognition, the approval, the support, and the help that deviants need. Furthermore, adolescent leaders, with their similar age levels and background, would not only provide incentives but would also use the idiom by which youth communicate their feelings, goals, and experiences.

A most fitting conclusion for this study is suggested by Victor Frankl's (1969) comment about the goal of education:

...in an age such as ours, that is to say, in an age of existential vacuum, the foremost task of education, instead of being satisfied with transmitting traditions and knowledge, is to refine that capacity which allows man to find unique meanings. Today education cannot afford to proceed along the lines of tradition, but must elicit the ability to make independent and authentic decisions (page 64).

Helping students refine their capacity to find unique meanings and to make independent and authentic decisions may be the greatest challenge facing educators and counsellors today. Every day and every hour makes new deeds necessary and new experiences possible. May we not rest content with our achievements.
CHAPTER VII  REFERENCES


Crumbaugh, J.C. "Cross-Validation of Purpose in Life Test", Journal of Individual Psychology, 1968, 24


APPENDIX i  ORIGINAL INSTRUMENT: PURPOSE IN LIFE TEST
THE PURPOSE IN LIFE TEST

James C. Crumbaugh, Ph.D.  
Veterans Administration Hospital  
Gulfport, Mississippi

Leonard T. Maholick, M.D.  
The Bradley Center, Inc.  
Columbus, Georgia

Part A

For each of the following statements, circle the number that would be most nearly true for you. Note that the numbers always extend from one extreme feeling to its opposite kind of feeling. “Neutral” implies no judgment either way; try to use this rating as little as possible.

1. I am usually:
   1. completely bored
   2. (neutral)
   3. exhuberant, enthusiastic

2. Life to me seems:
   1. always exciting
   2. (neutral)
   3. completely routine

3. In life I have:
   1. no goals or aims at all
   2. (neutral)
   3. Very clear goals and aims

4. My personal existence is:
   1. Utterly meaningless without purpose
   2. (neutral)
   3. very purposeful and meaningful

5. Every day is:
   1. constantly new and different
   2. (neutral)
   3. exactly the same

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Psychometric Affiliates

CHICAGO PLAZA
BROOKPORT, ILLINOIS 62910

Test #168
6. If I could choose, I would:

<table>
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<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>prefer never to have been born</td>
<td>(neutral)</td>
<td>Like nine more lives just like this one</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

7. After retiring, I would:

<table>
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<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>do some of the exciting things I have always wanted to</td>
<td>(neutral)</td>
<td>loaf completely the rest of my life</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

8. In achieving life goals I have:

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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>made no progress whatever</td>
<td>(neutral)</td>
<td>progressed to complete fulfillment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

9. My life is:

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<tr>
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<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>empty, filled only with despair</td>
<td>(neutral)</td>
<td>running over with exciting good things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. If I should die today, I would feel that my life has been:

<table>
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<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>very worthwhile</td>
<td>(neutral)</td>
<td>completely worthless</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. In thinking of my life, I:

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<th>4</th>
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<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>often wonder why I exist</td>
<td>(neutral)</td>
<td>always see a reason for my being here</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. As I view the world in relation to my life, the world:

<table>
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<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>completely confuses me</td>
<td>(neutral)</td>
<td>fits meaningfully with my life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. I am a:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>very irresponsible person</td>
<td>(neutral)</td>
<td>very responsible person</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Concerning man's freedom to make his own choices, I believe man is:

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<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>absolutely free to make all life choices</td>
<td>(neutral)</td>
<td>completely bound by limitations of heridity and environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. With regard to death, I am:

<table>
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<tr>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>prepared and</td>
<td>(neutral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unafraid</td>
<td>unprepared and frightened</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. With regard to suicide, I have:

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>thought of it seriously</td>
<td>(neutral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>as a way out</td>
<td>never given it a second thought</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. I regard my ability to find a meaning, purpose, or mission in life as:

<table>
<thead>
<tr>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>very great</td>
<td>(neutral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>practically none</td>
<td></td>
<td></td>
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</tbody>
</table>

18. My life is:

<table>
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<tr>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>in my hands and I</td>
<td>(neutral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>am in control of it</td>
<td>out of my hands and controlled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>by external factors</td>
<td></td>
<td></td>
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</tbody>
</table>

19. Facing my daily tasks is:

<table>
<thead>
<tr>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>a source of pleasure</td>
<td>(neutral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and satisfaction</td>
<td>a painful and boring experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

20. I have discovered:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>no mission or</td>
<td>(neutral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>purpose in life</td>
<td>clear-cut goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>and a satisfying life purpose</td>
<td></td>
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</tbody>
</table>

Part B

Make complete sentences of each of the following phrases. Work rapidly, filling in the blanks with the first thing that pops into your mind.

1. More than anything, I want ______________________________________________________

2. My life is _____________________________________________________________________

3. I hope I can ____________________________________________________________________

4. I have achieved __________________________________________________________________

5. My highest aspiration ____________________________________________________________

6. The most hopeless thing _________________________________________________________

7. The whole purpose of my life ____________________________________________________
8. I get bored

9. Death is

10. I am accomplishing

11. Illness and suffering can be

12. To me all life is

13. The thought of suicide

Part C

Write a paragraph describing in detail your aims, ambitions, goals in life. How much progress are you making in achieving them?
APPENDIX ii  MODIFIED PURPOSE IN LIFE TEST
PART I

HOW TO ANSWER AND MARK THE ANSWER SHEET: (Nos. 1 -20)

1. In each of the statements below, choose the number that is most nearly true for you. Then completely blacken the numbered space on the enclosed answer sheet that corresponds to the question in this booklet.

2. The numbers (1, 2, 3, 4, 5, or, 5, 4, 3, 2, 1) in each question extend from one extreme feeling to its opposite kind of feeling. "Neutral" implies no judgment either way, try to use this rating as little as possible.

3. If you change your mind, erase your first mark completely. Make no stray marks on the answer sheet.

4. Use an HB pencil. Please do not use ink or ballpoint pen.

5. Sample questions:

1. I find my school experiences to be most:
   - 1 boring
   - 2 (neutral)
   - 3 exciting
   Answer sheet sample
   - 1 2 3 4 5

2. I feel that students are:
   - 5 always
   - 4 (neutral)
   - 3 completely
   - 2 unhappy
   Answer sheet sample
   - 5 4 3 2 1

APPROXIMATELY TEN MINUTES HAVE BEEN ALLOTTED FOR PART I

PART I QUESTIONS:

1. I am usually:
   - 1 completely bored
   - 2 (neutral)
   - 3 exhuberant, enthusiastic
   - 4

2. Life to me seems:
   - 5 always
   - 4 (neutral)
   - 3 completely
   - 2 routine

3. In life I have:
   - 1 no goals or aims at all
   - 2 (neutral)
   - 3 very clear aims and goals
   - 4

4. My personal existence is:
   - 1 utterly meaningless, without purpose
   - 2 (neutral)
   - 3 very purposeful and meaningful
   - 4

5. Every day is:
   - 5 constantly new and different
   - 4 (neutral)
   - 3 exactly the same
   - 2

6. If I could choose, I would:
   - 1 prefer never to have been born
   - 2 (neutral)
   - 3 like nine more lives just like this one
   - 4

(CONTINUE ON PAGE b)
7. After retiring, I would:
   5. do some of the exciting things I have always wanted (neutral)
   4. loaf completely the rest of my life
   3. 

8. In achieving life goals, I have:
   1. made no progress (neutral)
   2. 
   3. 
   4. progressed to complete fulfillment
   5. 

9. My life is:
   1. empty, filled only with despair (neutral)
   2. 
   3. running over with exciting good things
   4. 
   5. 

10. If I should die today, I would feel that my life has been:
    5. very worthwhile (neutral)
    4. 
    3. completely worthless
    2. 
    1. 

11. In thinking of my life, I:
    1. often wonder why I exist (neutral)
    2. 
    3. always see a reason for my being here
    4. 
    5. 

12. As I view the world in relation to my life, the world:
    1. completely confuses me (neutral)
    2. 
    3. fits meaningfully with my life
    4. 
    5. 

13. I am a:
    1. very irresponsible person (neutral)
    2. 
    3. very responsible person
    4. 
    5. 

14. Concerning man's freedom to make his own choices, I believe man is:
    1. absolutely free to make all life choices (neutral)
    2. 
    3. completely bound by the limitations of heredity and environment
    4. 
    5. 

15. With regard to death, I am:
    1. prepared and unafraid (neutral)
    2. 
    3. unprepared and frightened
    4. 
    5. 

16. With regard to suicide, I have:
    1. thought of it seriously as a way out (neutral)
    2. 
    3. never given it a second thought
    4. 
    5. 

17. I regard my ability to find a meaning, purpose, or mission in life as:
    1. very great (neutral)
    2. 
    3. practically none
    4. 
    5. 

18. My life is:
    1. in my hands and I am in control of it (neutral)
    2. 
    3. out of my hands and controlled by external forces
    4. 
    5. 

19. Facing my daily tasks is:
    1. a source of pleasure and satisfaction (neutral)
    2. 
    3. a painful and boring experience
    4. 
    5. 

20. I have discovered:
    1. no mission or purpose in life (neutral)
    2. 
    3. clear-cut goals and a satisfying life purpose
    4. 
    5. 

After the directions for Part II have been read, you continue with Part II.
PART II

INSTRUCTIONS

1. The following is a list of problems which often trouble students of your age. Some of these problems are likely to be troubling you and some are not. As you read the list, pick out the problems which are troubling you and mark the space below the numbers of those items on the answer sheet.

2. The items are numbered from 25.1 to 90.5 in the booklet and on the answer sheet. This means that you leave one complete line from left to right blank on the answer sheet between Part I and Part II.

3. The numbers on the answer sheet go from left to right across the page.

4. The items in the booklet are in groups of five and these groups are numbered from left to right across both page two and three. Open the booklet and look.

5. Read across both page two and three answering in columns 1, 2, 3, & 4 using the numbers of the items in the booklet as they are found on the answer sheet for items 25.1 to 68.5.

6. On page four the items in the booklet are in groups of five and these are numbered from left to right across the page. Use all four columns from item 69.1 to 90.5 for page four. Use the number on the answer sheet which is the same as the number in the booklet.

7. Answer as follows:

example 1. -- If 25.2 and 25.4 were troubling you, you would mark the answer sheet as follows.

(This is how the statements look in the booklet.)

25.1. Being underweight
2. Being overweight
3. Not getting enough exercise
4. Getting sick too often
5. Tiring very easily

(This is how you would mark the answer sheet.)

example 2. -- If none of the items in number 90 were troubling you, you would leave that part of the answer sheet blank.

(This is how the statements look in the booklet.)

90.1. School activities poorly organized
2. Students not given enough responsibility
3. Not enough school spirit
4. Lunch hour too short
5. Poor Assemblies

(This is how you would leave the answer sheet.)

Take a mark for each item that is troubling you, but do not make a mark for any item that is not troubling you.

START AT ITEM 25.1 ON THE ANSWER SHEET AND IN THE BOOKLET.

If you mark an item that is not troubling you, erase the mark for that item completely.

APPROXIMATELY 35 MINUTES HAVE BEEN MADE AVAILABLE FOR THIS SECTION. PLEASE WORK AS QUICKLY AS POSSIBLE. THANK YOU FOR YOUR COOPERATION.
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</thead>
<tbody>
<tr>
<td>29. 1.</td>
<td>Needing to learn how to save money</td>
<td>2. Not knowing how to spend money wisely</td>
<td>3. Having less money than my friends have</td>
<td>4. Having to ask parents for money</td>
<td>5. Having no regular allowance (or income)</td>
</tr>
<tr>
<td>37. 1.</td>
<td>Having dates</td>
<td>2. Awkward in making a date</td>
<td>3. Not mixing well with the opposite sex</td>
<td>4. Not being attractive to the opposite sex</td>
<td>5. Not being allowed to have dates</td>
</tr>
<tr>
<td>49. 1.</td>
<td>Not going to church often enough</td>
<td>2. Not living up to my ideal</td>
<td>3. Puzzled about the meaning of God</td>
<td>4. Doubting some of the religious things I'm told</td>
<td>5. Confused on some of my religious beliefs</td>
</tr>
<tr>
<td>53. 1.</td>
<td>Worried about a member of the family</td>
<td>2. Sickness in the family</td>
<td>3. Parents sacrificing too much for me</td>
<td>4. Parents not understanding me</td>
<td>5. Being treated like a child at home</td>
</tr>
<tr>
<td>57. 1.</td>
<td>Unable to enter desired vocation</td>
<td>2. Doubting the wisdom of my vocational choice</td>
<td>3. Needing to know my vocational abilities</td>
<td>4. Doubting I can get a job in my chosen vocation</td>
<td>5. Wanting advice on what to do after high school</td>
</tr>
<tr>
<td>61. 1.</td>
<td>Missing too many days of school</td>
<td>2. Being a grade behind in school</td>
<td>3. Adjusting to a new school</td>
<td>4. Taking the wrong subjects</td>
<td>5. Not spending enough time in study</td>
</tr>
<tr>
<td>65. 1.</td>
<td>Having no suitable place to study at home</td>
<td>2. Family not understanding what I have to do in school</td>
<td>3. Wanting subjects not offered by the school</td>
<td>4. Made to take subjects I don't like</td>
<td>5. Subjects not related to everyday life</td>
</tr>
<tr>
<td>26. 1.</td>
<td>Frequent headaches</td>
<td>2. Weak eyes</td>
<td>3. Often not hungry for my meals</td>
<td>4. Not eating the right food</td>
<td>5. Gradually losing weight</td>
</tr>
<tr>
<td>30. 1.</td>
<td>Too few nice clothes</td>
<td>2. Too little money for recreation</td>
<td>3. Family worried about money</td>
<td>4. Having to watch every penny I spend</td>
<td>5. Having to quit school to work</td>
</tr>
<tr>
<td>34. 1.</td>
<td>Not enough time for recreation</td>
<td>2. Not enjoying many things others enjoy</td>
<td>3. Too little chance to read what I like</td>
<td>4. Too little chance to get out and enjoy nature</td>
<td>5. Wanting more time to myself</td>
</tr>
<tr>
<td>38. 1.</td>
<td>No suitable places to go on dates</td>
<td>2. Not knowing how to entertain on a date</td>
<td>3. Too few dates</td>
<td>4. Afraid of close contact with the opposite sex</td>
<td>5. Embarrassed by talk about sex</td>
</tr>
<tr>
<td>42. 1.</td>
<td>Wanting a more pleasing personality</td>
<td>2. Not getting along well with other people</td>
<td>3. Worrying how I impress people</td>
<td>4. Too easily led by other people</td>
<td>5. Lacking leadership ability</td>
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<tr>
<td>50. 1.</td>
<td>Parents making me go to church</td>
<td>2. Disliking church services</td>
<td>3. Doubting the value of worship and prayer</td>
<td>4. Wanting to feel close to God</td>
<td>5. Affected by racial or religious prejudice</td>
</tr>
<tr>
<td>54. 1.</td>
<td>Not living with my parents</td>
<td>2. Parents separated or divorced</td>
<td>3. Father or mother not living</td>
<td>4. Not having any fun with mother or dad</td>
<td>5. Feeling I don't really have a home</td>
</tr>
<tr>
<td>58. 1.</td>
<td>Needing to decide on an occupation</td>
<td>2. Needing to know more about occupations</td>
<td>3. Restless to get out of school and into a job</td>
<td>4. Can't see that school work is doing me any good</td>
<td>5. Want to be on my own</td>
</tr>
<tr>
<td>62. 1.</td>
<td>Not really interested in books</td>
<td>2. Unable to express myself well in words</td>
<td>3. Vocabulary too limited</td>
<td>4. Trouble with oral reports</td>
<td>5. Afraid to speak up in class discussions</td>
</tr>
<tr>
<td>66. 1.</td>
<td>Textbooks too hard to understand</td>
<td>2. Teachers too hard to understand</td>
<td>3. So often feel restless in classes</td>
<td>4. Too little freedom in classes</td>
<td>5. Not enough discussion in classes</td>
</tr>
</tbody>
</table>
27. 1. Not as strong and healthy as I should be
2. Not getting enough outdoor air and sunshine
3. Not getting enough sleep
4. Frequent colds
5. Frequent sore throat

31. 1. Wanting to earn some of my own money
2. Wanting to buy more of my own things
3. Needing money for education after high school
4. Needing to find a part-time job now
5. Needing a job during vacations

35. 1. Nothing interesting to do in my spare time
2. Too little chance to go to shows
3. Too little chance to enjoy radio or television
4. Too little chance to pursue a hobby
5. Nothing interesting to do in vacation

39. 1. Disappointed in a love affair
2. Girl friend
3. Boy friend
4. Deciding whether to go steady
5. Wondering if I'll find a suitable mate

43. 1. Slow in making friends
2. Being timid or shy
3. Feelings too easily hurt
4. Getting embarrassed too easily
5. Feeling inferior

47. 1. Moodiness, "having the blues"
2. Trouble making up my mind about things
3. Afraid of making mistakes
4. Too easily discouraged
5. Sometimes wishing I'd never been born

51. 1. Wondering how to tell right from wrong
2. Confused on some moral questions
3. Parents old-fashioned in their ideas
4. Wanting to understand more about the Bible
5. Wondering what becomes of people when they die

55. 1. Being criticized by my parents
2. Parents favoring a brother or sister
3. Mother
4. Father
5. Death in the family

59. 1. Choosing best subjects to take next term
2. Choosing best subjects to prepare for college
3. Choosing best subjects to prepare for a job
4. Getting needed training for a given occupation
5. Wanting to learn a trade

63. 1. Not getting studies done on time
2. Not liking school
3. Not interested in some subjects
4. Can't keep my mind on my studies
5. Don't know how to study effectively

67. 1. Not enough good books in the library
2. Too much work required in some subjects
3. Not allowed to take some subjects I want
4. Not getting along with a teacher
5. School is too strict

28. 1. Poor complexion or skin trouble
2. Poor posture
3. Too short
4. Too tall
5. Not very attractive physically

32. 1. Living too far from school
2. Relatives living with us
3. Not having a room of my own
4. Having no place to entertain friends
5. Having no car in the family

36. 1. Not being allowed to use the family car
2. Not allowed to go around with the people I like
3. So often not allowed to go out at night
4. In too few student activities
5. Too little social life

40. 1. Being in love
2. Loving someone who doesn't love me
3. Deciding whether I'm in love
4. Deciding whether to become engaged
5. Needing advice about marriage

44. 1. Being criticized by others
2. Being called "high-hat" or "stuck-up"
3. Being watched by other people
4. Being left out of things
5. Having feelings of extreme loneliness

48. 1. Afraid to be left alone
2. Too easily moved to tears
3. Failing in so many things I try to do
4. Can't see the value of most things I do
5. Unhappy too much of the time

52. 1. Can't forget some mistakes I've made
2. Bothered by ideas of heaven and hell
3. Afraid God is going to punish me
4. Troubled by the bad things other kids do
5. Being tempted to cheat in classes

56. 1. Being an only child
2. Not getting along with a brother or sister
3. Parents making too many decisions for me
4. Parents not trusting me
5. Wanting more freedom at home

60. 1. Deciding whether or not to go to college
2. Needing to know more about colleges
3. Needing to decide on a particular college
4. Afraid I won't be admitted to a college
5. Afraid I'll never be able to go to college

64. 1. Trouble with mathematics
2. Weak in writing
3. Weak in spelling or grammar
4. Trouble in outlining or note taking
5. Trouble in organizing papers and reports

68. 1. Classes too dull
2. Teachers lacking personality
3. Teachers lacking interest in students
4. Teachers not friendly to students
5. Not getting personal help from the teachers
69. 1. Trouble with my hearing
2. Speech handicap (stuttering, etc.)
3. Allergies (hay fever, asthma, hives, etc.)
4. Glandular disorders (thyroid, lymph, etc.)
5. Menstrual or female disorders

69. 2. Parents working too hard
3. Not having certain conveniences at home
4. Not liking the people in my neighborhood
5. Wanting to live in a different neighborhood
6. Ashamed of the home we live in

70. 1. Poor teeth
2. Nose or sinus trouble
3. Smoking
4. Trouble with my feet
5. Troubled by a physical handicap

71. 1. Wanting to learn how to dance
2. Wanting to learn how to entertain
3. Wanting to improve myself culturally
4. Wanting to improve my appearance
5. Too care less with my clothes and belongings

72. 1. Too little chance to do what I want to do
2. Too little chance to get into sports
3. No good place for sports around home
4. Lacking skill in sports and games
5. Not using my leisure time well

73. 1. Going with someone my family won't accept
2. Afraid of losing the one I love
3. Breaking up a love affair
4. Wondering how far to go with the opposite sex
5. Wondering if I'll ever get married

74. 1. Wanting to be more popular
2. Disliking someone
3. Being disliked by someone
4. Avoiding someone I don't like
5. Sometimes acting childish or immature

75. 1. Being stubborn or obstinate
2. Tending to exaggerate too much
3. Having bad luck
4. Not having any fun
5. Lacking self-confidence

76. 1. Sometimes lying without meaning to
2. Swearing, dirty stories
3. Having a certain bad habit
4. Being unable to break a bad habit
5. Lacking self-control

77. 1. Clash of opinions between me and my parents
2. Talking back to my parents
3. Parents expecting too much of me
4. Wanting love and affection
5. Wishing I had a different family background

78. 1. Friends not welcomed at home
2. Family quarrels
3. Unable to discuss certain problems at home
4. Wanting to leave home
5. Not telling parents everything

79. 1. Not knowing what I really want
2. Needing to plan ahead for the future
3. Family opposing some of my plans
4. Afraid of the future
5. Concerned about military service

80. 1. Getting low grades
2. Just can't get some subjects
3. Not smart enough
4. Afraid of failing in school work
5. Wanting to quit school

81. 1. Teachers not considerate of students' feelings
2. Teachers not practicing what they preach
3. Too many poor teachers
4. Grades unfair as measures of ability
5. Unfair tests

82. 1. Poor teeth
2. Nose or sinus trouble
3. Smoking
4. Trouble with my feet
5. Troubled by a physical handicap

83. 1. Poor memory
2. Slow in reading
3. Worrying about grades
4. Worrying about examinations

84. 1. Not knowing what I really want
2. Needing to plan ahead for the future
3. Family opposing some of my plans
4. Afraid of the future
5. Concerned about military service

85. 1. Getting low grades
2. Just can't get some subjects
3. Not smart enough
4. Afraid of failing in school work
5. Wanting to quit school

86. 1. School activities poorly organized
2. Students not given enough responsibility
3. Not enough school spirit
4. Lunch hour too short
5. Poor assemblies

Check Part I.
**NAME**

**LAST**

**FIRST**

**MIDDLE**

**DATE**

**AGE**

**SEX**

**M OR F**

**SCHOOL**

**CITY**

**GRADE OR CLASS**

**INSTRUCTOR**

---

**DIRECTONS:** Read each question and its numbered answers. When you have decided which answer is correct, blacken the corresponding space on this sheet with a No. 2 pencil. Make your mark as long as the pair of lines, and completely fill the area between the pair of lines. If you change your mind, erase your first mark COMPLETELY. Make no stray marks; they may count against you.

**SCORES**

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<td>143</td>
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</table>
APPENDIX iii  ADMINISTRATION INSTRUCTIONS
TEACHER'S INSTRUCTIONS FOR THE
PIQUETTE & ANDERSON RESEARCH

TWO DAYS BEFORE THE ADMINISTRATION OF THE INVENTORY:

1. Please announce at each announcement period between now and test time that all students must bring to the class in which the inventories will be administered, two H.B. or #2 pencils and an eraser. If a reason is to be given, state that, "A survey designed to help educators gain information which will enable them to work towards improving the school system is to be administered."

BEFORE GOING TO CLASS ON THE DAY OF ADMINISTRATION, PLEASE DO THE FOLLOWING:

2. Take the envelopes of booklets and answer sheets from your mail boxes.

3. Check to see that you have a booklet and an answer sheet for each student in your class. Names will be attached to the answer sheets.

4. Obtain extra pencils from the office.

5. Be in the class before the period starts as the time scheduled provides us with a minimum of time.

IN CLASS PLEASE DO THE FOLLOWING: (NOTE: ORAL INSTRUCTIONS ARE TO BE GIVEN OVER THE P. A. SYSTEM)

6. Check to see that all students have pencils and erasers, and hand out extra pencils to those students who do not have pencils. Keep a record of those students who borrow pencils. No electrographic pencils are to be used.

7. Hand out booklets and answer sheets to the students according to the names on the answer sheets. NO STUDENT IS TO USE AN ANSWER SHEET OTHER THAN THE ONE WITH HIS OR HER NAME ON IT. (5 minutes for # 6&7)

8. Read the following:

GENERAL INSTRUCTIONS

The two sets of items which you have in the booklet before you are not meant to be a test. They are part of a research project which is intended to help educators improve schools. Please avoid falsifying your answers as this will mean that you do not wish to have your opinions or feelings considered.

In no way will the researchers be able to identify you as an individual once you have removed your name tag from the answer sheet. Please do not remove the name tag until instructed to do so. Name tags have been attached so that the researchers can keep a record of those who have not answered the inventory. This is important for compiling accurate research data. Please do not write your name or any other identifying information on the answer sheet. Make no stray marks on the answer sheet.

9. Read aloud from the booklet the instructions for Part I, as the students follow in their booklets. Say, "Follow the instructions for Part I as I read them to you." (3 minutes for # 8&9)
10. Allow ten minutes for Part I.

11. When 7 minutes have elapsed announce, "Three minutes remain for part one."

(Please move around the room watching for students who are answering improperly.)

12. When ten minutes have elapsed, announce, "Stop and listen to the instructions for part II. Follow the directions for part II on your booklet as I read them." (10 minutes for # 10, 11, & 12)

13. Please read the instructions for part II from the booklet. (3 minutes for # 13)

14. After ten minutes have passed say, "There are twenty-five minutes remaining."

15. After twenty minutes have passed say, "There are fifteen minutes remaining.

16. After thirty minutes have passed say, "There are five minutes remaining."

17. At the end of the class say, "Please remove your name tag from the answer sheet without tearing or damaging the answer sheet. The last person in each row collect the answer sheets. The first person in each row collect the booklets. All those who borrowed pencils please return them to me (the teacher) as you leave. Wait until I check your name of the list when you return your pencil."

18. Check to see that all pencils have been returned.

19. Place the answer sheets and the booklets in the envelopes, and return them and the pencils to the office yourself. (approximately 34 to 39 minutes for # 14 to 19)

50 to 60 minutes

THANK YOU FOR YOUR COOPERATION
THE PIQUETTE-ANDERSON RESEARCH PROJECT

The following changes are to be made in the Teachers' Instructions for this Project:

Sections 1 - 7  - no change

Section 8  - to be read over the P.A. to permit an explanation concerning coding.

Section 9  - to be read by the HR teacher including the instructions on Page (a)

Sections 10 - 11  - allow a maximum of ten minutes. Be sure to draw students attention to the fact that the Answer sheet moves Horizontally not vertically i.e. that Answers 1,2,3,4 are horizontally on the 1st line. Answers 5,6,7,8 horizontally on the second and so on.

- Instruct students to fold their papers, put down their pencil and sit quietly if they finish before the end of 10 min.

- At the end of 10 minutes OR when all students are finished carry on to Part 12.

Section 12  - As given

Section 13  - Read the Instruction on Page 1 for Part 11.

- Emphasize that students are to begin Part 11 with Answer 25. Inform students that, after they have completed all questions and checked their answers, they may turn in their answer sheets, and study quietly for the rest of the period. Tear off the name tags as the papers are brought in.

Section 14 - 18  - As given for those students who have not turned in papers before the maximum time allotment of 35 minutes.

When all papers have been collected complete

Section 19  Send papers to office as an indication that you are complete.
APPENDIX iv  IDENTIFICATION CODES
A grade ten, male, student leader, with C+ or better in more than 50% of his courses and attending Hillside School.

### Row 1, Behavior Groups
0 - Student Leader  
1 - Control  
2 - Deviant

### Row 2, Achievement Groups
0 - Student Leader C+ or better  
1 - Student Leader with less than C+  
2 - Deviant, more than D  
3 - Deviant, less than D

### Row 3, Sex
0 - Male  
1 - Female

### Row 4, Grade level
0 - grade 8  
1 - grade 9  
2 - grade 10  
3 - grade 11  
4 - grade 12

### Row 5, School
0 - Sentinel  
1 - Hillside  
2 - West Vanvouver
APPENDIX v LEADER QUESTIONNAIRE
NAME.......................... Division  .... Sex................

School................................

Please note your membership in any school club, organization, team or student council and your position, if any.

1. **Name of Club**  
   (Drama, Science, etc.)  
   Position Held  
   (Pres., Sect. etc.)  

<table>
<thead>
<tr>
<th>Name of Club</th>
<th>Position Held</th>
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2. **Name of Organization**  
   (Annual, Newspaper, etc.)  
   Position Held  
   (Editor, Art Director, etc.)  

<table>
<thead>
<tr>
<th>Name of Organization</th>
<th>Position Held</th>
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<tbody>
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</table>

3. **Teams: Name of Team**  
   (Basketball, etc.)  
   Position Held  
   (Captain, Coach, etc.)  

<table>
<thead>
<tr>
<th>Team Name</th>
<th>Position Held</th>
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<tbody>
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4. **Student Council**  
   Position Held  
   (Pres., Class Rep., Committee etc.)  

<table>
<thead>
<tr>
<th>Student Council</th>
<th>Position Held</th>
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APPENDIX vi  ANALYSIS OF VARIANCE TABLES

I. Behavior groups, sex, grade levels and school.

II. Leader-Achievement.

III. Deviant-Achievement.
Table I

ANALYSIS OF VARIANCE OF BEHAVIOR GROUPS, SEX, GRADE LEVELS AND SCHOOL ON THE PURPOSE IN LIFE TEST

ANALYSIS OF VARIANCE TABLE

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<tr>
<th>SOURCE</th>
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<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
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<td>MEAN</td>
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<td>4939165.00000</td>
<td>43064.21875</td>
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| GROUPS                  | 7019.52874     | 2    | 3509.76367  | 30.60136 **
| GROUPS 1 x 2            | 2507.46735     | 1    | 2507.46729  | 21.86241 **
| GROUPS 1 x 3            | 6994.41716     | 1    | 6994.41406  | 60.98378 *** |
| GROUPS 2 x 3            | 3853.50370     | 1    | 3853.50366  | 33.59840 *** |
| SEX                     | 316.51979      | 1    | 316.51978   | 2.75971 *< |
| GRADES                  | 9647.12964     | 4    | 2411.78223  | 21.02815 *** |
| GRADES 10 x 11          | 50.72246       | 1    | 50.72246    | 0.44225   |
| GRADES 10 x 12          | 410.84925      | 1    | 410.84912   | 3.58216   |
| GRADES 11 x 12          | 182.12483      | 1    | 182.12483   | 1.58793   |
| GRADES 8 x 9            | 236.31731      | 1    | 236.31731   | 2.06043   |
| GRADES 8 x 10           | 6059.86399     | 1    | 6059.86328  | 52.83549 *** |
| GRADES 8 x 11           | 5028.21239     | 1    | 5028.21094  | 43.84059 *** |
| GRADES 8 x 12           | 3018.21380     | 1    | 3018.21362  | 26.31558 *** |
| GRADES 9 x 10           | 3887.72331     | 1    | 3887.72314  | 33.89677 *** |
| GRADES 9 x 11           | 3055.09399     | 1    | 3055.09399  | 26.63713 *** |
| GRADES 9 x 12           | 1590.44138     | 1    | 1590.44116  | 13.86694 *** |
| SCHOOL                  | 123.97679      | 2    | 61.98839    | 0.54047   |
| GRADE x SCHOOL          | 2187.04446     | 8    | 273.38037   | 2.38358 * |
| GROUP x SEX x GRADE     | 1505.50477     | 8    | 188.18808   | 1.64080   |
| ERROR                   | 335247.70135   | 2923 | 114.69301   |           |

*** Significant at .001
** Significant at .01
* Significant at .05
† Significant at .10
### Table II

**ANALYSIS OF VARIANCE OF LEADER-ACHIEVEMENT GROUPS ON THE PIL**

**ANALYSIS OF VARIANCE TABLE**

<table>
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<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
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</thead>
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**Significant at .01**

**Significant at .05**
### Table III

#### ANALYSIS OF THE DEVIANT-ACHIEVEMENT GROUPS ON PIL

#### ANALYSIS OF VARIANCE TABLE

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** Significant at .01  
* Significant at .05  
† Significant at .10
APPENDIX vii  PII ITEM MEANS AND STANDARD DEVIATIONS FOR TOTAL POPULATION
### PIL ITEM MEANS AND STANDARD DEVIATIONS FOR TOTAL POPULATION

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APPENDIX viii PIL ITEM CORRELATION CLUSTER ANALYSIS FOR TOTAL POPULATION
### PIL Item Correlation Cluster Analysis for Total Population

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<th>TOT AVG</th>
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Average correlation with all items in scale = 0.231

Unclustered item = P15

ENTR AVG = average correlation of the item with previous item in scale

TOT AVG = average correlation of the item with all items in the scale
APPENDIX ix  PIL ITEM CORRELATION MATRIX
### PIL Item Correlation Matrix

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<th>P4</th>
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APPENDIX x PIL ITEM MEANS, S.D.'s, SKEWNESS AND KURTOSIS
### PIL ITEM MEANS, S.D.'S, SKEWNESS AND KURTOSIS

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APPENDIX xi

Figure 1. Index of Relation Between Group Membership and Scores on the Purpose in Life Test

Figure 2. PIL Scores of Leader, Normal and Deviant Students

Figure 3. PIL Scores for Student Leaders, High and Low Achievers

Figure 4. PIL Scores for Deviant Students with Passing and Failing Achievement
Figure I: Index of Relation Between Group Membership and Scores on the Purpose in Life Test.

\[ E = 0.95 \quad (E = \sqrt{\frac{E_x^2}{E_t^2}}) \]
Figure II: PIL Scores of Leader, Normal, and Deviant Students.

Legend

--- Leaders

--- Normals

...... Deviants
Figure III: PIL Scores for Student Leaders, High and Low Achievers.

Legend
- - - C+ and Higher
--- Less than C+

PIL Scores

Grade Levels
8 9 10 11 12
Figure IV: PIL Scores for Deviant Students with Passing and Failing Achievement.

Legend

--- Passing

--- Failing
APPENDIX xii

COMPUTER PROGRAM BMDX64
UBC BMDX64

Subject Codes: 13.6, 13.7, 13.2

GENERAL LINEAR HYPOTHESIS

Implemented from the UCLA BMD Package
by
Bill Coshow

The University of British Columbia
Computing Centre
March 1971
UBC APPENDIX

This appendix includes the modifications, extensions and/or restrictions to this program as implemented on the 360/67 at UBC. Headings and subheadings in the appendix correspond directly to those used in the main write-up, which is attached. Page references to the main write-up are also included.

2. ORDER OF CARDS IN JOB DECK (page 2)

a. Systems Cards

The first three system cards are as follows:

i. Request for Service Card
ii. $SIG ID number
iii. Password

The fourth system card, the $RUN card, varies according to where the user has his data stored, and where he would like his output to go. The program always expects to read control cards (i.e. 2(a) to 2(d) and 2(f) to the $SIGNOFF card) from unit 5, and to write the output on unit 6. If not otherwise specified on the $RUN card, these units will be the card reader and the printer respectively; so if the user has his data on cards the fourth system card for a batch run would be

$RUN *BMDX64

If the user has his data in a file called DATA and his control cards on cards, then column 22 of the PROBLM card must contain a number n (n≠1,5 and n<9). The number, n, refers to a file referenced by the $RUN card. The fourth system card would look like this, if the user put a 4 in column 22 of the PROBLM card:

$RUN *BMDX64 4=DATA

If the user has his control cards in a file, CONTRL, and his data in a file called DATA, with a 7 in column 22 of the PROBLM card, the fourth system card would be:

$RUN *BMDX64 5=CONTRL 7=DATA

If the data is stored on tape L15, there is a 4 in column 22 of the PROBLM card and the output is to be put on file OUTPUT, then the fourth and fifth system cards would be:

$RUN *MOUNT PAR=L15 9TP *DATA* RACK=RHH000
$RUN *BMDX64 4=*DATA* 6=OUTPUT
f. Data INPUT Cards

Each input record should contain one value for each variable.

g. Finish Card

Following the FINISH card there should be a $SIGNOFF card ($SIG in the first four columns is sufficient).
1. **GENERAL DESCRIPTION**
   a. This program computes a linear regression and tests general linear hypotheses concerning the model.
   b. Dummy variables specifying the analysis of variance part of the design are generated by the program and tested automatically.
   c. Additional hypotheses stated in the form of linear restrictions on the regression coefficients may be tested.
   d. It has the option of using design cards.
   e. Allowance is made for unequal cells and unequal replicates.
   f. The program is written in FORTRAN IV using double-precision arithmetic.

2. **RESTRICTIONS**
   a. \( t + q + \max(h, 10) \leq 90 \)
      where \( t \) = number of dummy analysis of variance variables generated
      \( q \) = number of covariates
      \( h \) = number of restrictions in the largest additional hypothesis
   b. \( p < 10 \) where \( p \) = number of analysis of variance indices

3. **ORDER OF THE INPUT DECK**
   a. System Cards
   b. Problem Card
   c. Dummy Variable Cards
   d. D-type Variable Format Cards for the data
   e. Data Deck if data is on cards
   (f.) D-type Variable Format Card for the hypotheses
(g.) Hypothesis Cards

(f.) and (g.) are required only for special types of hypotheses. Those tested automatically are:

(i) Each analysis of variance component equal to zero
(ii) Each covariate regression coefficient equal to zero
(iii) All covariate regression coefficients equal to zero simultaneously.

... Repeat a. - (g.) as desired

... h. Finish Card

4. PROGRAM CONTROL CARDS

b. Problem Card

Col. 1-6 PROBLM
7-12 Alphanumeric problem identification
13, 14 Number of covariates
15, 16 Number of analysis of variance components (dummy variable cards)
17, 18 Number of hypotheses in addition to those tested automatically
19, 20 Largest number of restrictions in any of the additional hypotheses
21, 22 Number of the alternate input tape if data is not on cards
23 Number of variable format cards for the data
24-28 If positive, this value is the number of observations (design cards are not used).
   If negative, this value is the number of cells (design cards are used).
29, 30 Number of analysis of variance indices (< 10)
31, 32 Number of levels of the first index
33, 34 Number of levels of the second index
35-50 etc. if necessary
51, 52 1 if design variables are specified on design card;
   0 if cell indices are specified on design card;
   blank if design cards are not used.

c. Dummy Variable Cards

Each analysis of variance component is designated by the breakdown of its degrees of freedom, e.g., I-1, I(J-1). If there is no dependency in the model, the product of the non-zero numbers following Column 12 will be the degrees of freedom for the component. The constant term is specified by blanks following Column 12.
Col.  1-6   DUMVAR
7-12   Alphanumeric name for this component
13, 14 Degrees of freedom attributed to the first index
15, 16 Degrees of freedom attributed to the second index
17, 18 etc.  For example, for a crossed two-factor design where
the factors I and J have 3 and 6 levels, respectively, the
dummy variable cards would be:

DUMVAR MEAN
DUMVAR I   2
DUMVAR J   5
DUMVAR IJ  2 5

d. Variable Format Card(s) for the Data

The format of the input data is specified with a FORTRAN format specifica-
tion.  This consists of a left parenthesis in column 1, followed by a
sequence of specifications, and ending with a right parenthesis. The
analysis of variance indices are specified using I-format code. The
dependent variable and covariates are specified using F-format code.
Columns 73-80 may not be used, but the format may be continued on up to
10 cards.

Example: The input data for a 2-way analysis with one covariate was
prepared with the indices in column 1 and column 3, the covariate in
columns 10-13, and the dependent variable in columns 20-25. The format

card was:

(I1,1X,I1,6X,F4.0,6X,F6.3)

e. Design Card(s)

(1) Specification of design card(s) with design variables.

Col.  1-6   DESIGN
7-9   Number of replicates
10-14 Value of the first design variable
15-19 Value of the second design variable
... 75-79 Value of the 14th design variable

If there are more than 14 design variables, use additional design cards
starting in Col. 10 and punching 14 values per card.

Note that the order of design variable for jth observation is $U_{j1}^{11}$,
$U_{j1}^{12}$, ..., $U_{j1}^{1(N_1-1)}$, $U_{j2}^{11}$, ..., $U_{j2}^{1(N_2-1)}$, ..., $U_{jP}^{1(N_P-1)}$,
where $N_i$ denotes the number of levels of ith index, and $P$ is
the number of indices.
Col. 1-6 DESIGN
7-9 Number of replicates
10, 11 First analysis of variance index
12, 13 Second analysis of variance index
...
28, 29 10th analysis of variance index

f. Data Deck

Each observation must be punched as specified in Section d above. If design card(s) are used, each observation is preceded by its design card.

(g.) Variable Format Card for the Hypotheses

One D-type variable format card specifying the \( t + q + 1 \) elements of one restriction.

(h.) Hypotheses Cards

Each hypotheses of the form
\[
\sum_{i=1}^{t+q} a_i \beta_i = C_j \quad j = 1, 2, \ldots, h
\]
is specified by a card (i) followed by a set of cards (ii)

(i) Col. 1-6 HYPOTH
7-12 Alphanumeric name for this hypothesis
13-14 Number of restrictions (h)

(ii) The \( h \) restrictions punched according to the hypothesis format card in the following order:

\[
\begin{array}{cccc}
a_{11} & a_{12} & \cdots & a_{1, t+q} & c_1 \\
a_{21} & a_{22} & \cdots & a_{2, t+q} & c_2 \\
& & \cdots & \cdots & \\
& & & \cdots & \\
a_{h1} & a_{h2} & \cdots & a_{h, t+q} & c_h
\end{array}
\]

\( a_{i1} \ldots a_{it} \) correspond to the variables generated by the dummy variable cards and \( a_{i, t+1} \ldots a_{i, t+q} \) correspond to the covariates.
5. **OUTPUT**

a. Regression coefficients under each hypothesis and under no hypothesis.

b. A tolerance factor for each matrix inversion required in (a) which may be used as an indication of the accuracy of the results. (See computational Procedure)

c. Analysis of Variance table

d. For each cell of the design the following is printed:

   (i) Dummy variables generated by the program.

   (ii) Predicted value of the dependent variable evaluated at the sample means of the covariates. These correspond to adjusted cell means if a full model is used; that is, if the number of cells is equal to the number of dummy variables.

6. **COMPUTATIONAL PROCEDURE**

The basic model is the analysis of covariance model:

\[ y = \mu_1 \mathbf{i}_1 + \cdots + \mu_p \mathbf{i}_p + \beta_1 \mathbf{x}_1 + \cdots + \beta_q \mathbf{x}_q + e \]

The variables \( i_1, \ldots, i_p \) are called the analysis of variance indices, the variables \( x_1, \ldots, x_q \) are called the covariates and the variable \( y \) is called the dependent variable.

The variables \( \mu_j = \mu_{i_1}^{(j)} \) are called analysis of variance components.

Each component is represented as a linear combination of dummy variables

\[ \mu_j = \beta_{j1} v_1^{(j)} + \cdots + \beta_{jd_j} v_{d_j}^{(j)} \]

The dummy variables \( v_1^{(j)}, \ldots, v_{d_j}^{(j)} \) for the \( j \)th analysis of variance component are specified by means of the \( j \)th Dummy Variable Card.

Let \( n_k \) denote the number of levels of the \( k \)th index \( i_k \) and let \( m_{jk} \) denote the value assigned to the \( k \)th index on the \( j \)th Dummy Variable Card.

\[ d_{jk} = \begin{cases} m_{jk} & \text{if } m_{jk} \neq 0 \\ 1 & \text{if } m_{jk} = 0 \text{ (or blank)} \end{cases} \]
For $i_k = 1, \ldots, n_k$ and $\ell = 1, \ldots, d_{jk}$ let

$$u_{i_k}^{jk\ell} = \delta_{i_k, \ell} - \delta_{i_k, n_k} + \delta_{\ell, d_{jk}}$$

For $\ell = 1, \ldots, d_{jk}$ and $i_k = 1, \ldots, n_k$ let

$$v_{i_1 \ldots i_p}^{j_{\ell_1} \ldots j_{\ell_p}} = \frac{p}{\prod_{k=1}^{d_{jk}}} u_{i_k}^{jk\ell}$$

For each $j$ this defines a set of $d_j = \prod_{k=1}^{d_{jk}}$ variables

$$v_{i_1 \ldots i_p}^{j_{\ell_1} \ldots j_{\ell_p}} = v_{i_1 \ldots i_p}^{j_{\ell_1} \ldots j_{\ell_p}}$$

For convenience we shall lexicographically order these variables on $\ell_1, \ldots, \ell_p$ with $\ell_1$ moving the fastest, $\ell_2$ the next fastest, etc., and denote them by

$$v_{j_1}, v_{j_2}, \ldots, v_{j_{d_j}}$$

These are the dummy variables specified by the $j$th Dummy Variable Card and used to represent the $j$th analysis of variance component $\mu_j$. The order of the entire set of variables is: the $d_1$ variables for the first component, the $d_2$ variables of the second component, etc., followed by the covariates in natural order. Let these be denoted by $z_1, z_2, \ldots, z_s$ and the corresponding regression coefficients by $\gamma_1, \gamma_2, \ldots, \gamma_s$. Then the full linear model can be written as

$$y = \gamma_1 z_1 + \cdots + \gamma_s z_s + e$$

Least squares estimates of $\gamma_1, \ldots, \gamma_s$ are obtained. An $F$-statistic is computed for each hypothesis of the form $\mu_j = 0$, $j=1, \ldots, \ell$ and least squares estimates of $\gamma_1, \ldots, \gamma_s$ under the hypothesis are obtained by eliminating the relevant variables. In addition, an $F$-statistic is obtained for each covariate. For each set of hypothesis cards an $F$-statistic for the hypothesis
\[ \sum_{j=1}^{s} a_{ij} \delta_j = c_i \quad i = 1, \ldots, r \]

is obtained. The values \( a_{ij}, c_i, r \) are specified on the hypothesis card.

Each matrix inversion is performed by pivoting on diagonal elements. Let 
\( S^{(k)} \) be the matrix as it appears after the \( k \)th pivot operation. The \((k+1)\)st 
pivot element is selected so that \( r_i = s_{ii}^{(k)} / s_{ii}^{(0)} \) is a maximum. If the largest 
\( r_i \) is smaller than \( 10^{-12} \), the matrix is assumed singular and the remaining 
variables are not used. The last value of \( r_i \) for which the corresponding variable 
is included is printed as the tolerance. A tolerance of \( 10^{-n} \) indicates that 
roughly \( 16-n \) places of accuracy remain.

7. **EXAMPLE**

The model used in the test problem is:

\[ y_i = u + a_{ij} + b_{ij} + c_1 x_1 + c_2 x_2 + e \quad i = 1, 2; j = 1, 2, 3 \]

Stated as a regression problem this becomes

\[ y = \sum_{k=1}^{8} \gamma_k z_k + e \]

The values of \( z_1 \) through \( z_8 \) generated for each cell of the design are indicated 
on the output. \( z_7 \) and \( z_8 \) are the covariates \( x_1 \) and \( x_2 \). In this case, the predicted 
cell values are the adjusted cell means.