A DISSERTATION PROPOSAL

The Influence of Adolescent Experiences
on the Development of Sex-Role Related
Attitudes and Life Choices of Young Women:
A Theoretical Development and Examination of
a Formal Model

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ABSTRACT

The proposed dissertation has two parts: 1) a theoretical perspective on the process of socialization; and 2) an examination of a formal model of factors that influence life choices and sex-role related attitudes of young women.

The theoretical perspective, which will hopefully be more fully developed in the dissertation, essentially sees socialization not as a short period of life in which the will of society is "imprinted" upon individuals, but as a life-long process of interaction between the individual and her/his social world in which the individual develops his/her view of reality (i.e. perception of self and the world around her/him). The process is not static, but is one of continual growth and development as individuals strive to affirm their existence, to maintain their self-esteem. This process may be characterized as one of symbolic interaction, as the individual's view of reality develops from the meanings s/he attaches to communications with other people. This process is seen as being constant throughout life. The content of this process, however, varies over time and from one social situation to another. Three categories of factors are seen as influencing the content of the socialization process: the individual him/herself, the others with whom the individual interacts; and the social structure in which the individual lives and interacts.

From this broad theoretical perspective the proposal narrows to an examination of factors influencing the life-choices of young women. Literature relating to this area is reviewed. Much conflicting research is found with virtually no attempts to examine interacting and confounding factors. Thus a formal model aimed at sorting out such interacting influences is proposed.

The data to be used for analysis of the proposal are discussed. Two methods of analysis are proposed: 1) examination of prediction equations with multiple-partial measures of association and 2) path analysis by first treating the data as interval and then employing dummy variables. Three appendices containing technical materials relevant to the data collection and analysis are included.

A final section of the paper discusses problems with the analysis. First, mathematical assumptions of path analysis that are rarely met in social research are discussed. Then a philosophical dilemma inherent in the proposal, if not in much work in sociology, is discussed. The initial theoretical development is essentially non-deterministic, assuming that within certain parameters determined by the social world individuals are free to develop their lives, to make their life-choices. Yet the proposed analysis is founded on inherent deterministic assumptions. Path analysis assumes that the dependent variables in the system may be totally accounted for (determined by) other variables within the system. Measures of association are not deterministic by nature and can be exceedingly useful. The questions with them come with the use of a proportional-reduction-of-error interpretation which assumes prediction as a goal in social studies. The basic dilemma of whether the knowledge gained from using these techniques offsets any harm incurred in their use is left unresolved, but not dismissed.

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The following proposal lies within the broad areas of "Socialization." The process of socialization seems extremely important as it defines the linkages between the individual and the rest of society. Thus, I shall first briefly discuss my theoretical conception of this process. Then I will define the specific area of inquiry of this proposal, review the relevant literature and discuss problems in the literature that lead to the research problem. Finally the mechanics of the proposed research will be discussed, including the anticipated findings, the nature of the data to be used, methods of analysis, specific problems with this analysis, and, finally, a proposed outline for the dissertation. Three appendices containing technical material related to the analysis are included.

1. The Nature of Socialization[1]

Inherent in my theoretical position are several assumptions about the nature of human beings and about society as a whole. My position falls into the broad perspective outlined by Mary Ellen Goodman that sees the individual "as a unit of society and a bearer of culture . . ., as at once the creator and -- to a degree -- the creature of culture." (1967, 13) In other words, I assume that individuals are thinking, acting human beings. Their fate is not determined

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by blind social forces. Instead, individuals, within certain parameters determined by their social world, are responsible for their own destiny. I also assume that society is a human creation. Individuals, building on both the past and the present, create their social world, yet this social world influences and in turn creates individuals. In this sense the relation of individuals with the world around them is dialectical. Individuals create their social world, but in this process this social world also creates them. (c.f. Laing & Cooper, 1971, p. 49)

Basically I see socialization as the process by which individuals come to define their place in the world in relation to people and objects around them. This is a life-long process, not a stage through which individuals may pass at one relatively brief moment of their lives. Instead, individuals are involved in continual processes of defining and redefining the reality around them. This is of course done by children (the stage on which most theorists have concentrated), but continues throughout the life process as individuals encounter new and different experiences.[2] Allport saw the development of "personality" (a concept somewhat different than my view of self-definition but highly related) in much the same way:

> Personality is less a finished product than a
> transitive process. While it has some stable
> features, it is at the same time continually
> undergoing change. (Allport, 1955, 19)

In many ways I see this process as identical to that described by existentialists when they talk about "becoming." Individuals may define their reality in one way; yet they continually meet other experiences which in some way counter this reality-definition. Then they must redefine their previous conceptions and pursue their "reality" again. Reality is seen here not as some kind of additive concept of meaning, but as a total gestalt, a way of viewing both one-self and others in the social world. Thus any redefinition of one's reality must involve alterations, additions, modi-fications that fit within that gestalt, that somehow make sense and have meaning within the individual's present reality definition.[3]

There is another way of viewing this process of "becoming" that may be more acceptable to a wider group of people. Adler, a man who developed upon Freud's work, saw the desire to maintain self-esteem as the main motivating factor in life. According to Becker, Adler saw self-esteem as "an inner self-righteousness that arms the individual against anxiety." (1971, 67).

> We must understand it, then, as a natural
> systemic continuation of the early ego efforts
> to handle anxiety; it is the durational
> extension of an effective anxiety-buffer. We
> can then see that the seemingly trite words
> "self-esteem" are at the very core of human
> adaptation. They do not represent an extra
> self-indulgence, or a mere vanity, but a matter
> of life and death. The qualitative feeling of

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self-value is the basic predicate for human
action, precisely because it epitomizes the
whole development of the ego. (Becker, 1971,
67, emphasis in original)

In our framework then we can interpret the process of sociali-
zation, the process of defining one's reality, as totally
intertwined with (if not identical to) attempts to maintain
self-esteem.

Individuals are continually pursuing goals of one kind
or another.[4] However, as they transcend or approach one goal
they define others. In this way individuals do not live
static lives with never-changing views of themselves and the
world around them. Contradictions exist between their view
of themselves and the world and what is presented to them as
true by others. In the process of recognizing the overcoming
these contradictions (a process which is dialectical by
definition), individuals gain a new view of their own
position within the world.

We should briefly consider the nature of these contra-
dictions and the question of their inevitability. It could
be said that contradictions that individuals encounter arise
from two theoretically distinct sources. First there are
the limitations set up by the structure of the society, the
structural definitions that limit what individuals may strive
for or attain, (e.g. sex and racial stratification). Perhaps
secondly there are more existential contradictions that arise
not as much in the instrumental sense of goal acquisition but

more in the sense of self-definition and reality-definition, the finding that what we once thought to be true no longer has the ring of clarity that it did previously. Whether such contradictions are or shall always be present is another question. Conceivably the first type of limitation could disappear in some kind of utopian social structure. However, the second kind of contradiction may be more permanent, for certainly an earmark of the human condition is the continual striving and reformulating and questioning of that which is or was once held to be true.

It is understood that this process of meeting contradictions and then overcoming them is not always completed; the contradictions may remain, perhaps because of the structural limitations mentioned above and to be discussed more thoroughly later, or perhaps because the individual is unable to psychologically face and overcome the contradictions. This inability to overcome the contradictions is not uncommon (and perhaps impossible to prevent) in our society. The presence of pathologies could be seen as one of its manifestations. Becker (1971) reached a similar conclusion:

> If there were any doubt that self-esteem is the dominant motive of man, there would be one sure way to dispel it; and that would be by showing that when people do not have self-esteem they cannot act, they break down. And this is exactly what we learn from clinical data, from the theory of the psychoses, as well as from anthropology. (75)

One of the real paradoxes of the process we are des-
cribing is that just as the person comes to be what we call
an individual, a human being, as he or she partakes in the
social world, in the world of symbolic gestures and communica-
tion and develops his or her sense of self-hood and self-
esteem, a process of alienation, of separation both from one-
self and from other people occurs. Following the work of
Adler, Reich, and the Gestalt psychology of Frederick Perls,
Becker suggests that

> The process of socialization is characterized by
> one fundamental and recurring fact: the child's
> natural urge to move freely forward, manipulate,
> experiment, and exercise his own assimilative
> powers is continually blocked. (58)

In other words, we must face a basic paradox. As
individuals become part of the social world (which they must
do to be truly human) they somehow give up part of their own
being, they lose part of their self. The attempts to regain
this self, to reaffirm the self as worthy, the quest for
self-esteem, may be seen as an attempt to combat this loss,
an attempt to overcome this contradiction. Here then we may
see the basic contradiction, the most overwhelming and
seemingly ever-present paradox, that as individuals become
part of the social world, as they begin to acquiesce in
various ways to what they interpret as being the desires of
others, they also give up part of themselves. They give up
part of their own being. Similarly, to look at the other

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side of the coin, as individuals try to develop that which

is unique within them, to keep secrets only to themselves,

to develop the unique portions of their personalities, they

cut themselves off from other people. They can never then

have a really complete union with others -- yet they can

never truly be themselves. Perhaps this is a paradox

inescapable in the human condition.

In this view of socialization I have incorporated

aspects of several theoretical perspectives. Among them are

symbolic interactionism, existentialism, and phenomenology.

From symbolic interactionism I accept three basic premises:

> The first premise is that human beings act
> toward things on the basis of the meanings that
> the things have for them. . . . The second
> premise is that the meaning of such things is
> derived from, or arises out of, the social
> interaction that one has with one's fellows.
> The third premise is that these meanings are
> handled in, and modified through an inter-
> pretative process used by the person in
> dealing with the things he encounters. (Blumer,
> 1972, p. 2)

In other words, I accept the idea that individuals produce

their "reality," their definition of themselves and the world

around them, from their interpretations of their interactions

with other people.

The symbolic nature of this interaction is important

to understand for it is not as much what others say or do

that influences what happens to an individual, but how that

individual interprets what is said or done, what the individual

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sees that action and communication reflecting upon or meaning
about him or her as an individual. Linking this symbolic
communication to the notion of alienation discussed briefly
above, Becker (1971) suggests that this implies that an
individual's self-esteem is rooted "in the internalized social
rules for behavior," (67), and, in this sense,

> the child's basic sense of self-value has been
> largely artificialized. His feeling of human
> worth has become largely a linguistic
> contrivance. And it is exactly at this point
> that we deem that he has been socialized or
> humanized! He has become the only animal in
> nature who vitally depends on a symbolic
> constitution of his worth. (67)5

In line with the phenomenologists I see the world as
a social creation. As individuals interact with the world
around them, they create a definition of that world and of
themselves. This process occurs continually so that indi-
viduals are constantly redefining and reassessing their place
within the social world.

From the influence of existentialists and Marxist-
existentialists (e.g. Sartre, de Beauvoir, Laing & Cooper,
Esteson) I emphasize that the actions of human beings are
not irrational or shaped only by biological drives. Instead,
all individuals want to become "transcendant human beings,"
to be in control of their own actions and lives. In this
sense the dialectic becomes important. As individuals inter-
act with the world around them they run into ideas or events

that seem to counter their view of reality or of what their
life should be. In facing these contradictions or negations
of their being and in overcoming or attempting to overcome
them they engage in a dialectical relation with the world,
a process by which they come to participate more fully in the
world as a human being.

From the work of psychologists like Allport, Adler,
and Otto Rank and anthropologists like Ernest Becker and Mary
Ellen Goodman, I have used the idea of the importance of
individual will, the possibilities of individual creativity,
and the motivating force of self-esteem. From Erich Fromm
and Abraham Maslow I appreciate the ideas of the potentialities
of individuals. (See Goodman, 1967, 1-31 for an excellent
brief discussion of these perspectives.)

In using these approaches then to describe the process
of socialization I am positing two things analytically:
1) interaction in the symbolic interactionist sense, and
2) the search of all individuals for a sense of meaning, for
self-esteem, for self-affirmation. Empirically these two
processes are inextricably intertwined. In the process of
interaction with those around them, individuals are engaged
in the process of becoming, of seeking self-esteem and
meaning in life. In the process of seeking self-esteem the
individuals must interact continually with the world around
them, for this self-esteem, this meaning, can only come

through communication, from the symbolic world of meaning that provides support for the lives of humans.

The paragraphs above outline the process of socialization; how it occurs and the ultimate goals and the motivations of the individuals involved. However, they do not specify the content of that process, the content of the interactions and the goals toward which people strive, nor the kinds of contradictions which they are likely to face. To put it another way, I maintain that the socialization process occurs continually; it is a life-long endeavor. We are always in the process of "becoming," of developing our ideas about ourselves, our place in the world, our relations to other people. Interactions with others never cease or we cease to be human. Likewise, in the existential framework the process of becoming, of facing contradictions in life, never ceases or we cease to be human, to live.

Thus I suggest that the basic process of interaction and the dialectic between individuals and the world around them remains essentially the same throughout the life process. The content and the intensity of this process, however, may vary from time to time both as the structural situation of the individual undergoes changes and as the individual is at different points in her or his own "process of becoming." In other words, both what one is as an individual at a certain point and the conditions of the social world in which one

finds oneself at a certain point in time influence the content of the socialization process and thus how an individual will come to define his or her place in the social world. Below I shall examine different categories of factors that I feel influence the content of this socialization process.

The factors that may influence the content of the socialization process fall into at least three different categories: 1) those related to the individual as a unique human being; 2) those related to individuals with whom our person of interest interacts at certain points within the life cycle; and 3) structural characteristics defined as relevant by the dominant socio-economic ethos.

No two individuals are alike. Even new-born infants have different responses to other people, to loud noises, to visual and tactile stimuli.

The unique nature of each human being may influence the way he or she interacts with the world around him or her, the meanings she or he assigns to actions, the responses she or he chooses, in short, the way that the socialization process proceeds for him or her. This idea of the uniqueness of each human being is not only basic to our analysis, but also to the symbolic interactionist and existential approaches.

Not only does the uniqueness of the individual influence the content of the socialization process, but where an

individual is at a certain point in time, his or her self-definition at that moment influences the content of that process. For example, as a person grows older some of her or his talents may become more used or may be more in demand than others and thus become more developed. Thus the individual may develop a different self-view and a different view of others at one point in time than at an earlier one. This different self-view, the place that the individual is in their own process of becoming, influences the content of his or her socialization process.

Secondly the individuals with whom our person of interest interacts influence the content of the socialization process of our person. They, too, are involved in their own socialization process, their own attempts to define their place in the world in relation to other beings. They too have their own innate capabilities, interests, and ways of facing the world. They too are at their own point in the process of becoming. Thus their influence on our person of interest is a function of all of these factors, of essentially their own self-definition and position in the social world. In their reciprocal role interactions with our person of interest these factors help shape the content of the interaction process, the types of expectations that are present, and the nature of the interaction itself.[6]

It is important to realize that not all of these other individuals' interactions with our person of interest are equally salient. Various factors, some as simple as frequency of contact and others as complex as degree of emotional involvement or perceived power within the larger social context may influence the salience of the interactions. For example, how important the expectations of the individuals are perceived to be and the attitude that the other individuals have toward our person of interest throughout the interactive process may influence how our person of interest interprets the interactions and responds.

It is also important to note that both (or all) participants in the interaction process are affected and changed by it. In other words, socialization is not a one-way street. The effects of the interaction on both (or all) members may not be identical (perhaps because of a variety of factors from physical reasons such as age, health, emotional involvement or status, to felt status and actual power in the relationship), yet all participants in the process are affected by what takes place.[7]

Finally, structural variables are important. They influence the content of interaction by defining accessible or potential goals of individuals and by defining the way in which certain groups of people may approach others. That is, they set limits on the content of the interaction process.

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Here I must be more explicit. Structural factors are defined as things like sex-stratification systems, sex-ratio of the society, the socio-economic stratification systems, racial distributions, overall ethos of the society (e.g., humanistic vs. authoritarian), and overall economic system of beliefs (e.g., capitalistic vs. socialistic). Within the categories defined by these structural characteristics there exist certain behaviors and attitudes which have come to be defined as "proper" or acceptable by people involved with those groups. These are then reflected in the reciprocal role expectations transmitted in interactions and in the way that certain attempts to "transcend" or to "become" are met by those in the world around the person.

Structural conditions also influence what kind of interactions may actually take place and the quality (e.g., intensity, importance) these interactions hold for the participants. For example, in a group with a male-female ratio of three or four to one, both the nature of an inter-action and the meaning attributed to it by the participants, regardless of sex, may be different than in a group with a more even sex-ratio.

As discussed above, I assume that individuals both create and are created by their social world. The human creation of a social world has been alluded to in the paragraphs above. Here I want to deal with the limitations

the social world places upon individuals. Perhaps the three
most salient division points of our society are class, race,
and sex. Within the categories defined by these parameters
certain behaviors and goals are seen as acceptable while
others are not. These unacceptable behaviors and goals are
perhaps expectations and social definitions built over the
years. Violating some would likely cause little actual harm
(e.g., electing an occasional woman official), while violating
others, or simply the continual overriding of limits like our
example would seriously challenge the actual structure, the
sex-class-race based divisions of our society. This can be
seen as coming from not only the actual danger to such a
system from something like an all-woman governing body, but
also the attacks such a situation would make upon the
definitions of reality held by members of the society. The
existence of these boundaries of acceptable behavior are
transmitted to individuals (and not just children) through
the process of symbolic interaction, the mutual communication
and understanding processes, detailed above. In this way the
structural imitations are continually re-legitimated and
redefined by the social group.

Of course not all limitations are equally sacred.
Some are surpassed much more easily than others. Again I
see this as a function of how the limitations affect indi-
vidual members of the social group, that is how essential

they are to maintenance of the interests of members, and the transmission of these views to each other. However, I don't mean to imply that only changed attitudes on the part of members of the social group will produce changes in these limitations and how they are applied. Certainly most of the limitations are tightly linked to conditions in the material world. For example, who may work at certain jobs is linked with the economic stratification of advanced industrial society. Changing views of people on how work should be divided will not affect empirical reality until these views are linked with action to change the actual nature of work division in the industrial setting.

This leads us to perhaps the most important point in this area, that in defining possible goals of behavior these structural conditions produce inherent contradictions and barriers to the attainment and maintenance of self-esteem. In this sense, by rigidly limiting the nature of the goals to which an individual may aspire and those which may be achieved, the structural conditions introduce lasting contra-dictions into an individual's life. These are contradictions that seem beyond any which can be overcome by one individual. If they are to be overcome, they must be faced by collective action of a group of people intent on gaining the ability to realize their own freedom.

Thus we come to the heart of a problem found in many

purely existential theories: is self-fulfillment or even

maintenance of self-esteem possible within an alienating

society? Perhaps in a pure sense it is not. However, in

trying to overcome the limitations present within such a

society individuals begin to transcend their existence. In

such efforts self-realization is being pursued. Only if the

individual refuses to face these contradictions and refuses

to try to overcome them is humanity and the pursuit of self-

affirmation denied.

This then is my formulation of the socialization

process:[8] It is a lifelong endeavor in which individuals

are continually "becoming," continually transcending present

experiences and contradictions in attempts to define their

own self in relation to others in the world around them.

They are continually seeking to develop and maintain their

self-esteem. All of this occurs in a dialectical process

where individuals continually discover alternative definitions

of themselves and the world around them. The individuals must

then confront these alternative explanations and come to some

new self-understanding, or to a point where they can live

with the contradictions. This process is seen as an universal

one, always involving interactions in the symbolic inter-

actionist sense where individuals come to define their reality

through their interpretation of interactions with those around

them. These interactions are not meaningless for the

individual; they are always directed towards making sense of the environment, towards developing a meaningful life purpose, towards self-affirmation.

This approach by itself, however, defines only the process and not the content of socialization. The content of the socialization process is seen as influenced by certain structural and human factors of the social world. In this sense the individual both shapes his or her social world and is shaped by it. Three different categories of variables are involved: those related to the individual and his or her own self-definition and definition of the world at any particular time; those related to significant others in his or her environment; and those related to the total social-structural or socio-economic context of the world (society) as a whole.

This process is not static. The content is always changing as the individual encounters new experiences and new outcomes. Of course some behaviors and attitudes persist over long periods of time. This could easily be accounted for by the continuing reinforcement such behaviors and attitudes get, and perhaps by the point in time at which they first appeared. For instance, for many years people will not question church attendance until they come into contact with individuals who do not assume such behavior is natural and always done. When they are involved in

interaction with such people, and their interpretation of the meaning of church attendance changes, their church going behavior may alter severely.

The above paragraphs present only an outline of the ideas and total theoretical position I hope to develop as the first part of the proposed dissertation. Among the areas I hope to explore and/or discuss in greater depth are classical and contemporary views of the socialization process; works in the area of existential and humanistic psychology (e.g., Perls, Maslow, Allport, Laing and Cooper); neo-freudians like Reich, Adler and Rank; anthropologists like Goodman and Becker; existentialists like Sartre and de Beauvoir; critical Marxists like Gramsci, Lukasc and Lefebvre; phenomenologists like Berger, Pullberg, Schroyer and Schutz; and symbolic interactionists, especially Mead and Blumer. Throughout these writings I propose to look for understandings and insight that will help me better focus and explicate the agreement presented above, to more clearly define terms used such as process, alienation and individuation, reality-defini-tion, becoming, self-esteem, and many more. I also propose to point out explicitly how my perspective differs from others in the field, and how research done over the years supports, adds, or detracts from that perspective. In other words I hope to somehow revise and develop the rather sketchy outline above into a more total and complete theoretical argument.

2. The Specific Problem of the Dissertation

The above outline gives not a theory that can be tested in the contemporary sense of Blalock (1964) or Simon (1957), but instead presents a perspective, a way of viewing phenomena that can never be totally tested, never proven or even disproven.

Perhaps we can conceive of the process of socialization as a large mountain. We, as mere small people, can only examine closely one part of that mountain at a time. We can stand at afar and see the whole thing in its grand entirety as we did above, but to examine any particular part of it we must take a closer look, necessarily blocking certain other parts of the mountain from our view as we do so. Our view of this mountain from afar may be seen as our overall theoretical perspective. Others may have other views, and we may try these views out periodically and compare their views with our own.[9]

Hopefully, other people are also examining other parts of the mountain, some with the same kind of instruments we use, some with other instruments and methods. Some may approach the mountain more closely than we do, some may stand further away and get a broader view. Some may look at the mountain at one season, some at another. Some may observe for many months, even years; some for only a short period. Periodically we all should send reports on

our observations to central transmitting stations that
relay the messages of what we see to each other. And, more
important, periodically we should all return to the vantage
points at afar to remember what the mountain looks like all
together. Thus we should try to merge the kinds of things
we have all learned so that even when we look at the
mountain from afar and see its total shape, we can know what
is happening at a closer range and how this affects and is
affected by the totality.

To translate this rather strange analogy into some-
thing closer to sociology, we are suggesting the need for
continual acknowledgement of the theoretical perspective
and assumptions underlying any research project. In
addition a number of methods and views of triangulation of
methods and perspective (Denzin, 1970, 471-475) are necessary
to understand as much as possible about a particular problem.
Through various methods we can come to revise our theory,
to understand more of its weaknesses, its strengths, to fill
in the specific details. By approaching the question of
socialization from a variety of angles and using a variety
of methods and then by merging and analyzing the various
results we can come closer to viewing the whole of the
problem before us.

For instance, there are several theoretical views
from which one can view the total situation of socialization

besides that sketched above (e.g. modeling theory espoused
by Bandura (1969) and Kohlberg (1966) or stimulus-response
theory espoused by B. F. Skinner and others). Using one of
these perspectives (or sometimes seemingly no background
perspective at all), researchers may look at infants,
toddlers, pre-schoolers, pre-adolescent young people,
adolescents, adults, males or females; in the family, at
school or with their peers; from a multitude of views.
Many methods may be used, from in-depth interviews to
observations, both long-term and short-term, in laboratories
and in natural settings. Unfortunately, in many of these
areas, the researchers fail to first merge or reconcile
their findings with those of others and secondly to step
back to the theoretical perspective from which they began
and redevelop and regroup their theory. This, sadly enough,
seems to be what has happened in the area I propose to
explore more closely, the sex-role related attitudes and
behaviors of young women.

If women are to achieve fulfilling and independent
lifestyles it seems important to understand the effect of
experiences in adolescent and childhood years on later
activities. Thus I propose to study the relative influence
of various aspects of the total life experience on attitudes
of late adolescent women toward their future life choices.
In other words, in the context of the earlier theoretical

development I am bracketing the question of "process" of socialization and looking at influences on the content of that socialization process as it regards the sex-role related attitudes and expectations of young women.

3. Definition of Terms and Concepts

Before proceeding to a review of the literature and my research plans, relevant terms and concepts must be briefly defined.[10] Sex-role-related attitudes are defined as attitudes regarding the proper delegation of behaviors and traits between the sexes. Sex-role-related behaviors are the actual things people do or want to do with respect to these types of behaviors and personality traits. It is not expected that there will be a perfect correspondence between an individual's sex-role related attitudes and her or his actual and expected or desired behaviors (see Wood, 1972). The adjectives neo-traditional, non-traditional and traditional may be appended to the terms above to indicate the nature of these behaviors and attitudes. Traditional behaviors and/or attitudes are those common to a person in a certain normative situation; i.e., those expected within a certain cultural or social context. Non-traditional, of course, is the opposite; and neo-traditional attitudes and behaviors include those that may be part of both extreme categories or intermediate to them. The term

"life choices" refers to the types of decisions an individual makes regarding the course and direction of her or his life. The same descriptive categories of non- and neo-traditional and traditional may be used with this term. Finally, the phrase "content of the socialization process" in line with the development in section 1 refers to the quality and actual nature of the interactions between an individual and her or his communicants, as influenced by the social interaction of the interacting people.

4. Review of Related Literature

Many studies have dealt with the development of career orientations and life plans of young men. Far fewer studies have, however, included both men and women in their samples or looked at women alone. No work found involving women joined its various findings into an analytical or critical summary or provided a total theoretical framework into which the results could be gathered. Several works have dealt extremely well with aspects of the total situation (e.g. Johnson, 1963), but most authors have ignored previous findings in the area producing discrete, even contradictory results. Little attempt has been made to examine possible interactive and confounding effects of the various independent variables. No attempt at developing a multidimensional view of the effect of life experiences on choices of young women has yet been attempted.

Studies related to the problem come mainly from the fields of counseling and education. Methodologies are usually one of two types: survey, questionnaire type methods or projective tests such as those used by counselors. Several papers (Boyle, 1966, Sewell and Shah, 1967; and Johnson, 1963) used earlier studies in support of their theories in addition to sometimes adding data of their own. Although the problem would suggest the use of longitudinal research, only three of those reviewed employed such tactics: McDill and Coleman (1965) who dealt only with the high school years, Thistlewaite and Wheeler (1966) and, to some extent, Freedman (1967). Both of these papers examined the experiences of college students.[12]

The works reviewed usually studied women in college or their last years of high school. The dependent variable involved their life-choices; usually whether they were of a traditional or non-traditional variety. This dependent variable was defined in numerous ways, from including any woman who wanted to work in the non-traditional category to examining the type of occupation and pattern of work-life desired or the sex-role related attitudes expressed. As each of these definitions must include at least some common element, studies using them will be reviewed together here. We shall review first the structural and demographic indices used as independent variables, and then the more subjective

or social psychological factors uncovered by these studies.
We shall not review the works one by one with a critique of
both their theoretical and methodological bases, but will
instead simply relate relevant findings.

Though not the primary focus of our study, the effect
of academic experiences on life-choices should be mentioned.
One aspect which, according to Boyle (1966) appeared in
several studies, involves the size and the quality of the
high school, especially its "success . . . in developing the
scholastic abilities of (its) students." (1966, 639) The
effect of the aspirations of a student's peers is also
important. (Thistlewaite and Wheeler, 1966; McDill and
Coleman, 1965) The effect was found to be slightly more
intense for boys (McDill and Coleman, 1965, 119), but for
both sexes the influence of in this case the student's
social status in the high school or the status of his or her
peer group was more important in determining life plans than
the family's background as measured by the father's educational
attainment. Looking at college women in a longitudinal study
Thistlewaite and Wheeler (1966) also noted the importance of
the educational aspirations of peers, adding that encourage-
ment by teachers and academic achievement and recognition
also enhanced future work.

Related to these variables are the work experiences
and the interests of a woman. In a longitudinal study in a

small private co-educational college Almquist and Angrist (1970) reported that the choice of "careers" or atypical occupations depended more on enriching experiences, influence by people in areas of interest, and actual experiences in a variety of fields rather than on specific "deviant"-type variables like unique dating patterns, extra-curricular activities, relations with parents and work values.

When we turn to family related factors we see a preponderance of discrete findings with few attempts at integration. While some authors find no relation between a family's social status and a daughter's work orientation (Seigal and Curtis, 1963; Zissis, 1964) others emphasize that social status has greater explanatory power than IQ in explaining college aspirations and graduation (Sewell and Shah, 1967) with slightly less significant results holding for the level of occupational aspirations. (Sewell, Haller, and Strauss, 1957, 70-71) Similarly, King, McIntyre, and Exelson (1968, 633-5) reported that higher social status ninth graders were less threatened by the prospect of maternal employment than lower status students.

Seigal and Curtis (1963) found the parents' educational level of no explanatory value, and McDill and Coleman (1965) found that high school status was a more highly predictive variable. However, Cecilia Zissis (1964) in her study of college women, although finding no differences in

28

social status of the parents, reported that the fathers of "marriage oriented" girls in contrast to fathers of "career-oriented" women were more likely to be college graduates. (156) Fogarty, Rapaport and Rapaport reported a similar finding using the occupational level of the father as the independent variable. (1971, 313-4)

Perhaps related to these findings is the report that differences in the attained educational level of the parents are related to career orientations of the daughter. Again the evidence here seems inconclusive. Meier (1972, 119) reports that a more highly educated mother and less well educated father "optimizes the probability of egalitarian attitudes toward women's roles" with the opposite effect also holding true. On the other hand Eyde (1958) in a study of college alumnae (class of 1953) found an association of "high work motivation" with "lower formal education for their mothers; and their father's occupational prestige" being in the "middle prestige category." (47) Eyde did not directly compare the educational levels of the parents, but it appears that her data did not show the differences reported by others.

The hypothesis that a working mother leads to a daughter having more positive feelings toward women working has also been examined several times with usually supportive findings resulting. (Almquist and Angrist, 1970, 246;

Eyde, 1968, 47; Zissis, 1964, 156; King, McIntyre, and Axel-
son, 1968; Fogarty, et al., 1971, 311-312) However, Lipman-
Blumen (1972, 37) found no relation between a mother working
and a daughter's sex-role ideology. Not only the actual
work status of the mother but the prestige of the mother's
occupation has been associated with the daughter's sex-role
orientations (Almquist and Angrist, 1970, 246; Meier, 1972,
119-120). According to these studies, young women with
mothers in higher prestige jobs were more likely to want and
to approve careers for women.

The final structural factors to be mentioned involve
the home situation: family division of labor, family power
structure, and the position and number of siblings in the
parental family. King, et al. (1968) reported that the
perception of maternal employment held by ninth graders was
more positive, especially for girls, when the father par-
ticipated more in household tasks. (636-7) Similarly,
Lipman-Bluman (1972, 37-8) noted that women from families
where the mother or neither parent was dominant tended to
have more contemporary sex-role ideologies.

Although Lipman-Bluman (1972) found no relation of
having siblings, either younger or older, sisters or
brothers, to sex-role ideology, Sutton-Smith and Rosenberg
(1968) studied the two child family (girl-girl and girl-boy
dyads only) and found that girls from like-sex dyads, that

is with only one sister and no brothers, tended to have

higher femininity scores on Gough's Scale of Psychological

Femininity than members of opposite sex dyads. (117-118)

Birth order was not found to significantly affect the

variance. Joan Acker and Mary Howard (1972), however, found

that women enrolling in feminist courses tended to be

predominantly first born children.

To briefly summarize this section, we have found that

the following factors have been studied in relation to sex-

role related attitudes and behaviors of young women: high

school achievement, size and quality of the high school

attended, aspiration of peers, social status of the woman

in school, work experiences and interests, family social

status, educational and occupational status of the parents,

family division of labor, familial power structure, and

presence and order of siblings in the parental home. In

line with the theoretical perspective given in section 1 we

can interpret these findings as meaning that the presence

of these conditions influence how a woman interacts with her

social world and the meaning these interactions have for her.

In defining the social structure in which a young woman may

find herself, these factors influence the nature of choices

to which she is exposed and the attitude which she perceives

others as taking, which she perceives others as wanting her

to take, and which she may take herself toward these choices.

We shall now turn to more subjective factors, looking first at research on the influences of attitudes of the parents, the parents' satisfaction with life, and finally, the relation of the daughter to her mother and father. In an excellent study of high-school students in a northern city, John Scanzoni (1967) dealt with why middle class boys and girls had consistently higher occupational and educational expectations than working class youngsters but had no measurable differences in aspirational values (e.g. on how important it is to "get ahead.") He suggests that it is important to distinguish interactions that shape personalities and those that tend to define attainable and unattainable goals or norms in the educational and occupational realms, and that the attitude of the parents toward the types of educational and occupational opportunities open to a child is more important in determining a child's achievement expectations and level than are differences in nurturance, warmth, and other relational variables.

An analogous argument could be made for the achievement of women, with the attitude of the parents regarding the proper avenues of educational and occupational achievement being important in determining her (the daughter's) actual achievement. Note that here we see the attitudes of the parents as influencing the content and nature of their interactions with their daughter. Perhaps lending support

to this thesis Lipman-Blumen, though she also noted the influence of personality related and structural variables, noted (1972, 39) that parental encouragement, especially that of the mother, was associated with a contemporary sex-role ideology.

Esther Matthews (1964) in a study of women in three life-stages (junior high, senior high, and young adult) although not directly concerned with the issue of socialization suggested that "a woman's perception of the male attitude toward her use of her intelligence" was important in her choice of life styles. (382) This statement seems to be directly supportive of our theoretical perspective. That is, a woman's self perception, which through interactions with people around her, influences choices she will make throughout her life.

Not only the attitudes perceived as directed toward the child, but the parents' attitudes toward their own life-style (or the child's perception of these attitudes) appear important in influencing the future life-choices of young women. Not only whether a mother works, but her orientation toward her work, has been shown to be related to a daughter's future life style desires. (Seigal and Curtis, 1963; Fogarty, et al., 1971, 311-12) Somewhat similarly, Lipman-Blumen found that daughters who perceived their mothers as being less than satisfied with life were more likely to choose more "contemporary" life styles. (1972, 38)

Steinmann, the only researcher to contact both
parents and children, suggested that the attitudes of young
women toward their future reflected both the views and the
actions of their parents. The fifty-one girls in her sample
expressed primarily traditional or neo-traditional views.
Most of their mothers felt that working after marriage was a
heavy burden and the fathers seemed to usually feel that
women should not work until their children were grown.
Steinmann suggested (and the basis for this suggestion is
not completely clear in her article) that the attitudes of
the girls reflected both the views and the actions of their
parents. In feeling it was possible to both work and raise
a family they were voicing the unfulfilled desires of their
mothers, but in attaching little importance to work and
being more home-oriented than work-oriented they were
reflecting the difficulties of their mothers' work experi-
ences and the attitudes of their fathers. (1970, 29-31)

How the attitudes and attentions of the parents
influence the developmental process has attracted theoretical
interest. In an excellent piece supported both by her own
research and that of others, Miriam Johnson presented this
thesis:

identification with the father, in the sense
of internalizing a reciprocal role relationship
with the father, . . . is crucial for producing
appropriate sex role orientations in both males
and females. (1963, 319)

In other words, Johnson suggested that the attentions and
attitudes of the father are essential in producing both the
traditional "male-associated" traits and behaviors in boys
and the "female-associated" traits in young girls; inter-
action with the father is crucial in the development of sex-
role differentiation. Johnson cites numerous empirical
studies to support her thesis. These include studies on
parental attitudes toward and roles with their children, and
identification of the child with the parents. Finally she
cites two studies that

> strongly suggest that those girls who were
> least feminine had fathers who were not
> solidary with them, while the most feminine
> girls had a solidary relationship with the
> father in which he was highly expressive.
> On the other hand, we found that the descrip-
> tions of their mothers given by the girls
> were not related to the latter's sex-role
> orientation. (330)

Perhaps, if we see father dominance in the family as somehow
related to greater associations with and thus greater soli-
darity with a daughter some support of this theory comes from
Lipman-Blumen's report that

> women with a contemporary sex-role ideology
> tended to come from families in which most of
> the time neither parent was dominant or from
> families in which the mother was dominant.
> When the father was more dominant in the
> marriage, the tendency of the daughter to
> develop the traditional concept of the female
> role was enhanced. (1972, 38)

However, when we examine the reported relations be-
tween the daughter and her parents in other studies reviewed

the findings seem somewhat more confounding. Fogerty et al.
(1971) reported that women who emphasized likeness with their
father more than with their mother tended "to be slightly
more career oriented." (311, emphasis in original) Looking
at the general quality of the relations Almquist and Angrist
(1970) reported a slight tendency for women making an
atypical career choice to report more negative relations
with both their parents. Somewhat similarly Lipman-Blumen
(1972) reported

> a slight tendency for women who admired their
> fathers more than their mothers to hold the
> contemporary view, whereas women who admired
> their mothers more tended to favor traditional
> sex-role related attitudes (39)

Women with the contemporary ideology were "most likely to
have rejected both parents as objects of admiration."
(Unfortunately Lipman-Blumen's analysis went no further
than percentage comparisons with no tests of significance
or multivariate analysis reported.)

On reflection, these research reports do not
necessarily conflict with Johnson's theory, but could easily
converge with her ideas. A major problem concerns the
different forms variables take in the studies. Johnson's
theory concerns sex-role identification apart from parental
identification, essentially the learning of sex-role dif-
ferentiated traits after the period of infancy. Parental
identification may be seen as the extent to which an

individual sees her or his actions, beliefs, and attitudes as similar to those of his or her parents, while sex-role identification may be seen as the identification of an individual with the usual or normative behaviors or attitudes appropriate to his or her sex. The learning of reciprocal role relations in Johnson's sense is quite apart from the assumption of personality traits or habits (Johnson, 1963, 327; Lynn, 1966, 282), and thus it could well be that a woman who did not have a solidary role relationship with her father and later was "less feminine" than the norm would come to see her personality traits as more like the instrumental qualities of her father than the more expressive traits of her mother. Or, conceivably seeing both parents as representing traditional life-styles and attitudes, the woman would reject both parents as being unlike herself or not worthy of admiration.

Obviously more work remains to be done on clearly delineating the implications and interconnections of these various theoretical positions and empirical results. We can note, however, how factors in the above paragraphs relate to our theoretical perspective. The following interpersonal and social-psychological variables have been noted in relation to the development of a woman's sex-role related attitudes and behaviors: parental views on the proper avenues of educational and occupational endeavor, amount of

parental encouragement, the attitude of significant males in a woman's life toward her "use of her intelligence," the parents' own satisfaction with their lives and, finally, the quality of the relationship between the daughter and her parents. In line with our earlier theoretical development we may see these factors as influencing not only the content of the socialization process, but also the nature of the interaction itself, its emotional overtones and subtle currents that affect not only what is said between the young woman and others, but also how the young woman interprets these interactions and how these interactions then affect her later interactions and decisions.

5. A Formal Model is Proposed

None of the research reviewed could be said to be definitive. Many writers ignored the findings of others; some seemed to have no theoretical basis; others had such poor methodology that little faith could be put in their results. It does seem feasible, however, that a re-examination of these findings in a more formal framework could be instrumental in both stating precisely the questions raised by the literature and in developing a better theoretical understanding of factors influencing the life-choices of women.

On the preceding pages contradictory or inconclusive findings were reported with respect to each of the following independent variables: the family's social status, father's education, mother's education, mother working, siblings in the parental family, and, to some extent, the relation of the father and mother to the daughter, and the daughter's admiration of her parents. As none of the studies looked at all of these variables together and tried to discern their inter-relations and interactions, the present state of theoretical understanding is bleak. We suggest, however, that many of these variables are interrelated, and that through studying their interactions and spurious effects we may begin to unravel the morass of variables.

It sometimes happens that a large number of individual variables actually represent or are related to a smaller number of underlying factors. In the case of the variables listed above regarding family structure and interactions and attitudes of family members we could hypothesize the existence of three underlying factors. One of these under-lying factors is hypothesized as being the young woman's c_l potential access to a range of life choices. This access is influenced not only by the young woman's social status and her parents' occupational and educational background, but also by the perception of her parents as to possible alternatives and opportunities open to her.

A second factor that may emerge from the various discrete variables suggested by the literature could be the saliency of available role models; the presence and attractiveness of models of alternative behavior for a young woman. This factor could include the mother, the peer group and other relatives, their life styles and happiness with them, the academic environment, and the interactions of these people and situations with the individual woman.

The third underlying factor may involve the relative dominance of the parents within the home. (See Wood, 1972 for a more detailed discussion of this area.) For instance, the participation of the father in household tasks, the relative education and occupational prestige of the parents, the work status of the mother, the family's socio-economic status, the ages of the children, and the nature of parent-daughter interactions are conceivably all related to the relative dominance and influence of the mother and father in the family as well as to the sex-role related attitudes of a daughter. It is also suggested that the last variable in the list above, parent-daughter interactions, not only influences the hypothesized third factor, but is itself influenced by the other variables in that list.

To enhance an understanding of the relations discussed above, a formal model of independent, intervening and dependent variables with the suggested underlying factors

involved in our problem is shown on the following page. The
model is presented in a block recursive format with the
assumption that variables within a given block are
interrelated. No causative relations between variables
within a block are hypothesized. Blocks within a column
are seen as interrelated but again no causative relation is
postulated. The causative relation comes between columns
moving from left to right with one way causation from one
column of block variables to the next.

Two ways of analyzing or testing this model will be
employed. First, following the work of Sullivan (1971) and
Wood (1973) multiple-partial measures of association will
be used to test the prediction equations of the model.
Secondly, using dummy variables to develop regression
equations, an extension of path analysis will be employed
to analyze the causal relations between the groups of
variables. With both of these methods the results will help
us rearrange the model to better fit the data, and the
results from the two methods may be compared. These methods
will be more thoroughly discussed in the following sections
and in appendices 2 and 3. At this point we shall discuss
further the theoretical implications of and hypotheses
related to the model presented above.

In the model, pre-existing conditions related to a
woman's home and school environment that have been suggested

as being related to her future life styles are presented in
columns A and B. Column C contains the factors earlier sug-
gested as underlying the variables in columns A and B: the
position of a woman within the social structure that deter-
mines her access to alternative styles of life; alternative
role models available to a woman, their adequacy and
saliency; and the structure of the parental family, espe-
cially the relative dominance of the mother and father.

Block A_1 contains variables hypothesized as related
only to the first factor. Larger and better quality schools
and academic achievement and recognition are both seen as
related primarily to a woman's favorable position in the
social structure and her access to more alternative styles
of life. Block A_2 variables are seen as related both to
factor one and to the second factor of alternative role
models. The variables here include the attention and
encouragement of teachers and professors, the higher
aspirations of peers, higher status in the school social
structure, and higher social status of the family. Implicit
is the opposite thesis that the absence of these character-
istics or their negative component (e.g. discouragement of
teachers) would lead to less access to a range of choices
and to the presence of fewer salient role models and thus
eventually to more traditional life-choices. All of the
variables in the two blocks are seen as interrelated with

no causative effects postulated between them.

Variables in blocks A_3, A_4, and A_5 have been the focus of our study. They contain the various family-related variables. Variables in block A_3 are hypothesized as related to all three factors. The relative education of the parents is postulated as being important with the hypothesis that in families where the father has more education than the mother the father will be more dominant, there may be fewer salient role models for the daughter and even though there may be structural access to alternatives they will not be encouraged and thus the daughter will be more likely to pursue traditional life styles. A similar effect is suggested for differences in occupational prestige. Finally, the siblings within the family, their sex, order, and age difference from the subject, are viewed as related to primarily the power structures and interaction patterns in the family. It is suggested that women with more male siblings at a closer age-range and/or women who are the oldest or only child will more often want non-traditional life-choices. How this variable is mediated by the hypothesized factors is a question that has not yet been firmly attacked theoretically and may have to await empirical examination. The perceived attitude of parents toward their children and toward each other is also viewed important as it influences the nature and quality of interaction in the

family, the woman's orientation toward her family, and thus

her reaction to possible role models. All of these variables

are seen as potentially interrelated with again no causative

relations posited. Similarly the entire block of variables

in A_3 is seen as related to blocks A_1 and A_2 (e.g., The

social status, education, and occupational levels of a family

may be related to the quality of school their children attend

and the attitudes of the teachers toward their children.)

The final block of variables in column A is seen as

related primarily to factors C_7 and C_8 and to variable B_5.

The mother's general satisfaction with life is seen as

related to the daughter's future life-style through influ-

encing the salience of role models and affecting family

dominance patterns and the nature of familial interactions.

We suggest that women whose mothers are dissatisfied or who

seem to their daughters to be dissatisfied will tend to

communicate this feeling to their daughters and their life

styles will then be a less salient choice for their daughters.

For instance, women who are perceived to or who actually have

a more intense dislike for homemaking and a greater liking

for employment outside the home are hypothesized as com-

municating this feeling to their daughters who in turn will

be less likely to desire this traditional life style. In

other words, that role model will be less salient. Homes

where the father is more likely to participate in household

tasks are hypothesized as being more likely to not have a traditional power arrangement and to affect the saliency of role models and are thus conducive to the production of non-traditional daughters. The attitudes and beliefs of the parents in relation to sex-role related attitudes and behaviors are also hypothesized as important. It is suggested that the sex-role related beliefs and attitudes of both the mother and the father will influence their interactions with the daughter and then influence her own life choices. The child-parent relations are the final factor to be included in this column. These variables are seen as contributing both to the power structure within the family and to the presence and salience of alternative role models. In line with the work above it is suggested that women from families with a mother dominated or more equalitarian rearing situation will tend to have and want more non-traditional life-styles. Similarly those girls more encouraged by their mother or equally encouraged by both parents to attain certain goals are hypothesized to be more anxious to pursue alternative life-styles. These variables are seen as contributing both to the power structure within the family and to the presence and salience of alternative role models.

There is only one variable in the second column, the nature and quality of parent-child interactions. These

role models-
where did
father go?
protective Diss
salience of
goals,
sal. of
encouragement

interactions are hypothesized as influenced by the variables in blocks A_3 and A_4; the parents' feelings about themselves, their sex-role attitudes and the nature of the family; and in turn to influence factor C_8, power structure within the family and the variable in column D, interests and experiences and feelings of the daughter about her family. We suggest that daughters who are more encouraged by their parents will seek more alternative experiences, while those who are more protected by their parents, especially by their fathers, will tend to pursue more traditional lines.

The third column contains the hypothesized underlying factors: position in the social structure reflecting the social and academic background of the woman; the presence and salience of various role models embodied by women in the young woman's environment; and the structure of the parental family, especially power differentials of the mother and father. This family structure is seen as providing the climate in which the other two factors must operate; the fourth column of variables is seen as caused at least partially by the factors in column C. Block D_9 contains variables related to the interests and experiences of the daughter. It is suggested that these interests and experiences are influenced by the woman's position in the social structure, the role models available to her, and the structure of and interactions in her parental family, and

in turn act upon the sex-role related beliefs and activities of the girl, her life-choices. It is also suggested that these two variables (interests and experiences) are inter-related and that it is impossible to determine any causative relation between them.

Block D_{10} involves the reactions of the woman to her environmental background, primarily her perceived similarity to and identification with her parents and her family. As implied earlier, it is suggested that women who perceive themselves as more like their father than their mother will be more likely to have non-traditional sex-role related beliefs and attitudes. Similar relations are suggested for admiration of the mother and father. Finally it is suggested that women who tend to perceive themselves as more dissimilar from the parental family will be more likely to desire a non-traditional life-style. Again it is suggested that the blocks of variables in column D may be interrelated but not in a causative fashion.

To summarize the expected relations between columns 3, 4, and 5, the following values of these factors are seen as related to more varied interests and experiences and through these variables to more non-traditional life-choices:

B_5) Supportive and encouraging relations with parents, especially the mother;

C_6) Greater potential access to alternative experiences, e.g. higher social status and GPA;

C$_7$) More actual and greater salient models of alternative life styles;

C$_8$) Egalitarian or mother-dominated family power structure which supposedly will lead to less solidarity with and/or exposure to the father and greater freedom for the daughter to explore avenues of interest.

The following values are suggested as related to greater perceived similarity to the parental family and then to more traditional sex-role related attitudes and behaviors:

B$_5$) Supportive and encouraging relations with parents, especially the protective attitudes of the father;

C$_6$) Less potential access to alternative experiences;

C$_7$) Fewer salient models of non-traditional life-styles;

C$_8$) Father-dominated family.

The variables in this column are finally seen as being causally related to the dependent variables in column E. These are titled "Sex-role related attitudes and behaviors" and within our formulation will be measured by the types of life-choices desired by the women in occupational, educational, and marriage and family plans and stated beliefs regarding the roles of women. It is suggested that non-traditional sex-role related attitudes and beliefs (i.e. those which agree with equality of women) will be evidenced by higher educational aspirations, the choice of occupational fields not traditionally held by women, and plans to either

postpone or reject marriage and the raising of a family; or to combine full time work outside the home with a career. In addition to such anticipated choices or behaviors we suggest that non-traditional attitudes may be evidenced by reactions to items regarding the role of women like those found on the Feminism Scale (WRSC, 1973). This scale measures adherence to positions favoring the development of life styles uncommon to the traditional position of women in American society. It is suggested that both a larger number of different interests and experiences and less perceived similarity to the mother and less closeness to the father will be related to measures of non-traditional sex-role related attitudes and behaviors.

Obviously not all possible influencing factors are included in the model and, as is common in such models, the presence of these extraneous variables or residuals is noted in the diagram by "R_i's" where i is some letter at the end of the alphabet. These residuals may be correlated with each other within a column but it is assumed in the path analysis framework that each residual variable may directly affect only one dependent variable within a relationship and is not related to any previous variables in the model (e.g., R_z and R_y may be intercorrelated, but R_z and A_1 may not be. Neither may R_u and R_z be intercorrelated).

6. The Data to Be Used

In conjunction with another larger study, some data from undergraduate women at the University of Oregon that is suitable for this proposal was gathered last year. In conjunction with this project we propose to revise the earlier schedule slightly, adding items not included in the preliminary test that would be helpful in this analysis and modifying and eliminating items found unsuitable in the first pretests. The original schedule along with a list of such modifications is included in Appendix I.

The data now available was gathered from students in introductory Sociology classes at the University in each term of the 1972-73 academic year. We propose to gather additional data in such a manner this year both at the University and at Lane Community College. Respondents at Lane will likely have a broader age span, and a more varied socio-economic status background than the University students and thus will add elements to the sample presently missing. Pretest data is now available for approximately 210 women students. It is hoped that about 500 additional respondents may be obtained for a total sample close to 700.[13]

In section 5 several variables were presented in a theoretical framework to be tested. In the final pages of Appendix I each of these variables from section 5 and

figure 5-1 are listed along with their proposed indicators
from the schedule. It should be noted that wherever possible
multiple indicators of the concepts or variables will be
used. (See Costner (1969) and Blalock (1971) for discussions
of the importance of this procedure.)

7. Data Analysis

The data analysis will involve four main steps, two
of which are more complex than the others: 1) a comparison
of results from each of the three groups included in the
sample (the 72-73 introductory classes, the fall 73 classes
at the university, and the classes at the local community
college; 2) testing of the model with prediction equations
and multiple-partial measures of association; 3) examining
the model with the use of path analysis and regression
equations based on dummy variables; and, finally, 4) com-
paring the results obtained in steps two and three.

It is anticipated that the obtained marginals may be
slightly different in the community college and the univer-
sity groups simply because of the different populations the
groups represent. However, the 72-73 groups of classes and
the fall 73 group should be more alike. To determine the
extent of these differences, percentage distributions,
medians and means of the distributions on all variables in
the model as well as age distributions from these three

groups will be compared with the aid of difference of means
and median tests. Any large differences should be examined
with respect to over time changes in the nature of the
responses. A decision on whether or not to group the sub-
samples together must be made at that time.

John Sullivan (1971) first suggested use of multiple-
partial measures of association to test prediction equations
of causal models incorporating multiple indicators of
variables. Noting the many advantages of using multiple
indicators in such models but problems coming with the large
number of prediction equations that must be tested if these
indicators are each used separately, Sullivan suggested that
researchers use "the indicators of the dependent variables
separately, but [allow] the indicators of the independent
and control variables to operate as a block." (329)
Sullivan also suggested that the researcher use the same
method to "check the assumptions upon which the model is
based, thus looking for non-zero multiple partials" (329)
as a complete test of the model.

Sullivan used only the multiple-partial form of the
Pearson product-moment correlation coefficient in his
formulation. While this has advantages of easy computation
and use with only a relatively small sample, it has implicit
assumptions and requirements that are often inapplicable to
data used in the social sciences. These include assuming a

linear relation between variables, multivariate normal distributions among all variables involved, and interval measurement of all variables. To counteract many of these problems I developed in an earlier paper several non-parametric multiple-partial measures suitable for variables measured on nominal and ordinal scales or for nonlinear relationships. While being potentially useful, they too have several disadvantages in that they can become relatively complex rather quickly and require large sample sizes for accurate results as they become more complex. (See Wood, 1973) Despite these problems one such non-parametric measure, multiple-partial gamma-k, will be used to test prediction equations in this model.[14]

The model presented in section 5 will be slightly modified for this analysis by eliminating the theoretical factors C_6, C_7, and C_8. In this form then, the model presents 5 different blocks of predetermined variables: A_1) Those regarding the school background; A_2) Those regarding social status factors; A_3) Family structural variables; A_4) Parental attitudes toward the daughter; and A_5) Parental interactions with the daughter. A_3 and A_4 are seen as influencing B_5, and all five blocks of variables, A_1, A_2, A_3, A_4, and B_5, are seen as influencing the two intervening variables: D_9) Interests and experiences of the young woman; and D_{10}) Activities with and perceived

similarities of the daughter to the parents. Then these
two intervening variables are seen as related directly to
the four dependent variables: $^{\epsilon}D_{11}$) Educational aspirations;
$^{\epsilon}D_{12}$) Occupational plans; $^{\epsilon}D_{13}$) Marriage and family plans;
and D_{14}^{ϵ}) Sex-role related attitudes. Note that in this
form of the model (See figure 7-1) the predetermined
variables act on the dependent variables only through their
influence on the intervening variables. It is this relation
that will be tested by the prediction equations.

Although it is possible to apply tests of signifi-
cance to the results obtained with this method, it shall not
be done here because we do not have a probability or random
sample. Thus, we will not be "testing" prediction equations
in the precise sense of the word. Instead, using the pro-
portional reduction of error interpretation of the measures
to be used we will examine the degree to which the proposed
arrangement of the model does or does not reduce prediction
error in the dependent variable. (See Costner, 1965; and
Wood, 1973 for further details both on the proportional
reduction of error (PRE) model and on the PRE interpretations
of multiple-partial non-parametric measures.) Note also
that no residual factors are included in figure 7-1.
Determination of relations with such residual factors is not
conventional when techniques of this process are employed.

Figure 7 - 1
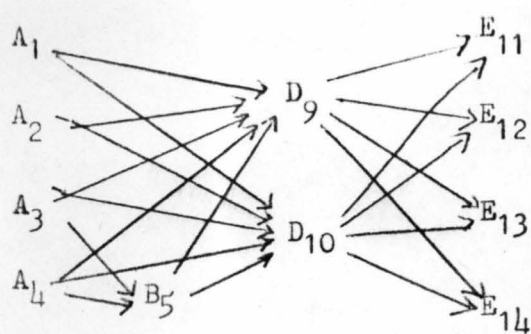
A$_1$: School background
A$_2$: Social Status
A$_3$: Family structure
A$_4$: Parental attitudes
B$_5$: Quality of interaction
D$_9$: Interests and experiences
D$_{10}$:Identification with
    parental family
E$_{11}$: Educational aspirations
E$_{12}$: Occupational plans
E$_{13}$: Marriage and family plans
E$_{14}$: Sex-role related attitudes

- - - - - - - - - - - - - -

Table 7 - 1

Prediction Equations from Figure 7 - 1

gamma-k 11 $(1,2,3,4,5)|(9,10) = 0$ gamma-k 14 $(1,2,3,4,5)|(9,10) = 0$

gamma-k 12 $(1,2,3,4,5)|(9,10) = 0$ gamma-k $9,5|(3,4) = 0$

gamma-k 13 $(1,2,3,4,5)|(9,10) = 0$

Assumption Equations from Figure 7 - 1

gamma-k $5,3 \neq 0$	gamma-k $9,4 \neq 0$	gamma-k $10,4 \neq 0$	gamma-k $11,4 \neq 0$
gamma-k $5,4 \neq 0$	gamma-k $9,5 \neq 0$	gamma-k $10,5 \neq 0$	gamma-k $12,1 \neq 0$
gamma-k $9,1 \neq 0$	gamma-k $10,1 \neq 0$	gamma-k $11,1 \neq 0$	gamma-k $12,2 \neq 0$
gamma-k $9,2 \neq 0$	gamma-k $10,2 \neq 0$	gamma-k $11,2 \neq 0$	gamma-k $12,3 \neq 0$
gamma-k $9,3 \neq 0$	gamma-k $10,3 \neq 0$	gamma-k $11,3 \neq 0$	gamma-k $12,4 \neq 0$

However, by using PRE statistics we will be able to deter-
mine what proportion of the error in our dependent variables
is not explained by the model and thus what proportion of
this error in a completely determined system must be
explained by other variables (i.e. residuals variable).[15]

Table 7-1 gives both the prediction and the assump-
tion equations to be tested with the model in figure 7-1.
The details on the categories involved and table set-up
are given in Appendix II. Because the number of categories
involved in such a formula as the first one in table 7-1
very quickly become enormous a method is proposed in
Appendix II for collapsing the categories as much as
possible. This method still uses the information provided
by the multiple indicators but makes the test of the model
much easier and hopefully more accurate by allowing cell
frequencies to remain relatively large.

Because we cannot actually "test" the prediction
equations some method for determining when a value of γ-k
actually supports an equation is needed. It is proposed
that the value of .10 be taken as an arbitrary dividing
point. That is if $\gamma_k \geq .10$ we shall say that an H_O $\gamma_k = 0$
may be rejected, but if $\gamma_k < .10$ that hypothesis may not be
rejected. (Note: If such a division proves unrealistic
for the set of data and sample size appropriate changes
may be made. Obviously this is only a rule of thumb and

should not be any kind of hard and fast rule.)

As often happens in testing such models the prediction equations and/or the assumption equations may not be supported by the data. This eventuality should not be seen as an indication of failure, but instead provides the opportunity for reformulating the model to better fit the data available. The process of finding the correct or best way of reformulating the model is painstaking, but will hopefully be rewarding.

Consider the possibility that gamma-k 11(1,2,3,4, 8) / (9,10) is found to be quite a bit higher than zero. That is, when the effect of the two intervening blocks of variables is removed, the predetermined variables still have some predictive power of dependent variable 11, educational aspirations. The problem then is to determine exactly how these predetermined variables affect the dependent variable since it is not in the hypothesized manner. The first step would be to compute the multiple partials gamma-k 11(1,2,3,4,8) / (9) and gamma-k(1,2,3,4,8) / (10) to see if the effect of the predetermined variables is absorbed or mediated by one of the intervening variables, but not by the other. This would be the case if one of these last two equations approached zero while the other did not. If only one or neither of these measures approached zero, it would be necessary to assume then that some of the affect

of the predetermined variables directly affects the dependent variables. We would then proceed to examine how this happens by looking at the relations of each predetermined variable alone and in combination with the others with the dependent variable while controlling for the intervening variables (e.g. look at gamma-k 11(1) / (9); gamma-k 11(1) / (10); gamma-k 11(1) / (9,10); gamma-k 11(1,2) / (9), gamma-k 11(1,2) / (10) and so on).

Such a continuous process of reformulating and testing relationships should lead to a better understanding of the actual interrelations among the variables involved. During the reformulation process the earlier collapsing of categories necessary for the first testing of the prediction equations (see Appendix II) should be reversed or modified so that nonmonotonicity and/or confounding effects may be more easily detected. Similarly, controlling for some predetermined variables while testing the effect of others should not be forgotten. Finally, when a model has been reached that seems to provide the maximum explanation of the dependent variables a new model may be formulated to show these relationships.

Whether or not one may arrive at a final choice of a model without trying all possible combinations of variables to see which best explains the dependent variables is at best an open question. It is hoped that the theoretical

ask about — will we have to look at all ways?

if try all may get better one thru capitalizing on error —

discussion in section 5 and the research of others described in section 4 will help shorten this process as much as possible.

It should be emphasized that we cannot and should not expect our measures of association to approach unity. Throughout our initial theoretical statement we emphasized the existence of individual will as an important factor in all life choices. That element cannot be ignored here. Precisely because we recognize the input of individual will in the making of life choices we cannot anticipate ever having measures of association approaching unity. (See also section 8.)

The third step in the analysis will be as complex as the second. It involves an examination of the formal model presented in section 5 with path analysis, a statistical device designed to demonstrate the interrelations and patterns of direct and indirect effects of independent and intervening variables upon dependent variables in linear causal models. (Land, 1969; Duncan, 1966, 1971) Land described the process of using path analysis as follows.

> Using the results of past research and current theory, the causal model is written as a set of structural equations that represent the causal processes assumed to operate among the variables under consideration. The structural equations in turn lead to parameter estimation procedures and evaluation of the model. The outcome of the empirical evaluation process is either the corroboration or reformulation of the causal

model. Finally, the inadequacies of the model
should precipitate a reconstruction of the
substantive theory that generated the causal
model at the outset. (1969, 4)

Figure 7-2 gives the causal model to be used in this
part of the analysis in pictorial form. As can be seen,
this model is not written in the block format as before, but
the various indicators in the block have each been written
separately. Note that still, moving from left to right,
variables in one column (except for the situation with A_{31}
to A_{43} and B_5) influence only variables in the next column.
No feedback loops are included.

The method assumes that the relationships among
variables are linear, additive and causal and that the
variables are measured on an interval scale. (Land, 1969,
5) It allows the inclusion of hypothetical variables like
C_6, C_7, and C_8 in our model. However these hypothetical
variables must be assumed to be continuous. The total
variation of the endogenous or dependent variables in the
system is assumed to be caused by variables included within
the system. In other words these dependent variables are
completely determinable. If the exogenous (predetermined
or independent) variables cannot completely account for the
endogenous variables, a residual variable assumed to be
entirely uncorrelated with the exogenous variables is seen
as the source of the remaining variation. (Land, 1969, 5-6)

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These residuals may be correlated with each other within a
column but may not be assumed to be correlated with any
independent variables related to that or any previous
dependent variable (e.g. R_5 may be correlated with R_6 but
not with A_{11}).

Some basic definitions and assumptions of path analy-
sis will be discussed and then we shall present briefly the
steps in this part of our analysis. In figure 7-2 the
causal relations between variables are shown by straight
lines with unidirectional arrows from an independent or
intervening variable to a variable dependent upon it. Non-
causal relations are shown by two-headed curved arrows. The
residual variables are shown by the letter R with letter
subscripts. Their direct effect on a dependent variable is
shown by straight unidirectional arrows while their non-
causal relations with other residual variables are shown by
curved, two-headed arrows. (Land, 1969, 6-7) We must
assume that the mean value of these residual variables is
one. If we were to use tests of significance we would also
have to assume that they have a normal distribution.
Finally, the p_{ij}'s refer to path coefficients, where i
denotes the dependent variable and j denotes the causal
variable on that arrow.

Following Sewell Wright (1934) Land defines a path
coefficient p_{ij} as

a number such that p_{ij} measures the fraction
of the standard deviation of the endogenous
variable (with the appropriate sign) for which
the designated variable is _directly_ responsible
in the sense of the fraction which would be
found if this factor varies to the same extent
as in the observed data while all other
variables (including residual variables) are
constant. (8-9)

. . . it follows that the _squared_ _path_ _co-_
efficient measures the proportion of the
variance of the dependent variable for which
the determining variable is _directly_ responsiblee.
(10) (emphasis in originals)

It should also be noted that the indirect effect of an exo-

genous variable on an endogenous variable may be computed

knowing the path coefficients of a model. (See Duncan,

1966, 1972, addendum, 137-8)

Table 7-2 contains the structural equations for our

model assuming the presence of interval data. (See Appendix

III, part 4 for the structural equations when dummy vari-

ables are employed for variables less than interval in

scale.) These structural equations represent the causal

relations within the model in figure 7-2. From these

structural equations by using the basic theorem of path

analysis (Duncan, 1966) we may derive the "path estimation

equations" which aid in estimating the path coefficients.

(See Appendix III, parts 2 and 5.)

The analysis in this section will involve two basic

steps. First we will treat the data as though it is inter-

val, compute the matrix of intercorrelations, insert these

Figure 7 - 2

Predetermined Variables   Hypothesized Underlying Factors   Intervening Variables   Dependent Variables
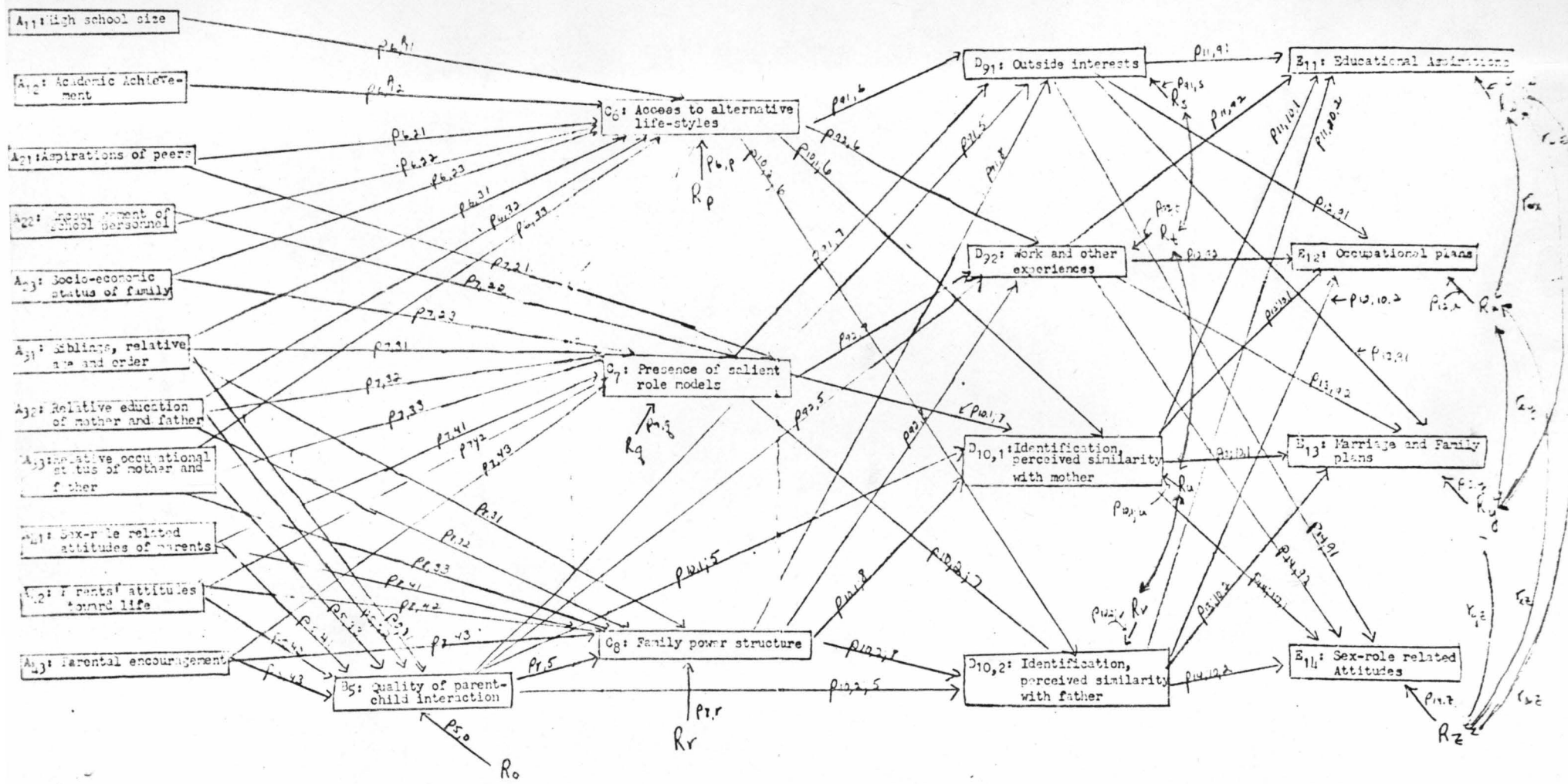
Table 7 - 2

Structural Equations for Path Model in Figure 7 - 2

$$B_5 = p_{5,31}A_{31} + p_{5,32}A_{32} + p_{5,33}A_{33} + p_{5,41}A_{41} + p_{5,42}A_{42} + p_{5,43}A_{43} + p_{5,o}R_o$$

$$C_6 = p_{6,11}A_{11} + p_{6,12}A_{12} + p_{6,21}A_{21} + p_{6,22}A_{22} + p_{6,23}A_{23} + p_{6,31}A_{31} + p_{6,32}A_{32} +$$
$$p_{6,33}A_{33} + p_{6,p}R_p$$

$$C_7 = p_{7,21}A_{21} + p_{7,22}A_{22} + p_{7,23}A_{23} + p_{7,31}A_{31} + p_{7,32}A_{32} + p_{7,33}A_{33} + p_{7,41}A_{41} +$$
$$p_{7,42}A_{42} + p_{7,43}A_{43} + p_{7,q}R_q \quad \text{all} + p_{7,5}B_5 \qquad 51 \quad 52$$

$$C_8 = p_{8,31}A_{31} + p_{8,32}A_{32} + p_{8,33}A_{33} + p_{8,41}A_{41} + p_{8,42}A_{42} + p_{8,43}A_{43} + p_{8,5}B_5 +$$
$$p_{8,r}R_r$$

$$D_{91} = p_{91,5}B_5 + p_{91,6}C_6 + p_{91,7}C_7 + p_{91,8}C_8 + p_{91,s}R_s$$
$$D_{92} = p_{92,5}B_5 + p_{92,6}C_6 + p_{92,7}C_7 + p_{92,8}C_8 + p_{92,t}R_t$$

$$D_{10,1} = p_{10,1;5}B_5 + p_{10,1;6}C_6 + p_{10,1;7}C_7 + p_{10,1;8}C_8 + p_{10,1;u}R_u$$

$$D_{10,2} = p_{10,2;5}B_5 + p_{10,2;6}C_6 + p_{10,2;7}C_7 + p_{10,2;8}C_8 + p_{10,2;v}R_v$$

$$E_{11} = p_{11,91}D_{91} + p_{11,92}D_{92} + p_{11;10,1}D_{10,1} + p_{11;10,2}D_{10,2} + p_{11,w}R_w$$

$$E_{12} = p_{12,91}D_{91} + p_{12,92}D_{92} + p_{12;10,1}D_{10,1} + p_{12;10,2}D_{10,2} + p_{12,x}R_x$$

$$E_{13} = p_{13,91}D_{91} + p_{13,92}D_{92} + p_{13;10,1}D_{10,1} + p_{13;10,2}D_{10,2} + p_{13,y}R_y$$

$$E_{14} = p_{14,91}D_{91} + p_{14,92}D_{92} + p_{14;10,1}D_{10,1} + p_{14;10,2}D_{10,2} + p_{14,z}R_z$$

values into the estimation equations and solve for the various path coefficients and correlations. The results from this process will allow us to reexamine the model, eliminating or adding paths where deemed advisable and/or rearranging the diagram to better account for the variance of the dependent variables. (See Appendix III, parts 1 and 2.)

This process will again be repeated using dummy variables for those measured on an ordinal scale, computing phi coefficients (a Pearson r when data is coded into only 2 categories, McNemar, 1962, 192) between these dummy variables and correlation coefficients between dummy variables and other variables with more than two values; inserting these values into the new set of estimation equations derived for this model (see Appendix III, part 5), and computing the path coefficients. The results with this method may then be compared with that in the first part of this section of the analysis primarily to determine the extent to which the variables depart from linearity. (See Boyle, 1970; Lyons, 1971) The final step in this section must be a decision of which path model best represents the data involved and which analysis is or will be most accurate. I would suggest that this decision be based not on purely mathematical grounds, but that theoretical and substantive intelligibility of the model be at least an equal criterion.

The fourth and final step in the analysis involves a reexamination of the results of steps two and three. In other words, the two final models developed in these steps must be compared, reasons for discrepancies in their findings sought, as well as theoretical support for any substantive changes.[16] This step is certainly the most important in the analysis, for it is at this point that the whole maze of computations and tedious work again firmly approaches the empirical level of how environmental influences interact to affect the life-choices young women make. Thus, it should be the step that requires the most serious thought and attention.

8. Some Problems

While formal models do have very real advantages in forcing researchers to clarify their working assumptions and maintain internal consistency in their theoretical developments and analyses, they have numerous restrictive assumptions that prove troublesome both empirically and philosophically. I shall try to deal briefly in this section with problems of both types, realizing that this discussion must be far from complete and that the issues are far from settled in my own mind.

David Heise (1969) noted many problems in path analysis and causal inference, warning sociologists "against

overly simple applications of the techniques in data analyses." (38-9) The methods of path analysis were first developed for use in biology ~~and economic~~s, areas in which these various assumptions and conditions might be more easily met. I shall only briefly review various assumptions and demands of this method that I feel are difficult to meet not only in the present proposal, but in much work in sociology.

First, path analysis, like all methods based on re-gression and the general linear model (see Fennessey, 1967), assumes that the relations between variables in the system are linear and additive in nature. In some cases (e.g. with multiplicative relations) this problem may be overcome by using logarithmic transformations. But there remains the restriction of assuming a linear, additive world to be studied still remains; a world which we are not at all sure exists in reality.

Secondly, it is difficult to incorporate feedback systems of any extent into path analysis models. Instead, we must assume that the flow of causality is unidirectional, that systems or events do not act back upon each other making a reciprocal effect as they continually transform and change. Conceivably, we could concentrate on only small spaces in time where such unidirectional action prevails. The question must then arise, however, of how generalizable such findings would be.

Similarly, it is assumed that the endogenous variables in a system are completely determined by those exogenous to it. If this is not possible, then residual variables, uncorrelated with the exogenous variables, must account for the remaining variation. Even people with the vaguest familiarity with the social world and the vast interconnections of all elements within it must admit some doubt as to the possibility of ever finding that assumption true. (The assumption of complete determination will be discussed later.)

It is also assumed that the variables used must be intervally measured. Following, Boyle (1970) and Lyons (1971) we have suggested that dummy variables be used to replace variables measured on cardinal and nominal scales in our formulation. There remains a problem, however, even with this suggestion. When dummy variables are used our correlation coefficients become phi coefficients which assume an "all or nothing distribution" in Land's (1969, 33-34) terminology (see also McNemar, 1962, 192-3). As nominal and ordinal scales are at best very crude themselves I doubt that many researchers would want to assume that all people in category one of a nominal scale fall exactly there and not somewhere between one and two. We must ask then which method encompasses the greater evil: assuming point distributions or internal measurement?

Finally, it is necessary to return to the philosophical implications of the assumption of complete determination of the system. We are dealing in this proposal with the question of life-choices of young women. In our initial theoretical section we made clear out prejudice that individuals are free within certain restrains set up by their social situation to choose the kind of life they will lead. However, a path analysis model both implicitly and explicitly violates this assumption by saying that some variables (some of which may not be measured and are then represented by residuals) determine completely what those life choices will be. The conflict between our theoretical presuppositions and the analytic model is obvious. We state and believe theoretically that individuals are thinking, acting human beings who while being created by their social world do also create it. However, our analytical framework at least within path analysis makes just the opposite implicit assumption.

We do not escape such problems even in the second stage of the analysis with multiple-partial measures. I have no qualms over using measures of association for they can prove very useful. The problem arises when we come to interpreting these measures and use the admittedly very useful proportional-reduction-of-error interpretations (Costner, 1965). This interpretation is based on the premise that

> For purposes of sociological research, measures
> that represent the "predictability" of one
> variable from knowledge of another appear to
> provide the most useful measures...." (Costner,
> 1965, 342)

Given some rule for predicting some characteristic of the

dependent variable, a PRE measure tells us how much our

error in predicting that characteristic of the dependent

variable is reduced by knowing the independent variable(s)

instead of just the dependent variable. The notion of

prediction then is intrinsically built into the PRE

interpretation.

Although in many ways it would be nice to be able to

predict some social events, my paranoia can reach a high

level simply by considering the all too frequent linkage of

the terms "prediction" and "control." While I feel (as

shown by the theoretical development in section 1) that in

the last analysis it will be impossible to completely

"control" social behavior, the mere fact that such actions

and thoughts occur to individuals should be a cause of grave

moral concern. Voicing his concern with this question,

C. Wright Mills said

> To say that 'the real and final aim of 'human
> engineering' or of 'social science' is 'to
> predict'' is to substitute a technocratic
> slogan for what ought to be a reasoned moral
> choice. (Mills, 1959, 117)

My concern is that when using measures of association and

PRE interpretations we not bypass such moral decisons, but

Hill - ye shall know the truth & the truth shall set you free

make clear to ourselves and our readers what, if anything, we are predicting and what such prediction may mean, not only within the context of our theory but within the social world as a whole.

We seem then to be faced with a dilemma. On the one hand we have analytical techniques that can help us probe, however imperfectly, more deeply into empirical questions that concern us. On the other hand implicit in the development of these techniques are assumptions that violate or contradict those that are basic to our starting theory.

I cannot pretend to have an answer to this dilemma. I can only recognize that it exists and ask if the value we will gain from such analyses will outweigh any philosophical harm accrued by using these methods. So far I have attempted to justify this proposal by saying we were examining factors that influence the content of the socialization process, which in turn influences the context in which life choices are made. By proposing to examine the interrelations and confounding effects of these factors I hope to better understand the conditions most conducive to supportive situations for non-traditional life-choices. However, it will be necessary throughout this project to step back and ask not only if violating the more empirical and mathematical assumptions of path analysis noted above destroys the empirical and statistical validity of our work, but if the

utilization of analytical techniques that violate our
theoretical and philosophical assumptions may destroy or
otherwise affect us as individuals? This is an open and a
baffling question, but one that should be faced by all of
us as sociologists and as human beings.

Proposed Outline of the Dissertation

I. The nature of socialization
   A. Theoretical importance of the topic
   B. Previous theoretical work
   C. Theoretical perspective for this project
   D. How this perspective relates to the work of others

II. The specific problem of this dissertation
   A. Relation to the theoretical development
   B. Importance
   C. Limits

III. Review of the literature
   A. Definitions of the dependent variable
   B. Extra-familial factors influencing the dependent variables
   C. Familial factors influencing the dependent variables
   D. Achievement motivation and literature on men

IV. The formal model
   A. Description of the model
   B. Hypotheses related to the model

V. Examination of the model with prediction equations
   A. Explanation and rationale of this method
   B. Development of zero-order associations
   C. Testing the model
   D. Modification of the model as necessary

VI. Examination of the model with path analysis
   A. Assuming the data is measured on an interval scale
      1. Explanation of the method
      2. Computation of correlation coefficients
      3. Testing of the hypothesized model
      4. Modifications of the model as necessary
   B. Using dummy variables where applicable
      1. Explanation of the method
      2. Computation of coefficients and testing of the model
      3. Modifications of the model as necessary
   C. Comparison of the results in B and C

VII. Discussion and Summary
   A. Evaluation of the model presented in section III
   B. Implications of the results in V and VI for the theoretical development
   C. Problems with the analysis
   D. Suggestions for further work.

FOOTNOTES

1   A draft of a longer paper on this topic is available on request.
I would like to thank several people for their comments on this earlier draft,
some of which have been incorporated into this section: K. Barry, D.
Elder, J. Ely, E. Morrissey, D. Parrish, L. Peterson, D. Pozzuto, F. Pozzuto,
W. Sheasby, D. Shipway, and D. Wellman, all members of the seminar for
which this paper was originally written, and J. Acker and M. Johnson. All
errors and problems are entirely my own responsibility.

2   I do realize that certain stages of this process, primarily the
points of infant and early childhood socialization, may be different both
in intensity and quality than other stages. This aspect will have to
be more thoroughly explored at a later point.

3   It may appear at first that the idea of a Gestalt, an additive concept
of reality definition, is contrary to the dialectical ideas. This, however,
is not necessarily so. In the dialectical mode, when individuals counter
something contrary to their experience they revise their view of life to
incorporate this new input; they create a new synthesis. This revision,
however, does not occur in a vacuum, but is based on their previous views
of reality, their definitions of reality. In this way then, they are adding
to , building upon that which is already present; operating within their
Gestalt.

4   Here goals are seen not only in the instrumental-attainment sense, but
also in more ego-centic ways of maintaining self-esteem or simple reality-
maintenance, holding on to that which we have.

5   Note that in this quote Becker uses the word "socialized" in exactly the
way I am trying to combat. He seems to imply that "socialization" is a process
that has an endpoint in time and that it is done "unto" another individual.
As is hopefully obvious from the text I can accept neither of these assumptions.
I do feel, however, that Becker's comments on the symbolic nature of
interaction and the basis of self-esteem is accurate.

6   Laing and Esterson (1964) have documented the subtle nature of the
effect these interactions may have in the family. They concentrated on
the family life of mental patients, seeing the illness of these people as
a response to their social situation.

7   Some fascinating research on the effect of children on parental
behavior patterns illustrates this point beautifully.

8   The term "socialization" is used instead of something like "interaction"
because the first term seems to imply more of a goal-oriented behavior,
a continual striving for something beyond self, something that is not ended
at one point in time which may be implied by the term "interaction."

9   I don't mean to imply here that all views are equally valid. I obviously
feel that some give a broader perspective than others and that the assumptions
underlying some are more acceptable than others. The analogy used is also
faulty in that it doesn't illustrate the impossibility of ever actually
separating ourselves from a social phenomena; that we can never really step
back and look upon the social world for we are always part of it.

10   These definitions are, for the most part, my own. They are not necessarily
used consistently in the same manner by writers reviewed in section four.

11   This literature review contains only items directly related to our
research problem, that is, factors related to sex-role related attitudes
and life-choices of women. No effort to read comparable works on men was
made. When results on men are cited they were usually given as part of an
article on women. In the final dissertation I hope to include a more
general discussion of achievement motivation as the concept relates to
women (following Horner, 1972) and a comparison of this situation to that
of meh.

12   Because of a limitation of research funds it will be impossible to
explore a fascinating measurement question associated with this field.
We may ask if the description given by the daughters of their home life
is adequate to fully describe that process; and if the addition of variables
or information from the viewpoint of the parents would heighten the validity
of these variables. Unfortunately this question has not been squarely
faced by researchers in this field. Such information should be examined
in future work.

13   To check for possible biases arising from different times and places
of administration see step one of the analysis, section 7.

14   Gamma-k has been chosen because all the variables to be used may be
assumed to be ordinal in nature. The use of such an ordinal measure does,
however, add the problem of ordering the independent variables. This issue is dis-
cussed in relation to our data in Appendix II.

15   See Section 8 for further discussion of this point.

16   Following Land (1969) and Wright (1934), p_{ij}^2 would have a PRE interpretation
similar to r^2 in terms of variance directly explained. There is a problem
of direct comparison with the multiple-partial measure because the qquared
path coefficient only gives the percentage of explained variance that is
directly (not indirectly) explained by a given independent or intervening variable.
but can add up effects à la Duncan.

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APPENDIX I

1. Pretest Schedule

2. Proposed additions to the schedule

3. Variables in the model; their proposed indicators,
    categories, and coding scheme

Appendix 1

2. Proposed additions to the schedule.

To section I I propose adding:

1. About how large was t̶h̶e̶ ̶h̶i̶g̶h̶ ̶s̶c̶h̶o̶o̶l̶ ̶t̶h̶a̶t̶ ̶y̶o̶u̶ ̶l̶a̶s̶t̶ ̶a̶t̶t̶e̶n̶d̶e̶d̶?̶ *your senior class in high school*

_____	less than one-hundred students	< 50
_____	100 to 249 students	50 - 100
_____	250 to 499 students	100 - 200 259
_____	500 to 999 students	300 - 500 499
_____	1000 to 2999 students	500 - 779
_____	over 3000 students	800 +

2. Think now about your best friend in high school (of the same sex as you). As best as you can remember, what did he or she plan to do or become in future years?

more space

3. When you were in high school, how often did the following people encourage you to continue your education?

	frequently	occa-sionally	rarely	hardly ever	never
a) teachers	____	____	____	____	____
b) counselor	____	____	____	____	____
c) principal	____	____	____	____	____

    What kinds of jobs did they encourage you to enter?

each person sep? teachers: _____ couns: prin:

To section II add:

My Mother or My Father	very true	tends to be true	tends to be untrue	very untrue
4. Tends to react emotionally in the same way I do.	____	____	____	____
5. Has life goals that are similar to mine.	____	____	____	____
6. Has work habits similar to mine.	____	____	____	____

How often did the following people encourage you to consider a certain what vocation you would pursue think about of what occupation did they encourage

To section IV add:

7. What other kinds of things do you like to do, either with your friends ~~and~~ alone or alone?

2 parts *What do like*
ws f.
alone

8. What kinds of summer and after-school jobs have you had? Include non-paying experiences like volunteer camp counseling, <u>etc.</u>

whc work or nonwork as well as...

Hopefully these new questions and the altered schedule will be pretested on a small group of students prior to the total administration.

Have your summer + after school jobs infl.
thinking of var.

What did you do —

Appendix I

3. Variables in the model, their proposed indicators, categories and coding scheme

Variable	Indicators	Var #	Coding for analysis (tentative)

A_{11} high school size   New question #1   405

Coding for analysis (tentative)
<100   1-<50
1 -- 0-249   67
2 -- 250 - 999 100-299 96
3 -- 1000 plus 300-499 135
4 - 500+   109

A_{12} Academic achievement # 3, GPA   303

1 -- less than 2.00 5
2 -- 2.00 - 2.49 36
3 -- 2.50 - 2.99 112
4 -- 3.00 - 3.49 247
5 -- over 3.50 226

A_{21} Aspirations of peers New question #2   328

1 -- traditional female occupation
2 -- non-traditional *

A_{22} Encouragement of school personnel   New question #3

329 - 334

335 - 340

using sum scores of encourage-
ment part of question;
5 -- frequently to 1 -- never
Dichotomize scores at median
point, or 8-15 -- encourage
and 1-7 -- low encouragement.
Code occupations by sex-nature
1 - only traditional occupations
2 -- non-traditional occupa-
        tions included
Combined code:
1 -- low encouragement, trad.
2 -- encourage, traditional
3 -- low encouragement, non trad
4 -- encourage, nontrad.

A_{23} Social status of family   5,6,13   308
father's occupation, 309
education, employer 319

1 -- blue-collar
2 -- white-collar

A_{31} Siblings: age sex, number and order relative to subject   11 & 12

6 -- oldest in family
5 -- oldest girl, one older brother
4 -- oldest girl, 2+ older brothers
3 -- 1 older sister, no older brothers
2 -- 2+ older sisters, no older brothers
1 -- combination of older brothers and sisters

add info
younger br
+ sis 403
Also only girl 403

and
1 -- span of more than or = five
    years between child and 101
    next older sibling
2 -- less than five yr. span 352
3 -- oldest or only child 174

nw/total 88

A_{32}: Relative education level of mother and father

13 and 14

319,320

1 -- father high school grad (hsg)
mother less than high school
2 -- father some college (sc),
mother less than sc
3 -- father college grad or more (cg)
mother less than cg
4 -- father hs, mother hs or
father less than hs,
mother less than hs
5 -- father sc, mother sc
6 -- father cg, mother cg
7 -- father less than hsg
mother hsg
8 -- father less than sc
mother sc
9 -- father less than cg
mother cg
recode:
1 -- father higher than mother:
1,2,3
2 -- father equals mother: 4,5,6
3 -- mother higher than father:
7,8,9

A_{33}: Relative occupational levels of mother and father

5 and 8

308
314

1 -- father blue collar (bc)
mother housewife (hw)
2 -- father wc, mother hw
3 -- father bc, mother bc
4 -- father wc, mother wc
5 -- father bc, mother wc
Recode:
1 -- 1,2
2 -- 3,4
3 -- 5

A_{41}: Parents' sex-role related attitudes

a mom
b dad

43,56--father
49,56--mother
Feels right
marriage is
more important
than right job
and woman's
place is in
home
*409, 413
made most of
dec.*

Use sum scores, breaking at
median for both mother and
father or using
1 -- 1-4, more traditional
2 -- 5-8, more nontraditional

------

* (from page 2) Non-traditional occupational groups will be defined here as those in which males in the total sample predominate in the question on preferred occupation (number 17).

Fa makes dec. VAR 409
MO " "   413

A_{42} Attitude toward life

father-28
mother 31
satisfied w/
life

1 -- very true
2 -- tends to be true
3 -- tends to be untrue
4 -- very untrue

A_{43} Parental encouragement

father:
17,44,52,
53,54
mother:
2,7,14,
37,52

Reverse order on question
52-mother, 53-father--
then use sum scores
4 - 8 high, code 3
9 - 15 medium, code 2
16-20 low , code 1

B_5 Quality of parent-child
interaction

Father-
4,20,29,26
Mother-
15,40,44,51

Reverse order on questions
15,40-mother and 4,20 father
Use sum scores
1-5 = 1, close relations
6-10 =2 , medium
11-16=3, distant

D_{91} Outside interests

new question
#4

fr. 417 $\overset{18}{336}$
22

$\overset{63}{alone\ 415\ 289}$

1 -- sex-stereotyped in
     female direction
     (e.g. cooking, sewing)
2 -- mixed (some stereotyped,
     some not or some female
     some male)
3 -- majority of items are
     not female sex-stereotyped
     (e.g. reading, swimming,...)

D_{92} Work and other experi-
     iences   418, 419, 420-24

New question
5

same as in D_{91}

$D_{10,1}$ Identification w/
     parental family
     here, the mother

Section 4, #
3,4, new ques-
tions 7,8,9
410,11,12

sum scores and dichotomize
at median or use
1 -- 1-11, similar
2 -- 12-22, less similar

$D_{10,2}$ Perceived similar-
     ity to father

Section 4,
#1,2; new ques-
tions 7,8,9
406,7,8

as in $D_{10,1}$

E_{11}: Educational aspirations

17, interpolate
from desired oc-
cupation

1 -- no college required
2 -- some college required
3 -- college graduation
     required
4 -- graduate work required

E_{12}:Occupational goals 17

324

1 -- blue collar, sex stereo-
    typed
2 -- white collar, sex stereo-
    typed
3 -- blue collar, non sex
    stereotyped
4 -- white collar, non stereo-
    typed

E_{13}: Marriage and family
plans   19,20,21

325, 326, 327

1 -- marriage yes, parent yes
    not work
2 -- marriage yes, parent no
    work no
3 -- marriage yes, parent yes
    work later
4 -- marriage yes, parent no
    work later
5 -- marriage yes, parent yes
    work full
6 -- marriage yes, parent no
    work full
7 -- marriage no, parent no
    no work
8 -- marriage no, parent no
    work later
9 -- marriage no, parent no
    work full
Recode:

1 -- 1-4
2 -- 5-9

E_{14}Sex-role related
  attitudes   Section 5

Use sum scores
either dichotomize at median
or split scores in half
(point depends on number of
 questions used.)

APPENDIX II

1. Steps in part 2 of the analysis

2. Recoding of categories of variables for extensive prediction and assumption equations.

3. Ordering of categories of the independent variables

4. Example of table set-up and computations for multiple-partial measure

Appendix II

2. Steps in part 2 of the analysis

1. With all data in the form shown in part three of Appendix one, compute
zero-order gamma between all variables. For pairs of variables in different
columns (e.g. AB,AC,AD,AE,BC,BD,BE,CD,CE, and DE) compute gamma-k's, with
variables in the column to the right as the dependent variable.*
Check relations for monotonicity. If this is not in evidence categories
should be rearranged or another measure, such as Goodman and Kruskal's
(1954) lambda, should be used.

2. Collapse categories of indicators in each block as outlined in section
two of this appendix.

3. Compute zero order gammas and gamma-k's as appropriate between all of these
collapsed indicators and compare results with those in section 1. If any
serious discrepancies appear, the nature of the collapsings should be exam-
ined to see how the discrepancy arose and how it may be corrected.

4. From these zero order gamma-k's (or revised gamma-k's) determine the
order of the independent variables as described in part three of this ap-
pendix.

5. Compute the prediction and assumption equations in table 7-1 and
decide what portions of the model may be accepted and which must be
revised.

6. Proceed to work back through the model testing various relationships,
using the uncollapsed categories of variables wherever possible, until a
satisfactory arrangement has been reached. (As discussed in the text, sat-
isfactory was arbitrarily defined as an arrangement where all predictive
equations yield a value of gamma-k approximately less than .10, and all
assumption equations yield a value equal to or greater than .10; i.e. a
situation where at least 10% of the error in predicting order of the
dependent variable has been explained.)

_____

* Note: gamma = $P_s - P_d / P_s + P_d$; gamma-k = $P_s - P_d / P_s + P_d + P_{ta}$,

where P_s is the proportion of total pairs of variables that are in the
same order, P_d is the proportion in the opposite order, and P_{ta} is the
proportion tied on the independent variable a. (See Morris (1970)
and Goodman and Kruskal (1954) and Costner (1968)

Appendix II

2. Recoding of categories of variables for extensive prediction and assumption equations.

Throughout these suggested recodings as in the first coding in Appendix I higher values are theoretically associated with more non-traditional aspirations.
As the recodings involve interactions among the variables within the blocks certain assumptions have been made here that may not be supported by the data and thus should be tested and examined before completing this step. The assumptions used are listed below for each block of variables.

A_1: Assumed that GPA will be more highly associated with the dependent variables than high school size.

A_2: Assumed that white collar status most highly associated with dependent variable, than encouragement of school personnel, then aspirations of peers

A_3: Assume relative occupational and education status of mother and father is most highly associated, then sibling placement, then years between siblings.

A_4: Assume sex-role attitudes of parents are most highly associated with dependent variables, then encouragement of parents, then the parents' satisfaction with life.

B_5: Here the interaction of quality of interaction with the parental attitudes forms the basis of the recoding. In other words it is assumed the influence of a parent's traditional-non-traditional attitudes is related to how the parents and daughter get along.

D_9: Outside interests are assumed to be more highly associated with the dependent variables than work and experiences.

D_{10}: As with B_5 the effect of closeness and similarity with the parents on traditional-non-traditional life choices is seen as interacting with the parents own sex-role related attitudes and behaviors.

Figures in cells show code for that category

Block A_1: School background

High School size

GPA	0-249	250-999	1000+	no data
less than 2.5	1	1	1	1
2.50 - 3.49	1	2	2	1
3.50 +	2	2	2	2
no data	1	1	2	0

Block A_2: Social Status

Father's Status

White Collar

Peer aspriations

School Encouragement	trad.	non-trad.	no info
high (3-4)	2	2	2
low (1-2)	1	2	1
no info	1	2	2

Blue Collar

Peer aspirations

trad.	non trad.	no info
2	2	2
1	1	1
1	2	1

Block A_3: Family Structure

Relative Occupational and Educational Status of Mother and Father

Mother higher than father in either

Age span between siblings (code, $A_{31,b}$)

Sibling placement (code, $A_{31,a}$)

0 = no info

$A_{31,b}$	6	5	4	3	2	1	0
2,3	2	2	2	2	1	1	2
1	2	2	1	1	1	1	1
0	2	2 2	2	1	1	1	2

Block A$_3$ continued

Mother less than or equal to father in
both occupational and educational status

Sibling placement

Age span
between siblings

	6	5	4	3	2	1	0
2,3	2	2	1	1	1	1	2
1	2	1	1	1	1	1	1
0	2	2	1	1	1	1	1

Block A$_4$: Parental attitudes; 2 indicators

1. A$_{41}$ - Mother

Sex-role related attitudes

non-traditional   traditional

Attitude toward life   Attitude toward life

Encourage-ment	1-2	3-4
high,medium	2	2
low	2	1

	1-2	3-4
	1	2
	1	2

2. Father   Sex-role related attitudes

non-traditional   traditional

Attitude toward life   Attitude toward life

Encour-agement	1-2	3-4
high,medium	2	2
low	2	1

	1-2	3-4
	1	2
	1	2

Block B_5: Quality of parent-child interaction

Mother

Father   close   medium &
distant

	close	medium & distant
close	a	b
medium & distant	c	d

If A_{41}(Mom) = 2 and A_{42}(Dad)=2
and B_5 =   Code

a	2
b	2
c	2
d	1

If A_{41} = 2, A_{42} = 1
and B_5 =   Code

a	2
b	1
c	2
d	1

If A_{41}=1, A_{42}=2
and B_5 =   Code

a	1
b	2
c	1
d	1

If A_{41}=1, A_{42} = 1
and B_5 =   code

a	1
b	1
c	1
d	2

Block D_9: Interests and experiences

Outside Interests

Work and experiences	Sex ster.	mixed	non-ster.	no info
sex ster.	1	1	2	1
mixed	1	1	2	1
non-ster.	2	2	2	2
no info	1	1	2	0

Block D_{10}: Identification w/ and admiration of family -- 2 indicators
(May be used instead of that given in appendix I)

1. Mother   2. Father

Closeness (#1,2-section IV-father, 3,4-mother, use sums)

Similarity   close(1-5)   less close (6-10) no info
New Questions
4,5,6

use sums similar(3-6)	a	b	c
less similar (7-12)	d	e	f
no information	g	h	i

1. Mother   2. Father
If A_{41}= 1, and   i=0 always   If A_{42} = 1 and

D_{10} =	code =
a	2
b	2
c	2
d	2
e	1
f	1
g	2
h	1

D_{10} =	code =
a	1
b	1
c	1
d	2
e	1
f	2
g	2
h	1

If A_{41} = 2, and   If A_{42} = 2 and

D_{10} =	code =
a	1
b	1
c	1
d	1
e	2
f	2
g	1
h	2

D_{10} =	code =
a	1
b	1
c	2
d	2
e	1
f	2
g	2
h	1

Block E_{11}: Educational aspirations
1 -- college graduate or less
2 -- graduate work

Block E_{12}: Occupational goals
1 -- sex stereotyped
2 -- non sex-stereotyped

Block E_{13}: Marriage and family plans
1 -- traditional (1,2)
2 -- neo-traditional (3,4,7,8) or (3,4,5,6,7,8)
3 -- non-traditional (5,6,9) or (9)

Block E_{14}: Sex-role related attitudes
1 -- traditional
2 -- non-traditional

3. Ordering of categories of the independent variables

As Morris (1970) pointed out, determining the order of categories of the independent variables in a multiple measure of association designed for variables measured on an ordinal scale can be difficult, for we must determine which of the variables are of major importance, which next most important, and so on in the combination of variables used. We propose using the criterion of zero-order measures with the dependent variables as a means of determining this importance. In other words, the independent variable with the highest measure of association with the dependent variable would be termed major in importance, the next highest would be second, and so on. This criterion should be examined when in use to see if it actually does usually produce the highest gamma-k values of the various arrangements.

As an example suppose we were interested in gamma-k 11(3,41,42) 9, where gamma-k 11,3 = .18; gamma-k 11,41 = .14; and gamma-k 11,42 = .13. Then variable A_3 would be the major variable, variable A_{41} of intermediate importance and variable A_{11}, 42 of minor importance. The set of tables for computation of this multiple partial with imaginary data and computations is shown in part 4 of this appendix.

4. Example of table set-up and computations for multiple-partial measure.

Here we shall assume there are two categories in the control variable D_9. There are 1000 cases altogether. 600 of these fall into category one of C_9 and the remaining 400 fall into category two. Proportions of cases are given in the cells and the weighted method of computing multiple-partial gamma-k is used. (See Wood, 1973)

Control Variable D_9; category one

			categories								
	Major variable A_3	1	1	1	1	2	2	2	2	totals
E_{11}: Educa-	Inter.variable A_{41}	1	1	2	2	1	1	2	2	
tional	Minor variable A_{42}	1	2	1	2	1	2	1	2	
Aspirations										
	Stereotyped (1)	.15	.10	.05	.05	.05	.04	.04	.02	.50
	Non-stereotyped (2)	.00	.10	.05	.10	.05	.10	.05	.05	.50
	totals	.15	.10	.10	.15	.10	.14	.09	.07	1.00

P_s = .15(.50) + .10(.40) + .05(.35) + .05(.25) + .05(.20) + .04(.10) + .04(.05)

$\quad$ = .075 + .040 + .0175 + .0125 + .010 + .004 + .002 = .161

P_d = .02(.45) + .04(.4) + .04(.3) + .05(.25) + .05(.15) + .05(.10) =

$\quad$ = .009 + .016 + .012 + .0125 + .0075 + .005 = .062

P_{ta} = 2(.15)(.0) + 2(.10)(.10) + 2(.05)(.05) + 2(.05)(.1) + 2(.05)(.05)

$\quad$ + 2(.04)(.1) + 2(.04)(.05) + 2(.02)(.05) =

$\quad$ = 2 (0 + .01 + .0025 + .005 + .0025 + .004 + .002 + .001)

$\quad$ = 2 (.027) = .054

gamma-k 11 (3,41,42) | 9_1 = .161 - .062 / .161 + .062 + .054

$\qquad$ = .099 / .277 = .356

Control Variable D9; category two

		categories									
	Major variable A_3	1	1	1	1	2	2	2	2	totals
E_{11}: Educational Aspirations	Inter variable A_{41}	1	1	2	2	1	1	2	2	
	Minor variable A_{42}	1	2	1	2	1	2	1	2	
Stereotyped (1)		.10	.05	.05	.06	.04	.08	.09	.03	.50
Non-stereotyped (2)		.00	.05	.05	.05	.10	.07	.08	.10	.50
totals		.10	.10	.10	.11	.14	.15	.17	.13	1.00

$P_s = .10(.50) + .05(.45) + .05(.40) + .06(.35) + .04(.25) + .08(.18) + .09(.10)$

$= .05 + .0225 + .020 + .021 + .010 + .0144 + .009 = .1469$

$P_d = .03(.4) + .09(.32) + .08(.25) + .04(.15) .06(.10) + .05(.05)$

$= .012 + .0288 + .020 + .006 + .006 + .0025 = .0753$

$P_{ta} = 2(.10)(.0) + 2(.05)(.05) + 2(.05)(.05) + 2(.06)(.05) + 2(.04)(.1) +$

$2(.08)(.07) + 2(.09)(.08) + 2(.03)(.10) =$

$2(0 + .0025 + .0025 + .0030 + .004 + .0056 + .0072 + .003)$

$= 2(.0278) = .0556 = .06$

gamma-k $11(3,41,42) | 9_2 = .1469 - .0753 / .1469 + .0753 + .06$

$= .15 - .08 / .15 + .08 + .06 = .07/.29 = .24$

so gamma-k $11 (3,41,42) | 9$ using the weighted method of computation equals

$600/1000 (.356) + 400/1000 (.24) = .214 + .096 = .310$

So knowing our three independent variables when the effect of the control
variable (here the intervening variable D9) is removed reduces our error
in predicting order of the dependent variable by .310. Note that this
reduction is higher than that obtained for any of the three independent
variables in their individual associations with the dependent variable.
We would likely then, after other relationships had been reviewed, have
to conclude that the independent variables do affect the dependent variable E_{11}
independently of their effect through the intervening variable D_9.

The technical interpretation in the PRE framework of a value of gamma-k in
in multiple-partial form would have to be the proportionate reduction of error
in guessing order of pairs of variables when the independent variables are
known over when we do not know the independent variables and the effect of
the control variable is removed. The total numberof pairs of variables
on which we assume predictions may be made are those in which there are
differences on the dependent variable. (See Morris, 1970; 307 and Wood, 1973).

APPENDIX III

Appendix III

1. Steps in the analysis

I. Assume data is interval (assume coding as in appendix I, part 3).
Compute matrix of intercorrelations among all variables $A_{11}, \ldots E_{14}$.
Insert results into path estimation equations (see section 2 of this
appendix). Compute path coefficients. Rearrange model as necessary.

II. Using ordinal and nominal properties of the data devise dummy variables
where necessary. Compute correlation coefficients between categories (the
dummy variables). Insert these coefficients into the estimation equations
and solve for the path coefficients. Place coefficients on lines and
rearrange model as necessary computing new path coefficients.

III. Compare results of Part II with those obtained in part I.

Appendix III

2. Path estimation equations for part I (assuming interval data)

1)
$$
\begin{bmatrix} r_{5,31} \\ r_{5,32} \\ \cdot \\ \cdot \\ \cdot \\ r_{5,43} \end{bmatrix}
=
\begin{bmatrix}
1 & r_{31,32} & r_{31,33} & \cdots & & r_{31,43} \\
r_{32,31} & 1 & & & & r_{32,43} \\
\cdot & & \cdot & & & \\
\cdot & & & \cdot & & \\
\cdot & & & & \cdot & \\
r_{43,31} & \cdot & \cdot & \cdot & & 1
\end{bmatrix}
\begin{bmatrix} p_{5,31} \\ p_{5,32} \\ \cdot \\ \cdot \\ \cdot \\ p_{5,43} \end{bmatrix}
$$

note: here 11,12 are A_{11} and A_{12}

2)
$$
\begin{bmatrix}
r_{6,11} & 0 & 0 & 0 \\
r_{6,12} & & 0 & 0 \\
\cdot & r_{7,21} & & 0 \\
\cdot & \cdot & & 0 \\
\cdot & \cdot & & 0 \\
\cdot & \cdot & & r_{8,31} \\
\cdot & \cdot & & \cdot \\
\cdot & \cdot & & \cdot \\
0 & \cdot & & \cdot \\
0 & \cdot & & \cdot \\
0 & \cdot & & \cdot
\end{bmatrix}
=
\begin{bmatrix}
1 & r_{11,12} & \cdot & \cdot & \cdot & r_{11,43} \\
r_{12,11} & 1 & & & & \\
\cdot & & & & & \\
\cdot & & & & & \\
\cdot & & & & & \\
\cdot & & & & & \\
& & & & & \\
r_{43,11} & & & & & 1
\end{bmatrix}
\begin{bmatrix}
p_{6,11} & 0 & 0 \\
p_{6,11} & 0 & 0 \\
p_{6,21} & p_{7,21} & 0 \\
& & 0 \\
& & 0 \\
\cdot & \cdot & p_{8,31} \\
\cdot & \cdot & \cdot \\
p_{6,33} & & \\
0 & & \cdot \\
\cdot & & \cdot \\
\cdot & & \cdot \\
0 & p_{7,43} & p_{8,43}
\end{bmatrix}
$$

3)
$$
\begin{bmatrix}
r_{91,5} & r_{92,5} & r_{10,1;5} & r_{10,2;5} \\
r_{91,6} & \cdot & & \cdot \\
\cdot & & \cdot & \cdot \\
r_{91,8;5} & & & r_{10,2;8}
\end{bmatrix}
=
\begin{bmatrix}
1 & r_{56} & r_{57} & r_{58} \\
r_{65} & 1 & & \cdot \\
& & & \\
r_{85} & \cdot & \cdot & 1
\end{bmatrix}
\begin{bmatrix}
p_{91,5} & p_{92,5} & p_{10,1;5} & p_{10,2;5} \\
p_{91,6} & & & \cdot \\
\cdot & & & \cdot \\
p_{91,8} & \cdot & \cdot & p_{10,2;8}
\end{bmatrix}
$$

4)
$$
\begin{bmatrix}
r_{11,91} & r_{12,91} & r_{13,91} & r_{14,91} \\
\cdot & & & \cdot \\
\cdot & & & \cdot \\
r_{11;10,2} & \cdot & \cdot & r_{14;10,2}
\end{bmatrix}
=
\begin{bmatrix}
1 & r\ r_{91,92} & r_{91;10,1} & r_{91;10,2} \\
r_{92,91} & 1 & & \cdot \\
& & 1 & \cdot \\
r_{10,2;91} & \cdot & \cdot & 1
\end{bmatrix}
$$

$$
\begin{bmatrix}
p_{11,91} & p_{12,91} & p_{13,91} & p_{14,91} \\
p_{11,92} & & & \\
p_{11;10,1} & & & \\
p_{11;10,2} & \cdot & \cdot & p_{14;10,2}
\end{bmatrix}
$$

Here 11 & 12 refer to A_{11} & A_{12}

5)
$$
\begin{bmatrix}
1 & r_{67} & r_{68} \\
r_{76} & 1 & r_{78} \\
r_{86} & r_{87} & 1
\end{bmatrix}
=
\begin{bmatrix}
r_{11,6} & r_{12,6} & r_{21,6} & \cdot & \cdot & \cdot & r_{43,6} & r_{5,6} \\
r_{11,7} & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & r_{5,7} \\
r_{11,8} & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & r_{5,8}
\end{bmatrix}
$$

$$
\begin{bmatrix}
p_{6,11} & 0 & 0 \\
p_{6,12} & 0 & 0 \\
p_{6,21} & p_{7,21} & 0 \\
p_{6,22} & p_{7,22} & 0 \\
p_{6,23} & p_{7,23} & p\ 0 \\
p_{6,31} & p_{7,31} & p_{8,31} \\
p_{6,32} & p_{7,32} & p_{8,32} \\
p_{6,33} & p_{7,33} & p_{8,33} \\
0 & p_{7,41} & p_{8,41} \\
\cdot & \cdot & \cdot \\
\cdot & \cdot & \cdot \\
0 & p_{7,5} & p_{8,5}
\end{bmatrix}
$$

6) $$\begin{bmatrix} r_{56} \\ r_{57} \\ r_{58} \end{bmatrix} = \begin{bmatrix} r_{31,6} & r_{32,6} & \cdots & r_{43,6} \\ r_{31,7} & \cdot & \cdot & \cdot \\ r_{31,8} & \cdot & \cdot & \cdot & r_{43,8} \end{bmatrix} \begin{bmatrix} p_{5,31} \\ p_{5,32} \\ \cdot \\ \cdot \\ \cdot \\ p_{5,43} \end{bmatrix}$$

7) $$\begin{bmatrix} r_{91,11} & r_{92,11} & r_{101,11} & r_{102,11} \\ r_{91,12} & r_{92,12} & r_{101,12} & r_{102,12} \\ \cdot & & & \\ \cdot & \cdot & & \\ \cdot & & \cdot & \\ r_{91,43} & \cdot & \cdot & \cdot \\ r_{91,5} & r_{92,5} & r_{101,5} & r_{102,5} \end{bmatrix} = \begin{bmatrix} r_{11,5} & r_{11,6} & r_{11,7} & r_{11,8} \\ r_{12,5} & r_{12,6} & r_{12,7} & r_{12,8} \\ \cdot & & & \\ \cdot & \cdot & & \\ \cdot & \cdot & \cdot & \\ r_{43,5} & r_{43,6} & \cdot & \cdot \\ r_{5,5} & r_{5,6} & r_{5,7} & r_{5,8} \end{bmatrix}$$

(Here 11 and 12 refers to A_{11} and A_{12})

$$\begin{bmatrix} p_{91,5} & p_{92,5} & p_{10,1;5} & p_{10,2;5} \\ p_{91,6} & \cdot & \cdot & \cdot \\ p_{91,7} & \cdot & \cdot & \cdot \\ p_{91,8} & p_{92,8} & p_{10,1;8} & p_{10,2;8} \end{bmatrix}$$

8) $\begin{bmatrix} 1 & r_{91,92} & r_{91,101} & r_{91,102} \\ r_{92,91} & 1 & \cdot & \cdot \\ \cdot & \cdot & 1 & \cdot \\ r_{10,2;91} & \cdot & \cdot & 1 \end{bmatrix} = \begin{bmatrix} r_{5,91} & r_{6,91} & r_{7,91} & r_{8,91} \\ r_{5,92} & \cdot & & \\ r_{5,10,1} & & \cdot & \\ r_{5;10,2} & & & r_{8;10,2} \end{bmatrix}$

$\begin{bmatrix} p_{91,5} & p_{92,5} & p_{101,5} & p_{102,5} \\ p_{91,6} & \cdot & & \\ p_{91,7} & & & \cdot \\ p_{91,8} & p_{91,8} & \cdot & p_{10,2;8} \end{bmatrix}$

In the equations above only sets one and four are just identified. In the rest there are 92 unknown quantities (fifty correlation coefficients and 42 path coefficients) and 134 equations. At least some of the unknown values then are overidentified and averaging methods (See Duncan, 1968,70,71; 234-8) will be employed to obtain these values. A Watfor program SOLNL can be used for solving equation sets one and four. I am unsure yet if a separate program will need to be written for the other problems.

The estimation equations for the residual paths follow the same general format. Below this general format and its expansion for only p_{5o} is given.

$p_{5o}^2 = 1 - p_{5,31}^2 - p_{5,32}^2 - p_{5,33}^2 - p_{5,41}^2 - p_{5,42}^2 - p_{5,43}^2$

$- 2 (p_{5,31}r_{31,32}p_{5,32} + p_{5,31}r_{31,33}p_{5,33} + p_{5,31}r_{31,41}p_{5,41} +$

$p_{5,31}r_{31,42}p_{5,42} + p_{5,31}r_{31,43}p_{5,43} + p_{5,32}r_{32,33}p_{5,33} + p_{5,32}r_{32,41}p_{5,41} +$

$p_{5,32}r_{32,42}p_{5,42} + p_{5,32}r_{32,43}p_{5,43} + p_{5,33}r_{33,41}p_{5,41} + p_{5,33}r_{33,42}p_{5,42} +$

$p_{5,33}r_{33,43}p_{5,43} + p_{5,41}r_{41,42}p_{5,42} + p_{5,41}r_{41,43}p_{5,43} + p_{5,42}r_{42,42}p_{5,43})$

or in general

$$p_{ij}^2 = 1 - \sum_q p_{iq}^2 - 2 \sum_{q,q'} p_{iq}r_{qq'}p_{iq'} \quad \text{(Duncan,1966,1971,122)}$$

where q and q' are all variables
leading directly to i, q<q'

Appendix III

3. Dummy variable coding for part II of this part of the analysis

Essentially transforming codes of a variable into dummy variable form is only a transformation to the binary number system. It must be admitted, in line with MacDonald (1973), that such a transformation cannot preserve the ordinal nature of a scale, but that the underlying ordinal properties of the variable can affect or be used in the interpretation. (See Boyle, 1970,1971; Lyons, 1971) It must also benoted, as briefly discussed in section 8, that correlation coefficients computed on binary coded variables are actually phi coefficients which do not assume underlying continuums. Then, actually we are assuming point distributions within our ordinal or nominal scales. That is, we are assuming that all individuals fall exactly at the point coded, obviously an assumption that will rarely hold in reality.

Below we shall present each variable used in the analysis, itsoriginal coding from Appendix one and then its dummy variables. (Note, to aid in later interpretations I have followed Boyle's examples of coding (1971,437).)

Variable	Previous coding	Dummy variable coding

A_{11} High school size

1 -- 0 - 249	
2 -- 250 - 999	
3 -- 1000 +	

If $A_{11}=$	Then $A_{11,1}=$	$A_{11,2}=$
1	1	0
2	0	1
3	0	0

A_{12} : GPA

1 -- under 2.00
2 -- 2.00 - 2.49
3 -- 2.50 - 2.99
4 -- 3.00 - 3.49
5 -- 3.50 +

$A_{12}=$

	$A_{12,1}=$	$A_{12,2}=$	$A_{12,3}=$	$A_{12,4}=$
1	1	1	1	1
2	0	1	1	1
3	0	0	1	1
4	0	0	0	1
5	0	0	0	0

A_{21} : aspiration of peers

1 -- traditional
2 -- non-traditional

Use original coding

A_{22} : Encouragement of school people

1 -- low enc., trad.
2 -- encour., trad.
3 -- low enc., non trad.
4 -- encourage, non trad.

$A_{22}=$

	$A_{22,1}=$	$A_{22,2}=$	$A_{22,3}=$
1	1	1	1
2	0	1	1
3	0	0	1
4	0	0	0

A_{23} : Family SES

1 -- blue collar (working)
2 -- white collar (middle)

Use original coding

Variable	Previous coding	Dummy Variable coding

A_{31}: Siblings
6 -- oldest child or only
5 -- oldest girl + more than five yrs. bet.
4 -- oldest girl + less than five yrs. bet.
3 -- 2nd oldest girl, + 5yrs+ bet.
2 -- 2nd oldest girl, less 5 yrs between
1 -- other combination

$A_{31}=$	$A_{31,1}=$	$A_{31,2}=$	$A_{31,3}=$	$A_{31,4}=$	$A_{31,5}=$
6	0	0	0	0	0
5	0	0	0	0	1
4	0	0	0	1	1
3	0	0	1	1	1
2	0	1	1	1	1
1	1	1	1	1	1

A_{32}: Relative ed. and oc. of mother and father
1 -- father higher than m.
2 -- father equal mother
3 -- father lower than m.

$A_{32}=$	$A_{32,1}=$	$A_{32,2}=$
1	1	1
2	0	1
3	0	0

(For A_{33}, occupational status, substitue 33 for 32 in formulation directly above)

A_{41}: Parents' sex-role attitudes
1 -- trad.
2 -- non-trad.

Use original coding

A_{42}: Parents satisfied w/ life
1 -- very true
2 -- tends to be true
3 -- tends to be untrue
4 -- very untrue

$A_{42}=$	$A_{42,1}=$	$A_{42,2}=$	$A_{42,3}=$
1	1	1	1
2	0	1	1
3	0	0	1
4	0	0	0

A_{43}: Parental encouragement
1 -- low
2 -- medium
3 -- high

$A_{43}=$	$A_{43,1}=$	$A_{43,2}=$
1	1	1
2	0	1
3	0	0

B_5: Quality of interactions
1 -- close
2 -- medium
3 -- distant

$A_5=$	$A_{5,1}=$	$A_{5,2}=$
1	1	1
2	0	1
3	0	0

D_{91}: Outside interests
1 -- stereotyped
2 -- mixed
3 -- non-sex-stereotyped

$D_{91}=$	$D_{91,1}=$	$D_{91,2}=$
1	1	1
2	0	1
3	0	0

D_{92}: Work, experiences

1 -- sex-stereotyped
2 -- mixed
3 -- non-sex-stereotyped

$D_{92}=$	$D_{92,1}=$	$D_{92,2}=$
1	1	1
2	0	1
3	0	0

$D_{10,1,2}$-iden. with parents

1 -- similar
2 -- less similar

Use original coding

E_{11}: Educational Aspirations

1 -- no college required
2 -- some college required
3 -- college grad. req.
4 -- graduate work req.

$E_{11}=$	$E_{11,1}=$	$E_{11,2}=$	$E_{11,3}=$
1	1	1	1
2	0	1	1
3	0	0	1
4	0	0	0

E_{12}: Occupational goals

1 -- blue, stereotyped
2 -- white, steret.
3 -- blue, non-steret.
4 -- white, non-st.

$E_{12}=$	$E_{12,1}=$	$E_{12,2}=$	$E_{12,3}=$
1	1	1	1
2	0	1	1
3	0	0	1
4	0	0	0

E_{13}: Marriage and family plans

Recode:
1 -- traditional
2 -- non-traditional

Use original coding

E_{14}: Sex-role related attitudes

Dichotomized
1 -- traditional
2 -- non traditional

Use original coding

Appendix III

4. Structural equations for part 2 of this part of the analysis

These structural equations are equivalent to those given in Table 7-2 except that for variables where dummy variables have been coded path coefficients have been added for each of these dummy variables. Thus the complete form of the equations has not been written here but could easily be supplied by the reader following Table 7-2 and section 3 of this appendix.

$$B_{51} = p_{51,311}A_{311} + p_{51,312}A_{312} + p_{51,313}A_{313} + \cdots + p_{51,aa}R_{aa}$$

$$B_{52} = p_{52,311}A_{311} + p_{52,312}A_{312} + \cdots + p_{52,a}R_a$$

$$B_{53} =$$

$$C_6 = p_{6,111}A_{111} + \cdots + p_{6c}R_c$$

.
.
.

$$D_{911} = p_{911,51}B_{51} + p_{911,52}B_{52} + p_{911,53}B_{53} + p_{911,6}C_6 + p_{911,7}C_7 + p_{911,8}C_8 + p_{911,f}R_f$$

.

.

.

$$E_{111} = p_{111,911}D_{911} + p_{111,912}D_{912} + p_{111,921}D_{921} + p_{111,922}D_{922} + p_{111,101}D_{101} +$$

$$p_{111,102}D_{102} + p_{111,1}R_1$$

.

.

.

$$E_{14} = p_{14,911}D_{911} + p_{14,912}D_{912} + \cdots p_{14,102}D_{102} + p_{14,s}R_s$$

Appendix III
5. Path estimation equations for part 2 of this part of the analysis.

As with the structural equations, the path estimation equations to be used with the dummy variables are identical to those given in section 2 of this appendix but expanded to include relations between the dummy variables where those have been added. Thus only a skeleton form of the equations are given here. The reader may use section 2 of this appendix and section 3 of this appendix in filling out the matrices.

1)
$$
\begin{bmatrix} r_{51,311} & r_{52,311} \\ \cdot & \cdot \\ \cdot & \cdot \\ \cdot & \cdot \\ r_{51,432} & r_{52,432} \end{bmatrix}
=
\begin{bmatrix} 1 & r_{311,312} \cdots r_{311,432} \\ \cdot & \\ \cdot & \\ \cdot & \\ r_{432,311} \cdot \quad \cdot \quad \cdot \quad 1 \end{bmatrix}
\begin{bmatrix} p_{51,311} & p_{52,311} \\ \cdot & \cdot \\ \cdot & \cdot \\ \cdot & \cdot \\ p_{51,432} & p_{52,432} \end{bmatrix}
$$

2)
$$
\begin{bmatrix} r_{6,111} & 0 & 0 \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ r_{6,21} & r_{7,21} & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ r_{6,311} & r_{7,311} & r_{8,311} \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ 0 & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{bmatrix}
=
\begin{bmatrix} 1 & r_{111,112} \cdots r_{111,432} \\ & & \cdot \\ & & \\ & & \cdot \\ & & \\ r_{432,111} \cdot \quad \cdot \quad \cdot \quad 1 \end{bmatrix}
\begin{bmatrix} p_{6,111} & 0 & 0 \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & p_{7,21} & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & p_{8,311} \\ \cdot & \cdot & \cdot \\ 0 & p_{7,41} & p_{8,41} \\ \cdot & \cdot & \cdot \end{bmatrix}
$$

3)
$$
\begin{bmatrix} r_{911,51} \cdots r_{102,51} \\ \cdot \\ \cdot \\ \cdot \\ r_{911,8} \cdots r_{102,8} \end{bmatrix}
=
\begin{bmatrix} 1 & r_{51,52} \cdots r_{51,8} \\ \cdot & \cdot \\ \cdot & \cdot \\ \cdot & \cdot \\ r_{8,51} \quad \cdot \cdot \cdot \quad r \quad 1 \end{bmatrix}
\begin{bmatrix} p_{911,51} \cdots p_{102,51} \\ \cdot \\ \cdot \\ p_{911,8} \cdots p_{102,8} \end{bmatrix}
$$

4) $\begin{bmatrix} r_{111,911} & \cdots & r_{14,911} \\ \vdots & & \vdots \\ r_{111,102} & \cdots & r_{14,102} \end{bmatrix} = \begin{bmatrix} 1 & r_{911,912} & \cdots & r_{911,102} \\ \vdots & & & \\ r_{102,911} & \cdots & \cdots & 1 \end{bmatrix} \begin{bmatrix} p_{111,911} & \cdots & p_{14,911} \\ \vdots & & \vdots \\ p_{111,102} & \cdots & p_{14,102} \end{bmatrix}$

5) $\begin{bmatrix} 1 & r_{67} & r_{68} \\ r_{76} & 1 & r_{78} \\ r_{86} & r_{87} & 1 \end{bmatrix} = \begin{bmatrix} r_{111,6} & \cdots & r_{52,6} \\ \vdots & & \\ r_{111,8} & \cdots & r_{52,8} \end{bmatrix} \begin{bmatrix} p_{6,111} & 0 & 0 \\ \vdots & \vdots & \vdots \\ \vdots & p_{7,21} & \vdots \\ \vdots & \vdots & p_{8,31} \\ 0 & \vdots & \vdots \\ \vdots & \vdots & \vdots \end{bmatrix}$

6) $\begin{bmatrix} r_{51,6} & r_{52,6} \\ r_{51,7} & \cdot \\ r_{51,8} & r_{52,8} \end{bmatrix} = \begin{bmatrix} r_{311,6} & \cdots & r_{432,6} \\ r_{311,7} & & \\ r_{311,8} & \cdots & r_{432,8} \end{bmatrix} \begin{bmatrix} p_{51,6} & p_{52,6} \\ \cdot & \cdot \\ p_{51,8} & p_{52,8} \end{bmatrix}$

7) $\begin{bmatrix} r_{911,111} & \cdots & r_{102,111} \\ \vdots & & \vdots \\ r_{911,52} & & r_{102,52} \end{bmatrix} = \begin{bmatrix} r_{111,51} & \cdots & r_{111,8} \\ \vdots & & \vdots \\ r_{52,52} & & r_{52,8} \end{bmatrix} \begin{bmatrix} p_{911,51} & \cdots & p_{102,51} \\ \vdots & \cdot & \\ p_{911,8} & \cdots & p_{102,8} \end{bmatrix}$

8) $\begin{bmatrix} 1 & r_{911,912} & \cdots & r_{911,102} \\ \vdots & \cdot & & \vdots \\ r_{102,911} & \cdot & \cdot & 1 \end{bmatrix} = \begin{bmatrix} r_{51,911} & \cdots & r_{8,911} \\ \vdots & & \vdots \\ r_{51,102} & & r_{8,102} \end{bmatrix} \begin{bmatrix} p_{911,51} & \cdots & p_{102,5} \\ \vdots & \cdot & \vdots \\ p_{911,8} & \cdots & p_{102,8} \end{bmatrix}$