INFLUENCE OF SIGNIFICANT OTHER AND LOCUS OF CONTROL DIMENSIONS ON WOMEN ENTREPRENEUR BUSINESS OUTCOMES

DISSERTATION

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By

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The personality characteristic locus of control internality is widely-accepted as a trait possessed by women entrepreneurs. Recent research also suggests the presence of a coexisting attribute of similar strength, characterized as influence of a significant other. The presence of one personality characteristic implying perception of self-directed capability, together with indication of need for external assistance, poses a theoretical paradox.

The study's purpose was to determine the nature and extent of direct and interactive effects which these and related variables had on entrepreneur return on investment. It was hypothesized that dimensions of significant other, as operationalized for this research, would support internality of locus of control and also modify constraining effects of educational and experiential disadvantage which the literature cites as pertinent to women entrepreneurs.

This was nonexperimental, exploratory research of correlational cross-sectional design which examined hypothesized variable linkages. A convenience sample from a women's entrepreneur networking group was surveyed.

Significant other elements were derived from factor analysis, resulting in four common dimensions. These factors, together with Rotter's Locus of Control instrument scores, reports on levels of education and experience, and hypothesized interactions, were independent variables. Hierarchial multiple regression was used to test a proposed path model.

Two interpretable four-factor solutions derived from significant other variables were tested in two models. Although neither model attained overall significance, individual variables were directionally as hypothesized, and locus of control and certain factoral dimensions attained bivariate significance. Significant other factors appear to influence locus of control through statistical suppression as they interact with other variables. Results point toward a possibility that significant others who most affect female entrepreneur performance are those who give specific advice and aid, rather than moral support. Further research to explore what seems a strong relationship between return on investment and locus of control internality is recommended.

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CHAPTER I

INTRODUCTION

> The optimal pattern of search does not simply mirror the pattern of probability density of that which we seek.
>
> Abraham Kaplan

In the summer of 1985 the opportunity arose to study information needs and sources of a group of women business owners in a large Southwestern City.[1] Such studies are of continuing research interest, since the charting of informal information channels used by such entities may ultimately help form a more coherent understanding of small business operations (9,17).

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[1]A semantic issue arises in categorizing business owners. The literature refers to entrepreneurs and business owners interchangeably, except for recent attempts to separate the two based on differing roles. Under these distinctions, "entrepreneur" is a person chiefly after rapid financial gain through business innovation. The "business owner" is committed to a specific firm over a long time period, and associates his or her personal value with the fate of the business. A recent review of problems surrounding these definitions concluded that until ways are found to operationalize them, distinctions are of little research value (3). In this study the group from which the sample was taken called itself an "entrepreneur association." However, their businesses had been operating an average of forty-five months, with a similar standard deviation. The membership was probably a mixture of "entrepreneurs" and "business owners." In this effort the terms will thus be used synonymously.

The surveyed group consisted of members of a networking association who consented to questions on the usefulness and extent of usage of business information sources. A list of possible choices from the literature was offered for their ranking (18). However, two additional sources were also included. The first was networking, done in deference to the group's chief interest. The second, stated as "advice of a significant other," was included in light of infrequently found but intriguing implications in a few research articles that something of importance might be associated with that source (8).

For the study, the term "significant other" was operationalized as: "A current close personal associate, family or not, whose opinion is of such value it would be specifically sought and could cause one to change a decision." This enabled inclusion of not only family members, but also friends and professional associates (14).

Not surprisingly, networking attained the highest importance as an information source. However, the source which was rated second was not the anticipated accountant, banker, or attorney, but the significant other. Significant other emerged not only as a source used more consistently than virtually any other; it was found fully as useful as any of the traditional sources (14).

Analyses were made of the responses of subgroups within the overall sample with similar results. Strong positive statistically significant attitudes toward advice of significant others were held by those with a wide range of education and experience. That finding was of particular interest in view of the literature's consensus that those very characteristics are key limiting factors in the success of females who choose to enter business for themselves (6,8). Women entrepreneurs, in that context, are seen as part of a disadvantaged class of business owner, often bereft of formal education and training in business. These conditions have lead one research team to typify women business owners as inhabitants of "entrepreneurial ghettoes" of retail and service firms (2, p. 394).

At this point in the inquiry, the significant other finding did not seem counterintuitive to the female entrepreneur business literature. If women in business face such background limitations, it is not surprising that they turn to nontraditional sources such as family and friends for information. In fact, that seems in line with other research which indicates that small business owners generally use the most readily available and easily contacted sources (6,22).

Additional follow-up work was conducted with the same group several months later to more closely examine the nature of advice received from the significant other. When members were questioned about the total contribution of the significant other it was found that more than information was derived from that source. Emotional support, planning advice, day-to-day operational hints, financial assistance, contacts with important business associates, and physical support were all assessed of importance. It became clear that the original "advice of a significant other" responses had reflected a scope of advice and assistance not originally envisioned (15).

Although significant other findings were interesting, it was difficult to integrate them into the commonly understood theoretical structure surrounding small business owners. Evidence from a second theoretical arena evoked suspicion that the significant other artifact might not be typical of entrepreneurs in general. Since the mid-1960s, the psychological school of social learning theory has amassed findings indicating the pervasiveness of a personality construct called locus of control (19). The construct reflects the degree to which persons believe themselves to be the main casual actor in their lives. Such persons are termed relatively "internal" in locus of control. Those who believe outside forces or random chance are the key arbiters of their personal fate are said to have "external" orientation (19). Research applying locus of control to small business ownership has repeatedly shown internality to be associated with such activity for both genders (2,4,7). Such internality would not seem to match strong needs for the advice of others.

Further reflection on the significant other phenomenon in light of still other theory resulted in the conclusion that its appearance should not be dismissed as only a curious research artifact. Socologists have long maintained that reality consists of the perceptions persons have of themselves, reflected by others. Members of the symbolic interactionist school of that discipline have asserted that significant others play key roles in the process by which reality is thus brought into focus (5,10,12). The findings from preliminary inquiry of the female entrepreneur sample seemed to conform to implications which arise from this sociological view.

A paradox thus emerged from an apparent conflict between symbolic interactionism's socially-constructed view of the world, and the theoretical and empirical body of locus of control work. Resolution of that paradox was the starting point of this inquiry.

Problem

Research was planned to explore the relationship between female entrepreneurs and key significant others in terms of business outcomes, the effect of significant others on the personality construct locus of control, and how both of these issues were influenced by the biographical dimensions of education and experience.

Usefulness of the Study

Thomas Kuhn has commented on the difficulty of communication between paradigms within a discipline (11, p. 148). In this case, the paradigms of symbolic interactionism and social learning theory are interdisciplinary, making justification of one difficult in terms of the other. The theory and research of symbolic interactionism has produced relatively global insights into the nature of socially-constructed relationships between individuals and those who are called significant others. Social learning theory has focused on the locus of control construct to enable researchers to measure the extent of influence of past experience on individuals' future aspirations.

Both schools of thought should help explain success in business ownership. It appears that the constructs of each school may be interactively related and mutually influential. If such relationships were empirically verified, further research across the two paradigms and fresh insights into the nature of entrepreneurship might be encouraged. That contribution would support a recent appeal for more sophisticated insights into the many variables which impinge on both the entrepreneurial act and its outcome (3). One such insight might be in the realm of specifying congruence structures which may produce favorable small business operating conditions (16).

Hypotheses

The following are general hypotheses, elaborated in Table 1 with direct and interactive effects.

1. The dimensions of significant other may be interpreted in two common factors: significant other advice and significant other assistance. The factor, significant other advice, is expected to account for the majority of measured variation.

2. There is a significant and hierarchial positive relationship between business financial success as a dependent variable and the independent variables entrepreneur education, entrepreneur experience, significant other advice or assistance, and internal locus of control.

3. As shown in Table 1, each independent variable dimension including the common factors associated with significant other has specific hypothesized direct and interactive effects on dependent and independent variables, with the exception of entrepreneur education and entrepreneur experience. Neither of these dimensions has direct effects on the dependent variable, but are acted upon by each other and in turn influence the dependent variable through the remaining independent variables.

4. Internality of locus of control is enhanced through its interaction with significant other common factors.

TABLE 1

DIRECT AND INTERACTIVE EFFECTS OF VARIABLES

Variable	Direct Effect on...	Interactive Effect on...
Entrepreneur business education X_1	Entrepreneurial experience X_2	Entrepreneur expérience X_2
Entrepreneur experience X_2	Advice of significant other X_{3a}	Entrepreneurial business education X_1
	Assistance of significant other X_{3b}	
Advice of significant other X_{3a}	Internality locus of control X_4	Entrepreneurial experience X_2
	Entrepreneurial experience X_2	Internality locus of control X_4
	Business success (ROI)	
Assistance of significant other X_{3b}	Internality locus of control X_4	Entrepreneurial experience X_2
	Entrepreneurial experience X_2	Internality locus of control X_4
	Business success (ROI)	
Internality locus of control X_4	Business success (ROI)	Advice of significant other X_{3a}
	Advice of significant other X_{3a}	Assistance of significant other X_{3b}
	Assistance of significant other X_{3b}	Business success (ROI)

Limitations of the Study

The study used a convenience sample of female entrepreneurs drawn from an existing 200-member association established to promote networking among women business owners. All participants were located in one specific geographical business environment, thus universal extension of research findings will be inappropriate. However, it is hoped that replication of these efforts at other locations and other times will aid small business researchers to develop further hypotheses on the role of significant other as a socially-constructed variable. The study was further limited in that only female entrepreneurs were surveyed, thus comparisons between male and female segments of the entreneurial populations could not be made.

Research Design

This is nonexperimental, explanatory research of correlational cross-sectional design which seeks to establish potential linkages between one set of socially-constructed or structural independent variables, one personality-based independent variable, variables derived from autobiographical reports, and a dependent variable. A convenience sample of respondents from the Association of Women Entrepreneurs of Dallas who elected to complete a survey instrument was used as the data source.

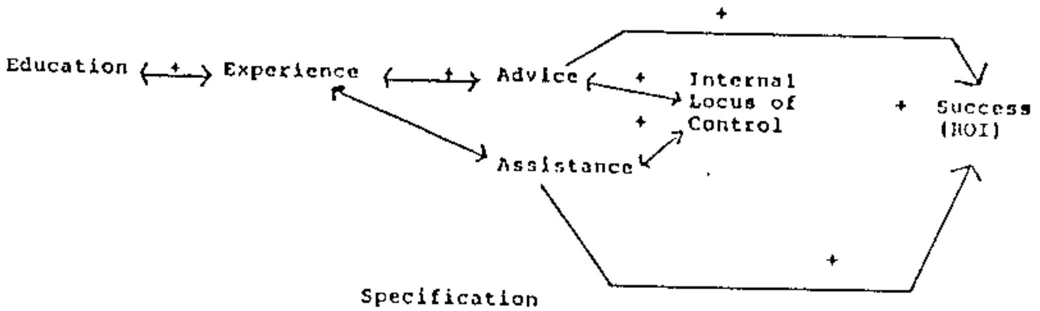
Model Specification

It was postulated that a hierarchy of relationships exists among variables already associated with entrepreneurship, variables related to the identity and contribution of the significant other, and a measure of business success. As shown in Figure 1, the path diagram indicates direct effect relationships between hypothetical significant other factoral dimensions and the dependent variable, return on investment. Similarly, a direct effect between locus of control and the dependent variable consistent with Waddell's findings was asserted (23). The model also hypothesized relationships between experience and significant other advice and assistance dimensions. This theoretical relationship was based on findings earlier cited which described

Figure 1

Hypothesized Path Model and Variable Specification

Path Model



Specification

ROI_Y (f): Entrepreneur education X_1 + Entrepreneurial Experience X_2 + $X_1 X_2$

+ Significant Other Advice or Assistance X_{3a} or b + Internality Locus of control or Assistance X_4 + $X_3 X_4$

female entrepreneurs as disadvantaged from their lack of past business experience and education, and the reasoning that the chronological order of first education and then experience would cause the latter to dominate in direct effect. As shown in Figure 1, it was thought these disadvantages were modified through the effects of significant other on return on investment.

Measurement of Variables

Locus of control was operationalized using Rotter's concept of consistent individual differences among individuals to the degree that they are likely to attribute desired results to personal control in given situations. These attributions are measured by responses to forced choice questions from which a locus of control score is computed (21). Reliability and validity reported by Rotter and Phares were considered satisfactory for purposes of this study (19,21).

The variables pertaining to significant other would consist of reports on perceptions of the skills, knowledge, and contributions of a significant other to the individual respondent, reduced through factor analysis to a construct or constructs. The basis of measurement of these artifacts was operationalization of the term "significant other." This was done as: "Significant other is a current close associate, family or not, whose good opinion you value so highly you would go to some trouble to seek it out before making a critical business decision, or whose good opinion you value so highly that you would change a decision he or she thought ill-conceived." This operationalization sought to make the concept of significant other include both family and nonfamily associates, yet focus on a key person whose opinion about business was highly valued. This placed significant other in a role of actual participant or advisor in decision making, emphasizing the role as one which provides more than just consistent physical assistance, i.e., a housekeeper. "Good opinion" is included to make the response to significant other reflect a voluntarily sought interaction, rather than a coercive constraint which might exist through family responsibility or expectation. Respondents were given this definition and asked to rate the importance of both advice and assistance behavior by the significant other.

Success as a dependent variable was assessed by respondents through calculation of return on investment, resulting in a ratio index number. Success was also separately operationalized as the level of business financial return received, based on what the respondent had expected when starting the business, and satisfaction derived from the business. Each of those measures was ordinal, and taken to obtain potential surrogates for return on investment, should measurement of that variable prove unacceptable.

Questionnaire Administration

The questionnaire was to be administered to all members of the participating group through direct contact and mail solicitation. An announcement of the survey was made in the organization's newsletter preceding a meeting in which questionnaires were to be distributed and completed. Subsequent mailings of questionnaires were planned if necessary to enlarge the sample size. Mail questionnaires were to be returned to the researcher in provided stamped, self-addressed envelopes.

Data Analysis

The independent variable dimensions of significant other were factor analyzed to calculate common constructs. All variables including hypothesized interactions were then regressed hierarchially to ascertain a coefficient of determination (R^2) for the overall hierarchy, and F values to determine statistical significance of the design. Protected t tests were conducted to control Type I error.

Internal and External Validity

Internal validity threats of maturation, differential selection and history arose from the experimental design. Respondents were asked their retrospective opinion on the effect of contribution of a significant other to their business lives in the past and present. The passage of time and development of new insights due to personal growth and experience casts some question on the validity of such retrospective measures. Differential selection was a problem in that the group from which the sample was drawn consisted of women committed so strongly to the entrepreneurial process that they had joined a networking group of likeminded others. This level of commitment virtually guarantees the absence of more passive business owners, persons who view themselves chiefly as business owners and less as having the assertive qualities often ascribed to entrepreneurs, and those who might view their business as transitory or perhaps failing. Within the group, issues were also present having to do with willingness to respond to a somewhat lengthly questionnaire, and the "true representativeness" of the sample which would eventually be analyzed in terms of the overall frame. Finally, in a historical sense, the research was conducted at a time when regional business was in recessionary decline. Somewhat less pessimistic responses might have been rendered if the economy were expanding.

External validity can emerge only through replication of study efforts with similar groups in other geographical areas subject to social and economic variables different from those unique to the Dallas area.

Report Organization

The research is summarized in the following chapters. Chapter II surveys the literature pertaining to the construct of significant other. This is compared to relevant work done with locus of control, and conclusions are drawn about similarities and difference of the variables and the constructs they represent. Additional research is reviewed which pertains to significant others and locus of control in entrepreneurship, with an excursion into a summary of relevant aspects of the mentorship literature. Chapter III describes methodology, including the techniques of factor analysis used, regression strategies, and samples tested. Chapter IV presents findings from analysis of the data, and Chapter V contains implications of the work and recommendations for future efforts.

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CHAPTER II

SIGNIFICANT OTHERS, LOCUS OF CONTROL, AND THEIR CONNECTION

> I was a wisp of undifferentiated nothingness, and then a little peephole opened quite suddenly. Light and sound poured in. Voices began to describe me and my surroundings. Nothing they said could be appealed.
>
> Kurt Vonnegut

Fiction aside, this is the way a long tradition of behavioral science literature describes the process whereby persons are created in a social world. The concepts behind such a description reach back to what some late 19th Century philosophers thought might indeed be a "science of man" (46). They cast a theoretical shadow which, though sometimes faint, has persisted from that early time to some of the most recent work in social psychology (52).

Still, the contribution of theory and research in that tradition is by no means universally accepted as the final model of how persons first become part of a social community and then react to the community's influence. For the past two decades a theoretical structure from psychology with a somewhat different view of the socialization process has been a popular explanatory mechanism (37, 44).

This chapter reviews the central tenants of these two descriptive approaches, from the standpoint of the project defined in Chapter I. The theoretical bases of each will be summarized, relevant research cited, and a possible synthesis, or at least accommodation, of the two will be described. Beyond that, beliefs about still a third set of biographical issues thought to influence small business ownership will be discussed. That set consists of the education and experience of the entrepreneur. As earlier indicated, a series of hypotheses about the interrelationships of these matters forms the structure of empirical research which is addressed in Chapters III and IV.

Comparison of Variables

Before describing the published material on significant other and locus of control, it is necessary to mention a fundamental difference in the extent to which they have been empirically applied. They represent, in effect, extreme opposites in terms of their relative degree of "soft" and "hard" theoretical grounding (9).

Locus of control is most readily measured with scores derived from administration of an existing instrument of high theoretical validity and reliability. The school of social learning theory looks on that very instrument as the epistemic foundation on which its structure stands (37). However, significant other is a construct which represents only one aspect of a portion of the theoretical framework of the sociological and social psychological paradigm of symbolic interactionism (25, 52).

Before the 1960s, the concept of significant other was assumed to be a given; an integral part of early theoretical structure -- a structure which had neither been successfully challenged nor verified due to problems in operationalizing its contextual terms which included "significant other" (52). Only recently has the paradigm been revisited with newer methodologies of sufficient intensity to unfold verifying insights (44, 52).

Locus of control, on the other hand, is a relatively new construct developed by psychologists who subscribe to social learning theory. Emerging in the 1960's with the work of Phares and Rotter, the school quickly developed a measuring instrument of such reliability and validity that it is used today, virtually unchanged from its earlier form. The instrument's high level of acceptance indicates it deals with a construct which has become so clearly operationalized that it has the status of a descriptive personality variable (37, 43).

Significant other and locus of control are more alike as constructs today than five years ago. However, locus of control has a much stronger history of quantitative evaluation and application than does significant other. In the following discussion it will become clear that this is so because of the history of the behavioral science schools which have produced each one. It is necessary, however, to understand these varied backgrounds to appreciate the manner in which empirically each of the constructs was handled in this effort.

Given that disclaimer, the background and content of the constructs and theoretical basis which supports them may be considered. In deference to age and scope, significant other comes first.

Symbolic Interactionism and Significant Others

Much of the literature on significant other falls within the area of sociological thought which has for its primary thesis the view that the self is created through social interaction (35). In some theorists' view, the interaction is between individual and group; the cluster of persons with whom one lives, by which he or she was influenced as a child, and through which he or she is controlled as an adult (25). However, from the perspective of social psychology, the term "other," or the enactor of this force, may also be an individual (35).

From psychiatry, sociology, and social psychology a construct has emerged which, though it seems on the surface almost self-evident, has been fraught with definitional and operational problems. The idea that one's significant others -- close associates of family or nonfamily origin -- are influential in one's life, is seemingly so basic to our view of the world to warrant uncritical acceptance. We need friends, and we are not to forget the enviable gift of such relationships. One recent popular writer says:

> Close friends contribute to our personal growth. They also contribute to our personal pleasure.... Friends furthermore take care. They come if we call them at two in the morning; they lend us their car, their money, their bed, their ear; and although no contracts are written, it is clear that intimate friendships involve important rights and obligations (54, p. 200).

Friendship, however, has other implications. One of these is found in the perspective of behavioral psychologists, who maintain that in spite of the need for friendship and the influence brought to bear by significant others on one another, the individual is "independent causal agent of his/her own behavior" (52, p. 84). This issue of internal and environmental causality seems at the root of some of the earliest attempts in sociology to deal simultaneously with the importance of personal relationships and a definition of self. The outcome was construction of a world with self and others as principal actors, moving in a theoretical framework called symbolic interactionism (35).

The Founder and the Other

Symbolic interactionism has been called one of the four paradigms of social psychology. It emerged out of Hegel's concept of dialectical interaction and the pragmatism of James and Dewey. George H. Mead, a philosophy professor at the University of Chicago, formulated the early symbolic interactionist concepts, to fashion a science of man which would link the new field of psychology with larger social issues (46).

Mead asserted that the self arises or is developed from social interaction. Others train the self to participate in social acts which are rich in cultural meaning, and once socialized in his way, the self participates as other to train new members of the community. This, in effect, creates a self to recreate itself by recreating society (3, 46). Simultaneously, the self engages others who convey symbols to the self which create a picture of the reality of that society. Put another way, in a dialectical manner, self and other interact to produce a third entity: reality. The theoretical structure thus explains the socialization of individuals and points toward the creation and sustainment of culture (3, 30, 38).

The cornerstone of Mead's formulation is the concept of the "social act." This phenomenon arises from the human understanding that meaning lies not only in actions which are fully performed, but in the anticipated consequences of the act's initiation. The interpretations which we place on acts and gestures are the things which give those acts and gestures meaning. A clinched fist and angry shout conveys threat, while a smile and wave connotes peaceful openness. While these are obvious examples, Mead and his followers came to believe in a vast repertory of symbols which relate subtle shades of meaning and convey to others the hidden nature of ourselves (35, 46).

> In a social encounter each member exposes for public scrutiny, and possible intolerable undermining, the one thing he needs most; the positive self-valuation he has so laboriously fashioned. With stakes of this magnitude there can be nothing routine about social life. Each social encounter is a hallowed event (2, p. 94).

As persons interact they create a social process through the use of symbols. Such symbols make interaction predictable and understandable even while the interaction is in process. Without the interpretation of these interactive symbols, every gesture and nuance of speech and motion would have to be interpreted anew, without criteria. By developing a socially-constructed menu of actions which contain meanings similar to the interpretations of others' actions we feel safe in making, one is able to function as an individual in society. Selfhood is thus attained (46).

The notion of <u>process</u> is crucial in symbolic interactionist thought. To Mead the idea of other was more global than the sum of individual persons with whom the self interacts. Other was also conceived as an overarching social force which interacted with the self to convey larger institutional meanings in the world (30, 35). This process, which is instrumental in conveying meaning from what Mead called "generalized other" to the self, begins when one becomes concerned with what "they" may think. To Mead, "they" is an organized set of common values held by the culture, itself. These values are in effect, rules of the road for interaction in a broader realm of society. Through the process of learning these rules, visualizing the impact of actions upon others' expectations of our knowledge of the rules, and acting in conformity with these expectations, a "collective me" is formed, competent to act in a social framework. A separate "I" self remains intact, and is responsible for creativity, innovation, and other non-group artifacts (46).

Into the Looking Glass with Cooley

As a doctoral student, Charles Horton Cooley first became fascinated with a part of Adam Smith's writings which dealt with the need to take another's point of view in order to learn to act effectively in society. This interest in what today might be called role playing caused Cooley to move beyond Mead's conception of generalized other and consider the transactions which take place between individuals. This lead Cooley, as a social psychologist, to develop a concept which became one of the central theoretical components of symbolic interactionism (35, 46).

Cooley's contribution was the theory of the "looking-glass self." Such a self has three elements: the perception of appearance to the other person; one's own perception of that other's judgment about that appearance; and a self-feeling which arises from the transaction such as "pride or mortification" (11, p. 184). Under this construction, other actually becomes internalized, existing as our perception of the attitudes individuals hold toward us, based on our history of contacts with the outside world. "The social self," Cooley wrote, "is simply any idea or system of ideas drawn from the communicative life that the mind cherishes as its own" (11, p. 179). Stated another way: "The imaginations people have of one another are the solid facts of society" (11, 121).

Cooley's work added a strong developmental aspect to symbolic interactionism. One's self-concept can change based on new information. Communication is so important in forming the self-concept that Cooley used it to describe the boundaries of what he called the "primary group." That group, which validates the self and gives variety to life, cannot exceed in size the capability of communication among its members (35).

The members of this primary group are said to constitute an "epistemic community," creating in effect, the self and the world one takes for granted, based on the motives and meanings learned from the world's creators. As long as one is part of a primary group, "they" keep reinforcing earlier strictures and lessons. Finding new worlds by learning new realities requires finding new groups with different lessons to teach (45).

Others and Others

The term "significant other" was first used by Harry Stack Sullivan in a psychotherapeutical application in 1940 (25). Although influenced by symbolic interactionism, Sullivan, as a social psychologist, was far more attuned to Freud than Mead in his clinical practice. Possibly due to that separation from the interactionist school, the notion of other denoting a specific individual, although present in some of Cooley's work, remained a separate idea, not widely applied outside clinical work. Sieber, for example, viewed role relationships between self and other as transactional events in which others are gatekeepers for those seeking valuable benefits. Some of these benefits may include introduction to influential persons, good credit rating, access to potential mates, insider tips, or even access to graft, bribes, or payola (50).

Such significant others have been called role-specific, and have been seen as useful in research, as opposed to the more generalized, societal concepts, because the former can be operationalized. This became a problem for symbolic interactionism. Adherents of the old line school of Mead and Cooley disdained empirically testing the formulations of the founders. Newer members of the sociological and social psychology community insisted that untested theories amounted to "gloss" rather than substance (52).

Attempting to save the concept of other for more useful work than adornment of a theoretical structure, Manford Kuhn developed the concept of "orientational other." He suggested such others have certain attributes:

> (1) The term refers to others to whom the individual is most fully, broadly, and basically committed, emotionally and psychologically;
>
> (2) It refers to the others who have provided him with his general vocabulary, including his most basic and crucial concepts and categories;
>
> (3) it refers to others who have provided and continue to provide him with his categories of self and other and with the meaningful roles to which such assignments refer;
>
> (4) it refers to the others in communication with whom his self-conception is basically sustained and/or changed (25, p. 18).

Kuhn points out that this orientational other has some relationship to an earlier concept of primary self and primary others by Dai. However, he denies that the orientational other has importance in infancy or childhood only, as was Dai's contention. Kuhn advocates viewing this orientational other as an object for study to discover "if there are regularities in the relation between orientational other and self which can account for the discrepancies between regularities of the social system and the phenomenon of individual behavior" (25, p. 19).

The other thus propounded by Kuhn can be operationalized. Each of the attributes is capable of at least nominal measurement. However, the emphasis on basic commitment and preeminent importance moves such a construct away from the role-specific arena and toward a more comprehensive, global entity. The communication requirement established by Kuhn further forces the significant other into a unique category normally filled by a spouse. The concept is therefore of limited value to the research described in this paper, but forms an example of the problem of operationalizing a significant other. From that point of view, it does illustrate the difficulty of doing empirical research to test the symbolic interactionist hypotheses.

The literature which emerged during the hayday of symbolic interactionism reflects this array of other variants. These are: Meade's generalized other, Cooley's internalized other, Sullivan's significant other, and Kuhn's orientational other, plus Sieber's concept of a transactional other and Dai's primary other. For this research, the concept of significant other was reformulated as a combination of orientational and transactional other.

Elaborating Theories and Empirical Research

As indicated earlier, the school of symbolic interactionism fell into unpopularity within sociology in the 1960s and 1970s, and with that unpopularity came fewer attempts to deal with the paradigm's theories and constructs. Some research, however, was conducted which does provide insights into, if not exactly the identity of the other, the nature of relationships between selves and other.

Second and Backman used significant other in a theory of interpersonal congruency, which maintains that both personal stability and change are functions of striving to maintain congruence between self-concept, conceptually relevant behavior, and the reaction of the significant other to that behavior (47).

Denzen studied significant other relationships in a college population to determine their identity, if gender-related differences influenced the importance of a specific other, and if significant others changed through students' matriculation. Although his work was limited in that students were given only specific individuals to rank (parents, teachers, friends), Denzen's work is interesting since he made a distinction between role-specific and the more generalized, orientational others as described by Kuhn. Role-specific others were those whose opinion was of importance to the individual in that individual's student role. Orientational others were significant for their importance in evaluating the worth of the respondent as a person. In the former case, faculty were of predominant importance, due probably to their evaluative function of the individual's progress through courses. In the latter case, however, friends and family were most important. Interestingly, females thought of friends as orientational others to a much greater extent than did males. Also of interest is Denzen's interpretation of his finding on the consistency of orientational other identity, compared to the transitional nature of role-specific other.

> We suggest that individuals have longer histories of relationships with orientational others than they do with role-specific others, and hence it is to the orientational other that we must turn if we are to learn anything about the more basic, underlying dimensions of a person's personality (14, p. 308).

Both Kuhn and Denzen thus aligned their concept of research fruitfulness behind the orientational other. Casual, transitory, role-specific friends and acquaintances, under their formulation, have much less influence than those with whom we are involved in relationships of long duration. This approach doubtless influenced the type of relationships which subsequently have been studied. Most direct evaluative efforts in the significant other arena have dealt with spousal interaction. Such relationships fit the Kuhn-Denzen construct, and are also advantageous since relationship pairs can be readily identified.

Most of the research on self and other compares self-evaluations with evaluation by others, pursuing a web of hypotheses based on the concept of the looking glass self. In such work, attempts are made to capture the self-concept of individuals and determine if those self-concepts hold up in the face of revealed lower or higher evaluations by others. Rose has indicated that in such inquiries members of minority groups consistently show patterns of self evaluation which reflect greater situational empathy than do members of the majority. Women, for example, seem to sense that evaluations of them do not really reflect the totality of the other's attitudes, and may represent more "role-determined politeness rather than expressions of the 'real' attitudes of others" (40, p. 476). Rose reports on findings of several research projects that male subjects performing self-evaluations rank themselves higher than others rank them, while women consistently rank themselves lower (40).

More recent work has indicated that this tendency may be situational. Hoelter found in a group of high school seniors that the perceived evaluations of others had greater effect on males than females (20). Recent work by Shore and Thornton with persons of both genders in an actual work situation, however, fails to establish gender as a primary cause for differences between self and other-initiated evaluations (49).

Rosenberg's study of 2,000 Baltimore school children (41) was landmark research on the significant other aspect of symbolic interactionism. The effort was conducted to define both the identity and importance of various significant others. The inquiry grew from the observation that discrepancies existed in the theory of reflected appraisals: some persons, who believe others think well of them, often have negative self-attitudes and vice versa. Rosenberg hypothesized that significance is in the eye of the beholder. By directly asking a person who in their lives are more or less significant to them in an evaluative sense, we can determine significance.

Rosenberg also introduced an important elaboration of relationship dimensions; significance based on valuation and credibility. Valuation is a desire for the favorable opinion of another, either due to intrinsic attractiveness or benefits the relationship may confer. Credibility is the respect we have for an other, and is in large measure a function of our view of the scope and relevance of that other's experience and ability.

In the research, an alternative definition for generalized and role-specific significant others was developed, by viewing them as either primary or secondary relationships. A primary relationship, according to Rosenberg, is one in which the relationship is an end in itself, is concerned with mutual benefit, and includes all aspects of the individual's life. A secondary relationship is segmental and role-specific. He further indicates that the more complex the society the more heavily represented are secondary relationships.

More meaningful measurement of the nature of self in response to other has recently emerged through use of more sensitive comparative methods. Schaefer and Kieth have examined what they call the "major" assumption of the interactionist model -- the process of role-taking. In their analysis they apply three components of self-concept which differ somewhat from Cooley's original formulation (45). Under this newer view, the self-concept is a function of how the individual sees him or herself, how the individual believes others see him or her, and how others actually see the individual (42).

Based on the belief that perception is the reality on which an individual organizes, changes, and validates a self concept, Schaefer and Kieth attempted to measure the evaluative perceptions of interactive persons. The group they studied consisted of sets of marriage partners, a frame desired by the researchers to identify pairs of persons having mutually strong biographical significance (45).

Although Schaefer and Kieth dealt with orientational others who were, by definition, generalized in impact on their partners, their method of evaluating the interactions between persons yielded findings of great interest. Development of path analysis which described the degree of main and interactive effects of the variables on one another, also enabled the computation of the extent to which each variable acts on another given variable in the presence of a third.

In this study, 333 couples were stratified as to age and presence of children in the household. The individual members were asked to assess themselves on a self-concept scale of items such as friendly/unfriendly, capable/incapable and satisfied/frustrated. Ratings on a seven-point scale were made for each of the three global constructs, derived from specific attribute scores (Alpha reliability in excess of .7 was reported for each). Findings were that marriage partner appraisals are reflected in each partner's self-concept, but that effect is mediated through the process of role-taking. Beyond that, it was found that almost half the variation in self concept for both husbands and wives was explained by factors not included in the model (45). The finding supports Cooley's original proposition about the looking glass self as not an absolutely true reflector of self-concept. We do not, in other words, absolutely mirror the assessments of others with our assessments of self. The looking glass has intrinsic distortion, so we mirror inexact images, reflected in the process of perception of the other's opinion: the act of role-taking. The early theorists, in other words, formulated elements of a "science of man" which was not only conceptual, but increasingly appears to be measurable.

Mentoring Theory and Significant Others

During the past several years the phenomenon of mentoring has attracted much research interest. The findings which have grown from that effort provide insights into critical dimensions of significant other relationships in the workplace. Mentoring, in current usage, is chiefly concerned with persons interacting within formal organizations having larger size and more elaborate structure than those operated by the small business owner (12, 21, 26). However, mentoring literature still contains the most complete body of information on role-specific relationships in organizations. In this discussion, that which seems relevant to entrepreneurs will be addressed.

One emphasis in the literature of mentoring is the association between developmental stages of the individual career and correspondingly differing types of mentoring activity. Although "mentor" connotes a relationship between a young and older adult, in which youth is guided through a maze of potential difficulties to desirable levels of competence, this traditional view may be limiting. Kram, in a study of the more substantive mentoring work, indicates that both the content of assistance and process of helpfulness is multidimensional. For example, mentoring relationships can occur at any stage in one's working life, from neophyte to pre-retiree. In any stage, the mentor receives as well as gives, and in so doing gains valuable benefits from the protege (24).

Kram has synthesized the body of mentoring research into a conceptual framework. Its foundations are the stages of career and human development, formulated by organizational career writers such as Hall, Erickson, and Super (15, 17, 53). The structure consists of a web of changing personal relationships which are each appropriate for specific stages in career and life. The career stages of early, middle, and late are complimented by a dichotomy of mentoring functions, consisting of career and psychosocial functions contributed by both mentor and protege (24).

Career Mentoring Functions

The functions of sponsorship, exposure and visibility, coaching, protection, and challenging assignments seem to fit the structure of large rather than small entrepreneurial organizations. However, the functions are not necessarily so limited. Sponsorship, as the most frequently observed career function, could be of aid to the new business owner. Under Kram's definition, this sponsorship consists of a senior official's public support in launching a junior's career (24, p. 25). In such a context, the function's applicability to small business is obvious. Such aid would be of great value to the entrepreneur who wants to convince financial backers, suppliers, customers, and the public of his or her commitment to socially and financially desirable practices. The underwriting dimension of sponsorship can greatly facilitate the opening of critical initial doors.

Exposure and visibility in the corporate world consists of keeping the protege in the favorable eye of superiors under controlled conditions where failure is unlikely (24, p. 27). In the world of small business, such assistance would be an extension of initial sponsorship. Introduction to key business contacts may continue as the needs of the entrepreneur change due to growth or expansion of the business.

According to Kram, the coaching function retains high importance (24, p. 28) from beginning to final career stages in the traditional organization. The coaching process provides detailed direct information and feedback on how to navigate successfully in the corporate world, and could readily be applied to a person in business for him or herself. There are vestiges of Cooley's concepts in the coaching function, which underline its importance in almost any activity. Because of that, coaching was applied as a dimension in this current research effort, operationalized as the provision of how-to-advice and strategic advice on business matters.

Psychosocial Mentoring Functions

These functions consist of role modeling, acceptance and confirmation, and counseling and friendship. They are functions which might equally apply in importance in a corporate environment and an entrepreneurial situation. Role modeling, which Kram reports is the most frequently reported psychological function (24, p. 33) might be expected to manifest itself in a small business situation as the desire by self to be as capable as the significant other. Some caution should be exercised, however, about the substance of role modeling. Much of the function is related to emulation of style, which is often vital in a corporate culture (13). Such emulation seems almost misplaced in the case of the entrepreneur, who in many cases has chosen an independent role precisely to avoid the need for such structured role modeling (4, 5, 51).

Acceptance and confirmation involves development of a sense of self by both parties in the relationship. The protege becomes more adroit and effective. The senior feels more creative and useful by seeing proffered advice bear fruit in the junior's career (18, 24). While this interaction undoubtedly exists in a long term significant other relationship in a small business environment, its operationalization would be difficult. Measurement of the attitude of the business owner, and of the significant other would be necessary.

Counselling and friendship, according to Kram, differ in that the former relates to work issues and the emotions or feelings which surround them. Friendship goes a step beyond to "social interaction that results in mutual liking and understanding, and enjoyable informal exchanges about work and outside work experiences" (24, p. 38).

Peer Relationships in the Workplace

Peer relationships are vital and more readily available to most persons than are the classical mentoring ones. They endure longer than mentorship, and provide opportunity for two-way relationships in which each person concurrently supports the other, without regard to such issues as protege success. In formal organizational settings such relationships are of great importance. Dalton, for example, finds that such a relationship is often needed to move successfully from entry to contributory phases of a career (12). Some indications have also been found that in mid-career, peers and spouses both provide psychosocial functions in both personal terms and a career sense (24, p. 149).

Kram hypothesizes a relationship continuum representing types of peer associations providing developmental assistance at different life phases. Such associations range from informational to collegial, and finally, encompass unique or special peers. Informational peers are casual associates from whom information is received about what is going on in the work situation. Collegial peers perform functions of career strategizing, job-related feedback, and friendship. Special peers confirm the actions and intentions of the individual, provide emotional support, offer personal feedback, and provide friendship. For each of these relationships the level of commitment, disclosure, and trust moves from slight for the information peer to possibly best friend status for the special peer. The special peer also provides an inclusive range of support for both family and work concerns, and offers a chance for expression of personal and professional fears (24, pp. 146-150).

The Relationship Constellation

Kram concludes that both career and psychosocial functions are fulfilled through a variety of relationships. She calls the complex of these sources a "relationship constellation," and finds that those who seek support, aid, and friendship, find it best with several persons, rather than one significant other. The combination includes family members, friends outside work, peers, mentors, subordinates, and bosses (24, p. 149). In effect, she is noting the importance of multiple role-specific others.

Significant Other and Entrepreneurial Research

Although much work has been done on types of relationships and their contribution to the individual in a corporate setting, little exists which directly deals with entrepreneurs in our society. Only four studies have been found which refer to the importance of the other as a factor in starting or operating a business. One study noted the supportiveness of successful female entrepreneurs' husbands. Thirty-eight percent of those interviewed in that effort reported that spouses were instrumental in convincing them to start a business. Another effort dealt with British female entrepreneurs, and found career success associated with spouse supportiveness. A third effort, in the U. S., found that male spouses of professional background often provide financial as well as emotional support (4). The fourth effort, discussed in Chapter I, was a study of information needs of female entrepreneurs which lead to the present research (34).

The Nonexistence of Closure

When the research just referred to was originally completed, its finding of the significant other's role as an entrepreneur information source was thought fairly obvious. However, subsequent study of the theoretical history of symbolic interactionism concepts and the significant other construct points to a dilemma. Mead, Cooley, Kuhn, Rosenberg, and others have all assured us that other exists and is an important explanatory phenomenon impinging on the way we view the world we inhabit. Others more directly sociological in approach have moved beyond this to assert the very reality we perceive is thus socially constructed (3). Still, the problem with which symbolic interactionism has always wrestled remains not only how to measure its content, but which variables might best be measured to usefully describe its constructs.

The multiple dimensions of other cited by Kuhn illustrate the issue. Even after Kuhn's article, most work was done from the perspective of some predefined other's immediate impact on the subject of inquiry. Significant others were assumed to be persons in obviously significant roles: spouses, parents, teachers, friends. Rosenberg pulled away from that traditional view to show that not all significant others are as significant as preconception would have us believe. Still, doubtless for both financial and logistical reasons, most research on other has been performed using college populations in retrospective evaluative settings with the identity of other, a given.

Mentoring research, on the other hand, provides a rich assortment of both concepts and research findings taken, almost by definition, from those in actual work settings where mentoring must exist. From these reports it has become evident that one's personal relationships not only enhance, but often make endurable a career as manager in a large organization. The conclusion which must emerge from this is that if the spectrum of relationships within the mentoring arena is vital for those in our culture who find themselves in large organizations, it may be similarly important for those who choose to be business owners. The frustration is that the potential for expanded work into that arena has been unfulfilled.

Origins of Theory and Construct

Social learning theory, the structure within which the construct locus of control was developed, originated from two schools of psychology. The first was behaviorism, applied in B. F. Skinner's rigorously empirical way (37). The second was Homans' exchange theory (46).

The behavioral school is a particularly important originating force because within it an almost radical empiricism developed. Skinner claimed the proper concern of psychology was only the individual whose behavior was observed, and no other entity (46). The individual organism, as the field of study, was driven by the response to stimuli of its autonomic and central nervous systems. All the observer can therefore really know about behavior is what can be observed of the actions resulting from stimuli, and those stimuli. Skinner called the process of learning, in which the organism's systems learn to react to specific stimuli, operant conditioning. The purposefulness of behavior, under this definition, moves in response to stimuli which, in the past, has energized actions with predictable, favored results (37, 46).

A different school's focus shifted from the behavioral to the cognitive, associating great importance to the expectation an individual has that actions in response to stimuli will bring certain outcomes. Homans and other colleagues believed expectation was controlled by some form of preference schedule which placed actions in priority based on the value attached to an outcome, given the likelihood of that outcome. Rather than reacting merely with a learned response, the mind factors into expectation the nature of the overall situation in which the stimulus appears, inserting into the calculus of desirability, a component of likelihood of attaining the desired ends (46).

Social learning theory was synthesized from these two channels of thought, not in a move toward parsimony but in response to clinical need. By the mid-1950s a concensus had formed that much treatment given for neurotic disorders was in vain. The behavioral approach was disappointing. Carrots proffered were often ignored or spurned. Varying reinforcement schemes had low predictive likelihoods. Therapists were frustrated, for example, by frequent patient refusal to try new forms of behavior which appeared "best" for them. Apparently some cognitive force was influencing the willingness to behave that behaviorism had not taken into account. The theory which began to emerge in response to this asserted that persons vary in willingness to behave in certain ways because their life experiences have indicated to them different things about their likelihood of success (37).

An initial step away from behaviorism into these new approaches came with Campbell's development of the concept of acquired behavioral disposition. Under this concept, behavioral tendencies are as important as the actual behavior which follows them. Two aspects of this concept are particularly different from the behavioralist view. One is a belief that past events effect current behavior not through conditioning but through memory and analysis. The other is a belief in tendency, caused not by trait but future perception acquired from past experience (7). Measuring that future perception through the locus of control was social learning theory's contribution.

The Social Learning Concept

Social learning theory asserts that the potential for behavior is a function of both the expectation of occurrence of a reinforcement, and the value of that reinforcement in a given situation. Expectancy stems from past experience, and is in effect the probability one assigns to one's success. Need represents the degree to which we desire an outcome. Frustration results from discrepancies between the expectation of results and the need for those results (37, 43, 44).

Locus of control is a construct which encompasses expectation, moderated by the effects of situational variables. It is measured on a continuum ranging from relatively internal to relatively external. Internality represents expectation of control over a situation based on one's own abilities, while externality reflects a belief that forces other than one's own ability will be the final governing factors in goal attainment (37). From a clinical standpoint, a patient whose therapist suggests more open, even confrontational contact with an employer might take the suggestion if his or her own experience had been that openness of that sort would result in respect, tenure, or whatever the goal might be. If, however, the perception of outcome based on experience with such behavior was opposite, no amount of therapy could move the person toward such behavior.

Social Learning Theory Assumptions

The key assumptions of social learning theory are: (37, p. 11-13)

1. Individuals respond subjectively to their environment on the basis of specific experience; what they have personally seen and done.

2. The emphasis is on learned social behavior, as opposed to instinct, neuron response, or other behavioralist belief.

3. There is unity in the personality, based on the accumulated knowledge of all prior experiences. Persons act in ways which are generally consistent with this unity.

4. The unity in personality stems from experience, and is not found in broad, general traits which were once thought responsible for the consistency of action.

5. Behavior is purposeful, determined by the personal importance of specific goals within a given setting, and the anticipation that they will or will not be attained.

Together, the concepts and assumptions of social learning theory give it broad explanatory power. Several other psychological constructs can be addressed from its platform. Those which are relevant to the current research are:

--Autonomy, seen as the mastery of oneself and the environment. If past actions have been successful in achieving control and domination, one's propensity is to believe that the future probably holds more of the same.

-- Competence, the individual's ability to interact effectively with the environment, which results in "feelings of efficacy." If experience shows past interactions to have been successful, one is apt to be optimistic about future interactions.

--Psychological causality, typified by increasing internalization of one's locus of causality. As part of this process, one takes increasing responsibility for one's own actions, rather than claiming helplessness. (32, 230-231)

It is important to note, particularly in regard to causality, that the individual's perception of this causality is the important issue, rather than an actual historical reality. Persons may feel autonomous, competent, and in charge of their own destiny, when they objectively are not. It is the perception that cognitively makes reality exist (32, 43).

The social learning theory concepts and assumptions are also related to issues of achievement, risk, and power. McClelland's work on achievement suggests that those with high need for achievement also have a strong belief in their own ability to influence outcomes (29). Risk is seen as a situation having what appears to be a random outcome. The situational aspect of the theory requires that the expectation of competence and mastery be a function of past mastery in similar situations. If one thus is placed in a situation in which the ability to influence the outcome is beyond predictive ability, a belief in potential mastery falls dramatically (37, p. 33).

The theory may be used to address the issue of latent power; one's ability to influence the resource allocation process. Failure in past experience to successfully exert influence gives one a low expectation of future influential likelihood, and can, in extreme forms, result in the opposite of power; alienation (32, 48).

Application of Locus of Control to Research

Rotter's instrument consists of 23 forced-choice alternative statements which reflect attitudes associated with internality or externality. Test-retest reliabilities of .83 and .61 for one and two months with a sample consisting of female college students, together with an internal consistency for female students of .79 (Spearman-Brown formula) were originally cited (43). Similarly adequate test-retest reliability scores have consistently been reported (37). This attribute, coupled with relatively low correlations with social desirability scales, render the instrument popular.

Construct validity has been studied by comparing the I/E scores of different groups to see whether differences in group averages are in the anticipated direction. Whites have been compared to blacks, middle-class children to lower class, mental patients to "normal" groups. Persons who seek out information about their health have been compared to those who do not. In all these cases, differences in locus of control have been in the anticipated direction (55).

Locus of control has been applied as an explanatory variable in scores of projects over the past two decades. Phares attributes the volume of work to two factors. First, the kinds of social problems which have emerged in the recent past are often those with aspects which locus of control can articulate in meaningful ways. Second, a measuring instrument is available which is easily used and has high levels of reliability and good validity indications (37). The construct has been used in wide ranging arenas from health care to social work to organization behavior. Overall, however, the work has shown that using the variable locus of control as a single independent or dependent aspect of a situation, is misleading. The variable interacts with and upon other forces within a given situation. The implication for this research is, locus of control, in itself, is only a single aspect of some cluster of variables which can offer explanatory assistance in terms of female entrepreneur outcomes.

Four recent studies support this view. One concerns job dissatisfaction, another was performed in a mental health setting, a third shows a basic laboratory experiment in suggestability, and the fourth, experiments in an area called "learned helplessness."

Kasperson studied locus of control in terms of job dissatisfaction using 274 hospital employees as a sample. He found that those whose measurable level of job satisfaction was high in terms of eight organizational variables scored in the midrange in locus of control. The relationship between job satisfaction and locus of control was curvilinear with persons of relatively high and low loci scores showing less satisfaction than those in the midrange. These results do not offer directly comparable data for other inquiries, however, since the entire Rotter scale was not used. This accounts for an extremely low reported locus of control mean of 2.42 (23).

Hayworth studied inconsistency in locus of control attribution and blame, to see if individuals in some settings separated the perception of internal or external control from strong feelings of self-worth or deprecation. Sample groups of college students, on the one hand, and ante-natal patients suffering from clinically-defined _post partum_ depression were compared. Rotter's scale and a Hostility and Direction of Hostility instrument were measuring instruments. For the students, external locus of control was nonsignificantly (at the .05 level) but negatively correlated with internal attribution of blame. For the expectant women, scores on the two measures were completely unrelated. Hayworth speculated that four perceptual styles were present, accounting for unexpected relationships between locus of control and locus of blame. These styles were: both internal control and blame; internal control and external blame; external control and external blame; and external control and internal blame. He hypothesized that "incongruent" combinations (such as internal control and external blame) would be linked to such neurotic states as depression (19).

Regarding the perceptual aspect of locus of control, research was conducted by Lohr and Southeaver to determine if linkages existed between the degree of suggestibility of individuals and locus of control reinforcement. In a laboratory experimental situation consisting of listening to "falling forward" tapes, 300 college undergraduates were evaluated in terms of suggestability. They also completed the Rotter instrument, and the scores were compared. No significant relationship was evident, indicating that propensity toward internality or externality is of enduring enough strength that short-term experience does not readily alter it. This somewhat surprised the researchers, since "learning" was the construct thought to be the basis of both locus of control and suggestability. They determined that suggestability and locus of control must not be based on a common instrumental conditioning mechanism (27).

Along generally parallel lines, locus of control has been assessed in light of what researchers call a "learned helplessness" paradigm. Such a condition has been created by training subjects to perform cognitive tasks, and then exposing them to failure which is not contingent on their performance. Exposure to unsolvable problems was found to reduce performance in a dissimilar situation only when failure was attributed to global and stable causes. However, the expectation of uncontrollability was found to be more closely associated with helplessness than was the internality dimension. In other words, one can be an internal in Rotter's terms and still attribute failure to extrinsic issues (31).

Overall, these studies show that locus of control is not an invariant or straightforward predictor of behavior, in spite of its high level of reliability. Other strong internal and external aspects of the personality and environment seem to exist in conjunction with propensity to be internal or external. All these variables probably influence overall performance, life satisfaction, or whatever is being measured. Thus a problem in using locus of control as a research variable is model specification. If locus of control is placed in an inappropriate role in relation to other variables, quite differing associative results might be expected (9).

Locus of Control and Entrepreneurship

Several studies which all point toward internality as an entrepreneurial characteristic have been conducted. Brockhaus cites evidence of significant internality among Italian entrepreneurs, graduate business students with stated entrepreneural intentions, and a sample of Texas entrepreneurs. A 1980 study compared locus of control for owners of businesses which had survived for three years, with scores for persons whose businesses failed during the initial three years, and found the survivors more internal than those who failed (5). A recent assessment of six variables (achievement motivation, locus of control, sex-role masculinity, and three types of role model availability) showed that considered simultaneously, each variable discriminated between female entrepreneurs, managers, and secretaries. However, in hierarchial comparison of each group for each variable the relationships were less clear. Locus of control internality was not significantly different for managers or owners, but increased for each group above that of secretaries (55).

Recent work by Neider compares locus of control for samples of female entrepreneurs in two studies to females in the general population. The profile of the female entrepreneur which emerged from this work was of one with a strong belief in the efficacy of personal effort in goal attainment (33).

A comparison of locus of control measurement for those groups cited by Neider and groups assessed by Waddell is shown in Table 2.

TABLE 2

LOCUS OF CONTROL SCORES FOR SELECTED GROUPS

Sample	N	Mean
Rotter: Females in General Population	4,433	8.50
Mescon and Stevens: Arizona Real Estate Independent Agents	87	5.23
Neider: Florida female entrepreneurs	40	5.01
Wandell: Secretaries	47	8.36
Waddell: Managers	47	7.51
Waddell: Owners	47	6.68

The data indicates that locus of control for female entrepreneurs is generally, more internal than that of females in the general population. However, the sample sizes indicated are unfortunately typical of much of the research which has been done. Only Waddell exposed the effects of locus of control to other variables. Other studies measured the locus of control as an independent phenomenon.

The Symbolic Interaction Connection

When reviewing the literature pertaiing to self and other in the ostensibly symbolic interactionist tradition, one is struck by the similarity in content to social learning theory. Both perspectives are concerned with the cognitive process of expectancy development. As such, they both are related to research inquiry which deals with how the self perceives its competence, ability, and probability of success. Each of these approaches to knowledge might also be considered a paradigm, from Gutting's perspective. Both social learning theory and symbolic interactionism, meet the tests of having substantive content to the degree that each approach has a scientific worldview, and each has spawned much explanatory and research effort (16, p. 1-2).

As indicated earlier, for some time a body of literature cited research indicating women's self-appraisal was more critical than that performed by males. This has been extrapolated into feelings of lower self-confidence for women. They have often been found to perceive a lower likelihood of success for specific endeavors, and are retrospectively more self-critical than men. In one recent study, the hypothesis that such low self-confidence might be overcome by positive feedback was tested. The surveyed group consisted of 114 males and 62 females; MBA students who were given an experimental task to perform. Groups were given positive external feedback before, during, and after performance. It was found that women's levels of confidence never reached those of the men. In fact, men who had no positive feedback at any time showed higher levels of confidence than did women who received positive feedback at each point in the test (28).

Other recent work indicates, however, that in actual work situations rather than artificial tasks, female self confidence may not differ greatly from men's. In a study of 35 supervisors and 90 subordinates Shore and Thornton assessed the hypothesis that females would self-rate their past performance lower than males. No significant differences in ratings emerged, regardless of gender. This could point to the possibility that age and experience in an actual task, instead of an experimental one, might eliminate the differences in female self-assessment shown in many studies of college populations (49).

Still within the arena of reflected appraisal, and applicable both to symbolic interactionism and social role theory, is the use of feedback from the other to the self. A popular concept which has recently been questioned in this vein is the resource theory of feedback. The theory's assertion is that information we receive about our performance enables us to improve that performance. Such information may thus be considered a resource. Further, the more of the resource we receive in natural daily interaction, the less energy we are likely to expend in search of more.

In a study of 331 employees in a public utility marketing department, Ashford found that those receiving the greatest amount of feedback wanted even more than those who were receiving much less. The inference which emerged from this finding was that persons may not consider the search for feedback as having inhibiting cost. Although the cost of feedback in wounded self-image or physical effort expended may influence initial feedback-seeking decisions, reward from feedback is subsequently the motivating influence which propels the search for more (1).

Whether the self is seeking developmental assistance through mentoring, advice of a peer, or another member of a relationship constellation, or whether the individual is seeking feedback on performance through which a modified cognitive view of future success is formed, the search often seems to be dealing with essentially many of the same issues of both symbolic interactionism and social learning theory. The constructs appear to overlap, like Venn Diagrams which represent shared commonality of events or sets. This shared commonality, undefined but potentially of research interest, will be examined in Chapter IV in greater detail.

Female Entrepreneur Education and Experience

One of the well-settled presumptions about female entrepreneurs is that though their level of formal education is higher than that of their male counterparts, their education is not in the field of business, and this is a problem for them (4, 5, 34). Although business formation and subsequent operation may not be disasterously influenced, a lack of managerial experience will inhibit high performance (4, 36, 51). The overall effect of this phenomenon is for female entrepreneurs to be viewed as a disadvantaged group. These problems have also been used to explain the concentration of women in types of businesses which are "easiest" to start: retail and service firms (4).

Two things might be said about the above presumption. First, it makes quite a bit of theoretical sense. As Carsrud and Olm have emphasized, situational factors are as influential in small business formation as the more global political or economic conditions in which entrepreneurship is alleged to thrive (8). However, the other point reflects Brockhous' warning about entrepreneurial folklore and its propensity to assume the status of tested construct (6). A lack of measurement of such variables as education and experience as part of a larger set which might contain several other potentially impinging constructs may have resulted in too simplistic bivariate considerations of such issues. Education and experience, in other words, should be viewed in light of other similar explanatory variables set against some common dependent variable. Meanwhile, one can say there is evidence that education and experience are inhibiting factors in female entrepreneurships, but cannot say how inhibiting they really are.

Mead and Conrad Versus the Law of the Instrument

One of the main efforts of this research is to assess the relative effects of two constructs as they interact together and mutually influence a final outcome. The comparative difficulties in doing this reflect both the operationalization problems historically associated with symbolic interactionism, and the temptingly quantifiable nature of social learning theory.

Mead and Cooley and immediate followers created an intuitively appealing matrix of meaning to explain the formation of the self in society. They were influenced by the pragmatism of Mead's mentor, John Dewey (46), to the extent that in creating a science of man they chose to grapple directly with one of the central issues of human-kind: how society is created. They raised this global issue at a time when other social sciences attempted to gain status similar to the natural sciences, by emphasizing an empirical approach. Without constructs that could be measured and tested, symbolic interactionism seemed out of step with the times after its key theories were formulated (52).

The review of the significant other research has shown that in operationalizing the phenomenon for further inquiry, several issues should be taken into account.

-- The concepts of valuation and credibility developed by Rosenberg (41) seem relevant. Persons seek advice and aid from others who have something worthwhile to offer. These concepts provide a way of defining those offerings. Associated with those is the additional notion of primary and secondary others. These categories legitimize the theoretical likelihood of more than one significant other in the individual's relationship constellation. The research needs to identify which sort of other the female entrepreneurs deem most important in terms of their businesses.

-- The interactive nature of the role taking process, demonstrated by Schaefer and Kieth (45) indicates that assessments of self and perceptions of the assessment of others are influenced by intervening distortions. That finding points toward a need in research to become aware of the duration of significant other relationships. Those which have proven nontransitory are the ones which have apparently held up over time in spite of the difficulties caused by perceptual distortion, and are thus probably more influential than others might be.

-- Kram's concept of career and psychosocial mentoring benefits (24) as already indicated, seems applicable to significant other relationships of female entrepreneurs. In Chapter III the extent to which Kram's functions were used to define the significant other construct for this work will be described in detail.

Social learning theory presents still another research dilemma. The construct, locus of control, was operationalized early in the theory's development, and "worked" so well on such a variety of problems that it gained a broad following of adherents. But in its ease of measurement and apparently wide applicability, the danger of the law of the instrument arose. In reviewing the many applications of locus of control and the explanations of its developers of the theoretical basis which supports it, one may begin to wonder if some problems the instrument seems to address were created in response to the existence of the instrument. Effective tools, after all, beg for usage (22, p. 29).

Locus of control may thus appear on the surface a straightforward construct which can be readily measured using Rotter's instrument. However, the research cited in this chapter demonstrates that one blindly adopts locus of control as a single explanatory variable at some peril. Hayworth (19) has shown the inconsistency of persons who may score internal, but attribute their fate to external sources. Kasperson's finding (23) of a curvilinear function associated with locus of control and job satisfaction indicates that interpretation of locus of control in terms of dependent variables may hold surprises for the researcher. The learned helplessness paradigm (31) and suggestibility experiments (27) reflect that the construct may not be consistent in all aspects of a person's life; in experimental situations, for example, one's internality or externality might not match what would occur in actual situations. Waddell's findings (55) indicate that variables which have theoretical relationship to locus of control, such as need for achievement, may influence the singular impact of locus of control. In effect, this construct is not to be treated cavalierly. Whatever is being measured is more complex than polar dichotomy or even linear continuum will fully reflect.

The application of locus of control to female entrepreneurship research has not reflected the measurement and interpretive insights shown in the above studies. In most cases locus of control averages and standard deviations are announced, without regard to other variables which may influence or be influenced by locus of control. In terms of significant other, the scant mention of its implication in research hardly warrants scrutiny at this point. Both the constructs, in effect, seem to mirror the limitations which Brockhouse recently cited for much entrepreneurial research (6).

The remaining variables mentioned in this review -- education and experience -- are relevant to the female entrepreneur situation mainly because of their potential impact on both significant other and locus of control. Again in their case, researchers have interviewed and surveyed, found respondents whose background lacked popularly theorized necessities, and used those deficiencies to explain the sort of businesses women tend to begin and operate. Whether this has resulted in a truly meaningful finding remains to be seen (4, 6).

The task of dealing with both symbolic interactionism and social learning theory is not just one of making sense and meaning out of the confluence of two paradigms. In reality, the two converge of their own volition, attracted by many common textures. Adding to the two the degree of prebusiness training and suitable experience, and asserting that all these variables, if they are of any interest, must influence business outcomes, would be a contributory achievement, but not an entirely new one.

Joseph Conrad wrote precisely about these matters in the early part of the Century. In "The Secret Sharer" Conrad placed a neophyte sea captain in a position of stress and uncertainty; a first command with a new ship and barely civil crew. The young captain's lot was tolerable only through the presence of a stowaway; another youth of about the captain's age, fleeing the law. Through the story the new leader shares fears, feelings, and aspirations with this secret companion hidden in his cabin. In so doing he gains self-confidence, and to the crew, perceived capability and finally respect. The two young men are, for one another, significant others. The captain emerges from the experience with what psychologists might term an internalized locus of control. Parallel to that, the secret sharer has given what Berger and Luckmann claim is needed for alternation or re-socialization from one life to another.

> A 'recipe' for successful alternation has to include both social and conceptual conditions, the

> social of course serving as the matrix of the conceptual. The most important social condition is the availability of an effective plausibility structure, that is, a social base serving as the 'laboratory' of transformation. This plausibility structure will be mediated to the individual by means of significant others, with whom he must establish strong affective identification (3, p. 157).

It was in pursuit of such a "recipe" and its attendant plausibility structure that the research design described in Chapter III was created.

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CHAPTER III

METHODOLOGY

This chapter describes the methods of data capture and analysis. It discusses the overall research strategy, desired sample size, instrument development, and questionnaire distribution; and it explains the techniques used to extract meaning from the captured data.

Research Considerations

The methodology is based on two widely used components of empirical research. The first is essentially analytical, and has been called the ANOVA, or analysis of variance paradigm (10, p. 125). It represents a thread of speculation which runs from Galileo and Bacon to John Stuart Mill's view of the significance of "concomitant variations"; an assertion that phenomenal covariance is interpretively linked (29, p. 130-219). The second is the measurement convention of survey research; a process of asking persons their opinion on specific operationalized matters which bear on research questions.

Modeling Issues

The ANOVA methodology consists of interpreting data which has been superimposed on types of variance models such as, in this case, factor analysis and multiple regression/-correlation. In turn its outcome, given anticipated statistical interpretability of various components, is expected to be an operational model. An appropriate introduction to discussion of how this methodology was applied is thus a brief description of the use of models in this way.

Models are abstractions of reality which simplify that reality yet represent its essential nature (24, p. 47). It has been claimed that they mirror what is real, though imperfectly. Indeed it is this imperfection -- this very inexactness -- which makes a model useful. We construct models because we cannot actually understand the confusing world. As the model simplifies, it enables us to grasp conceptual outlines which permit a plausible explanation of the world. But the process of simplification is also one of necessary falsification. Ironically, the closer the model comes to reality the less useful it is, for the confounding and distracting totality of nature destroys interpretability as we come close to actuality. Such a failure of interpretability in turn defeats the purpose of the model (13, p. 79).

So a model is a distortion, but a legitimate operational one. In the case of ANOVA, despite practitioner disclaimer of any implication that covariance is the essence of causality, there is a strong touch of Mill embedded in its application. The seductivity of ANOVA's analytical tools lies in the controls placed on interpretation to avoid spurious association, detect variable redundancy, and tease out suppressive influences in support of elegant assertions about the data's meaning. To the assessor of such a tool's output its various components seem so intuitively genuine that again and again one must consciously back away from the view of model as more real than phenomena. When one begins to believe one's own model as if it were a piece of nature instead of a clever simplification of a thin slice of nature, reification has occurred (16, p. 61). But even short of committing that sin, the researcher is likely to be the intellectual captive of classical causality in areas where it is simply inapplicable (13, p. 38), particularly if a formulation points toward "routes to the unsurprising" (13, p. 78). This is the basis of warnings about over-emphasis on form and the presumptive use of statistics to describe a world of complexity beyond the capacity of the most elegant mathematics (16, p. 279).

A Data Collection Issue

In approaching survey research as a data collection process, one should similarly be aware that beyond the disclaimers which can be made about sample size, opportunity for response, or situations surrounding response preparation, the act of polling both captures and influences data

(4, p. 380). For example, in this effort the construct of significant other was partially measured by asking for response ratings from several suggested advice and assistance behaviors by the significant other. In an attempt to capture other unstated behaviors, an "other" option was offered with an invitation to describe in writing what that behavior might be. Not a single person expanded the predefined set of behaviors. It would be folly to assert that those "dreamed up" by the researcher were exhaustive of the universal set of behaviors of a significant other. This was handled similarly to the treatment of a null hypothesis.

If a null hypothesis asserts no significant difference in the variation of phenomena, and analysis fails to detect such significance, we merely choose not to reject the null by withholding judgement. So it is with a blank other category. Although we cannot say the survey document captured all aspects of significant other behavior, judgement can be withheld on the existence of further unspecified aspects, and an analysis of what is there may proceed. This is done, of course, in the face of evidence of the response set phenomenon, which has as one implication the finding that when a respondent completes a set of questions about a subject, further struggle with that subject is often mentally foreclosed (4, p. 381-382).

In choosing the survey as a data collection tool, we must finally also recognize that we are dealing with one of Bacon's "Idols." To assert that questions on paper with sets of predetermined answers are a finely-honed epistemological tool is to ignore his warning:

> ...it is by discourse that men associate and words are imposed according to the apprehension of the vulgar. And therefore the ill and unfit choice of words wonderfully obstructs the understanding.... (3, p. 32).

The Strategic Meaning

The importance of the strategic components of the research lies in their ability to influence Type I and Type II errors. Type I, detecting something that isn't really there, may be statistically though not conceptually controlled through multiple regression methodology. Type II, not finding something that is there, is less likely than Type I since the search process is oriented toward hypothesis testing (23). However, survey construction flaws and the other combined threats to internal validity may form a confounding screen to complicate detection.

The inductive approach of Bacon and Mill tempts the belief that the ANOVA paradigm is robust enough to tolerate the risk of error. However, Hanson's message reminds us that such inductive models may ignore the confounding variables which are their greatest threats. This is an appropriate warning, not to discourage the use of concomitant variation as an idea generator, but to remind us that modeling exercises remain unique from the process they intend to detect.

Dependent Variable Considerations

Parametric techniques such as multiple regression require designation of a dependent variable against which the behavior of independent variables can be compared. The objective of the multiple regression model is detection of changes in that dependent variable for certain changes in the independents. The basis of significance of variation is the degree of dependent variable change not attributable to chance.

In dealing with a small business several measurable phenomena might be selected as dependent variables. In fact, the menu may be less restricted for small than larger enterprises, in view of the eclectic array of business motivations recorded in entrepreneurship research. Particularly in regard to female entrepreneurs, there is evidence that high levels of profitability are only one important business goal (5, 8, 22).

Female entrepreneur research has dealt with business outcomes in two ways. The first, and most frequent, is based on an assumption that whatever the outcomes, they must be satisfactory to the owner. Given that assumption, research becomes a process classifying owner opinion regarding such business matters as sources of needed information or financing (5,6). The analytical techniques used to handle these efforts are nonparametric, often consisting of Chi Square comparisons of expected and actual responses or the ranking of problems or priorities. The second approach attempts to compare business effort with some measure of results. Such measures may be financial or nonfinancial. The latter is illustrated in several studies. Waddell used time in business as a surrogate for effectiveness, reasoning that long tenure was consistent with the attainment of various business goals (32). Carlsrud and Olm applied productivity as an indicator of success (6). Smith and Gannon categorized entrepreneur business growth stages in terms of temporal business activity associated with respondent-generated criteria for effectiveness (30).

Choosing a dependent variable is a crucial research decision. Not all phenomena are directly influenced by many of the softer theoretical constructs of the social sciences. Many causes lag for some time before manifesting themselves through some effect. Fundamentally, one must also have a theoretical basis for linking behaviors or backgrounds with outcomes. This process of model specification, if haphazardly done, can result in rather meaningless efforts (21, p. 27).

Financial measures of business operation are ones which do make theoretical sense as candidate dependent variables, if the process of running a business is considered fundamentally an economic activity. However, for small businesses such as those sampled here, such measures may not always match the primary business rationale. In the case of female business owners some research characterizes their business formation as a flight away from the employee role, rather than a race toward increased wealth (5, p. 400). Beyond that, financial measures are influenced by such economic variables as interest rates which influence sales, credit policies, and flow of payments for services, which in turn may have an intervening and confounding influence.

A frequently encountered disadvantage of financial performance as a dependent variable lies in the difficulty of capturing it. Survey research can exercise little control over the questionnaire completion. When asked for a financial ratio or estimate of sales or some similar element contained in a past financial statement, some respondents may seek absolute accuracy, put the form aside, intend to check the figure, and never return to complete the questionnaire. Others may guess wildly. Still others, in spite of assurances of confidentiality, may be reluctant to disclose such information for a variety of legal and business reasons (17, p. 137).

The usefulness of return on investment as a dependent variable, however, is rooted in what some believe is the very essence of entrepreneurship. Economic views of this essence deal with the reallocation of resource process attributed to the entrepreneur, who responds to economic, social, or technical disequilibrium with innovative products or services. Successful responses such as this return the economy to equilibrium. The entrepreneurial tradition centers around this economic function. In effect, the incentive for entrepreneurship provided by return on one's investment draws entrepreneurs toward needed areas and provides a self-correcting mechanism promoting economic efficiency. Although some might question return on investment as the dominating force which universally motivates those who form businesses, its ultimate realization for good or ill is a reality which is potentially measurable (19, p. 274). Thus in view of the importance of return on investment as an entrepreneurship outcome, together with a belief that theoretical linkage exists between the independent variables under examination and return on investment, its choice as dependent variable was appropriate.

Research Design and Validity Threats

The decision on what to measure established the framework for subsequent research design. Survey research was selected as the medium through which measurement would be performed. The availability and amenability of an existing group to such research resulted in a situation in which resources, availability of data, and appropriate analytical means coincided. However, adoption of this approach involved the acceptance of certain threats to internal and external validity.

Internal validity threats of maturation, differential selection, and history arise from the research design (31). Respondents were asked their opinion on the effect of contribution of a significant other on past and present business activity. The passage of time and development of changed perspectives due to personal growth and expanded experience casts a question on the accuracy of such retrospective measures. Differential selection exists in that the overall group from which the sample was to be drawn consists of women greatly committed to the entrepreneurial process; so much so that they joined a networking group focused on that interest. Such a level of commitment virtually guarantees the absence of more passive business owners. Within the group, there may be differences between those willing to take time to complete a lengthy questionnaire, and those who are not. This would influence the "true representativeness" of those who formed the sample which was to be investigated. Finally, in a historical sense, the research was conducted during a time of business contraction in the Dallas area. Somewhat more pessimistic responses might be expected during such a time than during a period of economic expansion.

The fact that the sample of female entrepreneurs is drawn from a single association in a specific geographical area with unique social and economic attributes renders an extension of findings to the universe of all female entrepreneurs inappropriate. External validity can emerge only through replication of study efforts with similar groups in other geographical areas subject to a variety of environmental differences.

Questionnaire Development

The data collection questionnaire was designed for distribution and completion by respondents either through mail or in a group setting. This was an important consideration in instrument design. The Association of Women Entrepreneurs of Dallas consisted of 235 members who were accessible through two channels. The first was direct contact during a monthly meeting; the other was direct mailing by the association secretary to all members.

High potential return was the first consideration of distribution and design. It was known that five independent variables would not require an extremely large sample. However, this was exploratory research, several interactions of variables were to be tested, and significant other factoral structure was yet to be established. Due to these imponderables, the precise variable structure was initially unknown, so it was felt necessary to maximize returns.

It was anticipated that a portion of the membership would complete the questionnaire at a monthly meeting, and others from the remainder of the group would respond to a supplemental mailing. Questions had to have sufficient clarity for successful completion with only written instructions. Overall questionnaire length was also an issue, in view of indications of decreasing likelihood of return associated with greater length (24, p. 185).

Questionnaire length was maintained at a given level by two constraints. One was the length of the Rotter Scale -- 23 items covering almost an entire questionnaire page. The second was a great variety of significant other questions. Earlier work with that construct had produced promising results with a series of questions on type of advice and assistance rendered by a significant other. In that effort the operationalized elements of advice or assistance were offered for ordinal rating of importance (25). Expanded exploration of the nature of significant other was planned for this effort. This required additional questions on the identity and background of that person. The previously used significant other questions, combined with additional ones operationalized as shown in Appendix A, comprised a second questionnaire page.

Questions related to other research variables of education and experience were also needed. In addition, several background questions which helped characterize the respondent, such as age, months of business operation, and type of business were included. A crucial inquiry on return on investment which required respondent computation of a ratio was inserted, along with an explanation on how to calculate the ratio, and an example. Two additional questions which measured an ordinal assessment of personal and financial satisfaction with the business were included for use should the return on investment variable prove unusable. Together, these filled the equivalent of a third page.

A fourth page consisting of an explanatory letter was required. It was believed by the researcher and officials of the Association that additional queries which would lengthen the document might be counterproductive in returns.

Appendix B provides a rationale for each question asked. However, additional issues pertaining to queries on significant other are of note.

Significant Other Items

As stated in Chapter II, significant other is a construct which in the past has been measured chiefly through one's response to the exposed evaluation of such an other. Although Denzen dealt with the joint influence of significant others in an educational setting (9), Rosenberg's work (27) remains the key research contribution from which expanded work can move.

In that effort, significant others were categorized in terms of valuation and credibility. Valuation is a desire that the significant other look upon one favorably. Credibility lies in one's perception of the significant other's experience and ability.

Kram, it may be remembered, developed mentoring functions from career and psychosocial support aspects one receives from a mentor relationship. These constructs form

TABLE 3

SIGNIFICANT OTHER DIMENSIONAL FRAMEWORK

Rosenberg's sources of influence	Kram's Mentoring Functions	Nelson's Advice & Assistance Elements
Valuation	Sponsorship	Introduction to business contacts
	Coaching	General Advice & Assistance initially & after start-up.
	Protection	Physical Support Emotional Support Financial Support
	Challenging	Strategic Advice How-to-Advice
	Counselling and Friendship	Emotional Support
Credibility	Role Model	In same/Similar Business Also a Small Business Owner Great General Life Experience Much General Business Experience Has specific needed Business Skills

a theoretical structure which explains specific behaviors of a significant other (20). In Nelson's research pertaining to female entrepreneurs, possible contributions of a significant other were offered for evaluation, and those contributions appeared exhaustive of the experience of members of that sample (25).

Table 3 shows the relationship of these approaches. Nelson's list reflects 15 items, all included in the appended instrument.

Rosenberg's assertion that some others are more significant than other others resulted in a query as to how many persons in the respondent's life fit the provided operational definition of significant other. The rationale for this was that if, as Rosenberg believed, in a complex society each person has numerous significant others of the secondary or segmental variety (related to a specific aspect of one's life such as work or hobby) (27, p. 831), then business owners might be expected to be similar. They may have more than one individual whom they would categorize as a significant other. Previous research (25) found the female entrepreneurs had little problem responding to queries about a singular "significant other." This might indicate they focused on one primary person in regard to business matters. However, to insure that the possibility of multiple specific others was recognized, a question was included after the significant other operationalization asking how many of these persons existed in the respondent's life. A response of only one would indicate that the earlier survey had indeed captured information about a single individual. More than one might indicate a more segmented significant other role. Respondents, however, were asked to respond to all subsequent questions about significant other from the point of view of the one significant other having the most influence. All did this without any communicated problem.

Questionnaire Administration

The study was announced to all members of the Association through their monthly newsletter (Appendix C). It was administered at a monthly meeting to about one-fourth of the group, and to the rest of the membership through mailing. A follow-up letter was sent to each member and a further request for completion of the survey was made at the next monthly meeting. Overall, the process of announcement, distribution, follow-up, and collection spanned seven weeks.

The decision to offer the questionnaire for completion by those attending the monthly meeting was made for three reasons. First, such distribution offered the chance to quickly reach about 25 percent of the 235 members. Prior experience with the group had demonstrated their willingness and ability to complete a survey instrument during a meeting. This particular meeting was to be devoted to election of officers for the coming year, so even less distraction than might normally be expected was anticipated. Most who received the questionnaire in that setting, in other words, seemed likely to complete it.

Because most of those at the meeting were expected to complete the form in the researcher's presence, this medium offered an opportunity to identify confusing or ambiguous questions. The researcher was allowed to make a brief appeal for participation to all attending the session, and remain throughout the meeting to answer questions that might arise during the actual completion of the questionnaire. In effect, distribution at the meeting provided a relatively controlled situation in which the understandability of the questionnaire could be informally assessed.

Finally, distribution at the meeting offered a public relations opportunity for the research effort. Although attendance of a majority of Association members was unlikely, many attendees might personally encourage absent friends to complete the rather long survey instrument if they believed the effort was important. A personal appeal both by the researcher and highly-respected outgoing Association President would increase the overall level of response.

Of 65 member attendees, 60 completed the questionnaire. No requests for clarification were received. The researcher personally collected all forms and encouraged comment on any aspect of the questionnaire. From comments it appeared those who had completed the survey did not feel the questions unduly intrusive. More important, the comments indicated group members felt measuring significant other contributions was a task worthy of their time. Several expressed interest in receiving feedback after an overall analysis had been completed.

Sample Issues

Although a high rate of return had been achieved during the meeting, the rest of the Association had to be surveyed by mail. This was necessary due to matters of sample representativeness and size.

If a sample is not reflective of the population it purports to measure, external validity issues arise. If it is not reflective of the rest of the group from which the sample is drawn, internal validity comes under question (31, p. 18). In this instance, meeting attendees were assumed to have different characteristics from non-attendees. The meeting was an administrative and political occasion, likely to draw members who were more interested in influencing the organization's leadership than those who failed to attend. Those attending came to participate in association business, make nomination speeches, and vote for candidates. Such participation indicates tendencies in locus of control, or the belief in one's efficacy in an organizational or political process, which might differ substantially from that of the overall membership. The type of meeting, in effect, was thought to have potentially influenced the composition of attendees. Limiting the survey to such a group might prevent analysis from a wider sample containing more inclusive opinion variance.

The sample of 60 was also believed to be too small to form a basis for inference which would be adequately protected from commission of a Type II Error; sustaining a false null hypothesis (23, p. 369).

Chapter I specified hypotheses to be tested in the research, stated as affirmative research issues. For each hypothesis, regression analysis enables testing to insure that, within statistical boundaries, the influence of independent variables on the dependent variable is due to forces other than chance. Type I errors are managed by assigning the statistic α, usually for research of this sort at a .05 level. This reflects a tolerance of no more than five percent probability of rejection of a true null hypothesis. Such a probability is the significance level for acceptability of Type I error; the likelihood that one will attribute significant meaning to phenomena when in fact significance is absent.

Type II errors involve the risk of sustaining a false null hypothesis. For example, assume one null research hypothesis is that no significant variation exists between return on investment and locus of control. Analysis of the data shows that some mutual variation exists, but that variation is disregarded. The null is thus sustained. If this sustainment is actually erroneous, a Type II error, finding no significant covariation when there really is such, has been committed.

The statistic which reflects willingness to risk a Type II error is conventionally shown as risk $\underline{\beta}$. While risk $\underline{\alpha}$ is usually set at .05, $\underline{\beta}$ risks less stringent are usually assigned. Researchers can endure a higher $\underline{\beta}$ than $\underline{\alpha}$ risk because the penalties of Type I error are generally greater than Type II. If we assert that there is a statistically significant relationship between two variables, such an assertion may lead to findings and action recommendations which can be costly in both financial and social terms. Avoiding a Type II error, thus prevents overenthusiastic application of tentative research findings. A conventional parameter for $\underline{\beta}$ is .20, based on the assumption that with $\underline{\alpha}$ set at .05, the risk of sustaining a false null is about four times less serious than the risk of finding what does not really exist (23, p. 370).

Once the tolerance levels for Type I and II errors have been established, other phenomena pertaining to the research can be examined to develop what is called a power analysis. Such an analysis helps establish sample size through calculating the anticipated relationship of three codeterminents of power; significance, reliability, and effect size (7, p. 116).

TABLE 4

n* FOR DIFFERENT POWER AND EFFECT SIZES

Power of with-standing Type II Error	Anticipated $\underline{R}^2$ of Function	Effect Size ($\underline{f}^2$)	Number of vari-ables	$\underline{L}$	Sample Required $\underline{n}$*
.90	.10	.1111	5	16.47	154
.80[a]	.13	.1500	5	12.83	92
.75	.30	.4286	10	14.72	45
.90	.40	.6666	10	20.53	42
.80	.50	1.0000	15	18.81	35
.75	.10	.1111	15	17.11	170
.90	.20	.2500	20	26.13	126
.80	.30	.4286	20	20.96	70
.80[b]	.20	.2500	10	16.24	76

Source: Cohen, Richard and Patricia Cohen, Applied Multiple Regression/Correlation Analysis For the Behaviorial Sciences, 2nd ed., (Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers, 1983), 164;527.

[a]Suggested power set for exploratory work

[b]Likely power set for this research

Power Analysis

This approach injects discipline in the research effort by indicating appropriate sample size, through requiring the researcher to substantively consider the relationship of several issues. For one, the stakes of committing Type I or II errors must be decided, and the level of probability acceptable for such errors established. In terms of computation, α; the probability of erroneously rejecting a null hypothesis, must be set. Generally, the smaller α the higher the power and the less likely a true null will be rejected. For example, to minimize risk greatly, one might reduce α from .05 to .01. This would be a conservative research move, which would result in much greater required sample size.

The reliability of sample results is reflected in the R^2 of sample data, compared to R^2 for similar other efforts using similar variable sets. Independent variables with high demonstrated reliability coefficients and similarly reliable outcome in terms of dependent variables may be expected to contribute relatively consistent R^2 values in subsequent research. One's projection of an anticipated R^2 is an important aspect of power analysis. The higher this coefficient, the smaller the sample size.

Effect size is the magnitude of a phenomenon in the population. It is calculated as a ratio of anticipated R^2 to $1 - R^2$.

Number of independent variables also influences the power analysis; the greater that number the larger sample needed. However, their proportional impact is much less than anticipated R^2.

Table 4 shows relationships between power, anticipated R^2 (assuming reliability of results and comparability of variables), computed effect size resulting from R^2, and number of variables anticipated. The L value reflects a relationship between number of variables and desired power level, given a .05 probability of sustaining a Type I error. The sample size n^* reflects the outcome of substituting values in the equation:

$$n^* = \frac{L}{f^2} + k + 1$$

The table reflects the dominance of R^2 in these relationships. The weaker the anticipated strength of that statistic, the greater the sample required to attain established power levels. Cohen and Cohen indicate that in social sciences small effect sizes are the norm. However, in cases where R^2 is unknown they recommend using a "medium" effect size of .15 (23, p. 370). Such an effect size results from R^2 of 13 percent. That effect size and a .8 conventional level of power (7, p. 161) with five independent variables requires a sample size (n^*) of 92, as shown in the table. In this research, the .8 power convention was accepted. However, previous work with the group and similar significant other variables lead to an estimate of anticipated $\underline{R}^2$ of .2. The final line in the table reflects these values, together with ten variables (accounted for by five initially anticipated main variables and five interactions). Such a combination would require a sample of 76.

Additional Survey Work

Given the sample size which emerged from power analysis and the suspicion of a nonrepresentatively sampled group, additional sampling was conducted. All who attended the meeting at which the questionnaire was distributed had been given the opportunity to complete the form. This comprised 65 members of the 235 total membership. Since attendees had all registered their presence at the meeting, those not attending could be identified for receipt of a mailing by the Association secretary. Packets consisting of the questionnaire with cover letter and stamped self-addressed return envelopes were mailed to 170 remaining members. Order of return was captured both for those completing the form on the meeting night and the 68 who returned the mail survey, for later analysis to see if sequence of receipt was significantly associated with the dependent variable.

With 128 completed surveys in hand, an assessment was conducted to identify responses which could not be used. Eleven were disregarded due to failure to complete the dependent variable questions, absence of locus of control measurement, or failure to answer significant other questions. The surviving 117 were deemed appropriate for analysis. However, it was then realized that 15 respondents with under one year in business could not have return on investment ratios comparable to the rest of the group. Those were also set aside, resulting in a total of 102 usable, valid questionnaire forms.

Analysis Techniques

The two analysis techniques were factor analysis and multiple regression. The nature of each method will be explained, and issues which arose in their application which were unique to this work will be discussed.

Factor Analysis

Factor analysis is a matrix evaluation technique with two key attributes. First, as a data reduction method it enables reduction of a great number of variables to a smaller, more useful set. Second, factor analysis follows the ANOVA view of the world in that it establishes statistically constructed factors which are unique forms of the variables which initially existed in the matrix. Essentially, factor analysis both reduces the number of analysis variables and creates new variables which are constructs. In its latter role the technique responds to a Platonic suspicion that the actual moving forces in the world are really shielded from direct observation; that what we can see and directly measure is a pale reflection of a hidden reality (12, p. 239).

Constructs such as those which emerge from factor analysis are theoretically definable but not directly observable. An example is biological growth. One can measure changes in neck size, height, weight, and foot size over time, and find that each of these variables is highly correlated. However, dealing with four such variables to define one essential phenomenon -- growth -- is cumbersome.

Factor analysis transforms a matrix of the intercorrelations of these four variables into a single unique variable. This product can stand alone as a single index of the construct, growth, or it can be used in concert with other variables or constructs in further analyses such as multiple regression.

TABLE 5

Correlation Matrix

	Height	Weight	Neck Size	Foot Size
Height	1.00			
Weight	.76	1.00		
Neck Size	.55	.49	1.00	
Foot Size	.38	.43	.66	1.00

The mathematical aspect of the factor analysis process, as illustrated in a hypothetical example in Table 5, begins with establishing a correlation matrix of variables which are of interest. Those which have highest intercorrelation are grouped together as reflected in Table 6, through a process called extraction. Table 6 reflects the correlation of each variable with the single factor. The square of each number is the percent of variance of each variable which is explained by its relationship with the factor. Thus the first three variables each have about 70 percent of their variance in common with that of the emergent construct's overall variance. The last variable, foot size, has only a bit over half its variance in common. Still, all the variables had high enough mutual variability that they fit or were "loaded" into a single factor.

TABLE 6

Factor Matrix

	Factor 1
Height	.84
Weight	.83
Neck Size	.83
Foot Size	.75

The case in Tables 5 and 6 is rather unusual, in that all the variables are so highly intervariant that they form a single factor through only an extraction process. In the early part of the century psychometrists such as Burt, Thurstone, and Spearman developed a further refinement of factor analysis which is based on the extent to which variable communalities, when plotted in a spatial configuration, lie close to groupings which, themselves, are apart from one another. From such plotting, called rotation, more parsimonious factoral results can often be achieved. Fewer factors can account for more variables (11, p. 49).

Extraction and rotation will be further discussed in regard to initial assessment of this data later in the chapter. However, at this point a key aspect of the technique must be emphasized. As with all methods which deal in comparison of variability, mutual causality can be speculated upon, or hypothesized about, or even bet on if a number of studies produce consistently similar high corelative results. But causality cannot be assured. Many phenomena are intercorrelated. That property does not assure causal linkage. For example, the data in Tables 5 and 6 are not taken from body measurement data, but from the scaled measurements of four variables in the current work. They represent the respondents' opinion on the value of advice and assistance both during the time of business start-up and after the initial growth stages were completed.

This is an important phenomenon to reflect on while using factor analysis as a data reduction tool. The numbers can take you anywhere. The real value of the method is created by the researcher who interprets the meaning of the factoral constructs which are produced.

Factoring significant other.

Twenty-six variables as reflected in Table 7 were measured in an attempt to capture the identity of significant other, background of the significant other of which the respondent was aware, and behavior of the significant other of importance to the respondent in her business. The analytical strategy was to first factor analyze all variables using different extraction and rotation techniques to see if useful reduction could be attained.

Table 7 lists the variables under examination, with their mean values and standard deviations. They are grouped for discussion into four sets.

Questions 2 through 6 (Set 1) deal with significant other attributes. They attempt to describe the individual in terms of business experience, business skills, and life experience or general knowledge. They were included to help determine if a common pattern or basis might emerge for choosing a significant other.

Questions 7 through 16 (Set 2) attempt to specify the type and length of personal relationship between the respondent and significant other. All respondents indicated

TABLE 7

VARIABLES USED IN FACTOR ANALYSIS

	Variable	Data Code	Type Measurement	Mean	S.D.
1.	Number of persons considered significant others.	SOS	Ordinal	1.912	1.109
2.	Is significant other in same or similar business to yours?	SBUS	Nominal Yes/no	.392	.488
3.	Is the significant other owner of small business?	OWN	Nominal Yes/no	.520	.502
4.	Is he/she someone with much general life experience on which to draw in giving assistance or advice?	LIF	Nominal yes/no	.881	.325
5.	Is he/she someone with a great amount of general business experience?	BEX	Nominal yes/no	.696	.462
6.	Is he/she someone with specific business skills you feel you lack?	BSKL	Nominal yes/no	.716	.453
7.	Is this person your spouse?	SPO	Nominal yes/no	.431	.498
8.	Is this person your male parent?	MPAR	Nominal yes/no	.069	.254
9.	Is this person your female parent?	FPAR	Nominal yes/no	.069	.254
10.	Is this person a male sibling?	MSIB	Nominal yes/no	.025	.055
11.	Is this person a female sibling?	FSIB	Nominal yes/no	.020	.040
12.	Is this person a male child?	MCHL	Nominal yes/no	.001	.001
13.	Is this person a female child?	FCHL	Nominal yes/no	.004	.002
14.	Is this person a male close friend?	MFR	Nominal yes/no	.216	.413
15.	Is this person a female close friend?	FFR	Nominal yes/no	.127	.335
16.	For how many years have you known this person?	YKN	Cardinal	17.379	12.351
17.	Value of this person's advice when you first started your current business?	STAD	Ordinal (5-1)	3.673	1.150
18.	Value of advice you received from this person after start-up?	PAD	Ordinal (5-1)	3.804	.955
19.	Value of assistance (other than advice) when you first started your current business?	STAS	Ordinal (5-1)	3.730	1.374
20.	Value of assistance (other than advice) after the start-up phase?	PAS	Ordinal (5-1)	3.782	1.145
21.	Current assistance in the form of introduction to new business contacts?	INTR	Ordinal (5-1)	2.637	1.278
22.	Current assistance in the form of how-to advice on the mechanics of running a business?	HTO	Ordinal (5-1)	3.127	1.264
23.	Current assistance in the form of strategic advice on long-run business issues?	STRT	Ordinal (5-1)	3.324	1.118
24.	Current assistance in the form of emotional support?	ESPT	Ordinal (5-1)	4.539	.873
25.	Current assistance in the form of direct financial assistance?	FSPT	Ordinal (5-1)	2.676	1.530
26.	Current assistance in the form of physical support -- child care, running errands, etc.	PSPT	Ordinal (5-1)	2.843	1.681

relationships among nine discrete choices listed. An implicit null hypothesis that there were no other important categories within the group's experience was thus not rejected.

Questions 17 through 20 (Set 3) asked the value of advice and assistance rendered by the significant other at start up and following that period, pursuing earlier research findings (25) that advice and assistance usefulness decreases over time. As relatively global measures these could be expected to emerge as a separate factoral construct.

Questions 21-26 (Set 4) suggested specific contributions the significant other might make, together with an open-ended "other" category. All contributions were specified in terms of some form of assistance. This was deliberately done to avoid the possibility of the response set phenomenon (4); i.e., the responses to the global advice and assistance queries overly influencing subsequent answers, as respondents attempted to maintain their perception of consistency. The set, however, consists of two specific categories. Questions 22, 23, and 24 actually address "advice" issues. Questions 21, 25, and 26 are tangible assistance received. Again, no respondent made an entry in the other category, indicating that the issues raised were not seen as nonexhaustive of advice and assistance received in actual experience. Question 1 sought the number of significant others who met the operational criterion. It should be noted that subsequent questions dealt with the most important significant other. However, it was considered important in view of Rosenberg's work to discern the extent of significant other relationships (27). Such measurement would indicate if one chief other was looked to for significant other advice or assistance, and could thus indicate if that person was a primary or secondary specialized other. Inclusion of the number of such relationships might also form a meaningful contributory variable. However, it was not deemed a logical part of this or any other set.

Implications of Significant Other Candidate Variables

Set 1 variables, nominally measured, were scored "1" for yes and "0" for no. The resulting scores are probabilities of "yes" responses by the entire sample. From the raw data, it might be inferred that the significant other has a rather high level of business and general life experience, and possesses specific business skills the respondent feels she lacks. It should be noted, however, that although the sample group rated a variable as having great value, such value may not survive regression analysis. The dependent variable and any given popular independent variable may not correlate highly, or may correlate moderately but without statistical significance. Also, similarity of means and standard deviations for individual variables do not necessarily signal covariance, and the possibility of reduction to a single artifact through factor analysis. For example, mean and standard deviation for general and specific business skills are similar, but their shared correlation coefficient ($\underline{r}$) is only .24. Further, their mutual $\underline{r}^2$ of .06 shows slight explanatory power of one against the other.

Set 2 revealed three relationship categories which, together, accounted for 78 percent of the significant others. These were spouse, male close friend, and female close friend. Male and female parents together comprised only 14 percent (influenced no doubt by the relatively high mean age of 41.7). The significant other relationship had existed an average of 17.38 years. However, a high standard deviation of 12.35 years indicates great variability in relationship duration. Generally, parent and spouse relationship times were high and male or female close friend relationship times spanned a range from high to relatively low.

Set 3 showed consistency in direction and amount of change. Slight increases in the value of advice and assistance over time were indicated, together with small decreases in variability of response, reflected by narrowing standard deviations. $\underline{Z}$ tests of means showed those differences in themselves statistically nonsignificant at .05 reflecting high probability that the changes are due only to chance.

Set 4 variables showed interesting results. The mean of emotional support, together with its narrow standard deviation, renders it somewhat separate in both strength and uninymity of response. (It was this universality of support for the value of emotional support from the significant other which was the basis for this inquiry as it evolved from other research.) Strategic and how-to advice rated relatively high, while the "assistance" matters of introduction to business contacts, direct financial assistance, and physical support, were lower.

Matrix Analysis

Factor analysis is inappropriate for all types of variable sets. Although one could combine widely disparate variables into a reduced number of factors, certain structural constraints exist, apart from a need for variables to be theoretically related. These constraints were used as criteria in the current research for decisions on which combination of variables to include in actual extraction and rotation.

Sphericity test

This measures the extent to which a correlation matrix of candidate variables departs from an identity configuration (perfect correlation on the diagonal, zero correlation for all other relationships). Bartlett (26,136-137) advocates a Chi-square transformation of the matrix determinant, which provides an index of significance. This index reflects the likelihood that the true matrix configuration is an identity. A high probability outcome renders further consideration of factor analysis inappropriate. (After reviewing the sphericity of several matrices developed in this research, it appears that this is really a basic threshold test).

Examination of partial correlation effects

If variables share common factors, their partial correlation coefficients should be small when the effects of other variables are eliminated or held constant. These coefficients may be used to estimate correlation between unique attributes of variables or partial correlation and should all be close to zero (28, p. 104,142). SPSS-X displays the partial correlation in a reproduced correlation matrix. While there is no specific criterion as to proportion of large partials (greater than .05) permissible in a candidate matrix, those matrices with over 50 percent of cells in excess of .05 are considered relatively weak for the factoral model (26, p. 128-129).

Kaiser-Meyer-Olkin measure of sampling adequacy

This is another indicator of the degree to which the variables contain usefully correlating information, as opposed to residue from other influences. In comparing the magnitude of the observed correlation coefficients with that of their partials. A ratio in excess of .6 is thought to reflect high enough common variance for factor analysis acceptability (15, p. 33). SPSS-X displays KMO scores for the overall candidate matrix, as well as for each variable. The standard of .6 acceptability index applies to both (26, p. 128).

Communalities

The squared multiple correlation coefficient ($\underline{R}^2$) between a given variable and all factors shows, in effect, the strength of linear association. This is reflected in the Final Statistics Table generated with Principal Components Analysis extraction (Initial Statistics Table using any other extraction methods). A low communality reflects low contribution by a specific variable to underlying factoral structure making that variable a poor choice for inclusion in further factor analysis (26, p. 130). High communality is related to low uniqueness; matrices which thus produce high communalities for variables under consideration promise to be rich sources for deriving underlying constructs. It should be noted, however, that high communality can exist with other variables even if the variable in question, itself, contains sufficiently great random error elements so that it explains very little of theoretical substance (28, p. 101-102).

From the above it should be evident that the decision to use factor analysis in any data set rests on a combination of tests, each of which demands a measure of nonquantitative judgement. With sufficiently high sphericity, a matrix with a small proportion of high partial correlation coefficients, acceptable measures of sampling adequacy, and a relatively strong set of communalities, the researcher may proceed, but still without guarantees of meaningful data reduction. The key issue is that a substantive awareness of what makes theoretical sense and what does not appears to be the vital moderator in the application of factor analysis.

Extraction

Although several techniques have been developed for extraction of factors from a set of variables, all have a common objective of reducing data into one or more meaningful and interpretable factors (28, p. 169).

Two extraction methods -- maximum likelihood and principal components analysis -- were assessed in this work. Maximum likelihood is a technique which develops factors from the correlation matrix by establishing common factor estimates which have maximum correlation with groups of variables. It is analogous to the least squares method of curve fitting used in regression analysis. However, in factor analysis it is expanded to postulate an ideal number of factors that might be expected, given the number of variables involved and sample size. It is this latter attribute that can cause a replication problem for future research. Differing sample sizes can cause different levels of factoral acceptability, and thus different factoral solutions (28, p. 121-122).

Principal components analysis is conducted with no assumptions about the data's common or unique parts, other than they exist within the variables, themselves, and not their correlation matrix. The technique extracts factors based on the amount of variance they define as shown in the earlier example. Categories of variables most highly correlated are then developed to reduce the original variable set to a smaller, more parsimonious number of factors (28, p. 112).

For years, principal components was the most popular extraction method. It is the method most often represented in discussions of factor analysis which depict vectors in space surrounded by elliptical swarms of observations (28, p. 168). A key principal component analysis problem is that the number of factors sought must be specified in advance. For that task, judgment based on the supposed theoretical structure or rule of thumb must be employed (14, p. 141,-143). As might be imagined, in exploratory factor analysis when the theoretical structure is highly speculative, applying judgement often boils down to choosing from a variety of hunches. The alternative rule of thumb --

Eigenvalue 1 criteria -- is therefore often used. With this approach, the explained variance of each factor, represented with an index number or Eigenvalue, is examined. All factors with numbers in excess of unity are considered sufficiently powerful to include as worthy constructs. (18, p. 49).

Both maximum likelihood and principal components methods are cannonical in that they each produce factors which, themselves, are uncorrelated. However, they will produce differing results when applied to a given data set. The researcher's choice will probably depend on which extraction method ultimately is proven to contribute best to a given rotation approach.

Rotation

Factor rotation involves adjusting the factor extraction results to a best fit with the vectoral patterns of interrelationship in the data (28, p. 18). Practically, it involves plotting all factor clusters derived from extraction on a vector plane, and rotating the axes on which the clusters lie to sharpen the groupings; or make them more unique groups (18, p. 50). What is sought is an attribute called simple structure, or simplification. Simplification, as summarized by Jackson, involves attaining a factor structure with these properties:

1. For each variable, there are some factors on which that variable does not load heavily.

2. With the possible exception of one general factor, each factor shows low loadings for some variables.

3. With the possible exception of a general factor, different factors have large loadings for different sets of variables (14, p. 148).

The factor loadings attained both in extraction and rotation are critical interpretational indicators. They reflect which variables are involved in what factor and to what degree. Moreover, they are correlation coefficients between variables and factors. Thus high correlation coefficients reflect high percentages of common variation a variable shown with the construct which has emerged (28, p. 137).

In the factor analysis literature a guideline for selecting rotation method coexists with the implied admonition to use judgment. Although simple structure is a goal of factor analysis, the <u>simplest</u> structure may not reflect constructs that make sense. On the other hand, high loadings cannot be ignored in exploratory analysis. They may indicate something is really there which theory has previously overlooked (14, p. 148-149).

Two primary rotation methods exist. The varimax technique maintains 90 degree arc distances between rotated factors, producing factoral solutions which are orthogonal, or uncorrelated. Oblique rotation relaxes this rule, and seeks higher loadings (better fit) by allowing the factor axes to shift to locations of maximum correlation (minimum variance) (28, p. 392,399).

The favored method seems to move in and out of fashion. In the 1960s, Varimax seemed accepted as the preferred method, largely because it would maintain the same initial cluster of variables in spite of the introduction of additional variables. This reflected a robust quality which made research using varimax amenable to replication (28, p. 392). More recently, however, oblique appears to have gained favor, particularly in the social sciences. The argument for oblique is that in nature almost everything is intercorrelated in some sense, and a rotation method which submits to this reality may provide more realistic factoral outcomes (26, p. 148).

Kim and Mueller recommend using a rotation method which subdivides the variables into the most theoretically meaningful factors. They further indicate that in exploratory factor analysis the rotation method is of less importance than the discovery of meaningful and perhaps highly significant constructs which are new (18, p. 50).

In this effort both orthogonal (Varimax) and oblique (Oblimin) rotations were tried, with two considerations in mind. First, data interpretability was of uncompromising value. If factors emerged from one rotation method which were masked by another, the more meaningful set in terms of theory would be used, together with the rotation method which produced it. Second, the possible extent of factoral intercorrelation which might exist with oblique was viewed as a potential problem which could cloud the use of factor analysis results in subsequent regression models. The criteria applied to resolve this was that intercorrelation would be acceptable if more meaningful factors might emerge through oblique rotation.

Significant Other Variable Reduction

Cohen and Cohen recognize the desire of a researcher to thoroughly cover as many exploratory aspects of a construct as possible, but warn that in so doing, the multiple variables generated may have undesirable results. Although relatively high $\underline{R}^2$ values may result from the use of several variables in multiple regression, the redundant and potentially spurious relationships which can result may leave the researcher more confused than before the effort began. They advocate use of factor analysis, a modified theoretical approach, altered model specification, or almost any means available to reduce the number of variables so that those finally applied to a dependent variable have meaningful influence, are interpretable, and can advance one's understanding (7, p. 170).

With this in mind 26 significant other variables which had been measured were addressed. Although the rationale for including each issue shown in Appendix B may be clear, and their suitability for consideration in sets may have logical appeal, 26 variables form a potentially confounding mixture.

The data reduction process began with initial examination of all measured variables under the significant other rubric (Shown in Table 7) with a view to combine or eliminate those which apparently added little to the overall explanatory structure. The four identification variables of siblings and children were initially selected for exclusion in this way. Combined, they represented an aggregate of

TABLE 8

PRINCIPAL COMPONENT AND MAXIMUM LIKELIHOOD EXTRACTION -- 22 VARIABLES

Selection Criterion	Maximum Likelihood	Principal Components
Number of Variables	22	22
Number of Factors	8	8
% Variance within Eigenvalue 1	69.4	69.4
Matrix KMO	.52687	.52687
% KMO below .6 for variables	50	50
% of Significant Partials	14	40
Low 3 Communalities	.08436 .19947 .13700	.50083 .52925 .53106

less than five percent. Their elimination reduced 25 variables (not including number of significant others) to 22. The surviving variables were then factor analyzed, using principal components and maximum likelihood extraction methods. Table 8 summarizes results of that effort. The two methods yield similar results except in percentage of significant partials and low communality levels. In the former case, maximum likelihood extraction results in a correlation matrix in which relatively slight significant residual association exists. Although principal component partials are more highly associated, they still are well below the fifty percent danger range mentioned earlier. Comparison of the low three communality figures for the two methods, however, shows principal components explaining a much greater amount of variability in regard to extracted factors than maximum likelihood.

To proceed with the factoral process and determine which variable mix would be best, each set and two interset variable combinations were tested. Table 9 shows the results. A low KMO for Set 1 and 2 together with high percentages of individual variables with low KMO, eliminated sets 1 and 2 from meaningful consideration.

While set 3 had an acceptable overall KMO level, its relatively high percentage of significant partials made its factoral usefulness as a single set questionable. Set 4

TABLE 9

PRINCIPAL COMPONENTS EXTRACTION: POSSIBLE FACTORAL SETS

Selection Criterion[a]	1	2	3	4	12[b] Variable Model	12[c] Variable Modified Model
Number of Variables	5	7	4	6	12	12
Number of Factors	2	4	1	2	4	4
% Variance Within Eigen-value 1	57.8	79.7	65.9	61.0	65.6	64.9
Matrix KMO	.58817	.18182	.66667	.64580	.72428	.75043
% KMO below .6 for Variables	60	86	0	17	8	0
% Significant Partials	70	47	83	73	60	54

[a]All sets reflected nonsignificance at .00001 level or lower with Bartlett sphericity test.

[b]Consists of ownership of a small business, possessing business skills the respondent felt she lacked, set 3 and set 4 variables.

[c]Consists of ownership of a small business, possessing business skills the respondent felt she lacked, Set 3, Set 4 Without Emotional Support, and Number of Significant Others.

showed promise but again, by itself suffered from a relatively high percentage of partial correlation significance. However, it was evident that sets 3 and 4 were promising while 1 and 2 were not.

In developing a mixture of variables which might be theoretically explanatory, the overall factoral model was again consulted. Variables with KMO in excess of .6, together with all variables from sets 3 and 4 were considered retention candidates for factoring. This lead to a 12-variable model which included Sets 3 and 4 plus the variables "possessing business skills you feel you lack" and "owner of a small business." This provided a healthy overall KMO and contained only one variable which when intercorrelated, failed to attain a KMO over .6. (That was provision of physical support, with KMO of .59.) The percentage of significant residuals was down to 60 and reduction from 12 variables to four factors had been accomplished. Although rotation might prove the need to revisit the extraction process, at this point it appeared that principal components extraction of four factors using the 12-variable model would serve acceptably for further work. Based on assessment of a 23-variable model which included number of significant others, one additional extraction set was derived. That consisted of 12 variables, all of which had KMO scores above .6. This caused elimination of "emotional support" from Set 4, and addition of "number of significant others." Results shown at Table IX are incrementally better than those for the standard 12-variable model.

Rotation of the models ultimately indicated which configuration was of greater explanatory aid. However, the extraction assessments done early in the effort established two sets of variables which made theoretical and parsimonious sense of resulting significant other factors.

Multiple Regression

The multiple regression algorithm is a powerful analytical tool which has broad application with virtually any sort of data. Although once considered applicable only for data subject to interval or cardinal measurement, techniques of data transformation and coding have also brought nominal and ordinal within the scope of analysis (7, p. 13).

The purpose of regression is to explore relationships among variables (21, p. 9). Although a predictive equation is not expected from experimental work with regression, several useful descriptors of variability are generated when the algorithm is applied (7, p. 9). Its chief attribute is the ability to describe movements in variation of a dependent variable in relation to unit changes in an independent variable while all other variables are held at constant values. As used in this work, regression enables the assessment of changes in education, experience, locus of control, and significant other dimensions in relation to one another and to return on investment. By combining independent variables to form interactions, further associative matters may be examined. All this is conducted within predesignated statistical limits, set to insure that inferences from the data are appropriately qualified so they may be meaningfully applied to the research hypotheses.

Regression Assumptions

Although regression is a robust technique which can be used to assess all sorts of data, it contains vulnerabilities embedded in the four assumptions on which the technique is based. The first two of these assumptions are essentially classical, and less absolute in their application than the final pair. However, avoiding violation of the assumptions supports the use of regression in a specific research effort. Ignoring them is unacceptable methodology (21, p. 26-29).

Assumption 1: No specification error

Three aspects are of note in this assumption. The first is that the relationship between the dependent variable, and independent variables, is essentially linear. As one shifts in value, the other shifts a proportional amount across the range of observations. This does not mean each variable's values describe absolute straight line relationships. Through the technique of variable transformation, curvilinear data can be analyzed. However, even with transformation, the assumption of acceptably uniform variability is present. This concern falls within the realm of specification error in that failure to include a relevant independent variable or inclusion of an inappropriate variable, alters the nature of all other relationships. These considerations are the basis of second and third aspect of this assumption. Appropriate specification includes the presence of relevant and the absence of confounding variables. Variables included in any multiple regression model must contribute information which is nonconfounding and supportive of explanatory value (7, p. 129-130).

<u>Assumption 2. No measurement error</u>

This assumption reflects the need for accurate measurement of all values. The regression algorithm is founded on a set of beliefs about the distribution of values in nature which can be discerned through appropriate sampling. However, if the sampling is not properly done and the data elements which are captured with the sample not correctly valued, the powerful regression model will generate plausibility structures which will mislead more than illuminate (21, p. 27).

<u>Assumption 3: Homoskedastic residual values</u>

Since seldom are variables perfectly matched in covariance, a residual or error term is reflected in all regression applications. This error represents the variation of Y which cannot be explained by the independent variables. In social science research the explanation of much more than 50 percent of a dependent variable's variance is rare, so the presence and importance of residuals becomes evident. This assumption is that the value of all residual data do not form a relationship pattern with the predicted values of the dependent variable which are generated through regression. Such a pattern, if of sufficient strength, indicates the likely presence of curvilinearity in the dependent and certain independent variables. Its presence signals the misinterpretation of statistical values such as confidence intervals, which undermines the very reason for using regression as an analytical tool. Heteroskedasticity can be dealt with in several ways, chiefly through transformation of variables (7, p. 125-129).

<u>The absence of multicollinearity</u>

When independent variables are strongly covariant, their joint effect on the dependent variable results in confounding interpretation of data. Virtually all social science variables show some signs of intercorrelation. However, when two or more variables are so intervariate that they effectively may be reflecting surrogate phenomena, the researcher must abandon those offending elements or accept an uninterpretable model (7, p. 109).

Regression Statistics

Multiple regression has several statistical indices of evaluation which enable the researcher to draw inferences from data analysis. The first and most generally recognized is R^2, the coefficient of determination. R^2 represents the percentage of variance in Y explained by the independent variables. This phenomenon makes it a key tool of assessment, in that the most cursory glance at regression results will tell the consumer of research the amount of explanatory force in terms of Y the specified independent variables have (7, p. 100). However, the nature of R^2 makes it an almost misleading evaluative index. Almost any variable will serve to "explain" at least some dependent variable variation. Thus, the attachment of independent variable after independent variable will have the effect of inexorably raising R^2, albeit incrementally. Such a procedure is discouraged, for the basic goal of analysis is not maximizing R^2 but, within a given R^2 explaining the relative effects of various elements specified in the research proposal. This is not to say that the serendipitous discovery of a nonspecified variable of great explanatory power is to be ignored. However, it is to say the researcher must use caution and not blindly seek ever higher R^2 only to end with an inexplicable array of variables whose only virtue is a coincidental variability with the dependent variable (7, p. 170).

The partial regression coefficients of each independent variable are important assessment indicators. In an unstandardized form they reflect the amount of average change in Y which may be attributed to each of the independent variables, when the value of all other independent variables is held constant.

The semipartial correlation coefficient sr and its square sr^2 are further interpretive statistics. The proportion of Y variance accounted for by a specific independent variable beyond that accounted for by all the other independent variables is reflected in sr^2. It may be considered the unique contribution of that variable to the overall R^2 of the regression function (7, p. 101-102).

The partial correlation coefficient squared (pr^2) is the proportion of that part of the Y variance which is accounted for uniquely by a specific independent variable and is independent of the remaining independent variables. Both sr^2 and pr^2 in themselves can provide useful interpretive assistance and together aid in diagnosing conditions of redundancy and suppression among independent variables (7, p. 102).

Confidence intervals for significance can be constructed with multiple regression, as with other similar techniques. Such intervals are the basis for interpreting statistical significance for any independent variable. Conventionally, an aggregate significance level for an entire function is determined from a calculated F value which is a function of $\underline{R}^2$ and the degrees of freedom in the expression, expressed as (n-k-1) where n is sample size and k is the number of independent variables (7, p. 104). A confidence interval for a specific variable is calculated using the t test; a similar statistic to F but including sr as an element applicable to specific variables (7, p. 107). In practice, one normally conducts Fisher's protected significance tests, in which confidence intervals for the F statistic are checked, and explicit t values for independent variables are deemed significant or not only if the overall F value meets predetermined levels of significance (7, p. 167). In multiple regression, the significance levels of F and t values are set to avoid Type I errors. The conventional significance level for the α risk associated with this is .05, for both F and t.

Analysis Technique

Conducting an analysis using multiple regression involves several operations. In this case, SPSS-X software was used for both factor analysis and multiple regression of the data. Initially, a factor analysis effort was mounted to reduce and interpret significant other variables. Earlier in the chapter a description was provided of the means through which 22 and 23 were reduced to two possible sets of 12 each, which in turn each converted into four factors. Each of these factors became a variable.

In order to increase the uniqueness of each factor in its explanatory effect on Y, factor residuals were calculated and used in place of the originally-derived factors. This operation was conducted by regressing each combination of three factors against the remaining one, and saving the residuals. The resulting factors were pure, in the sense that they each explained a portion of the measured significant other phenomenon which was not addressed at all by the variance of the other factors.

As indicated in Chapter I, the remaining hypotheses dealt with the variables locus of control, education, and experience. Rotter's instrument produced a cardinal score for locus of control, which could be readily applied for each case. Questions on amount of education and type of education were included in the questionnaire. However, in light of theoretical statements which were the basis for the present education hypothesis, only type of education expressed in the nominal "business/economics" major and "other" were used. For experience, three measurements were taken. The first dealt with whether the respondent's prior experience consisted of management or nonmanagement work. The second asked the degree of prior business experience before starting one's own business, and the third asked the degree of experience in the field of work represented by the entrepreneur's business, prior to starting that business. When treated as individual independent variables and regressed against return on investment as a dependent variable, none of these experience variables attained significance at the .05 level. Two of their residuals, plotted against the preducted values of return on investment, were nonsignificant at the .05 level, but those of management showed a significant relationship, indicative of the heteroskedastic condition. This would have required transformation of the dependent and perhaps independent variables for correction, should the variable management experience be retained in the function. A decision was made to use factor analysis to reduce the three variables to a single experience factor. With that approach, _t_ remained at a nonsignificant 1.330, but the correlation between the preducted Y values and residuals was a homoskedastic .069, making the factor useful as an experience surrogate.

The modified variables were thus prepared for application in a multiple regression function. Education, reflected in type of college major; experience, a factoral result of three discrete measures; locus of control; and four factoral dimensions of significant other. These would be regressed against the dependent variable return on investment, calculated by the respondents. Interactions hypothesized in Chapter I would be tested through the combination of significant other variables with locus of control and experience. Such interactions would be treated as sets and examined as such, both for overall explanatory value and for the significance of individual variables (7, p. 301-2).

Information which would be generated by this operation includes $\underline{R}^2$, zero-order correlations for all combinations of variables, partial and semi-partial correlations, regression coefficients, beta values for each coefficient, and $\underline{F}$ and $\underline{t}$ indices of significance. To facilitate further explanation of the effect of each variable on all others, a hierarchial regression strategy was selected, in which each variable or set would be inserted in turn so it is unique explanatory value and possible redundant or suppressive effects on other variables could be examined. Thus, important information would be contained in every step of a hierarchial progression toward a fully-partialled model, as well as in the final form that model would take (7, p. 120).

Through this process, the hypotheses of Chapter I were examined. Additional inferences which might emerge from the examination of residual values, the various coefficients, and indications of common interrelationships were also considered. It is the array of those findings which will be of concern in Chapter IV.

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CHAPTER IV

FINDINGS

The research results are presented and discussed in this Chapter. First, the two factoral sets described in Chapter III will be further elaborated through theoretical designation of each factor. Then, the results of bivariate regression used to evaluate independent variables will be summarized. Finally, the results of multiple regression hierarchial analysis will be discussed for each model derived from the two factoral sets.

In order to make the discussion less cumbersome for writer and reader, a convention for describing the two model sets in both factoral and regression phases has been adopted. Set 1 describes the outcomes which result from application of the data from the first factoral set described in Chapter III. Set 2 will be used to describe the model developed from the second factoral set.

The Factoral Configurations

The first step in data analysis was development of an explanatory structure for the factors which formed the basis of the two proposed models. Set 1, the first factoral configuration, consisted of all variables pertaining to advice and assistance, plus two significant other background variables: "owner of a small business" and "possessing specific business skills you feel you lack." Set 2 was identical to the first with a single substitution. Emotional support was deleted and replaced by the number of persons considered significant others.

Tables 10 and 11 depict these sets, indicating factoral designations, variable composition of each factor, loading of each variable, and percentage of variance for each factor. The two structures show several similarities. Overall explanatory power reflected by percentage of variance accounted for is within .7 for the two solutions. Factor by factor, the difference in variance explained is similarly slight. However, each configuration was deemed a credible explanatory alternative possibility for two reasons. First, the combined financial and physical support variables in each set emerged as parts of unique factors, with only slightly different levels of explanatory power. Similarly, the variables "strategic advice," "how-to advice," and "introduction to business contacts" remained grouped together in each of the sets, but in different factoral positions. In Set 1 these variables were enhanced by inclusion of the background characteristics "possession of specific business skills the respondent felt she lacked," and "owner of a small business." This is a logical association, in that providing the advisory and introductory assistance cited in the factor is most readily done by persons with a skill and relationship base to support provision of the assistance.

Interestingly, in Set 1 the variable "emotional support" attained a unique and moderate positive loading in Factor 4, while the variable "possession of specific business skills the respondent felt she lacked" was negatively loaded. This could indicate that when emotional support is present it closely matches with a significant other's lack of specific skills. The one is perhaps important because of the other's absence. This is of particular potential interest since less than 30 percent of the respondents indicated their significant other had those specific skills, while virtually all respondents rated emotional support of high importance.

Set 2 produced a simpler configuration in that no common variables loaded above the .4 communality level in more than one factor. Factor 1 for both Sets 1 and 2 was virtually identical in both variable composition and loading. In Set 2, in the absence of the emotional support variable, significant other background characteristics together with "number of significant others" migrated to Factor 4. There the two background variables attained substantially higher loadings than they did in Factor 2 of Set 1.

TABLE 10

SET 1 FACTORAL DESIGNATION AND COMPOSITION

FACTOR NO.	DESIGNATION	% OF VARIANCE	VARIABLE	LOADING
1	Long and Short Run General Advice and Assistance.	33.7	Start-up Advice	.80354
			Start-up Assistance	.79650
			Advice after completion of start-up period	.79001
			Assistance after completion of start-up period	.67419
2	Coaching and Exposure, based on knowledge of processes and people	13.0	Strategic Advice	.73875
			How-to Advice on day-to-day problems	.73493
			Introduction to important business contacts	.58501
			Owner of a small business	.44501
			Has specific business skills respondent feels she lacks	.49060
3	Safety Net Support	10.3	Physical support	.91034
			Financial Support	.76679
4	Counselling and Friendship	8.6	Emotional Support	.68677
			Has specific business skills respondent feels she lacks	-.62217

Factor designations for each set are also shown in Tables 10 and 11. Factor 1 is identical for each set. Factor 2 for Set 1 is called "Coaching and exposure based on knowledge of processes and people." This applies Kram's terminology (3) to reflect the likelihood that the significant other is coaching, giving specific advice, and providing exposure to the business community through introductions to important others. This is made possible through knowledge possessed by the significant other. Factor 3 in Set 1 is called "Safety net support," for it consists of physical and financial aid. It is identical to Factor 2 in Set 2. Factor 4 in Set 1 is called "Counselling and friendship," again borrowing from Kram's classification system. This factor was so designated because a negativity associated with specific knowledge coincident with the positive valuation of emotional support, implied the sort of extravocational assistance Kram indicated was a key aspect of counselling and friendship. In Set 2, Factor 4 was seen to contain the basis of much worthwhile advice and aid: knowledge based on experience. It was interesting that "numbers of significant others" also had a high positive correlation in this factor. This might indicate that persons with a greater number of significant others seem to be emphasizing their importance through their ability to tangibly contribute. This is an interpretation aligned with Rosenberg's concept of the role-specific significant other (4).

TABLE 11

SET 2 FACTORAL DESIGNATION AND COMPOSITION

FACTOR NO.	DESIGNATION	% OF VARIANCE	VARIABLE	LOADING
1	Long and Short Run General Advice and Assistance.	32.5	Start-up Advice	.80823
			Start-up Assistance	.79076
			Advice after completion of start-up period	.77532
			Assistance after completion of start-up period	.67134
2	Safety Net Support	13.5	Physical Support	.90627
			Financial Support	.77585
3	Coaching and Exposure	10.5	Stragetic Advice	.79627
			How to advice on day-to-day problems	.73654
			Introduction to important business contacts	.53050
4	Knowledge of Processes and People	8.4	Number of significant others	.76621
			Has specific business skills respondent feels she lacks	.62720
			Owner of a small business	.51481

Each of the two factoral models thus appears theoretically supportable and structurally legitimate. Reliability is acceptable for each, computed using the Chronbach Alpha method (Set 1: .80; Set 2: .78). Application of the Theta reliability statistic frequently used in factor analysis results in a .81 for each set (1). Since both the models were acceptable it was decided to try each as elements of the hierarchies to be tested to see if one produced more meaningful results than the other.

Bivariate Relationships

In preparing the data for hierarchial analysis using multiple regression, it was first necessary to examine each independent variable in relation to the dependent variable to detect possible heteroskedasticity. Such a condition, although usually correctable, needed to be diagnosed if present, since it signals violation of one of the basic regression assumptions. That violation would render the regression confidence intervals uninterpretable, and thus negate the method's usefulness. The tool used for this detection was the Pearson Correlation Coefficient, together with the statistic p; the probability that correlations of a given level are due to chance. The Pearson coefficient was derived through comparison of predicted values of the dependent variable with corresponding values of its residuals. A relatively high Pearson's r value reflects a distinctive associational pattern. A two-tailed test with

TABLE 12

BIVARIATE REGRESSION: NONFACTORALS

	DEPENDENT VARIABLE								
	Return on Investment			Square Root Return on Investment			Log 10 Return On Investment		
	r^2	t	p	r^2	t	p	r^2	t	p
College Major									
	.0080	-.898	.469	.0055	-.742	.214	.0004	-.200	.397
Management Experience									
	.0069	-.834	.081	.0037	-.606	.396	.0022	-.468	.504
Field Experience									
	.0152	1.243	.257	.0278	1.691	.605	.0341	1.879	.191
Business Experience									
	.0073	.853	.248	.0099	.998	.337	.0098	.995	.680
Locus of Control									
	.0374	-1.970	.017	.0332	-1.852	.137	.0169	-1.311	.553
ID	.0053	- .731	.205	.0072	-.854	.237	.0076	-.876	.516

significance level of .05 for p was established as an indicator of such a relationship pattern which would be heteroskedastically unacceptable.

Table 12 contains the bivariate relationships for key nonfactoral variables. All r^2 values are quite low, indicating weak explanatory power for individual variables in relationship to the dependent variable. Only locus of control approaches a significant t value. However, its Pearson r level reflects heteroskedasticity. Although these initial test results seem to predict only slight meaningful association, it should be remembered that these results indicate as much about the dependent variable as they do the independent variables.

The dependent variable return on investment was assessed to see if it might be enhanced, or made potentially less troublesome, through transformation. Return on investment is a cardinal measure with a minimum of zero and no natural maximum. It contains enough high values to possess a substantial right skew, inviting improvement through either square root or logarithmic transformation.

Table 12 shows the relationship between each independent variable and the dependent variable, when the latter is transformed. In the locus of control case with square root transformation, the heteroskedasticity problem is solved. However, the solution leaves the independent variable less statistically meaningful than before. The transformation of return on investment using logarithm Base 10, also defeats heteroskedasticity, however, with locus of control, it is again at the expense of independent variable explanatory ability.

Table 13, however, shows more promising indications. Transforming not only the dependent variable but also a key independent variable clearly enhances explanatory ability. In this case locus of control is transformed with a Base 10 logarithm and square root and regressed against two transformed and one unchanged configuration of return on investment. In the case of logarithmic transformation of locus of control with no dependent variable transformation, explanatory power of the transformed independent variable increases sharply; along with statistical significance. However, heteroskedasticity becomes more severe. For a square root independent and dependent variable transformation, the defeat of heteroskedasticity is only by a narrow increment. When both variables are transformed with logarithms, explanatory power in terms of the dependent variable is still not great, but statistical significance is high and virtually no heteroskedasticity remains. A reliability check of locus of control measured for this sample showed Alpha of .69, reflecting possible measurement shortcomings.

This analysis illustrates the need for transformation of this dependent variable in the fully-partialled multiple

TABLE 13

LOCUS OF CONTROL TRANSFORMATION

DEPENDENT VARIABLE	INDEPENDENT VARIABLE: LOCUS OF CONTROL			TRANSFORMATIONS		
	r^2	t	p	r^2	t	p
Return on Investment	.03737	-1.970	.017	.06669	-2.673	.003
Square Root Return on Investment	.03317	-1.852	.137	.04953	-2.283	.077
Log 20 Return on Investment	.01689	-1.311	.553	.03892	-2.012	.355

regression model. As will be subsequently noted, both Set 1 and 2 were tested with each possible dependent variable configuration. In each case the logarithmic transformation proved of greater explanatory power than the alternatives, consistent with nonviolation of regression assumptions.

Other Regression Outcomes

Using bivariate models to initially view the major independent variables was also of further assistance in determining if the order of questionnaire return was of research importance. The variable "ID" was the identification number assigned to each case for file construction and editing, and also represented the order in which responses were received from survey participants. When regressed against the dependent variable, with and without transformation, no significant explanatory values were associated with order of response return. It thus could not be asserted that order of return was a variable of consequence, given the dependent variable chosen for the analysis. (ID was also inserted in the fully-partialled models and run against logarithm Base 10 of return on investment with similarly nonsignificant results.)

A serendipitous finding which resulted from bivariate analysis was a highly significant relationship between the dependent variable in all states and the measurement of months in operation. Although not part of the hypotheses cited in Chapter I, this phenomenon was kept in mind for possible inclusion in the multivariate models for two reasons. The first was the high explanatory value of months in operation. It is difficult to ignore an available variable which has such an effect even if not forecast as relevant. Further, months in operation did not appear to be multicollinear with the other variables planned for the model. Its use could be justified, if necessary, not only as a broadening explanatory element but as a variable which might attack heteroskedastic tendancies which might appear in the fully-partialled model.

The Regression Model

The first step in the regression analysis was placement of each variable and set in an appropriate order for entry in the hierarchy. The technique for this mirrored Cohen and Cohen's suggestions for hierarchial composition (2, p. 121). First in the hierarchy were status variables which were temporally determined; type of education preparation and the "experience" factor. Following these, locus of control was entered, inserted before the more exploratory significant other factors. Each factor was then entered separately to assess its partialling influence on the previous variables and permit the assessment of individual dimensional contribution to the overall model. Finally the hypothesized interactions were entered. The array strategy is shown in Table 14.

Once hierarchial order was tentatively established, the process of regression analysis began. This consisted of examination of each variable's characteristics as it was entered, and the way each variable altered the coefficients of other variables already entered. The steps with which this was conducted were:

1. A hierarchial regression program was executed which produced step by step displays of R^2, r, sr, pr, $beta$, and F for the overall model at each step, and the t statistic for each variable.

2. As a by-product of the resulting hierarchial model, a Pearson correlation computation was made for the

TABLE 14

INITIAL HIERARCHIAL ENTRY OF VARIABLES

RATIONALE	VARIABLES(S)
Temporality	College major
	Experience factor
	Locus of Control
Exploratory Issues	Factor_1
	Factor_2
	Factor_3
	Factor_4
Exploratory Issues of less importance than significant other measures	College major X Experience Factor Set: Significant other factors X Locus of Control Set: Significant other factors X Experience Factor

dependent variable predicted values of the fully-partialled model and corresponding residuals. As earlier described, a significant relationship between these would signal heteroskedasticity; a violation of regression assumptions which precludes meaningful interpretation of any coefficient or statistic other than $\underline{R}^2$.

3. A series of regression hierarchies was tested, using logarithm base 10 of return on investment, square root of return on investment, and return on investment, untransformed, as dependent variables. Each outcome was first subjected to the heteroskedasticity test. If it passed that

hurdle, its overall configuration of F values was consulted to determine model acceptability. Although R^2, in itself, was not of fundamental consideration, the F statistic was absolutely central to the analysis. This latter statistic indicated whether or not the model, with its particular order of variable entry, passed the milestone of statistical significance under the Fisher protected t method. If at any point the F statistic significance level for the hierarchy exceeded .05, individual variables could no longer be considered significant on their own merits. They would, however, remain in the model for analysis of the interactive effects they might have on previously entered variables.

Table 15 compares R^2, overall F, and heteroskedasticity significance level p for each of the models which were initially tested. It is apparent that the configurations cited above had severe interpretability limitations.

The heteroskedasticity dilemma reflected in Table XV is not surprising, considering the nature of the dependent variable used in this study. Heteroskedasticity occurs when important variables are excluded from the hierarchy. It is a reflection of powerful correlative influences between residuals and other independent values which are not in the equation. Since return on investment is obviously subject to covariance with many other variables not measured in this effort, a strong tendency toward that phenomenon is

TABLE 15

CONSIDERATION OF MODEL SET ADEQUACY

DEPENDENT VARIABLE	STATISTIC R^2	F	P	REMARKS
Log 10 Return on Investment (Set 1)	.1883	.261	.089	No individual variable passes F test
Square Root Return on Investment (Set 1)	.2180	.167	.035	Only square root locus of control and F_2 under .05 significance[2]
Return on Investment (Set 1)	.1713	.370	.000	Only log 10 locus of control under .05 significance
Log 10 Return on Investment (Set 2)	.1540	.499	.028	No individual variable passes F test[a]
Square Root Return on Investment (Set 2)	.1769	.151	.005	Only square root locus of control, and F_3 under .05 significance[b]
Return on Investment (Set 2)	.1420	.594	.000	Only log 10 locus of control under .05 significance.

[a]Independent variable Locus of Control transformed with Log 10

[b]Independent variable locus of control transformed with square root.

expected. Such a variable as level of capitalization of the business, for example, would have great effect on return on investment. That was not assessed in this model. Such unmeasured variables, shaped the residuals into a significant heteroskedastic pattern. Such a pattern also helps explain the relatively low $\underline{R}^2$ of the model under review. Other variables simply have more direct influence on return on investment than those addressed here.

Having already transformed the dependent variable into configurations most likely to defeat heteroskedasticity, it remained to either accept uninterpretability of the model or include a relevant additional independent variable which might serve to randomize the observed residual pattern of return on investment. A variable which could serve this purpose had been captured in the survey instrument. It was believed that time in operation of the business might correlate well with return on investment (in light of Waddell's findings described in Chapter II) and in so doing, randomize the patterned residuals. A potential problem of insertion of this variable was possible multi-collinearity with locus of control or significant other factors. However, the SPSS-X system contains a multi-collinearity check which alerts the user to this phenomenon when it reaches unacceptable limits.

The first step in dealing with these configurational problems was insertion of months in operation in the hierarchy as a device to manage heteroskedasticity. The degree to which it was effective in Set 1 is reflected in Table 16.

TABLE 16

SET 1 ADEQUACY WITH MONTHS IN OPERATION INCLUDED

DEPENDENT VARIABLE	STATISTIC R^2	F	P	REMARKS
Log 10 Return on investment	.2260	.138	.135	Log 10 locus of control passed protected t test
Square root, Return on Investment	.2201	.160	.011	Square root locus of control passed
Return on Investment	.1959	.280	.000	Log 10 locus of control and F_1 passed

At this juncture further discussion of Set 2 results will be deferred, and Set 1 coefficients, significance testing, and relevant associational characteristics will be assessed. Set 2 will be similarly analyzed after Set 1 is fully described.

Set 1 Coefficients

The key coefficients for each variable in the acceptable Set 1 configuration are shown at Table 17. The coefficient *r*, is the correlation coefficient between each independent variable and the dependent variable in the fully-partialled model. Its square, the coefficient of determination (R^2), indicates the percentage of variance in the dependent variable accounted for by each independent variable. As can be readily seen, these variables, with the exception of log 10 months in operation and log 10 locus of control, account for quite small amounts of return on investment variance. The sr^2 value indicates the percentage of dependent variable variance accounted for by each independent variable, apart from that accounted for by all the others. This coefficient highlights the relative unique influence of each variable. For example, although the coefficient of determination for factor F_2 is so low as to appear almost irrelevant, its sr^2 value reflects a unique explanation of over seven percent of dependent variable variance which cannot be accounted for by the other independent variables in the model. This is almost twice the unique variance shown by sr^2 for log 10 locus of control and almost three times the uniqueness shown for the highly-correlated log 10 months in operation. This relatively large effect is carried through in the interaction of factor F_2 and locus of control, with a unique variance accounted for in excess of six percent.

The coefficient pr^2 reflects the same uniqueness in contribution of the independent to the dependent variable,

TABLE 17

FACTORAL SET 1 FULLY-PARTIALLED COEFFICIENTS

Variables	coefficients $\underline{r}$	$\underline{r}^2$	$\underline{sr}^2$	$\underline{pr}^2$
COLLEGE MAJOR	-.019948	.00040	.00002	.00003
EXPERIENCE	.131822	.01738	.01344	.01686
LOG 10 MONTHS IN OPERATION	.237397	.05636	.02824	.03479
LOG 10 LOCUS OF CONTROL	-.197255	.03891	.04136	.05014
F_2	.049588	.00246	.07493	.08731
F_1	-.020784	.00043	.00310	.00394
F_4	-.034417	.00148	.00012	.00015
F_3	-.038494	.00118	.00314	.00399
EDUCATION X EXPERIENCE	.118906	.01414	.00718	.00908
LOCUS OF CONTROL X F_3	-.022009	.00048	.00007	.00009
LOCUS OF CONTROL X F_1	.001679	.00000	.00137	.00174
LOCUS OF CONTROL X F_4	.006184	.00004	.00023	.00030
LOCUS OF CONTROL X F_2	-.032927	.00109	.06376	.07526
EXPERIENCE X F_3	.043624	.00190	.00061	.00078
EXPERIENCE X F_2	-.024041	.00058	.00106	.00135
EXPERIENCE X F_4	.062782	.00395	.03123	.03834
EXPERIENCE X F_1	.008918	.00008	.00999	.01260

but the base of variation is that part of both the dependent and independent variable variance not accounted for by other influences. Thus the $\underline{pr}^2$ value for F_2 increases to over eight percent of dependent variable variation. Similarly, the interaction of log 10 locus of control with the F_2 variable viewed in this way is also higher than its $\underline{sr}^2$.

Review of these coefficients indicates that the log 10 of months in operation, which was inserted to deal with heteroskedasticity, does not dominate the data's interpretability. Log 10 locus of control is much more uniquely correlated with the dependent variable, as is both factor F_2 and the interaction of these two variables. It thus appears that the addition of this seemingly extraneous variable resulted in precisely what was intended; better basic model interpretability without confounding influence on other independent variables.

Set 1 Significance Testing

As stated earlier, the protected $\underline{t}$ test was used to determine if the implied null hypothesis of no significant relationship between variables should be accepted. This approach resulted in an analytical discipline which required that the $\underline{F}$ test for all newly-entered variables meet the .05 significance criteria before any $\underline{t}$ value's significance could be considered. This is not to say that only the variables which survived both $\underline{F}$ and $\underline{t}$ tests were relevant to the study. The Set 1 and 2 models reflected the hypotheses of Chapter I. Under those hypotheses the redundant or suppressive effects of newly-entered variables on those already in the model are of relevance even though they are not significant in their own right. Thus, each variable's *t* value, together with its *sr* and beta, were examined from three dimensions. First, as the variable entered the hierarchy, the impact on overall *F* value and its possibly relevant *t* was assessed. Subsequently, as each variable was entered, prior variables were examined to see if they reflected the influences of redundancy or suppression. Finally, after all the variables were entered, the fully-partialled model was examined for statistical significance and overall interpretive substance.

Appendix D shows the SPSS-X report for entry of each variable into the hierarchy. In summary, neither college major nor the factoral measure of experience nor log 10 months in operation entered the model at significant *F* levels. However, upon entry of log 10 locus of control, the model attained an *F* with significance above .95, enabling provisional acceptance of the independent variable's level of significance reflected in its *t* value.

Following entry of log 10 locus of control the significant other factors were aligned for entry. Although initially they were entered in Eigenvalue sequence, the testing of different orders of factoral entry showed that the relatively low explanatory power of the first factor decreased the model's overall F value to the point that a potentially explanatory second factor had to be ignored. Factoral order of entry was thus modified to bring F_2 in first, followed by the other factors in descending order of pr^2.

This tactic enabled consideration of the second factor, which consisted of the variables "provision of strategic advice," "provision of how-to advice on day to day matters," "introduction to business contacts," "owner of a small business" and "possessing business skills you feel you lack." However, beyond that entry, additional variables failed the protected t requirement.

Set 1 Redundancies

Redundancy is an associative pattern between three variables in which two share a common pattern of variability with a third. Table 18 shows this pattern for the Set 1 configuration.

The interactive term formed by college major and the experience factor shows a redundant association with college major, the experience factor, itself, log 10 months in operation, and factor F_3. Table XVII shows that the interaction has a relatively high r of .1189, but an sr^2 of almost zero. This low unique explanatory power for the interaction variable, together with a substantial r, points toward a condition consistent with spurious relationship between the interaction and the dependent variable. The

TABLE 18

SET 1 REDUNDANCY ASSOCIATIONS

INFLUENCED VARIABLE	REDUNDANT ENTRY
College Major	Interaction: College Major X Experience
Experience	Log 10 Months in Operation Log 10 Locus of Control Interaction: College Major X Experience
Log 10 Months in Operation	Log 10 Locus of Control Interaction: College Major X Experience
Log 10 Locus of Control	None
Factors:	
Coaching and Exposure based on knowledge of processes and people (F_2)	None
Long and short run general advice and assistance (F_1)	None
Counselling and Friendship (F_4)	None
Safety Net Support (F_3)	Interaction: College Major X Experience
INTERACTIONS:	None

real relationship is found between the dependent variable and those other independent variables which were redundant with the interaction.

The model contains several other redundancies which are not apparently spurious, but provide interpretive insights. Log 10 locus of control and log 10 months in operation are redundantly associated, as is experience and log 10 locus of control, and experience and log 10 months in operation. Although these redundancies are understandable, and of the sort common in social sciences (2, p. 94), they are not particularly severe in their impact on coefficients. They do not substantially reduce beta values on entry, thus they are not a confounding interpretability issue.

Set 1 Suppression

Suppression is a more significant associational influence than redundancy. The true nature of relationships between variables is more fully describable by examination of covariance among independent variables, or in some cases two or more independent and the dependent variable. Such covariance in the form of suppression increases beta coefficients of independent variables, causing some to appear to have more influence than they actually would if set alone against the dependent variable. For example, the variable log 10 locus of control is suppressed several times in the hierarchy by the subsequent entry of other variables. Such suppression results in the core variable, which entered almost but not quite at the level of significance, finally attaining a clearly significant status at the .05 level. It is important to note that such suppressive activity does not contaminate the research by infusing more statistical than substantive explanatory value. Suppression by the variables in a regression model acts similarly to influences in nature which shape the effects of phenomena. Suppression is thus an indication of the accuracy of the model in reflecting the confusion of the world, rather than a flaw in "pure" explanatory ability.

Table 19 reflects suppressor associations in the Set 1 model. The majority of these are identifiable in Appendix D by a close to zero correlation between suppressor and dependent variable upon hierarchial entry. In these instances the suppressor has common variance with part of another independent variable, but has almost no association of its own with the dependent variable.

Set 1 Summarized

Set 1 is amenable to relatively straightforward analysis. The R^2 of .2166 reflects that portion of the variance of log 10 return on investment which can be attributed to the model. The model is homoskedastic at the .05 level, and thus meets a crucial regression requirement. No multicollinearity signal was provided by the SPSSX operation during program execution, which reflects acceptability in terms of the second critical regression assumption. Specification was initially inadequate due to emergent heteroskedasticity. However, inclusion of the log 10 months in operation defeated that problem, with a trade off of inclusion of an exogenous variable into the originally specified mix.

Although the critical regression assumptions were met, the fully-partialled model did not attain statistical

TABLE 19

SET 1 SUPPRESSIVE ASSOCIATIONS

INFLUENCED VARIABLE	SUPPRESSORS
College Major	Experience, ($F_{1...4}$) (Log 10 Locus of Control)*
Experience	Counselling and friendship, ($F_{1...4}$) (Experience)
Log 10 Months in Operation	None
Log 10 Locus of Control	All factors; (College Major) (Experience); ($F_{1...4}$) (Log 10 Locus of Control) ($F_{1...4}$) (Experience).
Factors:	
F_1: Coaching & exposure based on knowledge of processes and people	Remaining factors; (College Major) (Experience); ($F_{1...4}$) (Log 10 Locus of Control); ($F_{1...4}$) (Experience)
F_2: Long and short run general advice and assistance	Remaining factors; (College Major) (Experience); ($F_{1...4}$) (Log 10 Locus of Control); ($F_{1...4}$) (Experience)
F_3: Counselling & friendship	(College Major) (Experience); ($F_{1...4}$) (Log 10 Locus of Control)
F_4: Safety Net Support	($F_{1,,,4}$) (Log 10 Locus of Control)
Interactions;	
(College Major) (Experience)	($F_{1...4}$) (Experience)
($F_{1...4}$) (Log 10 Locus of Control)	None
($F_{1...4}$) (Experience)	None

significance. Using the protected $\underline{t}$ test, the model was significant with only five of seventeen variables. Three factors and the interactive effects failed to attain sufficient magnitude of explanatory power in terms of the dependent variable to allow acceptance as sets of relationships which might be attributed to other than chance. However, the presence of all variables in the hierarchy produced valuable insights as to the nature of locus of control and significant other variables which promise to be useful in further research. At Table 20 is an array of critical coefficients, showing significance levels of $\underline{F}$ for each variable and set at entry, and significance of $\underline{t}$ at that point in the hierarchy in which significance of the overall model was sufficient to enable analysis of individual variables.

Modification of Set 2 Model

In dealing with the presence of heteroskedasticity in Set 2, a variety of transformations were tested. Unlike Set 1, the full array of variables, including interactions, retained its heteroskedasticity in spite of logarithmic transformations of return on investment and locus of control. Table 21 shows the modifications attempted in search of a model which met the regression assumptions and was still interpretable.

TABLE 20

FULLY-PARTIALLED SET 1 HIERARCHIAL MODEL

VARIABLE	r	r^2	β	sr^2	pr^2	Entry Significance of F	Interpretable
College Major business or economics or other	-.019948	.0004	-.005484	.00002	.00003	.842	N/A
Experience factor	.131822	.0174	.146888	.01344	.01687	.392	N/A
Log 10 Months in Operation	.237397	.0564	.180745	.02824	.03479	.061	N/A
Log 10 Locus of Control	-.197255	.0389	-.232704	.04136	.05014	.027	-2.106
Coaching and Exposure based on knowledge of processes and people (F_2)	.049589	.0025	1.008452	.074929	.08728	.038	2.834
Long and Short Run general advice and assistance (F_1)	-.020784	.0004	.152784	.00310	.00394	.063	N/A
Counselling and friendship (F_4)	-.034417	.0012	-.145387	.00314	.0040	.100	N/A
Safety Net Support (F_3)	-.038494	.0015	.025790	.00012	.00015	.153	N/A
INTERACTION: College major X Experience	.118906	.0141	.117702	.00718	.00908	.218	N/A
INTERACTIONS IN FACTORAL SETS:							
Log 10 Locus of control x F_3	-.022009	.0004	-.019897	.00007	.00009		
Log 10 Locus of control X F_1	.001697	.0000	-.090679	.00137	.00174		
Log 10 Locus of control X F_4	.006184	.0000	.036508	.00023	.00030		
Log 10 Locus of control ³X F_2	-.032927	.0011	-.891739	.06376	.07526	.155	N/A
Experience X F_3	.043624	.0019	-.028770	.00061	.00078		
Experience X F_2	-.024041	.0006	-.042173	.00106	.00135		
Experience X F_4	-.062782	.0039	-.240157	.03123	.03834		
Experience X F_1	.008918	.0001	-.142208	.00999	.01260	.175	N/A

The 16-variable model failed to surmount heteroskedasticity, had a relatively low R^2, and was not significant at the .05 level. It seemed, however, that heteroskedasticity was addressed a bit more effectively with the transformation of log 10 return on investment than with the square root or the untransformed variable. Again, as with Set 1, a 17-variable configuration was tried, including months in operation and log 10 of months in operation. Although that latter transformation had little impact on R^2 or overall F values, it did make inroads against heteroskedasticity. Still, the model configured similarly to Set 1 had failed to meet the regression requirements due to the covariance of predicted and residual values of the dependent variable.

Based on the possibility that a variable or a set was acting with the dependent variable to contribute to heteroskedasticity, one of the two exploratory interactive four-variable sets (experience factor X significant other factors) was eliminated, and the model tested in a 13-variable configuration. As shown in the table, heteroskedasticity was finally defeated at the .05 level. That configuration also contained an acceptable R^2 and a workable F test structure. Thus the Set 2 model became a 13-variable hierarchy through log 10 transformation of return on investment, locus of control, and months in operation, and with one interactive set deleted.

TABLE 21

SET 2 MODEL VARIATIONS

PROPOSED CONFIGURATION	STATISTICS R^2	Signif-icant F	P	Dependent Variable
16-VARIABLE[a]	.1540	.499	.028	Log 10 Return on Investment
16-VARIABLE	.1650	.428	.011	Square Root Return on Investment
16-VARIABLE	.1420	.594	.000	Return on Investment
17-VARIABLE[b]	.1956	.281	.030	Log 10 Return on Investment
17-VARIABLE[c]	.1954	.283	.036	Log 10 Return on Investment
13-VARIABLE[d]	.1871	.113	.056	Log 10 Return on Investment
13-VARIABLE	.1656	.141	.001	Square Root Return on Investment
13-VARIABLE	.1419	.354	.000	Return on Investment

[a]Originally-hypothesized model

[b]Original model with months in operation added

[c]Original model with Log 10 months in operation added

[d]Original model without Experience X Locus of Control Interaction, and with Log 10 Months in Operation.

Set 2 Coefficients

Table 22 shows coefficients of Set 2 for the fully-partialled model. Log 10 locus of control, log 10 months in operation, Factors F_3 and F_4 all show promise in their zero order correlations, $\underline{sr}^2$, and $\underline{pr}^2$. The interaction of those factors with log 10 locus of control produces $\underline{sr}^2$ and $\underline{pr}^2$ values which invite further examination of their performance in the hierarchy. Once again, as in Set 1, insertion of log 10 months in operation does not appear, in itself, to adversely influence interpretability. It is not multicollinear and was entered early in the hierarchy, thus it has little partialling effect on variables other than college major and experience.

Set 2 Significance Testing

Application of the protected t discipline for Set 2 was as limiting as in Set 1. Significance of the model using that criterion was not attained until Log 10 Locus of Control entered the hierarchy, but was lost upon entry of factor F_2.

Set 2 Redundancies

Several redundancies existed in Set 2. As shown in Table 23, each of the first four variables shared part of its variance with others. While none of the redundant associations had serious impact on beta levels, some

TABLE 22

FACTORAL SET 2 FULLY-PARTIALLED COEFFICIENTS

VARIABLE	COEFFICIENTS r	r^2	sr^2	pr^2
College Major	-.019948	.00040	.00264	.00323
Experience	.131822	.01738	.00688	.00839
Log 10 Months In Operation	.237397	.05636	.03724	.04381
Log 10 Locus of Control	-.197255	.03891	.03853	.04526
F_3	.147488	.02175	.05692	.06544
F_4	-.156343	.02444	.03002	.03562
F_2	-.068227	.00465	.00000	.00000
F_1	-.002100	.00000	.00799	.00973
Education X Experience	.118906	.01414	.00067	.00083
Locus of Control X F_2	-.036130	.00131	.00024	.00029
Locus of Control X F_1	.015710	.00025	.00358	.00438
Locus of Control X F_4	.156630	.02453	.03547	.04181
Locus of Control X F_3	.058331	.00340	.04215	.04930

influence did exist. Of particular note was the association of two factoral variables with log 10 locus of control. Although such association cannot be asserted to be of more substance than coincidental covariance, the fact that locus of control retained a robust significance level in spite of such redundancy reflects its strength as a covariant with the dependent variable.

TABLE 23

SET 2 REDUNDANCY ASSOCIATIONS

INFLUENCED VARIABLE	REDUNDANT ASSOCIATION
Experience Factor	Log 10 Months of Operation; Coaching and Exposure
College Major	Log 10 Locus of Control
Log 10 Months of Operation	Coaching and Exposure
Log 10 Locus of Control	Knowledge of Processes and People; Safety Net Support.
Knowledge of Processes and People	Safety Net Support

Set 2 Suppressors

In Set 2 the factoral suppression of both core variables and other factors was apparent (see Table 24). This indicates much covariation among independent variables. The differences in suppressive associations between Set 1 and Set 2 indicate how different the outcomes of two hierarchies may be, based on small changes in the structure of certain variables; in this case, the factors. Of interest also is the fact that the interaction of college major and experience resulted in only suppressive influence in Set 2, rather than the spurious redundancy of Set 1.

TABLE 24

SET 2 SUPPRESSIVE ASSOCIATIONS

INFLUENCED VARIABLE	SUPPRESSORS
College Major	Experience Factor Long and short-run general advice and assistance
Log 10 months in operation	Long and short run general advice and assistance
Log 10 locus of control	Coaching and Exposure Long and short run advice and assistance $(F_{1...4})$ (Log 10 locus of control)
Long and short run general advice and assistance	Experience Factor X College Major
All factors	$(F_{1...4})$ (Log 10 locus of control)

Set 2 Summarized

Table 25 contains critical coefficients and statistics for Set 2. Its relatively modest $\underline{R}^2$ of .1871 again reflects that more variables influence the dependent variable than those elements in the model under consideration. Although the $\underline{F}$ significance level is marginally improved over Set 1, the model still fails to attain overall significance. The protected $\underline{t}$ test allowed two factors to be interpreted before falling $\underline{F}$ significance precluded further overall assessment. Interestingly, these two factors were composed of variables similar to the one significant interpretable factor of Set 1. Again, Log 10 locus of control was a strong variable, withstanding redundancy to retain significance in relation to the dependent variable.

Alternative Dependent Variables

Since the return on investment variable and its transformations proved less than satisfactory, two surrogate dependent variables on which data had been collected were tested for possible use. The first was operationalized as level of financial success attained, compared to original goals, and had been measured on a five-point ordinal scale. The second was degree of personal satisfaction with the business, also ordinally measured. Each of the variables was tested as the dependent variable in the Set 1 model. In neither case did the model attain significance. Despite transformations, heteroskedasticity, again, was evident. Table 26 summarizes these results.

TABLE 25

FULLY-PARTIALLED SET 2 HIERARCHIAL MODEL

VARIABLE	r^2	PARAMETER β	sr^2	pr^2	Entry Significance of F	t
College Major Business/ Economics or Other	.00040	-.056854	.00264	.00323	.8423	N/A
Experience Factor	.01738	.010553	.00688	.00839	.3917	N/A
Log 10 Months in Operation	.05636	.201994	.03724	.04381	.0607	N/A
Log 10 Locus of Control	.03891	-.217607	.03853	.04526	.0267	-1.918
Coaching and Exposure (F_3)	.02175	.856043	.05692	.06544	.0212	1.518
Knowledge of Processes and People (F_4)	.02444	.564536	.03002	.03562	.0343	- .656
Safety Net Support (F_2)	.00465	.003346	.00000	.00000	.0589	N/A
Long and Short Run General Advice and Assistance (F_1)	.00000	.220340	.00799	.00973	.0926	N/A
Interaction: College Major X Experience Factor	.01414	.033565	.00067	.00083	.1397	N/A
Factoral Set Interactions						
Log 10 Locus of Control X (F_2)	.00131	.034113	.00024	.00029		
Log 10 Locus of Control X (F_1)	.00025	-.142810	.00358	.00438		
Log 10 Locus of Control X (F_4)	.02453	-.527985	.03547	.04181		
Log 10 Locus of Control X (F_3)	.00340	-664789	.04215	.04930	.1130	N/A

Hypothesis Summary

In spite of the model's lack of statistical significance, meaningful statements about the hypotheses cited in Chapter I can be made, in regard to both the overall model and specific variables. These are summarized in Table 27. Chapter V will provide further elaboration on these and other matters in the form of conclusions and recommendations.

TABLE 26

PERFORMANCE OF ALTERNATE DEPENDENT VARIABLES

DEPENDENT VARIABLE	STATISTIC R^2	F	P	REMARKS
FINANCIAL SATISFACTION	.2054	.227	.003	Model never significant
LOG 10 FINANCIAL SATISFACTION	.1913	.306	.000	Model never significant
SQUARE ROOT FINANCIAL SATISFACTION	.1984	.265	.000	Model never significant
PERSONAL SATISFACTION	.2066	.221	.000	Model significant through two factors.
LOG 10 PERSONAL SATISFACTION	.2034	.238	.000	Model significant through two factors
SQUARE ROOT PERSONAL SATISFACTION	.2001	.220	.000	Model significant through only three variables

TABLE 27
HYPOTHESIS SUMMARY

RESEARCH HYPOTHESIS	NULL CONFIGURATION	OUTCOME
Significant other variables would reduce to two common factors: advice and assistance	Variables would converge in other than two-factor configuration	Four factors converged from the 12 variables of each of the two factoral sets. Resulting structure was of greater complexity than hypothetically envisioned.
A significant hierarchial relationship exists between the dependent variable (Return on investment) and independent variables.	The model would fail to attain significance while meeting regression assumptions	The hypothesized model failed to attain significance under Fisher's protected t test.
Each independent variable has significant effects on dependent variable	Given overall model significance, hypothesized direct and indirect effects can be stated. If null hypothesis accepted, model has failed to attain significance, and no effects can be cited.	In that model failed to attain significance, no effects can be asserted. (NOTE: certain strong indications of association outside the model structure did emerge.)
Internality of locus of control would be enhanced by interaction of significant other factors with locus of control and experience variables.	In spite of model significance, interactions had no meaningful suppressive influence on locus of control or experience.	In that model failed to attain significance, no interactive suppression can be asserted. (NOTE: Indications exist which point toward this association.)

CHAPTER IV BIBLIOGRAPHY

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CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Although the analysis provided indications of possible bivariate associations, a lack of overall statistical significance precludes accepting the model-based hypotheses of Chapter I. Thus the seeming paradox of coexistence between significant other and locus of control to a large extent remains.

Reasons for Nonsignificance

The situation, of course, does not foreclose further inquiry along these lines, nor does it shut a final door on the relationships which were subjects of this study. There are issues and forces which influenced the hypothesized model, contributing to its overall explanatory difficulty.

The Dependent Variable

One of the first problems addressed in the research was selection of a dependent variable, Y. Return on investment was chosen based on the concept that although owners of small businesses are in operation for a variety of reasons, they cannot long escape the central need for profitability. When analyzed, however, return on investment's residuals were heteroskedastic. Heteroskedasticity occurs when a dependent variable's residuals form a pattern of relationship with the predicted values of Y. This reflects the presence of other variables not included in the model which influence the Y variance. With return on investment as a dependent variable, one can easily envision a multitude of such unmeasured effects. Level of initial capitalization, current economic conditions, or market environment, all surely play a great influential role in Y variation.

This dependent variable vulnerability was reflected not only in heteroskedasticity, but also in the relatively low R^2, and a confounding configuration of the *F* statistic for the model. Although transformations of return on investment resulted in improved *F* values, heteroskedasticity often returned with the transformation of the dependent variable to nullify what had been gained. This was a dilemma. On one side was the problem of heteroskedasticity, which could be solved only through variable transformation which, on the other hand, adversely influenced the requirement of overall statistical significance for the model.

Such a situation may be not only the fault of the type of dependent variable chosen, but also of the measuring technique for return on investment. Respondents were asked to compute a return on investment rate, and were permitted to do so by informally estimating numerator and denominator values. An estimate rather than precise recording of documented return on investment elements was accepted for the two reasons indicated in Chapter III. First, business owners are reluctant to divulge profitability information for competitive, legal, and personal reasons. To have requested a rate which even indirectly reflected actual sales figures might have discouraged many from responding. Second, even if respondents had not been reluctant to divulge accurate return on investment figures, it was feared that the time and effort required by them to retrieve accurate information might have also discouraged replies. While acceptance of estimates of return on investment values harmed the dependent variable's reliability, such a loss was accepted as a trade-off to gain a higher potential rate of questionnaire return.

It should be noted that while the means of capturing return on investment was not the most theoretically accurate possible, two indirect indices of reliability and validity are contained in the research effort, which indicate a fair degree of dependent variable acceptability. One is the significance of order of questionnaire receipt as a function of return on investment. As stated in Chapter IV, no associative significance was found between the two which reflected any pattern. The second was testing of alternative dependent variables, ordinally measured in terms of acceptability of achieving financial goals and personal satisfaction with the business. As also indicated in Chapter IV, the regression behavior of each of these variables in relation to all the independent variables was quite close to that recorded with return on investment. Thus, if confounding issues influenced return on investment they also operated on entirely different sorts of dependent variables, which were measured with even different quantitative scales.

Specification Error

Clearly, a full array of all potentially explanatory independent variables was omitted from the model. Possible measures which retrospectively could have been included have already been mentioned. Such measures might have raised $\underline{R}^2$, dealt with heteroskedasticity, and increased the overall $\underline{F}$ to a significant level. However, asking for such information would have presented problems similar to those confronted in asking for income information. Accurate data might not have been forthcoming, and the overall rate of survey return could have fallen. In any case, respondents would have had a difficult time estimating such external influences such as general economic conditions or market share. Level of initial capitalization might have been seen as too proprietary by many respondents for disclosure.

Another specification issue beyond inclusion of unmeasured variables surrounds the factoral dimensions which emerged. Originally, only two such factors were hypothesized: assistance, which could have addressed direct assistance such as financial support, and advice, which was viewed as a less tangible, more morale-related contribution. Again, retrospectively, the inquiries on which the factoral structure was based seem to invite more elaborate configurations than just a duality of advice and assistance. The dimensions which emerged were derived by generally accepted methods, and consisted of two similar yet unique enough factoral structures to warrant alternative testing in the regression model. It is thus likely that the four significant other factors represent valid dimensionality, given the basis of inquiry. However, if other directions of inquiry had been pursued with significant other, simpler, stronger configurations might have resulted. The factors were the regression model components which pushed $\underline{F}$ values below the minimum acceptable for significance. A different set might have had a different, significant outcome. It should be remembered, of course, that the history of measurement of significant other is quite barren of examples of approach and technique. That this new ground failed to provide a full harvest is scarcely surprising.

Group Composition

As stated in Chapter I, this group was unique in several ways. They were located in a major Sunbelt city which was entering an economic decline. They were persons of maturity and relatively high longevity as business owners. Judging from the positive relationship directions of months in operation and return on investment, they appear to have been persons who had experienced progressive business growth. They had chosen to be members of an informal network of female business owners and were willing to be relatively communicative about their business history and personal attitudes. It might be these unique characteristics had an impact on the findings. It cannot thus be said with assurance that these respondents truly reflect the values and attitudes of the universe of female business owners.

Lessons Learned

While not providing a specific model for future study or replication, the research results deserve further examination from several perspectives. Following is a discussion of four such items which warrant further work, together with discussion of potentially profitable and unprofitable areas of inquiry.

Locus of Control Vitality

Rotter's scale proved a fragile instrument, with a mediocre Chronbach Alpha of .69. Data captured with it did not show initial significance, although after transformation it demonstrated high explanatory potential. The directionality of locus of control and return on investment was as hypothesized. The more internal the respondent, the higher the return on investment. This indication is particularly noteworthy, for nowhere else has locus of control been associated with a measure of financial performance as fundamental as return on investment. Additional research should be done on these lines. Among many possible applications of the locus of control measure, one of the more intriguing is treatment of the internality/externality score as a dependent variable, with financial performance one of the independents. This would aim at the question: do we feel powerful because we are financially successful, or are we financially successful because we feel powerful? Longitudinal as well as cross-sectional work should also be attempted in these terms to avoid the confounding issue of purely retrospective attitude measurement.

A word of caution is needed regarding locus of control's influence on other variables. Phares (4) has mentioned the measure attains its highest meaningful levels in interaction with other variables. This occurred in the work reported here, reflected in the suppressive influence of interactive terms on the basic locus of control variable. The full associative relation of locus of control with the dependent variable, in other words, arose both from direct and indirect effects. That was one of the hypotheses the research addressed in the beginning. It still cannot be said that there is an interactive influence here which was observed within the bounds of statistical significance. However, there is indication that not only can internality of locus of control coexist with a significant other, but that the significant other's contribution may indeed support internality.

Convergence of Factoral Relevance

Although precise interpretability is not possible for the two regression models, it is important to note that with each different factoral approach a similar dimension was clearly in evidence. This dimension was represented in each model as the factor pertaining to coaching and exposure. The importance of such assistance is coincidental with findings on mentoring by Kram (3). Also, the fact that of the different combinations of factors which might have emerged commonly significant in the two models, this particular one points toward a significant other contribution chiefly oriented toward giving business help. It is, in effect, a role-specific significant other similar to that envisioned by Rosenberg (5) which may be glimpsed in these results.

"Entrepreneurial Ghetto" Variables

In Chapter II the variables pertaining to type of college education and preventure experience were introduced as those which had been cited in other research as having adverse impact on female entrepreneur success (1). Operationalized for this research as "college major" and a factoral derivation of three experience variables, and regressed both as individual independent variables and as an interactive variable, these issues were of little explanatory value. The most interesting relationship emerging from their use was the spurious interaction with other independent variables described in Chapter IV. These variables had been described by Bowen and Hisrich as among the reasons female entrepreneurs began relatively low-return service businesses which required little capitalization, or "entrepreneurial ghettos." In this study they did not however, show indications of relevance to the entrepreneur's success once in business, nor was there an indication of relevance associated with return on investment. This may be attributed to the relatively long business tenure of these particular respondents. Their knowledge and skills might have developed while in business for themselves to the degree that initial training or lack of initial business experience had long ago been overcome. Although explanatorily impotent here, these variables should not be discarded for future research. They may be relevant for samples consisting of persons relatively new to business ownership. For the overall population of female entrepreneurs, they might be viewed usefully as early phase inhibitors, rather than career-long problems.

Transformation Implications

When a dependent variable appears to be strongly correlated with other unmeasured variables, even stringent transformation efforts may be only marginally successful. In this work, both logarithmic and square root transformations were used with the dependent variable, and two independent variables to provide the best fit with the dependent. The strength of heteroskedasticity and threat of multicollinearity, however, caused much frustration. For example, with a square root transformation heteroskedasticity remained. With the logarithmic transformation, heteroskedasticity was defeated, but overall model significance was not greatly improved. Weighted least squares, attempted early in the data analysis phase of the work, completely overcame heteroskedasticity, but introduced multicollinearity in the interactions, rendering the model again uninterpretable.

This situation is apparently fairly common with social science data (2). Almost every phenomenon in a given problem area is in some way related, and as such, has the potential for multicollinearity, the possibility of spurious association, and the great likelihood of redundancy and suppression. Further complicating the matter is the chance that when attempting to interpret the effect of a handful of peripheral variables on a relatively global effect such as return on investment, we are actually dealing, as was evident here, with small portions of that global measure's variance. We thus are in danger of heteroskedasticity. The researcher is caught between heteroskedasticity and multicollinearity, moving on a tightrope of methodological discipline yet unsupported by a strong theoretical net. This dilemma may be faced by turning away from such operational and global dependent variable measures as return on investment and resorting to some nominal or ordinal index of relative satisfaction with the business. Unfortunately, in this case it was found that the ordinal measurements taken as alternative dependent variables showed precisely the same behavior as return on investment in terms of heteroskedasticity and level of significance. Even with more subjective lower level measures of effect, then, the dominance of unincluded variables potentially casts an analytical shadow over the creation of explanatory regression models.

Emergent Issues

Table 28 summarizes the substantive findings which emerged from data analysis. Although these findings are not formally appropriate as conclusions in view of model nonsignificance, they can form an agenda for future research.

Conclusions

1. The factor analysis approach was workable in defining significant other dimensions. Through theoretical elimination and analytical reduction two factoral sets were developed which, while of somewhat different composition,

TABLE 28

FURTHER ISSUES

Emergent Finding	Evidence	Implication
1. Four factor dimensionality	Using approach described in Chapter III, 22 and 23 variable matrices each reduced to four interpretable factors.	Replicable potential in other research, in that Principal Components extraction and varimax rotation were used.
2. Convergence of "Coaching" factor in each of two sets.	Coaching had highest correlation coefficient with dependent variable, had more unique explanatory ability than other factors (sr^2), and supported model significance	Signifcant other research might deal profitably with the female entrepreneur's significant other as role-specific, able to provide tangible assistance/advice.
3. Bivariate associations and other relationships of interest.		
a) Association of Log 10 Months in Operation and Log 10 Return on Investment.	r= .237, significant at .019 level. p= .049 reflects heteroskedasticity, however.	Directional association reflects payoff of experience as possible route for further inquiry.
b) Association of Log 10 Locus of Control and Log 10 Return on Investment	r= -.197; B= -.61, significant at .047 level. No heteroskedasticity.	Directionality indicates internals associated with higher levels of financial success.

TABLE 28 Continued

Emergent Finding	Evidence	Implication
c) Redundancy of Log 10 Months in Operation and Log 10 Locus of Control in hypothesized model.	Upon entry of Log 10 Locus of Control, the Beta value of Log 10 Months in Operation falls slightly. Beta and sr of Log 10 Locus of Control are lower in partialled model than in bivariate mode.	The variables seem to be reflecting somewhat similar variance characteristics. However, their redundancy is not sufficient to cause spurious effects.
d) Suppressive influence of interactions on Log 10 Locus of Control.	Upon entry of the interaction formed by Log 10 Locus of Control and each factor (entered as a set), *B* coefficient attained larger magnitude, and *t* value of Log 10 Locus of Control increased.	Locus of Control is enhanced in its effect by the interaction of other variables: in this case, the factors. Implication emerges of significant other influence on locus of control.
e) Association of Return on Investment, Financial Satisfaction, and Personal Satisfaction.		
1. Strong positive associaton between Log 10 Return on Investment and Financial Satisfaction.	r= .405, *t* value significant at .0000 level. No heteroskedasticity.	Could reflect: a. Response set phenomenon. b. Validity of Return on Investment measure used in this research.

TABLE 28 - Continued

Emergent Finding	Evidence	Implication
2. Personal Satisfaction shows strong positive association with Log 10 Return on Investment.	r= .362, t value significant at .0002 level. No heteroskedasticity.	Could reflect: a. Response set phenomenon. b. Only moderate association between personal satisfaction with business and its financial performance.
3. Suppressive association of Financial Satisfaction and personal satisfaction when regressed against Log 10 Return on Investment.	correlation coefficient of financial and personal satisfaction -.666. Upon entry of financial satisfaction, beta and sr values of personal satisfaction fall to negative levels.	Reflects strong net suppressive mutual influence of the two independent variables. Could indicate dominance of financial concerns which emerges when both variables are considered together.

produced relatively useful factor variables for regression. The configurations consisted of four factoral dimensions rather than the anticipated two. This expanded the number of principle and interactive model variables, and in so doing possibly contributed to the failure of the resulting regression models to attain statistical significance.

2. There was an indication of analytical convergence of factors in the two sets which were evaluated. The more tangible contributions of the significant other emerged with unique importance. This convergence which showed the tangible help to be of greater than anticipated value, implies that the significant others whom the respondents were consistently praising were those who provided practical specialized business aid. In Rosenberg's frame of reference, these would be role-specific significant others.

3. Locus of control was influenced by significant other factors. Their suppressive activity points toward interactive associations between the contribution of significant other and relative internality. Locus of control's relationship with return on investment was in the anticipated direction; internality and business success, moved coincidentally.

4. Emotional support was not of great importance in the dimensionality of significant other, reflected through factor analysis, nor in subsequent regression in which that variable was part of a factoral structure. Although as

noted in Chapter I the strong feeling of need for emotional support from a significant other was an earlier research finding which partly led to this research, it was only one piece of a single factor in one of the two models. While it accounted for much of the variance in that factor, it was interpreted as important only when the significant other had no specific advice or skills to offer. This is not to say the emotional support of a significant other is unimportant. It is only to say that its correlative level with other potential factors was relatively low or marginal, as measured by its KMO value. Thus, as it was relegated to a low degree of importance in the factoral models, it failed to achieve overall research importance in the regression phase. Emotional support, however, was rated of highest value of any significant other contribution by the overall sample. As in earlier work, it may be that the consistently high level of importance given emotional support precluded the kind of variance which would correlate well with other variables in factor analysis. The possible tendency of respondents to focus on specific help by a significant other reinforces the notion that a business significant other, differs from a generalized significant other in that emotional support is more valued in the latter. The artifact hiding in all of this might be that different types of significant other are important to the female entrepreneur. Future research might be profitably aimed at that speculation.

6. Although transformation of return on investment did not result in a very effective dependent variable, the research would have had no greater explanatory power using one of the two available surrogate dependent variables. Neither assessments of financial success nor general satisfaction performed any more satisfactorily than return on investment. Soft variables based on weak theory seem not to perform well in the shadow of explicit influences of strong theoretical origin (2).

Recommendations

1. Since the factor analysis was based on soft theory, other attempts to use that method to tease out significant other dimensionality might use entirely different sets of variables than those suggested here. However, the analytical outcome of this work gives enough support to the strength and direction of the significant other factors offered here to commend its elaboration rather than abandonment. One approach for further enhancement might be to use second order factor analysis, in which two phases of extraction and rotation are performed to further reduce the data to a more parsimonious grouping. Two factors rather than four might emerge from such an effort, making the possibility of model significance more likely.

2. In surveying persons to determine the identity, background, and characteristics of their significant others, it might be well to separate matters of specific, tangible

contribution from those which provide moral support. The possibility that significant others are role-specific in regard to tangible aid should be specifically examined. The role played by persons who contribute emotional support needs similar elaboration. Perhaps there is more than one category of significant other.

3. In future research using multiple regression, some strong and valid measure of business performance should be included as an independent variable to mediate heteroskedasticity. Net profit last year, initial capitalization, average sales over the past five years, or some other financially-based measure might usefully cope with the residual patterns which plagued this effort.

4. Measures of education and experience seem to have little relevance for a group of seasoned women entrepreneurs. Those measures may have more meaning in assessing the likelihood that an entrepreneur will actually start a business, than if that business will be financially successful in the long run. The experience in this research, however, indicates these variables bear scrutiny, against the possibility of spurious relationships.

CHAPTER V BIBLIOGRAPHY

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APPENDIX A

LETTER OF TRANSMITTAL AND QUESTIONNAIRE

NTSU
NORTH TEXAS STATE UNIVERSITY

Department of Management

Dear AWED Member,

This questionnaire is designed to collect information on two key issues in entrepreneurship -- the control you feel you have over your business future, and the professional benefits you gain from significant friendships. Past research has dealt with control, but little has been done on the issue of friendship. So the information you provide will be part of a pioneering study of woman entrepreneur needs.

The first part of the survey asks about your background and work satisfaction. The second part, on page 2, is a well-tested set of questions that helps you reflect your beliefs about control. The third part, on page 3, asks about key friends or relatives (significant others) in terms of who they are and what they provide you.

We know how tight your schedule is, and we deeply appreciate your help -- as we appreciate the help you've given in the past. As before, we'll provide the Association a report of findings, and welcome comments or questions from anyone in the group. AS ALWAYS, YOUR RESPONSES ARE COMPLETELY ANONYMOUS!

Please mail this using the attached stamped, self-addressed envelope by March 25, 1987.

Sincerely,

George W. Nelson
(Phone: 817/565-3166)

COLLEGE OF BUSINESS ADMINISTRATION
P.O. BOX 13677 DENTON, TEXAS 76203-3677
AC 817-565-3140 DALLAS-FT. WORTH METRO: 267-2832

____ (1-3)

FIRST, SOME QUESTIONS ABOUT YOUR BACKGROUND AND BUSINESS HISTORY:

(5) Would you classify your work experience before starting your own business as:

____ Management
____ Nonmanagement

(7-8) At the time you started your first business, how would you describe your level of experience in the <u>field</u> you were entering?

____ Extensive - years of experience in that particular field
____ Moderate - well prepared in some but not all necessary parts of the field
____ Slight - no first hand experience in that field

(10-11) At the time you started your first business, how would you describe your level of experience in matters related to <u>business</u>.

____ Extensive - years of experience in business work
____ Moderate - well prepared in some but not all aspects of running a business
____ Slight - little or no first hand business experience

(13-14) Approximately how many years of education have you completed? ____

(16-17) If a former college student, what was your major?

____ Business or Economics
____ Other than Business or Economics

(19-20) How would you categorize your <u>type</u> of business? ____________

(22-25) Approximately how long has your current business been in operation? ____ years, ____ months

---

(27-28) What was your age when you began this business? ____

(30-31) How many new businesses have you started? ____

(33-34) How many of these are still in operation? ____

(36) Please indicate the degree of personal satisfaction you have derived from your business, based on what you expected when you began, and your overall experience with it to date, marking the phrase below that comes closest to your feeling.

EXTREMELY SATISFIED: WOULD READILY DO IT AGAIN ____	MODERATELY SATISFIED: IT'S BEEN A GOOD CAREER ALTERNATIVE ____	SATISFIED, BUT THERE ARE OTHER PROFESSIONAL ROLES JUST AS APPEALING AS BUSINESS OWNERSHIP ____	MODERATELY DISSATISFIED: NOT AS GOOD A WORK ALTERNATIVE AS MANY OTHER POSSIBILITIES ____	VERY DISSATISFIED: MAY TERMINATE BUSINESS ____

(38-39) Is your business a: ?

____ Proprietorship
____ Partnership
____ Corporation

QUESTIONS ABOUT HOW MUCH CONTROL YOU FEEL YOU HAVE: Please indicate the extent of agreement you have for statements below, by circling the letter in front of the one in each set that <u>best</u> describes your belief, or comes <u>closest</u> to describing it. (41-42)

Set				
1.	A.	Many of the unhappy things in people's lives are partly due to bad luck.	B.	People's misfortunes result from the mistakes they make.
2.	A.	One of the major reasons we have wars is tbat people don't take enough interest in politics.	B.	There will always be wars, no matter how hard people try to prevent them.
3.	A.	In the long run, people get the respect they deserve in this world.	B.	Unfortunately, a person's worth often passes unrecognized no matter how hard he tries.
4.	A.	The idea that teachers are unfair to students is nonsense.	B.	Most students don't realize the extent to which their grades are influenced by accidental happenings.
5.	A.	Without the right breaks one cannot be an effective leader.	B.	Capable people who fail to become leaders have not taken advantage of their opportunities.
6.	A.	No matter how hard you try, some people just will not like you.	B.	People who can't get others to like them just don't understand how to get along.
7.	A.	I have often found that what is going to happen, will happen.	B.	Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
8.	A.	For a well-prepared student, there is rarely such a thing as an unfair test.	B.	Many times exam questions are so unrelated to course work that studying is a waste of time.
9.	A.	Becoming a success is a matter of hard work; luck has little or nothing to do with it.	B.	Getting a good job means mainly being at the right place at the right time.
10.	A.	The average citizen can have an influence on government decisions.	B.	The world is run by the few in power, and there is little the others can do about it.
11.	A.	When I make plans, I am almost certain I can make them work.	B.	It is not always wise to plan too far ahead because many things just turn out to be a matter of luck anyway.
12.	A.	In my case, getting what I want has little or nothing to do with luck.	B.	Many times we might just as well decide what to do by flipping a coin.
13.	A.	Who ends up the boss often depends on who was lucky enough to be in the right place first.	B.	Getting people to do the right thing depends on ability; luck has little to do with it.
14.	A.	As far as world affairs are concerned, most of us are victims of forces we can neither understand nor control.	B.	By taking an active part in political affairs, everyday people can have an influence on world events.

15.	A.	Most people don't realize the extent to which their lives are controlled by accidental happenings.	B.	There is really no such thing as "luck".
16.	A.	It is hard to know whether or not a person likes you.	B.	How many friends you have depends on how nice a person you are.
17.	A.	In the long run, the bad things that happen to us are balanced by the good ones.	B.	Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
18.	A.	With enough effort we can end political corruption.	B.	It is difficult for people to control the things politicians do once they're in office.
19.	A.	Sometimes I can't understand how teachers arrive at the grades they give.	B.	There is a direct connection between how hard students study and the grades they get.
20.	A.	Many times I feel I have little control over the things that happen to me.	B.	It is impossible for me to believe that chance or luck plays an important role in my life.
21.	A.	People are lonely because they don't try to be friendly.	B.	There's not much use in trying too hard to please people. If they like you, they like you.
22.	A.	What happens to me is my own doing.	B.	Sometimes I feel I don't have enough control over the direction my life is taking.
23.	A.	Most of the time I can't understand why politicians behave the way they do.	B.	In the long run, people are responsible for bad government on a national as well as local level.

(44-47) LEVEL OF PROFITABILITY OF BUSINESS: We need an estimate of your businesses' payoff as a ratio of profit after tax (for an average year) to the start-up investment. <u>This can be an estimate</u>. For example, if an average year's profit after tax is $20,000, and the start-up investment needed to get your business going (including borrowed money) was $50,000, profitability would be:

End Card I

$$\frac{\text{After tax profit of \$20,000}}{\text{Start-up investment of \$50,000}} = .4$$

Please compute this ratio for your business and place the result, as a percentage, on the line to the right: _____

PLEASE DO NOT SHOW YOUR COMPUTATIONS FOR THIS RATIO. ALL WE WANT IS THE PERCENTAGE.

(1-3) ID

(Card 2) **QUESTIONS ABOUT THE SIGNIFICANT OTHER:** In answering the following, please refer your thoughts to a current close associate, family or not, whose opinion you value so highly you would go to some trouble to seek it out before making a crucial business decision . . . or whose good opinion you value so highly that you would change a decision if they thought it ill-conceived.

(5) A. How many such persons are there in your life? ____

B. FOR THE FOLLOWING, ANSWER IN TERMS OF THE MOST IMPORTANT SUCH PERSON.

1) Is this person:

(7) In the same or similar business to yours? YES ____ NO ____

(9) Owner of a small business? YES ____ NO ____

(11) Someone with much general life experience on which they draw in giving advice or other assistance? YES ____ NO ____

(13) Someone with a great amount of general business experience? YES ____ NO ____

(15) Someone with specific business skills you feel you may lack? YES ____ NO ____

Is this person your: (Choose the one best description)

(17-26) Spouse ____ Male Parent ____ Female Parent ____ Male Sibling ____ Female Sibling ____
Male Child ____ Female Child ____ Male Close Friend ____ Female Close Friend ____ Other ____

(28-29) 2) For about how many years have you known this person? ____

3) FOR EACH OF THE FOLLOWING THINGS A SIGNIFICANT OTHER PROVIDES, PLACE AN "X" ON THE LINE BELOW THE WORD THAT BEST DESCRIBES THE VALUE OF THE CONTRIBUTION.

	ITEM	INDISPENSIBLE	VERY USEFUL	AVERAGE USEFULNESS	SLIGHT USEFULNESS	NO USEFULNESS
(31)	Advice given when you first started your business.					
(33)	Advice you got from this person after the start-up phase.					
(35)	Assistance (other than advice) given when you started your current business.					
(37)	Assistance (other than advice) after the start-up phase.					

	ITEM	INDISPENSIBLE	VERY USEFUL	AVERAGE USEFULNESS	SLIGHT USEFULNESS	NO USEFULNESS
	Current assistance in the form of:					
(39)	Introduction to good business contacts.					
(41)	"How to" advice on mechanics of running a business.					
(43)	Strategic advice on long-range business issues.					
(45)	Emotional support - sounding board or giving positive encouragement.					
(47)	Direct financial assistance.					
(49)	Physical support - child care, running errands, housework, etc.					
(51)	Other ____________ (Please Specify)					

(53) BUSINESS SUCCESS: Please think a moment about the extent to which your current business has met the financial goals you originally had for it, and respond to the following, indicating your extent of agreement or disagreement: THE BUSINESS HAS ATTAINED MY FORMAL AND INFORMAL FINANCIAL GOALS TO THE DEGREE THAT I WOULD ENTER IT AGAIN.

____ Agree very strongly

____ Agree

____ Undecided

____ Disagree

____ Disagree very strongly

YOU MAY USE THE BACK FOR ANY ADDITIONAL COMMENTS
YOU WISH TO MAKE, OR SUGGESTIONS.

THANK YOU FOR YOUR COOPERATION!

APPENDIX B

SURVEY RATIONALE

SURVEY RATIONALE

QUESTION(S)	OBJECTIVE	MEASUREMENT LEVEL
BACKGROUND:		
Would you classify your work experience before starting your own business as management or nonmanagement?	A component of relative experience which may contribute to overall quality of preparation for entrepreneurship.	Nominal
At the time you started your business, how would you describe your level of experience in the field you were entering?	An experience component that relates to task familiarity; i.e., retail operation, guidance counseling, etc.	Ordinal, in terms of extensive, moderate, or slight.
At the time you started your first business, how would you describe level of experience in matters related to business?	An experience component relating to degree of adequate business preparaation.	Ordinal, in terms of extensive, moderate, or slight.
Approximately how many years of education have you completed?	Seeks to establish educational level for use in research beyond the current scope.	Ratio as captured, with the possibility of nominalization
If a former college student, was your major business or economics, or some other field	Component of educational background. Seeking those who majored in business economics and those who did not.	Nominal

QUESTION	RATIONALE	MEASUREMENT LEVEL
How would you categorize your type of business?	Self-report of service, manufacturing retail, professional, or similar categorizable types for use in research beyond the current scope.	Nominal
How long has the business been in operation?	Direct measure of experience of running a business.	Ratio
What was your age when you began this business?	Means of computing current age of respondent for possible suppressive effect on locus of control.	Ratio
Is your business a proprietorship, partnership, or corporation?	Although not directly part of hypothesized relationships, may be useful in other related research.	Nominal
How many businesses have you started?	Direct measure of entrepreneurial experience; indirect measure of such aspects as commitment to entrepreneurship, or persistence.	Ratio
How many of these are still in operation?	Indirect measure of strength of the entrepreneurship drive if businesses are simultaneously operated.	Nominal
Degree of personal satisfaction from operation of the business.	A surrogate for business success. Not part of the stated theoretical structure, but available as an alternate dependent variable.	Ordinal

QUESTION	RATIONALE	MEASUREMENT LEVEL
LOCUS OF CONTROL QUESTIONS 1-23		
These are questions which comprise Rotter's Internal-External Locus of Control Instrument.	Measure degree to which respondents perceive that their individual outcomes are due to externalities such as luck, powerful others, etc.	Ratio,in terms of internality/ externality continuum.
Level of business profitability asks computation of return on investment using data derived by self-reported estimation.	The dependent variable.	Ratio
SIGNIFICANT OTHER QUESTIONS		
Based on definition of significant other provided respondents, the following are posed:		
How many such persons are there in your life?	Measures degree of concentration of influence by others. Introduces a variable which could be nominalized and regressed against a variety of others to gain indication of relationship of "number of significant others" to respondent background, and assistance the most important other provides.	Ratio, but likely to be nominalized as one or more.
(Other queries on significant other are made in terms of most important such person.)		
a. Is this person in same or similar business?	Creates variable to measure against what significant	Nominal (yes/no)

QUESTION	RATIONALE	MEASUREMENT LEVEL
	other provides, and background of entrepreneur.	
b. Owner of small business?	Creates variable as above. (Should be highly correlated with a. above)	Nominal (yes/no)
c. Someone with much general life experiience on which to draw in giving advice or other assistance?	Measures perception of overall background of significant other. Would be regressed as a and b.	Nominal (yes/no)
d. Someone with a great amount of general business experience?	Similar to c, but focused on business as opposed to more general terms.	Nominal (yes/no)
e. Someone with specific business skills you think you may lack?	Creates variable of significant business skills, and relative lack of skill variable for respondent. Should correlate with low levels of experience and education.	Nominal (yes/no)
f. Identity of significant other.	Creates a series of variables -- spouse, other than spouse, male parent, female parent, male sibling, female sibling, male child, female child, male close friend, female close friend, Enables partialling out of certain types of other types of other to ascertain effects.	Nominal

QUESTION	RATIONALE	MEASUREMENT LEVEL
g. How many years known?	Creates length of relationship variable, useful in examining respondent ratings of usefulness of advice/assistance during and after start-up phase.	Ratio

Following are valuation items provided by the significant other:

QUESTION	RATIONALE	MEASUREMENT LEVEL
a. Advice given when you first started business.	Indicates value of advice given at start-up.	Ordinal. Respondent assesses value in terms of Indispensable Very useful Average Usefulness Slight usefulness No usefulness (All following are similarly measured.)
b. Advice received after the start-up period.	Indicates value of advice given after start-up. Can be compared to length of time known to establish relationship.	
c. Assistance (other than advice) given during start-up period.	Separates such aid as child care, loans etc., from nontangible support such as advice.	
d. Assistance (other than advice) given after start-up period.	Rationale as above.	

QUESTION	RATIONALE	MEASUREMENT LEVEL
Following pertain to current valuation items provided.		
e. Introduction to good business contacts.	Aids entry into existing business community and subsequent continuation.	
f. "How-to" advice on mechanics of running a business.	Indicates operational nature of advice given.	
g. Strategic advice on long-range business issues.	Creates another type of advice variable, similar to f, above.	
h. Emotional support-sounding board or giving positive encouragement	Creates variable which indicates counselling and friendship valuation item.	
Direct financial assistance.	To determine if significant other supports through investment in the entrepreneur's business.	
j. Physical support - child care, running errands, housework, etc.	Creates variable to measure degree to which significant other is so involved.	
k. Other	Open-ended with request to specify.	
Business success is a self-reported measure by estimation of relative degree of satisfaction with the extent to which the business has met the formal or informal financial goals set by the entrepreneur.	A surrogate for the dependent variable of return on investment, to be used if necessary as an alternative.	Ordinal

APPENDIX C

CORRESPONDENCE WITH ASSOCIATION OF WOMEN ENTREPRENEURS OF DALLAS

NTSU

NORTH TEXAS STATE UNIVERSITY

Department of Management

March 31, 1987

Membership
Association of Dallas Woman Entrepreneurs
Dallas, TX

Dear AWED member,

A short time ago you were given a questionnaire on woman entrepreneurs, developed at North Texas State University. A request was made that you complete the survey and return it by March 25.

Although the response so far has been encouraging, we still would like to receive more questionnaires for analysis. Generally, the larger the number we get back, the greater the credibility of the conclusions drawn. Since AWEDs participation in this effort gives us a potential for a truly landmark effort, we certainly want that potential to be fulfilled.

Since the questionnaire is anonymous we have no way of knowing which specific members have returned the form. Please excuse this letter if you have already mailed your survey document. However, if you have not, please do so by April 10. Additional forms, if needed, are available from Carol Hammond at 352-3121 or George Nelson at 817/382-1328.

Sincerely,

George W Nelson

COLLEGE OF BUSINESS ADMINISTRATION
P.O. BOX 13677 DENTON, TEXAS 76203-3677
AC 817-565-3140 DALLAS-FT WORTH METRO: 267-2832

AWED

Association of Women Entrepreneurs of Dallas, Inc.
P.O. Box 835232, Richardson, Texas 75083 214/980-1007

March 23, 1987

George Nelson
1221 Bryn Mawr Pl.
Denton, TX 76201

Dear George,

We are mailing 170 questionnaire packets tomorrow. I took the liberty of putting a handwritten note on the back flap of each so hopefully that will "personalize" the inquiry a little more and get better response.

Please let me know the results of the mailing and call me if there is anything further I can do. What would you like me to do with the remaining 15 packets? I'll hold them until I hear from you.

Best regards,

Carol

Carol A. Hammond
President

CAH:hme

Carol will announce at April 6 meeting

Et cetera

Help. Help. Bernice Bisbee, who is chairing the programs subcommittee in charge of the April 11 AWED sales seminar, needs volunteers to help plan and produce this important workshop. Call her at 644-4646 to sign up. Titled "Selling A to Z," this seminar will cover topics such as contacting and qualifying prospects, presenting your products/service, closing the sale, and sales followup.

Success factors studied. George Nelson, a North Texas State University resercher, has asked AWED members to participate in a study of entrepreneurial success factors. A questionnaire will be distributed at the March meeting examining such issues as the extent to which people believe success is due to their own efforts or to luck, the importance of close relationships (significant others) to the entrepreneur's career, and how both factors combine for business success. Since AWED is the only group providing information for this research, it is important that as many members as possible complete the survey. Responses will be completely anonymous. After the analysis has been completed, results will be given for the overall group. The effort will be used to aid women entrepreneurs now and in the future. For information, contact Nelson at 817-382-1328.

President's Award Winner for February was **Karen Kovach** of Serv-Pro of Valley View, a membership committee volunteer who assembles, sorts, and supervises distribution of the AWED membership directories and updates. Congratulations!

Thought for the month

Happiness is doing what you want and getting paid for it.

—Dr. Patrick Eleam
President, Colburn Services
AWED meeting, Feb. 2, 1987

Calendar of events

Sat., Feb. 28 — AWED Expo '87, 8:30 a.m.-3:30 p.m., Hilton LBJ Hotel, 4801 LBJ Frwy., 980-1007.
Mon., Mar. 2 — AWED elections (members only), 6:30 p.m., Harvey Hotel, LBJ at Coit, 980-1007.
Sat., Mar. 28 — Entrepreneur Process Conference, "Ready, Fire! Aim," 8 a.m.-6 p.m., Downtown Dallas Hilton Hotel, 1914 Commerce St.; Contact Jane DuBovy, 521-2020.
Seminar on "Outmarketing the Competition: How to Prepare a Successful Marketing Plan," El Centro College, contact Linda Hanson, 942-1167.
Mon. April 6 — AWED meeting/Founders Day dinner, "Current Economic Trends: Implications for Texas," 6:30 p.m.; new member orientation, 5:45 p.m.; Harvey Hotel, LBJ Frwy. at Coit Rd., 980-1007.
Sat., April 11 — AWED Seminar, "Selling A to Z," 8:30 a.m.-4 p.m., Harvey Hotel in Addison, 14315 Midway Rd., 980-1007; (date rescheduled from April 25).

AWED
Association of Women Entrepreneurs of Dallas, Inc.
P.O. Box 835232, Richardson, Texas 75083

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Association of Women Entrepreneurs of Dallas, Inc.
P.O. Box 835232
Richardson, TX 75083
_(214) 980-1007_

Volume IV, Number 3
March 1987

Remember Expo '87

Don't forget to attend the annual AWED product exposition/trade fair — renamed Expo '87 —, on Saturday, Feb. 28, at the Hilton LBJ Hotel (northwest corner of I-635 and Dallas Parkway). Whether or not members exhibit, this is an excellent way to learn more about the businesses owned by their colleagues and to promote their own products and services.

Expo '87 also is open to the public. A variety of door prizes donated by exhibitors will be awarded throughout the day. Some of the door prizes already donated include a lead crystal item from Gloria Barovsky of the Irish Crystal Co., a $50 gift certificate from Diane Harker of Precious Accessories, one hour of complimentary copy writing from Kay Boone of Boone & Associates/Public Relations, two blinking t-shirts from Pat Andeweg of Iris Art & Design, and a $25 gift certificate from Joan Kliner of Jonaud, Inc. Executive Services.

Visitors will be admitted free to the Expo. Those who want lunch, however, and those who want to take advantage of networking opportunities during the lunch break, must pay — $12 for members and $15 for non-members. Please call for advance reservations so proper arrangements can be made with the caterer. Expo '87 will begin with coffee and networking at 8:30 a.m. and end at 3:30 p.m. For reservations or more information, call 980-1007 or Expo Chair Margaret Alivizatos at 352-5809.

It's time to vote

Our second election of officers will be held in March. **Please note that this is a members-only meeting.**

Nominations for the five AWED executive board positions (president, 1st vice president/programs, 2nd vice president/membership, secretary, and treasurer) were presented by the elections committee in February. (See profiles of those nominated on p. 2 and 3.) Additional nominations will be accepted from the floor, but absentee voting will **not** be possible.

Thanks to elections committee chair Jan Griffitts as well as committee members Joan Youngblood and Molly Owen for interviewing and evaluating candidates.

Meeting: Monday, March 2, 6:30 p.m.
Harvey Hotel, LBJ Frwy. at Colt Rd., Dallas
Reservation/cancellation deadline: 11 a.m., Monday, March 2
Reservations made and not cancelled will be billed.
Contact: Joan Kliner at 980-1007
Cost: members with reservations — $10; $15 at the door; includes hors d'oeuvres and soft drinks.

APPENDIX D

FACTOR ANALYSIS AND REGRESSION OUTPUTS

APPENDIX D_1

SET 1: REGRESSION HIERARCHY

```
08 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:33:52     NORTH TEXAS STATE UNIVERSITY   NAS/8083          MVS/SP

For MVS/SP               NORTH TEXAS STATE UNIVERSITY        License Number 939

Use INFO OVERVIEW for more information on:

* INCLUDE - To bring in command files              * Improvements in:
* RENAME VARS - To rename variables                *    MANOVA
* AUTORECODE - To recode strings as numbers        *    TABLES
* DROP DOCUMENTS                                   *

  1  0  DATA LIST RECORDS = 2
  2  0       /1 ID 1-3 SBUS 5 OWN 7 LIF 9 BEX 11 BSKL 13 SPO 15 MPAR 17
  3  0        FPAR 19 SIBC 21 MFR 23 FFR 25 YKN 27-28 STAD 30 PAD 32
  4  0        STAS 34 PAS 36 INTR 38 HTO 40 STRT 42 ESPT 44 FSPT 46
  5  0        PSPT 48
  6  0       /2 MOSOP 5-7 AGE 9-10 LOC 12-13 ROI 15-17 SATIS 19
  7  0          FINSAT 21 MGT 23 FLDEX 25-26 BUSEX 28-29 COLM 31
  8  0                DSHP 33-34 CONT 36 TBUS 38 SOS 40

THE ABOVE DATA LIST STATEMENT WILL READ   2 RECORDS FROM FILE INLINE
```

VARIABLE	REC	START	END	FORMAT	WIDTH	DEC
ID	1	1	3	F	3	0
SBUS	1	5	5	F	1	0
OWN	1	7	7	F	1	0
LIF	1	9	9	F	1	0
BEX	1	11	11	F	1	0
BSKL	1	13	13	F	1	0
SPO	1	15	15	F	1	0
MPAR	1	17	17	F	1	0
FPAR	1	19	19	F	1	0
SIBC	1	21	21	F	1	0
MFR	1	23	23	F	1	0
FFR	1	25	25	F	1	0
YKN	1	27	28	F	2	0
STAD	1	30	30	F	1	0
PAD	1	32	32	F	1	0
STAS	1	34	34	F	1	0
PAS	1	36	36	F	1	0
INTR	1	38	38	F	1	0
HTO	1	40	40	F	1	0
STRT	1	42	42	F	1	0
ESPT	1	44	44	F	1	0
FSPT	1	46	46	F	1	0
PSPT	1	48	48	F	1	0
MOSOP	2	5	7	F	3	0
AGE	2	9	10	F	2	0
LOC	2	12	13	F	2	0
ROI	2	15	17	F	3	0
SATIS	2	19	19	F	1	0
FINSAT	2	21	21	F	1	0
MGT	2	23	23	F	1	0
FLDEX	2	25	26	F	2	0

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:34:18     NORTH TEXAS STATE UNIVERSITY   NAS/8083          MVS/SP

PRECEDING TASK REQUIRED        0.11 SECONDS CPU TIME;       17.09 SECONDS ELAPSED.

  50  0  FACTOR VARIABLES = OWN BSKL STAD TO PSPT/
  51  0       MISSING = MEANSUB/
  52  0       EXTRACTION = PA1/
  53  0       FORMAT = SORT BLANK(.4)/
  54  0       PRINT = ALL/
  55  0       ROTATION = VARIMAX/

THERE ARE   222284 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   222284 BYTES.

>NOTE    11284
>Since the ANALYSIS subcommand is not used, all variables on the VARIABLES
>subcommand will be used for the first analysis.

THIS FACTOR ANALYSIS REQUIRES      18698 (      18.3K) BYTES OF MEMORY.
```

- F A C T O R A N A L Y S I S -

ANALYSIS NUMBER 1 REPLACEMENT OF MISSING VALUES WITH THE MEAN

	MEAN	STD DEV	CASES	LABEL
OWN	.51861	.50208	102	SMALL BUSINESS OWNER
BSKL	.71569	.45331	102	SPECIFIC BUSINESS SKILLS YOU LACK
STAD	3.67327	1.14415	101	START UP ADVICE
PAD	3.80392	.95481	102	POST START UP ADVICE
STAS	3.73000	1.33391	100	START UP ASSISTANCE
PAS	3.78218	1.13878	101	POST START UP ASSISTANCE
INTR	2.65686	1.27811	102	INTRODUCTION TO BUSINESS CONTACTS
HTO	3.12745	1.26391	102	DETAILED HOW-TO ADVICE
STRT	3.32353	1.11836	102	LONG-RANGE STRATEGIC ADVICE
ESPT	4.53922	.87508	102	EMOTIONAL SUPPORT
FSPT	2.67647	1.52965	102	FINANCIAL SUPPORT
PSPT	2.84314	1.68126	102	PHYSICAL SUPPORT

CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT	ESPT	FSPT	PSPT
OWN	1.00000											
BSKL	.22049	1.00000										
STAD	.24112	.20091	1.00000									
PAD	.17332	.21305	.75645	1.00000								
STAS	.19677	.21564	.55371	.48518	1.00000							
PAS	.23434	.26221	.38261	.42832	.65514	1.00000						
INTR	.14173	.27426	.26787	.19583	.22434	.13465	1.00000					
HTO	.23786	.25398	.30980	.36550	.14282	.30425	.29089	1.00000				
STRT	.22663	.24182	.35946	.36598	.17734	.16796	.29318	.46088	1.00000			
ESPT	.18724	.01591	.32804	.19889	.16905	.30409	.16707	.31323	.13360	1.00000		
FSPT	.13081	.15161	.27082	.33576	.44463	.41597	.28677	.27760	.18912	.31653	1.00000	
PSPT	-.00805	.18773	.01763	.09167	.32970	.29830	.23273	.10735	-.00960	.28687	.64611	1.00000

DETERMINANT OF CORRELATION MATRIX = .0139698

INVERSE OF CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	1.17348								

- F A C T O R   A N A L Y S I S -

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
BSKL	-.17756	1.26861							
STAD	-.13215	-.11729	3.31928						
PAD	.13752	-.01797	-1.92344	2.74003					
STAS	-.07161	.08484	-1.16177	.10115	2.60789				
PAS	-.12657	-.24535	.44753	-.39926	-1.29418	2.16086			
INTR	-.01897	-.20629	-.26680	.17162	-.13304	.19692	1.28874		
HTO	-.10296	-.14563	.08050	-.31748	.36978	-.32207	-.19831	1.60318	
STRT	-.10501	-.13134	-.15221	-.18517	-.00919	.11301	-.19138	-.47189	1.45742
ESPT	-.10493	.24297	-.76642	.36808	.43900	-.39488	-.01885	-.28341	.04618
FSPT	-.09477	.18705	.01040	-.30412	-.25957	-.15417	-.08826	-.18852	-.14475
PSPT	.18968	-.31224	.65342	-.04377	-.44236	.05858	-.20537	.10089	.20227

	ESPT	FSPT	PSPT
ESPT	1.47114		
FSPT	-.08648	2.18403	
PSPT	-.42454	-1.22354	2.13231

KAISER-MEYER-OLKIN MEASURE OF SAMPLING ADEQUACY = .72428

BARTLETT TEST OF SPHERICITY = 397.90292, SIGNIFICANCE = .00000

THERE ARE 38 (28.8%) OFF-DIAGONAL ELEMENTS OF AIC MATRIX > 0.09

ANTI-IMAGE COVARIANCE MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	.85218								
BSKL	-.11928	.78828							
STAD	-.03393	-.02785	.30127						
PAD	.04277	-.00517	-.21149	.38496					
STAS	-.02340	.01960	-.13421	.01416	.38345				
PAS	-.04992	-.08950	.06240	-.06743	-.22968	.48278			
INTR	-.01254	-.12618	-.06237	.04860	-.03958	.07071	.77595		
HTO	-.05473	-.07160	.01513	-.07227	.08844	-.09297	-.09599	.62378	
STRT	-.06140	-.07104	-.03146	-.04637	-.00242	.03588	-.10189	-.20196	.68614
ESPT	-.06078	.13019	-.15695	.09131	.11442	-.12422	-.00994	-.12017	.02153
FSPT	-.03698	.06751	.00143	-.05082	-.04557	-.03267	-.03138	-.05384	-.04548
PSPT	.07978	-.11543	.09232	-.00749	-.07855	.01272	-.07473	.02954	.06508

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08 NOV 87   SPSS-X RELEASE 2.2  FOR IBM/MVS
11:34:30    NORTH TEXAS STATE UNIVERSITY   NAS/8083        MVS/SP
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- F A C T O R   A N A L Y S I S -

	ESPT	FSPT	PSPT
ESPT	.67974		
FSPT	-.02691	.45787	
PSPT	-.13534	-.26273	.46897

ANTI-IMAGE CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT	ESPT	FSPT	PSPT
OWN	.83861											
BSKL	-.14553	.74439										
STAD	-.06696	-.05716	.66629									
PAD	.07669	-.00964	-.63779	.74297								
STAS	-.04093	.03565	-.39487	.03784	.71588							
PAS	-.07849	-.14818	.16711	-.16408	-.54517	.74018						
INTR	-.01542	-.16134	-.12900	.09133	-.07257	.11801	.82443					
HTO	-.07507	-.10212	.03490	-.15148	.18083	-.17304	-.13797	.78180				
STRT	-.08030	-.09659	-.06921	-.09268	-.00471	.06388	-.13964	-.30871	.82299			
ESPT	-.07988	.17785	-.34683	.18333	.22412	-.22148	-.01369	-.18455	.03152	.61674		
FSPT	-.05920	.11237	.00386	-.12432	-.10876	-.07097	-.05261	-.10075	-.08113	-.04823	.76823	
PSPT	.12822	-.18984	.24561	-.01811	-.18759	.02729	-.12389	.05462	.11474	-.23970	-.58698	.59088

MEASURES OF SAMPLING ADEQUACY (MSA) ARE PRINTED ON THE DIAGONAL.

1-TAILED SIG. OF CORRELATION MATRIX:

' . ' IS PRINTED FOR DIAGONAL ELEMENTS.

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	.								
BSKL	.01298	.							
STAD	.00732	.02144	.						
PAD	.04074	.01578	.00000	.					
STAS	.02373	.01475	.00000	.00000	.				
PAS	.00888	.00388	.00004	.00000	.00000	.			
INTR	.07768	.00264	.00338	.02427	.01242	.08971	.		
HTO	.00804	.00500	.00081	.00008	.07816	.00099	.00151	.	
STRT	.01099	.00717	.00011	.00008	.03877	.04658	.00139	.00000	.
ESPT	.04647	.43697	.00044	.02253	.04635	.00100	.04664	.00067	.09033
FSPT	.09501	.06412	.00308	.00028	.00000	.00001	.00336	.00237	.02847
PSPT	.46800	.02941	.43053	.17975	.00040	.00122	.00929	.14143	.46185

- F A C T O R   A N A L Y S I S - - - - - - - - - - - - - - - - - -

	ESPT	FSPT	PSPT
ESPT			
FSPT	.00060		
PSPT	.00173	.00000	

EXTRACTION 1 FOR ANALYSIS 1, PRINCIPAL-COMPONENTS ANALYSIS (PC)

INITIAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
OWN	1.00000	*	1	4.04248	33.7	33.7
BSKL	1.00000	*	2	1.56251	13.0	46.7
STAD	1.00000	*	3	1.23866	10.3	57.0
PAD	1.00000	*	4	1.02643	8.6	65.6
STAS	1.00000	*	5	.92210	7.7	73.3
PAS	1.00000	*	6	.73414	6.1	79.4
INTR	1.00000	*	7	.66815	5.6	85.0
HTO	1.00000	*	8	.57329	4.8	89.7
STRT	1.00000	*	9	.49279	4.1	93.8
ESPT	1.00000	*	10	.29573	2.5	96.3
FSPT	1.00000	*	11	.27839	2.3	98.6
PSPT	1.00000	*	12	.16535	1.4	100.0

PC EXTRACTED 4 FACTORS.

FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
STAD	.72869			
PAD	.72276			
STAS	.71439		-.42437	
PAS	.69997			
FSPT	.65038	.52481		
HTO	.57670			
STRT	.50920	-.48929		
OWN				
PSPT	.43533	.75645		

09 NOV 87 SPSS-X RELEASE 2.2 FOR IBM/MVS
11:34:34 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

- F A C T O R A N A L Y S I S -

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
INTR	.47185		.48323	
ESPT	.47494			-.65562
BSKL	.43072			.62288

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
OWN	.25872	*	1	4.04246	33.7	33.7
BSKL	.70234	*	2	1.56251	13.0	46.7
STAD	.78947	*	3	1.23866	10.3	57.0
PAD	.73357	*	4	1.02843	8.6	65.6
STAS	.79520	*				
PAS	.62422	*				
INTR	.47697	*				
HTO	.64431	*				
STRT	.59432	*				
ESPT	.70166	*				
FSPT	.71899	*				
PSPT	.83028	*				

REPRODUCED CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	.25872*	-.08640	-.07525	-.13412	.00522	.04341	-.12935	-.09345	-.14263
BSKL	.30689	.70234*	.03808	.01820	-.08420	.00406	-.18191	.00775	-.09531
STAD	.31637	.16283	.78947*	-.00208	-.03921	-.15938	.10757	-.08480	-.06096
PAD	.30745	.19486	.75853	.73357*	-.12245	-.12255	.02621	-.00058	-.02736
STAS	.19154	.29985	.59291	.60761	.79520*	-.03558	.06658	.02360	.05652
PAS	.19094	.25815	.54197	.55087	.69071	.62422*	-.06660	.10218	.00231
INTR	.27108	.45617	.16031	.16962	.15776	.20125	.47697*	-.14518	-.10514
HTO	.33131	.24621	.39460	.36608	.11923	.20209	.43607	.64431*	-.11351
STRT	.36927	.33714	.42042	.39333	.12082	.16565	.39830	.57437	.59432*
ESPT	.08272	-.18947	.31213	.28140	.15928	.25580	.18072	.44284	.23451
FSPT	.11065	.21062	.26574	.28491	.49719	.51507	.33308	.28813	.11710
PSPT	-.01134	.20500	-.02770	.01253	.36268	.38713	.30080	.11569	-.07438

- - - - - - - - - - - - F A C T O R   A N A L Y S I S - - - - - - - - - - - -

	ESPT	FSPT	PSPT
OWN	.08452	.02016	.00329
BSKL	.20537	-.05902	-.01727
STAD	.01391	.00508	.04534
PAD	-.08251	.05085	.07914
STAS	.00977	-.05256	-.03298
PAS	.04830	-.09911	-.08883
INTR	-.01365	-.06631	-.06807
HTO	-.12962	-.01053	-.00834
STRT	-.10090	.07203	.06478
ESPT	.70166*	-.14863	-.05745
FSPT	.46516	.71899*	-.06301
PSPT	.34431	.70912	.83028*

THE LOWER LEFT TRIANGLE CONTAINS THE REPRODUCED CORRELATION MATRIX; THE DIAGONAL, COMMUNALITIES; AND THE UPPER RIGHT TRIANGLE, RESIDUALS BETWEEN THE OBSERVED CORRELATIONS AND THE REPRODUCED CORRELATIONS.

THERE ARE 40 (60.0%) RESIDUALS (ABOVE DIAGONAL) THAT ARE > 0.05

VARIMAX ROTATION 1 FOR EXTRACTION 1 IN ANALYSIS 1 - KAISER NORMALIZATION.

VARIMAX CONVERGED IN 8 ITERATIONS.

ROTATED FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
STAD	.80354			
STAS	.79650			
PAD	.79001			
PAS	.67419			
STRT		.73875		
HTO		.73493		
INTR		.58501		
OWN		.44501		
PSPT			.91034	
FSPT			.76679	
ESPT				.68677
BSKL		.49060		-.62217

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- F A C T O R   A N A L Y S I S -

FACTOR TRANSFORMATION MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	.69736	.54936	.45480	.07104
FACTOR 2	-.12057	-.54175	.82951	.06240
FACTOR 3	-.69963	.63454	.31870	-.07945
FACTOR 4	.09835	-.04555	.05920	-.99234

FACTOR SCORE COEFFICIENT MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
DWN	.02680	.21307	-.07073	-.10625
BSKL	-.04533	.24717	.10225	-.62126
STAD	.35603	.01894	-.19187	.12434
PAD	.34936	.00551	-.15998	.06886
STAS	.37227	-.20015	.09080	-.20029
PAS	.27697	-.12375	.11818	-.08092
INTR	-.17485	.32186	.16042	-.15649
HTO	-.12299	.39130	-.00748	.23744
SIRT	-.05111	.39598	-.12943	.04125
ESPT	-.05888	.08813	.14185	.64224
FSPT	-.00562	-.02644	.37988	.09238
PSPT	-.12451	-.07307	.51953	-.02291

COVARIANCE MATRIX FOR ESTIMATED REGRESSION FACTOR SCORES:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	1.00000			
FACTOR 2	.00000	1.00000		
FACTOR 3	.00000	.00000	1.00000	
FACTOR 4	.00000	.00000	.00000	1.00000

```
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```

NUMBER OF VALID OBSERVATIONS (LISTWISE) = 75.00

VARIABLE	MEAN	STD DEV	MINIMUM	MAXIMUM	VALID N	LABEL
ID	61.088	33.104	3	117	102	ORDER OF RECEIPT
SBUS	.382	.488	0	1	102	IN SIMILAR BUSINESS
OWN	.520	.502	0	1	102	SMALL BUSINESS OWNER
LIF	.881	.325	0	1	101	GENERAL LIFE EXPERIENCE
BEX	.696	.462	0	1	102	GENERAL BUSINESS EXPERIENCE
BSKL	.716	.453	0	1	102	SPECIFIC BUSINESS SKILLS YOU LACK
SPO	.431	.498	0	1	102	SPOUSE
MPAR	.069	.254	0	1	102	MALE PARENT
FPAR	.069	.254	0	1	102	FEMALE PARENT
SIBC	.049	.217	0	1	102	SIBLING OR CHILD
MFR	.216	.413	0	1	102	MALE FRIEND
FFR	.127	.335	0	1	102	FEMALE FRIEND
YKN	17.379	12.351	1	45	95	YEARS KNOWN
STAD	3.673	1.150	1	5	101	START UP ADVICE
PAD	3.804	.955	1	5	102	POST START UP ADVICE
STAS	3.730	1.347	1	5	100	START UP ASSISTANCE
PAS	3.782	1.145	1	5	101	POST START UP ASSISTANCE
INTR	2.657	1.278	1	5	102	INTRODUCTION TO BUSINESS CONTACTS
HTO	3.127	1.264	1	5	102	DETAILED HOW-TO ADVICE
STRT	3.324	1.118	1	5	102	LONG-RANGE STRATEGIC ADVICE
ESPT	4.539	.875	1	5	102	EMOTIONAL SUPPORT
FSPT	2.676	1.530	1	5	102	FINANCIAL SUPPORT
PSPT	2.843	1.681	1	5	102	PHYSICAL SUPPORT
MOSOP	50.961	47.037	12	240	102	MONTHS IN OPERATION
AGE	41.716	8.590	27	68	102	AGE OF RESPONDENT
LOC	5.891	3.385	1	19	92	LOCUS OF CONTROL
ROI	83.382	127.197	0	750	102	RETURN ON INVESTMENT
SATIS	4.480	.754	2	5	102	PERSONAL BUSINESS SATISFACTION
FINSAT	3.814	1.106	1	5	102	ATTAINMENT OF FINANCIAL GOALS
MGT	.634	.484	0	1	101	MANAGEMENT EXPERIENCE
FLDEX	2.753	3.849	0	10	97	PRIOR EXPERIENCE IN VENTURE FIELD
BUSEX	2.330	3.579	0	10	97	PRIOR BUSINESS EXPERIENCE
COLM	.260	.441	0	1	100	BUSINESS-RELATED COLLEGE MAJ
OSHP	2.853	4.429	0	10	102	TYPE LEGAL CONFIGURATION
CONT	.186	.391	0	1	102	NUMBER OF BUSINESSES IN OPERATION
TBUS	.745	.438	0	1	102	TYPE OF BUSINESS: SERVICE,ETC.
SOS	1.912	1.109	1	6	102	NUMBER OF SIGNIFICANT OTHERS

```
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PRECEDING TASK REQUIRED        0.72 SECONDS CPU TIME;       86.15 SECONDS ELAPSED.

  58  0  COMPUTE ADVISE = ZSTAD + ZSTAS + ZPAD + ZPAS
  59  0  COMPUTE ASSIST = ZSIRT + ZHTO + ZINTR + ZDWN + ZBSKL
  60  0  COMPUTE TANG = ZPSPT + ZFSPT
  61  0  COMPUTE BASE = ZESPT
  62  0  COMPUTE TROI = ROI + .5
  63  0  COMPUTE LTROI = LG10(TROI)
  64  0  COMPUTE RIROI = SQRT(ROI)
  65  0  REGRESSION DESCRIPTIVES/
  66  0         VARIABLES = ADVISE ASSIST TANG BASE/
  67  0         MISSING = MEANSUB/
  68  0         STATISTICS = R ANOVA COEFF ZPP CHA CI SES LABEL HISTORY/
  69  0         DEP = ADVISE/
  70  0         ENTER ASSIST/
  71  0         ENTER TANG/
  72  0         ENTER BASE/
  73  0         SAVE RESID(RADVISE)/
  74  0         DEP = ASSIST/
  75  0         ENTER ADVISE/
  76  0         ENTER TANG/
  77  0         ENTER BASE/
  78  0         SAVE RESID(RASSIST)/
  79  0         DEP= TANG/
  80  0         ENTER ADVISE/
  81  0         ENTER ASSIST/
  82  0         ENTER BASE/
  83  0         SAVE RESID(RTANG)/
  84  0         DEP = BASE/
  85  0         ENTER ADVISE/
  86  0         ENTER ASSIST/
  87  0         ENTER TANG/
  88  0         SAVE RESID(RBASE)

THERE ARE    219496 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS    215712 BYTES.

     2424 bytes of memory required for REGRESSION procedure.
        0 more bytes may be needed for Residuals plots.
```

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*** * * * M U L T I P L E   R E G R E S S I O N * * * ***

Mean Substituted for Missing Data

	Mean	Std Dev	Cases	Label
ADVISE	.075	3.176	99	
ASSIST	.000	3.207	102	
TANG	.000	1.814	102	
BASE	.000	1.000	102	

N of Cases encountered =   102

Minimum Pairwise N of Cases =   99

Correlation:

	ADVISE	ASSIST	TANG	BASE
ADVISE	1.000	.426	.377	.238
ASSIST	.426	1.000	.262	.249
TANG	.377	.262	1.000	.333
BASE	.238	.249	.333	1.000

```
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                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   ADVISE

  Descriptive Statistics are printed on Page   15

Beginning Block Number  1.  Method:  Enter      ASSIST

Variable(s) Entered on Step Number  1..    ASSIST

Multiple R            .42615                                      Analysis of Variance
R Square              .18160      R Square Change    .18160                        DF      Sum of Squares      Mean Square
Adjusted R Square     .17342      F Change         22.19030       Regression        1           185.00412        185.00412
Standard Error       2.88741      Signif F Change    .0000        Residual        100           833.71602          8.33716

                                                                  F =      22.19030       Signif F =  .0000

------------------------------------------- Variables in the Equation --------------------------------------------

Variable              B        SE B      95% Confdnce Intrvl B       Beta    SE Beta   Correl  Part Cor  Partial        T   Sig T

ASSIST          .422049     .089594      .244296     .599801     .426151    .090465  .426151  .426151  .426151    4.711   .0000
(Constant)      .075467     .285897     -.491743     .642877                                                       .264   .7923

End Block Number   1   All requested variables entered.

                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Beginning Block Number  2.  Method:  Enter      TANG

Variable(s) Entered on Step Number  2..    TANG

Multiple R            .50688                                      Analysis of Variance
R Square              .25693      R Square Change    .07532                        DF      Sum of Squares      Mean Square
Adjusted R Square     .24192      F Change         10.03542       Regression        2           261.73782        130.86891
Standard Error       2.76519      Signif F Change    .0020        Residual         99           756.98232          7.64629

                                                                  F =      17.11536       Signif F =  .0000
```

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**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. ADVISE

------------ Variables in the Equation ------------

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ASSIST	.348173	.088915	.171747	.524599	.351557	.089779	.426151	.339250	.366214	3.916	.0002
TANG	.497811	.157144	.186004	.809618	.284408	.089778	.376614	.274452	.303378	3.168	.0020
(Constant)	.075467	.273795	-.467800	.618735						.278	.7834

End Block Number 2 All requested variables entered.

* *

Beginning Block Number 3. Method: Enter BASE

Variable(s) Entered on Step Number 3.. BASE

Multiple R	.51048		
R Square	.26059	R Square Change	.00368
Adjusted R Square	.23795	F Change	.48524
Standard Error	2.77241	Signif F Change	.4877

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	265.46748	88.48918
Residual	98	753.25265	7.68625

F = 11.51265 Signif F = .0000

------------ Variables in the Equation ------------

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ASSIST	.336987	.090581	.157232	.516743	.340263	.091462	.426151	.323150	.351783	3.720	.0003
TANG	.465049	.164424	.138756	.791343	.265690	.093938	.376614	.245677	.274715	2.828	.0057
BASE	.207041	.297221	-.382784	.796866	.065191	.093588	.238121	.060507	.070183	.697	.4877
(Constant)	.075467	.274509	-.469287	.620222						.275	.7840

End Block Number 3 All requested variables entered.

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. ADVISE

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl
1	.4262	.1816	.1734	22.190	.000	.1816	22.190	.000	In:	ASSIST	.4262	.4262
2	.5069	.2569	.2419	17.115	.000	.0753	10.035	.002	In:	TANQ	.2844	.3766
3	.5105	.2606	.2380	11.513	.000	.0037	.485	.488	In:	BASE	.0652	.2381

* *

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	-4.3664	3.6435	.0755	1.6212	102
*RESID	-9.0175	5.7343	.0000	2.7309	102
*ZPRED	-2.7398	2.2008	.0000	1.0000	102
*ZRESID	-3.2526	2.0684	.0000	.9850	102

Total Cases = 102

* *

From Equation 1: 1 new variables have been created.

Name	Contents
RADVISE	Residual

```
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                     * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 2    Dependent Variable..   ASSIST

  Descriptive Statistics are printed on Page   15

Beginning Block Number  1.  Method:  Enter      ADVISE

Variable(s) Entered on Step Number  1..     ADVISE

Multiple R            .42615                                        Analysis of Variance
R Square              .18160        R Square Change     .18160                       DF       Sum of Squares      Mean Square
Adjusted R Square     .17342        F Change          22.19030      Regression        1            188.61784        188.61784
Standard Error       2.91548        Signif F Change     .0000       Residual        100            850.00114          8.50001

                                                                    F =       22.19030       Signif F =  .0000

------------------------------------------ Variables in the Equation ------------------------------------------

Variable             B         SE B     95% Confdnce Intrvl B      Beta     SE Beta   Correl Part Cor  Partial        T  Sig T

ADVISE          .430293      .091344      .249068     .611517   .426151    .090465  .426151  .426151  .426151    4.711  .0000
(Constant)     -.032473      .288758     -.605359     .540413                                                     -.112  .9107

End Block Number   1   All requested variables entered.

                     * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Beginning Block Number  2.  Method:  Enter      TANG

Variable(s) Entered on Step Number  2..     TANG

Multiple R            .44009                                        Analysis of Variance
R Square              .19368        R Square Change     .01207                       DF       Sum of Squares      Mean Square
Adjusted R Square     .17739        F Change           1.48223      Regression        2            201.15632        100.57816
Standard Error       2.90847        Signif F Change     .2263       Residual         99            837.46266          8.45922

                                                                    F =       11.88977       Signif F =  .0000
```

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 2 Dependent Variable.. ASSIST

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.385190	.098368	.190007	.580372	.381482	.097421	.426151	.353393	.368214	3.916	.0002
TANG	.209620	.172177	-.132016	.551257	.118607	.097421	.262278	.109874	.121454	1.217	.2263
(Constant)	-.029069	.288077	-.600677	.542538						-.101	.9198

End Block Number 2 All requested variables entered.

* *

Beginning Block Number 3. Method: Enter BASE

Variable(s) Entered on Step Number 3.. BASE

Multiple R	.45790		
R Square	.20967	R Square Change	.01598
Adjusted R Square	.18548	F Change	1.98322
Standard Error	2.89414	Signif F Change	.1622

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	217.76787	72.58929
Residual	98	820.85111	8.37603

F = 8.66631 Signif F = .0000

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.367229	.098710	.171342	.563116	.363694	.097760	.426151	.334092	.351783	3.720	.0003
TANG	.141978	.177934	-.211127	.495082	.080334	.100678	.262278	.071658	.080342	.798	.4268
BASE	.433660	.307938	-.177433	1.044753	.135233	.096028	.248551	.126487	.140839	1.408	.1622
(Constant)	-.027714	.286659	-.596579	.541151						-.097	.9232

End Block Number 3 All requested variables entered.

```
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                                   * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 2    Dependent Variable..   ASSIST

                                                        Summary table
                                                        -------------

Step   MultR     Rsq   AdjRsq    F(Eqn)  SigF   RsqCh      FCh  SigCh       Variable   BetaIn   Correl
   1   .4262   .1816    .1734    22.190  .000   .1816   22.190   .000   In:  ADVISE      .4262    .4262
   2   .4401   .1937    .1774    11.890  .000   .0121    1.482   .226   In:  TANG        .1186    .2623
   3   .4579   .2097    .1855     8.666  .000   .0160    1.983   .162   In:  BASE        .1352    .2486

                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Residuals Statistics:
                   Min           Max     Mean   Std Dev    N

*PRED          -5.6611        2.2188    .0000    1.4684   102
*RESID         -6.1501        8.0943    .0000    2.8508   102
*ZPRED         -3.8554        1.5110    .0000    1.0000   102
*ZRESID        -2.1250        2.7968    .0000     .9850   102

Total Cases =      102

                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

From Equation    2:    1 new variables have been created.

  Name        Contents
  ----        --------

  RASSIST     Residual
```

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 3 Dependent Variable.. TANG

Descriptive Statistics are printed on Page 15

Beginning Block Number 1. Method: Enter ADVISE

Variable(s) Entered on Step Number 1.. ADVISE

Multiple R	.37661			Analysis of Variance			
					DF	Sum of Squares	Mean Square
R Square	.14184	R Square Change	.14184				
Adjusted R Square	.13326	F Change	16.52809	Regression	1	47.16297	47.16297
Standard Error	1.68923	Signif F Change	.0001	Residual	100	285.35044	2.85350

F = 16.52809 Signif F = .0001

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.215166	.052925	.110164	.320168	.376614	.092637	.376614	.376814	.376614	4.065	.0001
(Constant)	-.016238	.167307	-.348169	.315693						-.097	.9229

End Block Number 1 All requested variables entered.

* *

Beginning Block Number 2. Method: Enter ASSIST

Variable(s) Entered on Step Number 2.. ASSIST

Multiple R	.39306			Analysis of Variance			
					DF	Sum of Squares	Mean Square
R Square	.15450	R Square Change	.01266				
Adjusted R Square	.13742	F Change	1.48223	Regression	2	51.37221	25.68611
Standard Error	1.68517	Signif F Change	.2263	Residual	99	281.14120	2.83981

F = 9.04501 Signif F = .0002

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*** * * *   M U L T I P L E   R E G R E S S I O N   * * * ***

Equation Number 3   Dependent Variable..   TANG

------------------------------ Variables in the Equation ------------------------------

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.184888	.058363	.069082	.300690	.323613	.102155	.376614	.292757	.303378	3.168	.0020
ASSIST	.070371	.057801	-.044319	.185060	.124370	.102155	.262278	.112512	.121454	1.217	.2263
(Constant)	-.013953	.166915	-.345148	.317243						-.084	.9335

End Block Number   2   All requested variables entered.

* *

Beginning Block Number 3. Method: Enter   BASE

Variable(s) Entered on Step Number 3..   BASE

Multiple R	.45772			
R Square	.20951	R Square Change	.05501	
Adjusted R Square	.18531	F Change	8.81888	
Standard Error	1.63772	Signif F Change	.0104	

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	69.66405	23.22135
Residual	98	262.84938	2.68214

F =   8.65778   Signif F = .0000

------------------------------ Variables in the Equation ------------------------------

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.162280	.057378	.048419	.276141	.284046	.100428	.376614	.254021	.274715	2.828	.0057
ASSIST	.045464	.056977	-.067606	.158533	.080350	.100699	.262278	.071663	.080342	.798	.4268
BASE	.444442	.170187	.106711	.782172	.244946	.093796	.332555	.234544	.255074	2.611	.0104
(Constant)	-.012247	.162217	-.334160	.309658						-.075	.9400

End Block Number   3   All requested variables entered.

```
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11:38:41     NORTH TEXAS STATE UNIVERSITY   NAS/8083        MVS/SP
```

*** * * *   M U L T I P L E   R E G R E S S I O N   * * * ***

Equation Number 3   Dependent Variable..   TANG

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl
1	.3766	.1418	.1333	16.528	.000	.1418	16.528	.000	In:	ADVISE	.3766	.3766
2	.3931	.1545	.1374	9.045	.000	.0127	1.482	.228	In:	ASSIST	.1244	.2623
3	.4577	.2095	.1853	8.658	.000	.0550	6.820	.010	In:	BASE	.2449	.3328

* *

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	-3.7353	1.2287	.0000	.8305	102
*RESID	-3.2020	3.2560	.0000	1.6132	102
*ZPRED	-4.4976	1.4794	.0000	1.0000	102
*ZRESID	-1.9552	1.9881	.0000	.9850	102

Total Cases =   102

* *

From Equation   3:   1 new variables have been created.

Name	Contents
RTANG	Residual

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 4 Dependent Variable.. BASE

Descriptive Statistics are printed on Page 15

Beginning Block Number 1. Method: Enter ADVISE

Variable(s) Entered on Step Number 1.. ADVISE

Multiple R	.23812	R Square Change	.05670
R Square	.05670	F Change	6.01098
Adjusted R Square	.04727	Signif F Change	.0180
Standard Error	.97608		

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	5.72685	5.72685
Residual	100	95.27315	.95273

F = 6.01098 Signif F = .0160

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.074977	.030581	.014305	.135650	.238121	.097124	.238121	.238121	.238121	2.452	.0160
(Constant)	-.005658	.096674	-.197456	.186140						-.058	.9534

End Block Number 1 All requested variables entered.

* *

Beginning Block Number 2. Method: Enter ASSIST

Variable(s) Entered on Step Number 2.. ASSIST

Multiple R	.28833	R Square Change	.02643
R Square	.08313	F Change	2.85396
Adjusted R Square	.06461	Signif F Change	.0943
Standard Error	.96716		

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	8.39642	4.19821
Residual	99	92.60358	.93538

F = 4.48819 Signif F = .0136

```
09 NOV 87   SPSS-X RELEASE 2.2  FOR IBM/MVS
11:36:48    NORTH TEXAS STATE UNIVERSITY   NAS/8083          MVS/SP

                        * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 4    Dependent Variable..   BASE
```

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.050863	.033496	-.015599	.117325	.161536	.106379	.238121	.146134	.150868	1.519	.1321
ASSIST	.056042	.033173	-.009781	.121864	.179712	.106378	.248551	.162577	.167302	1.689	.0943
(Constant)	-.003838	.095796	-.193918	.186241						-.040	.9681

End Block Number   2   All requested variables entered.

```
                        * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Beginning Block Number  3.  Method:  Enter      TANG

Variable(s) Entered on Step Number  3..    TANG

Multiple R           .37787                                 Analysis of Variance
R Square             .14279     R Square Change    .05965                         DF      Sum of Squares      Mean Square
Adjusted R Square    .11655     F Change          6.81988   Regression             3            14.42147          4.80718
Standard Error       .83992     Signif F Change    .0104    Residual              98            88.57853           .88345

                                                            F =      5.44132       Signif F =  .0017
```

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.023797	.034162	-.043997	.091591	.075578	.108497	.238121	.065149	.070193	.697	.4877
ASSIST	.045740	.032480	-.018715	.110194	.146677	.104154	.248551	.131710	.140838	1.408	.1622
TANG	.146392	.056057	.035149	.257635	.265621	.101712	.332555	.244242	.255074	2.611	.0104
(Constant)	-.001796	.093102	-.186553	.182962						-.019	.9846

End Block Number   3   All requested variables entered.

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**** MULTIPLE REGRESSION ****

Equation Number 4 Dependent Variable.. BASE

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl
1	.2381	.0567	.0473	6.011	.016	.0567	6.011	.016	In:	ADVISE	.2381	.2381
2	.2883	.0831	.0646	4.488	.014	.0264	2.854	.094	In:	ASSIST	.1797	.2486
3	.3779	.1428	.1165	5.441	.002	.0597	6.820	.010	In:	TANG	.2656	.3328

****

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	-.9048	.8060	.0000	.3779	102
*RESID	-3.7503	1.2945	.0000	.9259	102
*ZPRED	-2.3945	2.1330	.0000	1.0000	102
*ZRESID	-3.8900	1.3773	.0000	.9850	102

Total Cases = 102

****

From Equation 4: 1 new variables have been created.

Name	Contents
RBASE	Residual

```
08 NOV 87   SPSS-X RELEASE 2.2  FOR IBM/MVS
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PRECEDING TASK REQUIRED       0.78 SECONDS CPU TIME;      44.04 SECONDS ELAPSED.

  0   COMPUTE LOCAG = LOC * AGE
  0   COMPUTE LOCMO = LOC * MOSOP
  0   COMPUTE LOCRAD = LOC * RADVISE
  0   COMPUTE LOCRTN = LOC * RTANG
  0   COMPUTE LOCRAS = LOC * RASSIST
  0   COMPUTE LOCRBS = LOC * RBASE
  0   COMPUTE RADRAS = RADVISE * RASSIST
  0   COMPUTE RADRTN = RADVISE * RTANG
  0   COMPUTE RADRBS = RADVISE * RBASE
  0   COMPUTE RASRTN = RASSIST * RTANG
  0   COMPUTE RASRBS = RASSIST * RBASE
  0   COMPUTE RTNRBS = RTANG * RBASE
  0   COMPUTE LAGE = LG10(AGE)
  0   COMPUTE LMOSOP = LG10(MOSOP)
  0   COMPUTE EXP = ZMGT + ZBUSEX + ZFLDEX
  0   COMPUTE EASS = RASSIST*EXP
  0   COMPUTE EADV = RADVISE*EXP
  0   COMPUTE ETAN = RTANG*EXP
  0   COMPUTE ERBS = RBASE*EXP
  0   COMPUTE LEXP = LOC*EXP
  0   COMPUTE LLOC = LG10(LOC)
  0   COMPUTE ELLOC = EXP*LLOC
  0   COMPUTE ELRAD =RADVISE*LLOC
  0   COMPUTE ELRAS = RASSIST*LLOC
  0   COMPUTE ELRTV = RTANG*LLOC
  0   COMPUTE ELRBS = RBASE*LLOC
  0   COMPUTE LOCTIN = LLOC*LMOSOP
  0   COMPUTE CEP = COLM*EXP
  0   COMPUTE HETROI = ROI/83.4
  0   COMPUTE LOGF = LG10(FINSAT)
  0   COMPUTE LOGS = LG10(SATIS)
  0   COMPUTE RTFI = SQRT(FINSAT)
  0   COMPUTE STSA = SQRT(SATIS)
  0   VARIABLE LABELS
  0         RADVISE "GENERAL ADVICE AND ASSISTANCE"
  0         RASSIST "KNOWLEDGE-BASED COACHING"
  0         RTANG "SAFETY NET SUPPORT"
  0         RBASE "COUNSELLING AND FRIENDSHIP"
  0         LTROI "LOG OF RETURN ON INVESTMENT"
  0         RTROI "SQUARE ROOT OF RETURN ON INVESTMENT"
  0              LLOC "LOG LOCUS OF CONTROL"
  0              EXP "EXPERIENCE FACTOR"
  0              LMOSOP "LOG MONTHS IN OPERATION"
  0              CEP "COLLEGE MAJOR X EXP FACTOR"
  0              ELLOC "EXPERIENCE X LOG LOCUS OF CONTROL"
  0              EASS "EXPERIENCE X COACHING FACTOR"
  0              EADV "EXPERIENCE X GENL ADVICE FACTOR"
  0                   ETAN "EXP X SAFETY NET FACTOR"
  0                   ERBS "EXP X FRIENDSHIP FACTOR"
  0                   ELRAS "LOG LOC X COACHING FACTOR"
  0                   ELRAD "LOG LOC X GENL ADVICE FACTOR"
```

```
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11:37:33    NORTH TEXAS STATE UNIVERSITY    NAS/8083         MVS/SP

 0                  ELRTV "LOG LOC X SAFETY NET FACTOR"
 0                  ELRBS "LOG LOC X FRIENDSHIP FACTOR"
 0            ADVISE "NONRESIDUAL FACTOR ONE"
 0            ASSIST "NONRESIDUAL FACTOR TWO"
 0            TANG "NONRESIDUAL FACTOR THREE"
 0            BASE "NONRESIDUAL FACTOR FOUR"
 0            LOCAG "LOC X AGE"
 0            LOCMO "LOC X MONTHS IN OPN"
 0            LOCRAD "LOC X RESID OF FAC ONE"
 0            LAGE "LOC X AGE"
 0            LEXP "LOC X EXP"
 0            HETROI "RECIP OF ROI MEAN"
 0            LOGF "LOG FINANCIAL SATIS"
 0            LOGS "LOG PERSONAL SATIS"
 0            RTFI "SQUARE RT FINANCIAL SATIS"
 0            STSA "SQUARE RT PERSONAL SATIS"
 0      REGRESSION DESCRIPTIVES/
 0            VARIABLES = ADVISE ASSIST TANG BASE MOSOP AGE LOC LTROI MGT FLDEX
 0                        RADVISE RASSIST RBASE RTANG LOCAG LOCMO LOCRAD
 0                            ROI RTROI LAGE LMOSOP ERBS EADV ETAN EASS
 0                                   LEXP EXP LLOC ELLOC ELRAD ELRAS ELRTV ELRBS
 0                                           LOCTIN CEP BUSEX COLM ID
 0                                                SATIS FINSAT HETROI LOGF LOGS
 0                                                     RTFI STSA/
 0            MISSING = MEANSUB/
 0            STATISTICS = R ANOVA COEFF ZPP CHA CI SES LABEL HISTORY/
 0            DEP = LTROI/
 0                     ENTER COLM/
 0              ENTER EXP/
 0                    ENTER LMOSOP/
 0              ENTER LLOC/
 0                   ENTER RASSIST/
 0                  ENTER RADVISE/
 0                  ENTER RBASE/
 0                  ENTER RTANG/
 0                     ENTER CEP/
 0                          ENTER ELRAD ELRAS ELRTV ELRBS/
 0                      ENTER EADV EASS ETAN ERBS/
 0             RESID = DEFAULT,SIZE(SMALL)/
 0             SCATTERPLOT (*PRED *RESID)/
 0             SAVE PRED(BING) RESID(DING)/

THERE ARE   216456 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   214896 BYTES.

    59572 bytes of memory required for REGRESSION procedure.
     7336 more bytes may be needed for Residuals plots.
```

**** MULTIPLE REGRESSION ****

Mean Substituted for Missing Data

	Mean	Std Dev	Cases	Label
ADVISE	.075	3.176	99	NONRESIDUAL FACTOR ONE
ASSIST	.000	3.207	102	NONRESIDUAL FACTOR TWO
TANG	.000	1.814	102	NONRESIDUAL FACTOR THREE
BASE	.000	1.000	102	NONRESIDUAL FACTOR FOUR
MOSOP	50.961	47.037	102	MONTHS IN OPERATION
AGE	41.716	8.590	102	AGE OF RESPONDENT
LOC	5.891	3.213	92	LOCUS OF CONTROL
LTROI	1.472	.787	102	LOG OF RETURN ON INVESTMENT
MGT	.634	.482	101	MANAGEMENT EXPERIENCE
FLDEX	2.753	3.752	97	PRIOR EXPERIENCE IN VENTURE FIELD
RADVISE	.000	2.731	102	GENERAL ADVICE AND ASSISTANCE
RASSIST	.000	2.851	102	KNOWLEDGE-BASED COACHING
RBASE	.000	.926	102	COUNSELLING AND FRIENDSHIP
RTANG	.000	1.613	102	SAFETY NET SUPPORT
LOCAG	241.315	138.588	92	LOC X AGE
LOCMO	283.413	351.686	92	LOC X MONTHS IN OPN
LOCRAD	.619	18.032	92	LOC X RESID OF FAC ONE
ROI	83.382	127.197	102	RETURN ON INVESTMENT
RTROI	7.312	5.497	102	SQUARE ROOT OF RETURN ON INVESTMENT
LAGE	1.611	.089	102	LOC X AGE
LMOSOP	1.572	.333	102	LOG MONTHS IN OPERATION
ERBS	.383	1.614	92	EXP X FRIENDSHIP FACTOR
EADV	.156	4.728	92	EXPERIENCE X GENL ADVICE FACTOR
ETAN	-.460	2.823	92	EXP X SAFETY NET FACTOR
EASS	-.421	5.717	92	EXPERIENCE X COACHING FACTOR
LEXP	1.007	12.149	84	LOC X EXP
EXP	.065	1.972	92	EXPERIENCE FACTOR
LLOC	.698	.254	92	LOG LOCUS OF CONTROL
ELLOC	.070	1.363	85	EXPERIENCE X LOG LOCUS OF CONTROL
ELRAD	.065	1.924	92	LOG LOC X GENL ADVICE FACTOR
ELRAS	.191	2.118	92	LOG LOC X COACHING FACTOR
ELRTV	.010	1.172	92	LOG LOC X SAFETY NET FACTOR
ELRBS	-.009	.611	92	LOG LOC X FRIENDSHIP FACTOR
CEP	.142	1.082	98	COLLEGE MAJOR X EXP FACTOR
BUSEX	2.330	3.489	97	PRIOR BUSINESS EXPERIENCE
COLM	.260	.438	100	BUSINESS-RELATED COLLEGE MAJ
ID	61.088	33.104	102	ORDER OF RECEIPT
SATIS	4.480	.754	102	PERSONAL BUSINESS SATISFACTION
FINSAT	3.814	1.108	102	ATTAINMENT OF FINANCIAL GOALS
HETROI	1.000	1.525	102	RECIP OF ROI MEAN
LOGF	.553	.179	102	LOG FINANCIAL SATIS
LOGS	.644	.088	102	LOG PERSONAL SATIS
RTFI	1.926	.327	102	SQUARE RT FINANCIAL SATIS
STSA	2.108	.194	102	SQUARE RT PERSONAL SATIS

```
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                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG OF RETURN ON INVESTMENT

  Descriptive Statistics are printed on Page   30

Beginning Block Number  1.  Method:  Enter      COLM

Variable(s) Entered on Step Number  1..    COLM      BUSINESS-RELATED COLLEGE MAJ

Multiple R           .01995                                   Analysis of Variance
R Square             .00040        R Square Change     .00040                      DF      Sum of Squares      Mean Square
Adjusted R Square   -.00960        F Change            .03981     Regression        1              .02491           .02491
Standard Error       .79099        Signif F Change     .8423      Residual        100            62.56577           .62566

                                                                   F =        .03981       Signif F =  .8423

------------------------------------------ Variables in the Equation ------------------------------------------

Variable              B          SE B      95% Confdnce Intrvl B       Beta     SE Beta   Correl  Part Cor  Partial         T  Sig T

COLM           -.035980       .180329      -.393747      .321788  -.019948     .099980 -.019948 -.019948 -.019948     -.200  .8423
(Constant)     1.481642       .091281      1.300544     1.662740                                                     16.232  .0000

End Block Number   1   All requested variables entered.

                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Beginning Block Number  2.  Method:  Enter      EXP

Variable(s) Entered on Step Number  2..    EXP       EXPERIENCE FACTOR

Multiple R           .13695                                   Analysis of Variance
R Square             .01876        R Square Change     .01836                      DF      Sum of Squares      Mean Square
Adjusted R Square   -.00107        F Change           1.85213     Regression        2             1.17391           .58698
Standard Error       .78764        Signif F Change     .1766      Residual         99            81.41676           .62037

                                                                   F =        .94614       Signif F =  .3917
```

```
09 NOV 87   SPSS-X RELEASE 2.2  FOR IBM/MVS
11:37:55    NORTH TEXAS STATE UNIVERSITY   NAS/8083        MVS/SP

                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG OF RETURN ON INVESTMENT
```

--- Variables in the Equation --

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.067520	.181055	-.426772	.291732	-.037435	.100383	-.019948	-.037127	-.037454	-.373	.7100
EXP	.054541	.040077	-.024979	.134062	.136614	.100383	.131822	.135490	.135517	1.361	.1768
(Constant)	1.486311	.090959	1.305829	1.666793						16.340	.0000

End Block Number   2   All requested variables entered.

* *

Beginning Block Number 3. Method: Enter   LMOSOP

Variable(s) Entered on Step Number 3..   LMOSOP   LOG MONTHS IN OPERATION

				Analysis of Variance	DF	Sum of Squares	Mean Square
Multiple R	.26870						
R Square	.07220	R Square Change	.05345				
Adjusted R Square	.04380	F Change	5.64527	Regression	3	4.51912	1.50637
Standard Error	.76978	Signif F Change	.0194	Residual	98	58.07156	.59257

F =   2.54211   Signif F = .0607

--- Variables in the Equation --

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-7.30817E-04	.179170	-.356287	.354826	-4.051E-04	.099337	-.019948	-.000397	-.000412	-.004	.9968
EXP	.050290	.039209	-.027519	.128099	.125964	.098210	.131822	.124798	.128489	1.283	.2027
LMOSOP	.553619	.233007	.091225	1.016014	.234157	.098552	.237387	.231183	.233382	2.376	.0194
(Constant)	.599056	.383863	-.162707	1.360819						1.561	.1218

End Block Number   3   All requested variables entered.

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG OF RETURN ON INVESTMENT

Beginning Block Number 4. Method: Enter LLOC

Variable(s) Entered on Step Number 4.. LLOC LOG LOCUS OF CONTROL

Multiple R	.32572		
R Square	.10609	R Square Change	.03389
Adjusted R Square	.06923	F Change	3.67738
Standard Error	.75948	Signif F Change	.0581

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	6.64026	1.66007
Residual	97	55.95041	.57681

F = 2.87802 Signif F = .0267

-- Variables in the Equation --

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.036021	.177727	-.388760	.316717	-.019971	.098537	-.019948	-.019457	-.020575	-.203	.8398
EXP	.050333	.038684	-.026444	.127110	.126073	.096895	.131822	.124905	.130971	1.301	.1963
LMOSOP	.522937	.230444	.065570	.980304	.221179	.097468	.237397	.217844	.224526	2.269	.0255
LLOC	-.574088	.299369	-1.168250	.020079	-.185371	.096688	-.187255	-.184080	-.181118	-1.918	.0581
(Constant)	1.056242	.447517	.168046	1.944438						2.360	.0203

End Block Number 4 All requested variables entered.

* *

Beginning Block Number 5. Method: Enter RASSIST

Variable(s) Entered on Step Number 5.. RASSIST KNOWLEDGE-BASED COACHING

Multiple R	.33718		
R Square	.11369	R Square Change	.00760
Adjusted R Square	.06753	F Change	.82307
Standard Error	.76017	Signif F Change	.3666

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	7.11589	1.42318
Residual	96	55.47479	.57786

F = 2.46283 Signif F = .0382

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG OF RETURN ON INVESTMENT

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.019421	.178828	-.374392	.335549	-.010768	.099148	-.019948	-.010435	-.011084	-.109	.9137
EXP	.052242	.038777	-.024729	.129213	.130854	.097127	.131822	.129451	.136222	1.347	.1811
LMOSOP	.510798	.231042	.052183	.969413	.216045	.097721	.237397	.212430	.220109	2.211	.0294
LLOC	-.635135	.307105	-1.244734	-.025535	-.205084	.099164	-.197255	-.198717	-.206527	-2.068	.0413
RASSIST	.024963	.027515	-.029654	.079580	.090400	.099643	.049588	.087172	.092200	.907	.3666
(Constant)	1.113398	.452334	.215521	2.011272						2.461	.0156

End Block Number 5 All requested variables entered.

* *

Beginning Block Number 6. Method: Enter RADVISE

Variable(s) Entered on Step Number 6.. RADVISE GENERAL ADVICE AND ASSISTANCE

Multiple R	.34033		
R Square	.11582	R Square Change	.00213
Adjusted R Square	.05998	F Change	.22938
Standard Error	.76324	Signif F Change	.6331

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	6	7.24951	1.20825
Residual	95	55.34117	.58254

F = 2.07411 Signif F = .0834

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.010238	.180571	-.368716	.348241	-.005676	.100114	-.019948	-.005470	-.005817	-.057	.9549
EXP	.051894	.038940	-.025412	.129199	.129982	.097538	.131822	.128568	.135467	1.333	.1858
LMOSOP	.526071	.234157	.061211	.990931	.222505	.099038	.237397	.216743	.224613	2.247	.0270
LLOC	-.649591	.309819	-1.264660	-.034522	-.209752	.100040	-.197255	-.202273	-.210304	-2.097	.0387
RASSIST	.030214	.029723	-.028793	.089221	.109418	.107638	.049588	.098069	.103732	1.017	.3120
RADVISE	.014508	.030292	-.045629	.074645	.050329	.105085	-.020784	.048204	.049078	.479	.6331
(Constant)	1.097092	.455435	.192940	2.001243						2.409	.0179

End Block Number 6 All requested variables entered.

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```

*** * * *   M U L T I P L E   R E G R E S S I O N   * * * ***

Equation Number 1   Dependent Variable..   LTROI   LOG OF RETURN ON INVESTMENT

Beginning Block Number 7. Method: Enter   RBASE

Variable(s) Entered on Step Number 7..   RBASE   COUNSELLING AND FRIENDSHIP

Multiple R	.34217		
R Square	.11708	R Square Change	.00125
Adjusted R Square	.05133	F Change	.13355
Standard Error	.76675	Signif F Change	.7158

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	7	7.32802	1.04686
Residual	94	55.26285	.58790

F =   1.78068   Signif F = .1002

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.019553	.183182	-.383268	.344159	-.010841	.101562	-.019948	-.010345	-.011009	-.107	.9152
EXP	.054837	.039939	-.024463	.134138	.137355	.100039	.131822	.133067	.140216	1.373	.1730
LMOSOP	.522793	.235315	.056571	.991016	.221542	.099528	.237397	.215729	.223765	2.226	.0284
LLOC	-.640301	.312278	-1.260336	-.020265	-.206752	.100834	-.197255	-.198719	-.206908	-2.050	.0431
RASSIST	.027946	.030497	-.032607	.088499	.101205	.110443	.049588	.088810	.094098	.916	.3618
RADVISE	.012755	.030807	-.048412	.073922	.044248	.106871	-.020784	.040126	.042665	.414	.6798
RBASE	-.031642	.086584	-.203557	.140273	-.037215	.101833	-.034417	-.035418	-.037666	-.365	.7156
(Constant)	1.096434	.457529	.187999	2.004868						2.398	.0185

End Block Number   7   All requested variables entered.

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:37:55     NORTH TEXAS STATE UNIVERSITY    NAS/8083          MVS/SP

                              * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG OF RETURN ON INVESTMENT

Beginning Block Number  8.  Method:  Enter      RTANG

Variable(s) Entered on Step Number  8..     RTANG      SAFETY NET SUPPORT

Multiple R           .34224                                        Analysis of Variance
R Square             .11713      R Square Change     .00005                         DF       Sum of Squares       Mean Square
Adjusted R Square    .04118      F Change            .00521        Regression        8              7.33112            .91639
Standard Error       .77084      Signif F Change     .9426         Residual         93             55.25956            .59419

                                                                   F =       1.54225        Signif F =  .1534
```

-- Variables in the Equation --

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.017599	.186138	-.387232	.352034	-.009758	.103201	-.019948	-.009212	-.009804	-.095	.9249
EXP	.054507	.040412	-.025744	.134758	.136528	.101223	.131822	.131416	.138513	1.349	.1807
LMOSOP	.525085	.237246	.053962	.996208	.222088	.100345	.237397	.215645	.223688	2.213	.0293
LLOC	-.635644	.320502	-1.272097	8.08683E-04	-.205248	.103489	-.197255	-.193237	-.201441	-1.983	.0503
RASSIST	.027285	.032001	-.036262	.090831	.098809	.115887	.049588	.083074	.088070	.853	.3961
RADVISE	.011843	.033450	-.054582	.078267	.041083	.116040	-.020784	.034495	.036688	.354	.7241
RBASE	-.033738	.091761	-.215957	.148481	-.039680	.107922	-.034417	-.035824	-.038098	-.368	.7140
RTANG	-.003996	.055348	-.113907	.105915	-.008188	.113424	-.038494	-.007034	-.007488	-.072	.9426
(Constant)	1.090674	.466839	.163625	2.017723						2.336	.0216

End Block Number   8   All requested variables entered.

09 NOV 87 SPSS-X RELEASE 2.2 FOR IBM/MVS
11:37:55 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG OF RETURN ON INVESTMENT

Beginning Block Number 9. Method: Enter CEP

Variable(s) Entered on Step Number 9.. CEP COLLEGE MAJOR X EXP FACTOR

Multiple R	.34268		
R Square	.11743	R Square Change	.00030
Adjusted R Square	.03109	F Change	.03178
Standard Error	.77488	Signif F Change	.8589

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	9	7.35020	.81669
Residual	92	55.24047	.60044

F = 1.36015 Signif F = .2178

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.023875	.190397	-.402019	.354270	-.013237	.105562	-.019948	-.012282	-.013072	-.125	.9005
EXP	.050036	.047742	-.044784	.144856	.125329	.119583	.131822	.102651	.108620	1.048	.2974
LMOSOP	.523841	.238593	.049976	.997706	.221562	.100914	.237397	.215041	.223130	2.196	.0306
LLOC	-.823206	.329651	-1.277920	.031508	-.201232	.106444	-.197255	-.185165	-.193378	-1.891	.0618
RASSIST	.027199	.032172	-.036697	.091096	.098499	.116508	.049588	.082805	.087801	.845	.4001
RADVISE	.011477	.033688	-.055430	.078384	.039814	.116866	-.020784	.033368	.035498	.341	.7341
RBASE	-.034832	.092446	-.218438	.148774	-.040967	.108728	-.034417	-.036904	-.039252	-.377	.7072
RTANG	-.003469	.055717	-.114128	.107190	-.007109	.114179	-.038494	-.006098	-.006491	-.062	.9505
CEP	.015997	.089729	-.162213	.194208	.021993	.123367	.118906	.017481	.018583	.178	.8589
(Constant)	1.083621	.470953	.148268	2.018973						2.301	.0237

End Block Number 9 All requested variables entered.

09 NOV 87 SPSS-X RELEASE 2.2 FOR IBM/MVS
11:37:58 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG OF RETURN ON INVESTMENT

Beginning Block Number 10. Method: Enter ELRAD ELRAS ELRTV ELRBS

Variable(s) Entered on Step Number
10.. ELRTV LOG LOC X SAFETY NET FACTOR
11.. ELRAD LOG LOC X GENL ADVICE FACTOR
12.. ELRBS LOG LOC X FRIENDSHIP FACTOR
13.. ELRAS LOG LOC X COACHING FACTOR

Multiple R	.41946		
R Square	.17595	R Square Change	.05851
Adjusted R Square	.05421	F Change	1.56219
Standard Error	.76558	Signif F Change	.1915

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	13	11.01270	.84713
Residual	88	51.57798	.58611

F = 1.44534 Signif F = .1551

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.049081	.191659	-.429942	.331821	-.027201	.106262	-.019948	-.024771	-.027277	-.256	.7988
EXP	.048369	.047375	-.045779	.142516	.121152	.118663	.131822	.098799	.108198	1.021	.3101
LMOSOP	.452867	.243277	-.030596	.936329	.191543	.102896	.237397	.180138	.194644	1.862	.0660
LLOC	-.723297	.334023	-1.387098	-.059497	-.233551	.107855	-.197255	-.209544	-.224919	-2.165	.0331
RASSIST	.240142	.095473	.050411	.429874	.869653	.345745	.049588	.243403	.258984	2.515	.0137
RADVISE	.064705	.071052	-.076496	.205906	.224467	.246486	-.020784	.088125	.096624	.911	.3650
RBASE	.029125	.198431	-.365216	.423465	.034254	.233378	-.034417	.014203	.015644	.147	.8836
RTANG	.021746	.110330	-.197511	.241004	.044564	.226096	-.038494	.019073	.021007	.197	.8442
CEP	.044564	.090253	-.134795	.223923	.061271	.124088	.118906	.047781	.052563	.494	.6227
ELRTV	.002297	.149702	-.295204	.299798	.003420	.222887	-.022009	.001485	.001638	.015	.9878
ELRAD	-.055747	.095172	-.244881	.133387	-.136249	.232608	.001679	-.056682	-.062319	-.588	.5595
ELRBS	-.088113	.289513	-.663458	.487233	-.068418	.224794	.006184	-.029451	-.032427	-.304	.7618
ELRAS	-.291189	.123068	-.535761	-.046618	-.782677	.330790	-.032927	-.228963	-.244566	-2.366	.0202
(Constant)	1.325881	.479788	.372387	2.279335						2.763	.0070

End Block Number 10 All requested variables entered.

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. LTROI LOG OF RETURN ON INVESTMENT

Beginning Block Number 11. Method: Enter EADV EASS ETAN ERBS

Variable(s) Entered on Step Number 14.. ETAN EXP X SAFETY NET FACTOR
15.. EASS EXPERIENCE X COACHING FACTOR
16.. ERBS EXP X FRIENDSHIP FACTOR
17.. EADV EXPERIENCE X GENL ADVICE FACTOR

Multiple R	.46538		
R Square	.21656	R Square Change	.04081
Adjusted R Square	.05801	F Change	1.08887
Standard Error	.76404	Signif F Change	.3675

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	17	13.55478	.79734
Residual	84	49.03590	.58378

F = 1.36587 Signif F = .1748

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.009891	.194278	-.396235	.376452	-.005484	.107714	-.019948	-.004817	-.005555	-.051	.9595
EXP	.058643	.048858	-.038516	.155802	.146888	.122377	.131822	.115917	.129853	1.200	.2334
LMOSOP	.427338	.245600	-.061065	.915741	.180745	.103878	.237397	.168037	.186515	1.740	.0855
LLOC	-.720673	.342229	-1.401233	-.040113	-.232704	.110505	-.197255	-.203369	-.223929	-2.108	.0382
RASSIST	.278470	.098246	.083097	.473842	1.008452	.355788	.049588	.273732	.295454	2.834	.0057
RADVISE	.044042	.076448	-.107980	.196063	.152784	.265198	-.020784	.055638	.062735	.576	.5661
RBASE	-.123616	.213091	-.547370	.300138	-.145387	.250620	-.034417	-.056024	-.063169	-.580	.5634
RTANG	.012585	.111230	-.208608	.233778	.025790	.227940	-.038494	.010927	.012344	.113	.9102
CEP	.085608	.097573	-.108425	.279642	.117702	.134152	.118908	.084733	.095294	.877	.3828
ELRIV	-.013364	.150947	-.313539	.286811	-.019897	.224741	-.022009	-.008550	-.009659	-.089	.9297
ELRAD	-.037102	.096979	-.229954	.155751	-.090679	.237024	.001679	-.036947	-.041706	-.383	.7030
ELRBS	.047019	.297096	-.543788	.637825	.036508	.230682	.006184	.015284	.017265	.158	.8746
ELRAS	-.331765	.126888	-.584091	-.079439	-.891739	.341051	-.032927	-.252511	-.274339	-2.615	.0106
ETAN	-.008022	.031321	-.070307	.054263	-.028770	.112325	.043624	-.024735	-.027935	-.256	.7985
EASS	-.005807	.017264	-.040138	.028524	-.042173	.125375	-.024041	-.032485	-.036877	-.336	.7374
ERBS	-.117168	.064028	-.244494	.010159	-.240157	.131237	-.062782	-.176727	-.195799	-1.830	.0708
EADV	-.023677	.022867	-.069151	.021797	-.142208	.137344	.008918	-.099995	-.112259	-1.035	.3034
(Constant)	1.397788	.495042	.413353	2.382243						2.824	.0059

End Block Number 11 All requested variables entered.

09 NOV 87 SPSS-X RELEASE 2.2 FOR IBM/MVS
11:37:56 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG OF RETURN ON INVESTMENT

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl	
1	.0199	.0004	-.0098	.040	.842	.0004	.040	.842	In:	COLM	-.0199	-.0199	BUSINESS-RELATED COLLEGE MAJ
2	.1370	.0188	-.0011	.948	.392	.0184	1.852	.177	In:	EXP	.1366	.1318	EXPERIENCE FACTOR
3	.2687	.0722	.0438	2.542	.061	.0534	5.645	.019	In:	LMOSOP	.2342	.2374	LOG MONTHS IN OPERATION
4	.3257	.1061	.0692	2.878	.027	.0339	3.677	.058	In:	LLOC	-.1854	-.1973	LOG LOCUS OF CONTROL
5	.3372	.1137	.0675	2.463	.038	.0076	.823	.367	In:	RASSIST	.0904	.0496	KNOWLEDGE-BASED COACHING
6	.3403	.1158	.0600	2.074	.063	.0021	.229	.633	In:	RADVISE	.0503	-.0208	GENERAL ADVICE AND ASSISTANCE
7	.3422	.1171	.0513	1.781	.100	.0013	.134	.716	In:	RBASE	-.0372	-.0344	COUNSELLING AND FRIENDSHIP
8	.3422	.1171	.0412	1.542	.153	.0000	.005	.943	In:	RTANG	-.0082	-.0385	SAFETY NET SUPPORT
9	.3427	.1174	.0311	1.360	.216	.0003	.032	.859	In:	CEP	.0220	.1189	COLLEGE MAJOR X EXP FACTOR
10									In:	ELRTV	.1386	-.0220	LOG LOC X SAFETY NET FACTOR
11									In:	ELRAD	.0659	.0017	LOG LOC X GENL ADVICE FACTOR
12									In:	ELRBS	.0744	.0062	LOG LOC X FRIENDSHIP FACTOR
13	.4195	.1759	.0542	1.445	.155	.0585	1.562	.191	In:	ELRAS	-.7827	-.0329	LOG LOC X COACHING FACTOR
14									In:	ETAN	.0604	.0436	EXP X SAFETY NET FACTOR
15									In:	EASS	.0708	-.0240	EXPERIENCE X COACHING FACTOR
16									In:	ERBS	-.1964	-.0628	EXP X FRIENDSHIP FACTOR
17	.4654	.2186	.0580	1.366	.175	.0408	1.089	.367	In:	EADV	-.1422	.0089	EXPERIENCE X GENL ADVICE FACT

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:38:01     NORTH TEXAS STATE UNIVERSITY    NAS/8083          MVS/SP

                              * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI    LOG OF RETURN ON INVESTMENT

Residuals Statistics:

                    Min          Max      Mean   Std Dev     N

*PRED             .2686       2.8385    1.4723     .3683   102
*RESID          -1.9404       1.2507     .0000     .8968   102
*ZPRED          -3.2857       3.1835     .0000    1.0000   102
*ZRESID         -2.5396       1.6369     .0000     .9120   102

Total Cases =       102

Durbin-Watson Test =    1.85335

                              * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

  - - - - - - - - - - - - - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S

               FRED         BING

  FRED        1.0000       -.1417
             (    0)      (  102)
             P= .         P= .156

  BING        -.1417       1.0000
             (  102)      (    0)
             P= .156      P= .

  (COEFFICIENT / (CASES) / 2-TAILED SIG)
```

APPENDIX D_2

SET 2: REGRESSION HIERARCHY

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:39:47     NORTH TEXAS STATE UNIVERSITY    NAS/8083          MVS/SP

For MVS/SP              NORTH TEXAS STATE UNIVERSITY        License Number 839

Use INFO OVERVIEW for more information on:

* INCLUDE - To bring in command files             * Improvements in:
* RENAME VARS - To rename variables               *   MANOVA
* AUTORECODE - To recode strings as numbers       *   TABLES
* DROP DOCUMENTS                                  *

  1  0  DATA LIST RECORDS = 2
  2  0      /1 ID 1-3 SBUS 5 OWN 7 LIF 9 BEX 11 BSKL 13 SPO 15 MPAR 17
  3  0       FPAR 19 SIBC 21 MFR 23 FFR 25 YKN 27-28 STAD 30 PAD 32
  4  0       STAS 34 PAS 36 INTR 38 HTO 40 STRT 42 ESPT 44 FSPT 46
  5  0       PSPT 48
  6  0      /2 MOSOP 5-7 AGE 9-10 LOC 12-13 ROI 15-17 SATIS 19
  7  0         FINSAT 21 MGT 23 FLDEX 25-26 BUSEX 28-29 COLM 31
  8  0                OSHP 33-34 CONT 36 TBUS 38 SOS 40

THE ABOVE DATA LIST STATEMENT WILL READ   2 RECORDS FROM FILE INLINE  .
```

VARIABLE	REC	START	END	FORMAT	WIDTH	DEC
ID	1	1	3	F	3	0
SBUS	1	5	5	F	1	0
OWN	1	7	7	F	1	0
LIF	1	9	9	F	1	0
BEX	1	11	11	F	1	0
BSKL	1	13	13	F	1	0
SPO	1	15	15	F	1	0
MPAR	1	17	17	F	1	0
FPAR	1	19	19	F	1	0
SIBC	1	21	21	F	1	0
MFR	1	23	23	F	1	0
FFR	1	25	25	F	1	0
YKN	1	27	28	F	2	0
STAD	1	30	30	F	1	0
PAD	1	32	32	F	1	0
STAS	1	34	34	F	1	0
PAS	1	36	36	F	1	0
INTR	1	38	38	F	1	0
HTO	1	40	40	F	1	0
STRT	1	42	42	F	1	0
ESPT	1	44	44	F	1	0
FSPT	1	46	46	F	1	0
PSPT	1	48	48	F	1	0
MOSOP	2	5	7	F	3	0
AGE	2	9	10	F	2	0
LOC	2	12	13	F	2	0
ROI	2	15	17	F	3	0
SATIS	2	19	19	F	1	0
FINSAT	2	21	21	F	1	0
MGT	2	23	23	F	1	0
FLDEX	2	25	26	F	2	0

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:39:52     NORTH TEXAS STATE UNIVERSITY    NAS/8083          MVS/SP

             BUSEX        2       28      29         F             2    0
             COLM         2       31      31         F             1    0
             OSHP         2       33      34         F             2    0
             CONT         2       36      36         F             1    0
             TBUS         2       38      38         F             1    0
             SOS          2       40      40         F             1    0

END OF DATALIST TABLE.

   9   0   VARIABLE LABELS
  10   0         ID "ORDER OF RECEIPT"
  11   0         SBUS "IN A SIMILAR BUSINESS"
  12   0         OWN "SMALL BUSINESS OWNER"
  13   0         LIF "GENERAL LIFE EXPERIENCE"
  14   0         BEX "GENERAL BUSINESS EXPERIENCE"
  15   0         BSKL "SPECIFIC BUSINESS SKILLS YOU LACK YOURSELF"
  16   0         SPO "SPOUSE"
  17   0         MPAR "MALE PARENT"
  18   0         FPAR "FEMALE PARENT"
  19   0         SIBC "SIBLING OR CHILD"
  20   0         MFR "MALE FRIEND"
  21   0         FFR "FEMALE FRIEND"
  22   0         YKN "YEARS KNOWN"
  23   0         STAD "START UP ADVICE"
  24   0         PAD "POST START UP ADVICE"
  25   0         STAS "START UP ASSISTANCE"
  26   0         PAS "POST START UP ASSSTANCE"
  27   0         INTR "INTRODUCTION TO BUSINESS CONTACTS"
  28   0         HTO "DETAILED HOW-TO ADVICE"
  29   0         STRT "LONG RANGE STRATEGIC ADVICE"
  30   0         ESPT "EMOTIONAL SUPPORT"
  31   0         FSPT "FINANCIAL SUPPORT"
  32   0         PSPT "PHYSICAL SUPPORT"
  33   0         MOSOP "MONTHS IN OPERATION"
  34   0         AGE "AGE OF RESPONDENT"
  35   0         LOC "LOCUS OF CONTROL"
  36   0         ROI "RETURN ON INVESTMENT"
  37   0         SATIS "PERSONAL BUSINESS SATISFACTION"
  38   0         FINSAT "ATTAINMENT OF FINANCIAL GOALS"
  39   0         MGT "MANAGEMENT EXPERIENCE"
  40   0         FLDEX "PRIOR EXPERIENCE IN VENTURE FIELD"
  41   0         BUSEX "PRIOR EXPERIENCE IN BUSINESS"
  42   0         COLM "BUSINESS-RELATED COLLEGE MAJ"
  43   0         OSHP "TYPE LEGAL CONFIGURATION"
  44   0         CONT "NUMBER OF BUSINESSES IN OPERATION"
  45   0         TBUS "TYPE OF BUSINESS: SERVICE,ETC."
  46   0         SOS "NUMBER OF SIGNIFICANT OTHERS"
  47   0   MISSING VALUES LIF (9) YKN (99) MOSOP (99) LOC (9) MGT (9) COLM (9)
  48   0         FLDEX (99) BUSEX (99) STAD (9) STAS (9) PAS (9)
  49   0   BEGIN DATA
```

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11.40:00     NORTH TEXAS STATE UNIVERSITY   NAS/8083         MVS/SP

PRECEDING TASK REQUIRED        0.09 SECONDS CPU TIME;       5.11 SECONDS ELAPSED.

  50  0  FACTOR VARIABLES = OWN BSKL STAD TO STRT PSPT FSPT SDS/
  51  0      MISSING = MEANSUB/
  52  0      EXTRACTION = PAI/
  53  0      FORMAT = SORT BLANK(.4)/
  54  0      PRINT = ALL/
  55  0      ROTATION = VARIMAX/

THERE ARE   222152 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   222152 BYTES.

>NOTE    11284
>Since the ANALYSIS subcommand is not used, all variables on the VARIABLES
>subcommand will be used for the first analysis.

THIS FACTOR ANALYSIS REQUIRES      18696 (      18.3K) BYTES OF MEMORY.
```

- - - - - - - - - - - - F A C T O R   A N A L Y S I S - - - - - - - - - - - -

ANALYSIS NUMBER 1 REPLACEMENT OF MISSING VALUES WITH THE MEAN

	MEAN	STD DEV	CASES	LABEL
OWN	.51961	.50208	102	SMALL BUSINESS OWNER
BSKL	.71569	.45331	102	SPECIFIC BUSINESS SKILLS YOU LACK YOURSE
STAD	3.67327	1.14415	101	START UP ADVICE
PAD	3.80392	.95481	102	POST START UP ADVICE
STAS	3.73000	1.33391	100	START UP ASSISTANCE
PAS	3.78218	1.13978	101	POST START UP ASSSTANCE
INTR	2.65686	1.27811	102	INTRODUCTION TO BUSINESS CONTACTS
HTO	3.12745	1.26391	102	DETAILED HOW-TO ADVICE
STRT	3.32353	1.11836	102	LONG RANGE STRATEGIC ADVICE
PSPT	2.84314	1.68126	102	PHYSICAL SUPPORT
FSPT	2.67647	1.52965	102	FINANCIAL SUPPORT
SOS	1.91176	1.10895	102	NUMBER OF SIGNIFICANT OTHERS

CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT	PSPT	FSPT	SOS
OWN	1.00000											
BSKL	.22049	1.00000										
STAD	.24112	.20091	1.00000									
PAD	.17332	.21305	.75645	1.00000								
STAS	.19677	.21564	.55371	.48516	1.00000							
PAS	.23434	.26221	.38261	.42832	.65514	1.00000						
INTR	.14173	.27426	.26787	.19583	.22434	.13465	1.00000					
HTO	.23786	.25396	.30980	.36550	.14282	.30425	.29089	1.00000				
STRT	.22663	.24182	.35946	.36598	.17734	.16796	.29316	.46086	1.00000			
PSPT	-.00805	.18773	.01763	.09167	.32970	.29830	.23273	.10735	-.00960	1.00000		
FSPT	.13081	.15161	.27082	.33576	.44463	.41597	.26677	.27760	.18912	.64611	1.00000	
SOS	.15429	.20564	.16958	.12376	.03547	.08648	.17402	.14232	.11108	-.03405	-.03451	1.00000

DETERMINANT OF CORRELATION MATRIX = .0184811

INVERSE OF CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	1.17421								

- F A C T O R   A N A L Y S I S -

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
BSKL	-.14680	1.25038							
STAD	-.17185	.03369	2.84715						
PAD	.16360	-.07904	-1.73200	2.64795					
STAS	-.05199	-.02674	-.95431	-.00844	2.49350				
PAS	-.14732	-.16803	.25529	-.30062	-1.18688	2.06155			
INTR	-.00819	-.18342	-.25461	.17608	-.14462	.20278	1.30633		
HTO	-.11928	-.09247	-.06007	-.24665	.44880	-.39463	-.19621	1.55042	
STRT	-.10364	-.14211	-.13167	-.19668	-.02022	.12366	-.19363	-.46391	1.45643
PSPT	.16996	-.24118	.43330	.06244	-.31650	-.05485	-.20996	.01947	.21545
FSPT	-.11356	.18076	-.05756	-.28222	-.21585	-.18874	-.10794	-.21115	-.13909
SOS	-.09572	-.15605	-.17384	.00201	.13590	-.08622	-.14081	-.04527	.02241

	PSPT	FSPT	SOS
PSPT	2.00984		
FSPT	-1.24938	2.19828	
SOS	-.00670	.14661	1.11201

KAISER-MEYER-OLKIN MEASURE OF SAMPLING ADEQUACY = .75043

BARTLETT TEST OF SPHERICITY = 371.82886, SIGNIFICANCE = .00000

THERE ARE 28 (21.2%) OFF-DIAGONAL ELEMENTS OF AIC MATRIX > 0.09

ANTI-IMAGE COVARIANCE MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	.85163								
BSKL	-.09998	.79976							
STAD	-.04966	.00914	.33931						
PAD	.05262	-.02387	-.22194	.37765					
STAS	-.01776	-.00858	-.12986	-.00128	.40104				
PAS	-.06086	-.06518	.04202	-.05507	-.23089	.48507			
INTR	-.00534	-.11229	-.06613	.05090	-.04440	.07530	.76550		
HTO	-.06552	-.04770	-.01315	-.06008	.11609	-.12347	-.09688	.64498	
STRT	-.06061	-.07803	-.03068	-.05100	-.00557	.04119	-.10177	-.20544	.68661
PSPT	.07202	-.09597	.07315	.01173	-.06315	-.01324	-.07997	.00625	.07360
FSPT	-.04399	.06576	-.00888	-.04848	-.03938	-.04165	-.03759	-.06195	-.04344
SOS	-.07331	-.11223	-.05304	.00068	.04901	-.03761	-.09693	-.02626	.01384

- F A C T O R   A N A L Y S I S -

	PSPT	FSPT	SOS
PSPT	.49755		
FSPT	-.28278	.45490	
SOS	-.00300	.05998	.89927

ANTI-IMAGE CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT	PSPT	FSPT	SOS
OWN	.83296											
BSKL	-.12115	.82452										
STAD	-.09238	.01755	.72045									
PAD	.09278	-.04344	-.62000	.76648								
STAS	-.03039	-.01514	-.35203	-.00328	.74841							
PAS	-.09469	-.10466	.10357	-.12867	-.52349	.76250						
INTR	-.00661	-.14351	-.12976	.09468	-.08013	.12357	.80935					
HTO	-.08840	-.06641	-.02810	-.12173	.22826	-.22073	-.13787	.77160				
STRT	-.07926	-.10530	-.06355	-.10015	-.01061	.07137	-.14038	-.30872	.81757			
PSPT	.11063	-.15214	.17803	.02706	-.14138	-.02695	-.12958	.01103	.12593	.60472		
FSPT	-.07068	.10903	-.02261	-.11697	-.09219	-.08866	-.06369	-.11437	-.07773	-.59439	.73490	
SOS	-.08377	-.13234	-.09603	.00117	.08161	-.05694	-.11683	-.03448	.01761	-.00448	.09377	.73141

MEASURES OF SAMPLING ADEQUACY (MSA) ARE PRINTED ON THE DIAGONAL.

1-TAILED SIG. OF CORRELATION MATRIX:

' . ' IS PRINTED FOR DIAGONAL ELEMENTS.

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	.								
BSKL	.01298	.							
STAD	.00732	.02144	.						
PAD	.04074	.01578	.00000	.					
STAS	.02373	.01475	.00000	.00000	.				
PAS	.00888	.00388	.00004	.00000	.00000	.			
INTR	.07768	.00264	.00338	.02427	.01242	.08971	.		
HTO	.00804	.00500	.00081	.00008	.07816	.00099	.00151	.	
STRT	.01099	.00717	.00011	.00008	.03877	.04658	.00139	.00000	.
PSPT	.46800	.02941	.43053	.17975	.00040	.00122	.00929	.14143	.46185
FSPT	.09501	.06412	.00308	.00028	.00000	.00001	.00336	.00237	.02847
SOS	.06077	.01906	.04500	.10762	.36302	.19493	.04012	.07680	.13322

- F A C T O R   A N A L Y S I S -

	PSPT	FSPT	SOS
PSPT			
FSPT	.00000		
SOS	.36702	.36531	

EXTRACTION 1 FOR ANALYSIS 1, PRINCIPAL-COMPONENTS ANALYSIS (PC)

INITIAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
OWN	1.00000	*	1	3.90106	32.5	32.5
BSKL	1.00000	*	2	1.62001	13.5	46.0
STAD	1.00000	*	3	1.25766	10.5	56.5
PAD	1.00000	*	4	1.00858	8.4	64.9
STAS	1.00000	*	5	.88558	7.4	72.3
PAS	1.00000	*	6	.73634	6.1	78.4
INTR	1.00000	*	7	.72098	6.0	84.4
HTO	1.00000	*	8	.57521	4.8	89.2
SIRT	1.00000	*	9	.52138	4.3	93.6
PSPT	1.00000	*	10	.29617	2.5	96.0
FSPT	1.00000	*	11	.27953	2.3	98.4
SOS	1.00000	*	12	.19750	1.6	100.0

PC EXTRACTED 4 FACTORS.

FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
PAD	.73783		-.40960	
STAD	.73184		-.42910	
STAS	.72374			
PAS	.69390			
FSPT	.62724	-.55023		
HTO	.57056			
SIRT	.52542	.43447		-.44170
BSKL	.46567		.40781	
OWN				
PSPT	.40559	-.72044		

- F A C T O R   A N A L Y S I S -

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
INTR	.48280		.48692	
SOS		.41262		.58550

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
OWN	.34749	*	1	3.90106	32.5	32.5
BSKL	.51201	*	2	1.62001	13.5	46.0
STAD	.78095	*	3	1.25766	10.5	56.5
PAD	.75758	*	4	1.00858	8.4	64.9
STAS	.76829	*				
PAS	.65285	*				
INTR	.49306	*				
HTO	.60893	*				
STRT	.68550	*				
PSPT	.82271	*				
FSPT	.75318	*				
SOS	.60477	*				

REPRODUCED CORRELATION MATRIX:

	OWN	BSKL	STAD	PAD	STAS	PAS	INTR	HTO	STRT
OWN	.34749*	-.14887	-.06797	-.08982	-.03252	-.02435	-.08308	.00776	.00954
BSKL	.36737	.51201*	.01171	.05397	-.00510	-.01844	-.12122	-.04786	.01133
STAD	.30910	.18921	.78095*	-.00563	-.04248	-.14847	.09758	-.08038	-.08020
PAD	.26314	.15908	.76209	.75758*	-.11246	-.09831	.00836	-.04306	-.08704
STAS	.22929	.22075	.59619	.59762	.76829*	-.04492	.09172	-.02045	.06952
PAS	.25870	.28065	.53107	.52663	.70005	.65285*	-.04205	.12811	.05841
INTR	.22481	.39548	.17029	.18748	.13262	.17670	.49306*	-.18309	-.13063
HTO	.23010	.30182	.39018	.40856	.16328	.17614	.47398	.60893*	-.16637
STRT	.21709	.23050	.43966	.45301	.10782	.11155	.42380	.62723	.68550*
PSPT	-.01664	.23471	-.03934	.02460	.37861	.37789	.31530	.11625	-.04190
FSPT	.05075	.22617	.25742	.32119	.52303	.49080	.36015	.29981	.19110
SOS	.40795	.45398	.13164	.05549	.06845	.14117	.19664	.11564	.08730

- F A C T O R   A N A L Y S I S -

	PSPT	FSPT	SOS
OWN	.00859	.08006	-.25366
BSKL	-.04698	-.07456	-.24833
STAD	.05697	.01340	.03795
PAD	.06707	.01457	.06827
STAS	-.04891	-.07840	-.03297
PAS	-.07960	-.07483	-.05469
INTR	-.08257	-.09338	-.02261
HTO	-.00890	-.02221	.02668
STRT	.03230	-.00198	.02376
PSPT	.82271*	-.06830	.07558
FSPT	.71441	.75318*	.10246
SOS	-.10963	-.13697	.60477*

THE LOWER LEFT TRIANGLE CONTAINS THE REPRODUCED CORRELATION MATRIX; THE DIAGONAL, COMMUNALITIES; AND THE UPPER RIGHT TRIANGLE, RESIDUALS BETWEEN THE OBSERVED CORRELATIONS AND THE REPRODUCED CORRELATIONS.

THERE ARE 36 (54.0%) RESIDUALS (ABOVE DIAGONAL) THAT ARE > 0.05

VARIMAX ROTATION 1 FOR EXTRACTION 1 IN ANALYSIS 1 - KAISER NORMALIZATION.

VARIMAX CONVERGED IN 9 ITERATIONS.

ROTATED FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
STAD	.80823			
PAD	.79076			
STAS	.77532			
PAS	.67134			
PSPT		.90627		
FSPT		.77585		
STRT			.79627	
HTO			.73654	
INTR			.53050	
SOS				.76621
BSKL				.62720
OWN				.51481

- F A C T O R   A N A L Y S I S -

FACTOR TRANSFORMATION MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	.70384	.41542	.47612	.32458
FACTOR 2	-.01747	-.79875	.45331	.39522
FACTOR 3	-.70266	.43519	.36954	.42463
FACTOR 4	.10284	-.00529	-.65670	.74709

FACTOR SCORE COEFFICIENT MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
OWN	.04617	-.07285	-.03980	.36412
BSKL	-.11215	.11542	.00584	.45468
STAD	.36507	-.19075	.05758	-.05400
PAD	.34685	-.14554	.10181	-.13247
STAS	.34524	.10274	-.22719	.02471
PAS	.27501	.11823	-.21257	.11216
INTR	-.19857	.17833	.30713	.13313
HTO	-.08443	.00873	.46127	-.05413
STRT	-.04425	-.10063	.52028	-.12349
PSPT	-.12710	.52747	-.04489	-.01331
FSPT	.00606	.39852	.08089	-.14647
SOS	-.04920	-.09438	-.15058	.62425

COVARIANCE MATRIX FOR ESTIMATED REGRESSION FACTOR SCORES:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	1.00000			
FACTOR 2	.00000	1.00000		
FACTOR 3	.00000	.00000	1.00000	
FACTOR 4	.00000	.00000	.00000	1.00000

```
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NUMBER OF VALID OBSERVATIONS (LISTWISE) = 75.00

VARIABLE	MEAN	STD DEV	MINIMUM	MAXIMUM	VALID N	LABEL
ID	61.088	33.104	3	117	102	ORDER OF RECEIPT
SBUS	.382	.488	0	1	102	IN A SIMILAR BUSINESS
OWN	.520	.502	0	1	102	SMALL BUSINESS OWNER
LIF	.881	.325	0	1	101	GENERAL LIFE EXPERIENCE
BEX	.696	.462	0	1	102	GENERAL BUSINESS EXPERIENCE
BSKL	.716	.453	0	1	102	SPECIFIC BUSINESS SKILLS YOU LACK YOURSE
SPO	.431	.498	0	1	102	SPOUSE
MPAR	.069	.254	0	1	102	MALE PARENT
FPAR	.069	.254	0	1	102	FEMALE PARENT
SIBC	.049	.217	0	1	102	SIBLING OR CHILD
MFR	.216	.413	0	1	102	MALE FRIEND
FFR	.127	.335	0	1	102	FEMALE FRIEND
YKN	17.379	12.351	1	45	95	YEARS KNOWN
STAD	3.673	1.150	1	5	101	START UP ADVICE
PAD	3.804	.955	1	5	102	POST START UP ADVICE
STAS	3.730	1.347	1	5	100	START UP ASSISTANCE
PAS	3.782	1.145	1	5	101	POST START UP ASSSTANCE
INTR	2.657	1.278	1	5	102	INTRODUCTION TO BUSINESS CONTACTS
HTO	3.127	1.264	1	5	102	DETAILED HOW-TO ADVICE
STRT	3.324	1.118	1	5	102	LONG RANGE STRATEGIC ADVICE
ESPT	4.539	.875	1	5	102	EMOTIONAL SUPPORT
FSPT	2.676	1.530	1	5	102	FINANCIAL SUPPORT
PSPT	2.843	1.681	1	5	102	PHYSICAL SUPPORT
MOSOP	50.961	47.037	12	240	102	MONTHS IN OPERATION
AGE	41.716	8.590	27	66	102	AGE OF RESPONDENT
LOC	5.891	3.385	1	19	92	LOCUS OF CONTROL
ROI	83.382	127.197	0	750	102	RETURN ON INVESTMENT
SATIS	4.480	.754	2	5	102	PERSONAL BUSINESS SATISFACTION
FINSAT	3.814	1.106	1	5	102	ATTAINMENT OF FINANCIAL GOALS
MGT	.634	.484	0	1	101	MANAGEMENT EXPERIENCE
FLDEX	2.753	3.849	0	10	97	PRIOR EXPERIENCE IN VENTURE FIELD
BUSEX	2.330	3.579	0	10	97	PRIOR EXPERIENCE IN BUSINESS
COLM	.260	.441	0	1	100	BUSINESS-RELATED COLLEGE MAJ
OSHP	2.853	4.429	0	10	102	TYPE LEGAL CONFIGURATION
CONT	.186	.391	0	1	102	NUMBER OF BUSINESSES IN OPERATION
TBUS	.745	.438	0	1	102	TYPE OF BUSINESS; SERVICE,ETC.
SOS	1.912	1.109	1	8	102	NUMBER OF SIGNIFICANT OTHERS

```
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PRECEDING TASK REQUIRED       0.65 SECONDS CPU TIME;     156.29 SECONDS ELAPSED.

  58  0  COMPUTE ADVISE = ZSTAD + ZSTAS + ZPAD + ZPAS
  59  0  COMPUTE ASSIST = ZPSPT + ZFSPT
  60  0  COMPUTE TANG = ZSTRT + ZHTD + ZINTR
  61  0  COMPUTE BASE = ZSOS + ZBSKL + ZOWN
  62  0  COMPUTE TROI = ROI + .5
  63  0  COMPUTE LTROI = LG10(TROI)
  64  0  COMPUTE RTROI = SQRT(ROI)
  65  0  REGRESSION DESCRIPTIVES/
  66  0         VARIABLES = ADVISE ASSIST TANG BASE/
  67  0         MISSING = MEANSUB/
  68  0         STATISTICS = R ANOVA COEFF ZPP CHA CI SES LABEL HISTORY/
  69  0         DEP = ADVISE/
  70  0         ENTER ASSIST/
  71  0         ENTER TANG/
  72  0         ENTER BASE/
  73  0         SAVE RESID(RADVISE)/
  74  0         DEP = ASSIST/
  75  0         ENTER ADVISE/
  76  0         ENTER TANG/
  77  0         ENTER BASE/
  78  0         SAVE RESID(RASSIST)/
  79  0         DEP= TANG/
  80  0         ENTER ADVISE/
  81  0         ENTER ASSIST/
  82  0         ENTER BASE/
  83  0         SAVE RESID(RTANG)/
  84  0         DEP = BASE/
  85  0         ENTER ADVISE/
  86  0         ENTER ASSIST/
  87  0         ENTER TANG/
  88  0         SAVE RESID(RBASE)

THERE ARE   219496 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   215712 BYTES.

     2424 bytes of memory required for REGRESSION procedure.
        0 more bytes may be needed for Residuals plots.
```

```
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                                   * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Mean Substituted for Missing Data

             Mean   Std Dev   Cases   Label

ADVISE       .075     3.176      99
ASSIST       .000     1.814     102
TANG         .000     2.256     102
BASE         .000     2.040     102

N of Cases encountered =     102

Minimum Pairwise N of Cases =     99

Correlation:

                ADVISE      ASSIST        TANG        BASE

ADVISE           1.000        .377        .370        .330
ASSIST            .377       1.000        .260        .106
TANG              .370        .260       1.000        .392
BASE              .330        .106        .392       1.000
```

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**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. ADVISE

Descriptive Statistics are printed on Page 15

Beginning Block Number 1. Method: Enter ASSIST

Variable(s) Entered on Step Number 1.. ASSIST

				Analysis of Variance	DF	Sum of Squares	Mean Square
Multiple R	.37661	R Square Change	.14184	Regression	1	144.49302	144.49302
R Square	.14184	F Change	16.52809	Residual	100	874.22711	8.74227
Adjusted R Square	.13326	Signif F Change	.0001				
Standard Error	2.95673						

F = 16.52809 Signif F = .0001

-- Variables in the Equation --

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ASSIST	.659203	.162146	.337509	.980896	.376614	.092637	.376614	.376614	.376614	4.065	.0001
(Constant)	.075467	.292760	-.505360	.656295						.258	.7971

End Block Number 1 All requested variables entered.

* *

Beginning Block Number 2. Method: Enter TANG

Variable(s) Entered on Step Number 2.. TANG

				Analysis of Variance	DF	Sum of Squares	Mean Square
Multiple R	.47052	R Square Change	.07955	Regression	2	225.53365	112.76683
R Square	.22139	F Change	10.11493	Residual	99	793.18649	8.01198
Adjusted R Square	.20586	Signif F Change	.0020				
Standard Error	2.83054						

F = 14.07477 Signif F = .0000

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. ADVISE

------------------------------ Variables in the Equation ------------------------------

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ASSIST	.526320	.160751	.207356	.845285	.300696	.091840	.376614	.290361	.312574	3.274	.0015
TANG	.411176	.129284	.154648	.667704	.292087	.091840	.370243	.282049	.304466	3.180	.0020
(Constant)	.075467	.280266	-.480640	.631575						.269	.7883

End Block Number 2 All requested variables entered.

* *

Beginning Block Number 3. Method: Enter BASE

Variable(s) Entered on Step Number 3.. BASE

Multiple R	.51105		
R Square	.26117	R Square Change	.03978
Adjusted R Square	.23855	F Change	5.27645
Standard Error	2.77132	Signif F Change	.0237

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	266.05801	88.68600
Residual	98	752.66213	7.68023

F = 11.54732 Signif F = .0000

------------------------------ Variables in the Equation ------------------------------

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ASSIST	.524505	.157390	.212170	.836839	.299659	.089919	.376614	.289356	.319043	3.333	.0012
TANG	.291941	.136809	.020448	.563434	.207387	.097185	.370243	.185285	.210720	2.134	.0353
BASE	.337542	.146945	.045933	.629150	.216796	.094380	.329942	.199448	.226032	2.297	.0237
(Constant)	.075467	.274402	-.469074	.620008						.275	.7839

End Block Number 3 All requested variables entered.

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**** M U L T I P L E R E G R E S S I O N ****

Equation Number 1 Dependent Variable.. ADVISE

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl
1	.3766	.1418	.1333	16.528	.000	.1418	16.528	.000	In:	ASSIST	.3766	.3766
2	.4705	.2214	.2057	14.075	.000	.0796	10.115	.002	In:	TANG	.2921	.3702
3	.5110	.2612	.2386	11.547	.000	.0398	5.276	.024	In:	BASE	.2168	.3299

* *

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	-3.7105	3.8163	.0755	1.6230	102
*RESID	-8.5362	5.2299	.0000	2.7299	102
*ZPRED	-2.3327	2.3049	.0000	1.0000	102
*ZRESID	-3.0802	1.8871	.0000	.9850	102

Total Cases = 102

* *

From Equation 1: 1 new variables have been created.

Name	Contents
RADVISE	Residual

****** M U L T I P L E   R E G R E S S I O N ******

Equation Number 2 Dependent Variable.. ASSIST

Descriptive Statistics are printed on Page 15

Beginning Block Number 1. Method: Enter ADVISE

Variable(s) Entered on Step Number 1.. ADVISE

Multiple R	.37661	R Square Change	.14184
R Square	.14184	F Change	16.52809
Adjusted R Square	.13326	Signif F Change	.0001
Standard Error	1.68923		

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	47.16297	47.16297
Residual	100	285.35044	2.85350

F = 16.52809 Signif F = .0001

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.215166	.052925	.110164	.320168	.376614	.092637	.376614	.376614	.376614	4.065	.0001
(Constant)	-.016238	.167307	-.348169	.315693						-.097	.9229

End Block Number 1 All requested variables entered.

* *

Beginning Block Number 2. Method: Enter TANG

Variable(s) Entered on Step Number 2.. TANG

Multiple R	.39832	R Square Change	.01682
R Square	.15866	F Change	1.97923
Adjusted R Square	.14166	Signif F Change	.1626
Standard Error	1.68102		

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	52.75595	26.37798
Residual	99	279.75748	2.82583

F = 9.33458 Signif F = .0002

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11:43:07 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

*** * * * M U L T I P L E   R E G R E S S I O N * * * ***

Equation Number 2 Dependent Variable.. ASSIST

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.185634	.056697	.073134	.298133	.324922	.099239	.376614	.301832	.312574	3.274	.0015
TANG	.112286	.079813	-.046081	.270652	.139615	.099239	.259915	.129693	.140001	1.407	.1626
(Constant)	-.014009	.166501	-.344383	.316364						-.084	.9331

End Block Number 2 All requested variables entered.

* *

Beginning Block Number 3. Method: Enter BASE

Variable(s) Entered on Step Number 3.. BASE

Multiple R	.40310			
R Square	.16249		R Square Change	.00383
Adjusted R Square	.13685		F Change	.44826
Standard Error	1.68573		Signif F Change	.5047

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	54.02976	18.00992
Residual	98	278.48365	2.84167

F = 6.33779 Signif F = .0006

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.194066	.058234	.078503	.309629	.339682	.101929	.376614	.308074	.319043	3.333	.0012
TANG	.129611	.084116	-.037314	.296537	.161158	.104589	.259915	.142444	.153799	1.541	.1266
BASE	-.061294	.091549	-.242969	.120382	-.068907	.102920	.106331	-.061884	-.067478	-.670	.5047
(Constant)	-.014646	.166970	-.345991	.316700						-.088	.9303

End Block Number 3 All requested variables entered.

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**** M U L T I P L E R E G R E S S I O N ****

Equation Number 2 Dependent Variable.. ASSIST

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl
1	.3766	.1418	.1333	16.528	.000	.1418	16.528	.000	In:	ADVISE	.3766	.3766
2	.3983	.1587	.1417	9.335	.000	.0168	1.979	.163	In:	TANG	.1396	.2599
3	.4031	.1625	.1369	6.338	.001	.0038	.448	.505	In:	BASE	-.0689	.1063

****

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	-2.3452	1.3083	.0000	.7314	102
*RESID	-2.9871	3.5244	.0000	1.6605	102
*ZPRED	-3.2064	1.7888	.0000	1.0000	102
*ZRESID	-1.7720	2.0908	.0000	.9850	102

Total Cases = 102

****

From Equation 2: 1 new variables have been created.

Name	Contents
RASSIST	Residual

```
09 NOV 87   SPSS-X RELEASE 2.2  FOR IBM/MVS
11:43:13    NORTH TEXAS STATE UNIVERSITY   NAS/8083        MVS/SP

                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 3    Dependent Variable..   TANG

 Descriptive Statistics are printed on Page   15

Beginning Block Number  1.  Method:  Enter     'ADVISE

Variable(s) Entered on Step Number  1..    ADVISE

Multiple R            .37024                                  Analysis of Variance
R Square              .13708      R Square Change    .13708                       DF      Sum of Squares     Mean Square
Adjusted R Square     .12845      F Change         15.88553   Regression           1          70.46888        70.46888
Standard Error       2.10619      Signif F Change     .0001   Residual           100         443.60414         4.43604

                                                              F =      15.88553       Signif F =  .0001

------------------------------------------------ Variables in the Equation ------------------------------------------------

Variable            B        SE B     95% Confdnce Intrvl B       Beta    SE Beta  Correl  Part Cor  Partial        T  Sig T

ADVISE         .263009    .065989      .132090     .393929    .370243    .092894  .370243  .370243  .370243    3.986  .0001
(Constant)    -.019849    .208603     -.433712     .394014                                                      -.095  .9244

End Block Number   1   All requested variables entered.

                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Beginning Block Number  2.  Method:  Enter      ASSIST

Variable(s) Entered on Step Number  2..    ASSIST

Multiple R            .39242                                  Analysis of Variance
R Square              .15399      R Square Change    .01691                       DF      Sum of Squares     Mean Square
Adjusted R Square     .13690      F Change          1.97923   Regression           2          79.16370        39.58185
Standard Error       2.09595      Signif F Change     .1626   Residual            99         434.90932         4.39302

                                                              F =       9.01016       Signif F =  .0003
```

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 3 Dependent Variable.. TANG

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.225450	.070887	.084794	.366106	.317370	.099789	.370243	.294002	.304466	3.180	.0020
ASSIST	.174558	.124077	-.071638	.420755	.140389	.099789	.259915	.130052	.140001	1.407	.1628
(Constant)	-.017014	.207599	-.428936	.394908						-.082	.9348

End Block Number 2 All requested variables entered.

* *

Beginning Block Number 3. Method: Enter BASE

Variable(s) Entered on Step Number 3.. BASE

Multiple R	.48706		
R Square	.23723	R Square Change	.08324
Adjusted R Square	.21388	F Change	10.69419
Standard Error	2.00030	Signif F Change	.0015

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	121.95351	40.65117
Residual	98	392.11951	4.00122

F = 10.15970 Signif F = .0000

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.152095	.071274	.010653	.293536	.214106	.100334	.370243	.188263	.210720	2.134	.0353
ASSIST	.182499	.118440	-.052541	.417539	.146776	.095256	.259915	.135940	.153799	1.541	.1266
BASE	.338094	.103386	.132927	.543260	.305687	.093477	.391936	.288508	.313668	3.270	.0015
(Constant)	-.011478	.198133	-.404666	.381709						-.058	.9539

End Block Number 3 All requested variables entered.

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 3 Dependent Variable.. TANG

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl
1	.3702	.1371	.1285	15.886	.000	.1371	15.886	.000	In:	ADVISE	.3702	.3702
2	.3924	.1540	.1369	9.010	.000	.0169	1.979	.163	In:	ASSIST	.1404	.2599
3	.4871	.2372	.2139	10.160	.000	.0832	10.694	.001	In:	BASE	.3057	.3919

* *

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	-3.0511	2.2115	.0000	1.0988	102
*RESID	-4.6547	3.6790	.0000	1.9704	102
*ZPRED	-2.7766	2.0126	.0000	1.0000	102
*ZRESID	-2.3270	1.8392	.0000	.9850	102

Total Cases = 102

* *

From Equation 3: 1 new variables have been created.

Name	Contents
RTANG	Residual

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11:43:23 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

**** MULTIPLE REGRESSION ****

Equation Number 4 Dependent Variable.. BASE

Descriptive Statistics are printed on Page 15

Beginning Block Number 1. Method: Enter ADVISE

Variable(s) Entered on Step Number 1.. ADVISE

Multiple R	.32994		
R Square	.10886	R Square Change	.10886
Adjusted R Square	.09995	F Change	12.21600
Standard Error	1.93519	Signif F Change	.0007

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	45.74862	45.74862
Residual	100	374.49763	3.74498

F = 12.21600 Signif F = .0007

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.211915	.060631	.091624	.332206	.329942	.094400	.329942	.329942	.329942	3.495	.0007
(Constant)	-.015993	.191667	-.396255	.364270						-.083	.9337

End Block Number 1 All requested variables entered.

****

Beginning Block Number 2. Method: Enter ASSIST

Variable(s) Entered on Step Number 2.. ASSIST

Multiple R	.33051		
R Square	.10924	R Square Change	.00037
Adjusted R Square	.09124	F Change	.04163
Standard Error	1.94453	Signif F Change	.8387

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	45.90604	22.95302
Residual	99	374.34021	3.78121

F = 6.07028 Signif F = .0033

**** MULTIPLE REGRESSION ****

Equation Number 4 Dependent Variable.. BASE

------ Variables in the Equation ------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.216969	.065766	.086474	.347463	.337810	.102395	.329942	.312937	.314721	3.299	.0013
ASSIST	-.023488	.115114	-.251898	.204922	-.020893	.102395	.106331	-.019354	-.020502	-.204	.8387
(Constant)	-.016374	.192602	-.398537	.365789						-.085	.9324

End Block Number 2 All requested variables entered.

****

Beginning Block Number 3. Method: Enter TANG

Variable(s) Entered on Step Number 3.. TANG

Multiple R	.44371		
R Square	.19688	R Square Change	.08764
Adjusted R Square	.17229	F Change	10.69419
Standard Error	1.85580	Signif F Change	.0015

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	82.73659	27.57886
Residual	98	337.50967	3.44398

F = 8.00785 Signif F = .0001

------ Variables in the Equation ------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
ADVISE	.151361	.065893	.020597	.282124	.235662	.102593	.329942	.207945	.226032	2.297	.0237
ASSIST	-.074285	.110953	-.294468	.145897	-.066078	.098694	.106331	-.060610	-.067478	-.670	.5047
TANG	.291008	.088988	.114415	.467601	.321859	.098422	.391936	.296041	.313668	3.270	.0015
(Constant)	-.011423	.183818	-.376204	.353358						-.062	.9506

End Block Number 3 All requested variables entered.

```
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11:43:25     NORTH TEXAS STATE UNIVERSITY    NAS/8083          MVS/SP

                         * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 4     Dependent Variable..   BASE

                                                          Summary table
                                                          -------------

Step   MultR     Rsq   AdjRsq    F(Eqn)   SigF    RsqCh      FCh  SigCh       Variable   BetaIn   Correl
   1   .3299   .1089    .1000    12.216   .001    .1089   12.216   .001   In:  ADVISE      .3299    .3299
   2   .3305   .1092    .0912     6.070   .003    .0004     .042   .839   In:  ASSIST     -.0209    .1063
   3   .4437   .1969    .1723     8.008   .000    .0876   10.694   .001   In:  TANG        .3219    .3919

                         * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Residuals Statistics:

                  Min          Max      Mean   Std Dev     N

*PRED         -2.7910       1.8492     .0000     .9051   102
*RESID        -4.0632       4.3615     .0000    1.8280   102
*ZPRED        -3.0837       2.0431     .0000    1.0000   102
*ZRESID       -2.1895       2.3502     .0000     .9850   102

Total Cases =     102

                         * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

From Equation   4:   1 new variables have been created.

 Name        Contents
 ----        --------

 RBASE        Residual
```

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:43:32     NORTH TEXAS STATE UNIVERSITY    NAS/8083          MVS/SP

PRECEDING TASK REQUIRED        0.70 SECONDS CPU TIME;       39.91 SECONDS ELAPSED.

  89  0  COMPUTE LOCAG = LOC * AGE
  90  0  COMPUTE LOCMO = LOC * MOSOP
  91  0  COMPUTE LOCRAD = LOC * RADVISE
  92  0  COMPUTE LOCRTN = LOC * RTANG
  93  0  COMPUTE LOCRAS = LOC * RASSIST
  94  0  COMPUTE LOCRBS = LOC * RBASE
  95  0  COMPUTE RADRAS = RADVISE * RASSIST
  96  0  COMPUTE RADRTN = RADVISE * RTANG
  97  0  COMPUTE RADRBS = RADVISE * RBASE
  98  0  COMPUTE RASRTN = RASSIST * RTANG
  99  0  COMPUTE RASRBS = RASSIST * RBASE
 100  0  COMPUTE RTNRBS = RTANG * RBASE
 101  0  COMPUTE LAGE = LG10(AGE)
 102  0  COMPUTE LMOSOP = LG10(MOSOP)
 103  0  COMPUTE EXP = ZMGT + ZBUSEX + ZFLDEX
 104  0  COMPUTE EASS = RASSIST*EXP
 105  0  COMPUTE EADV = RADVISE*EXP
 106  0  COMPUTE ETAN = RTANG*EXP
 107  0  COMPUTE ERBS = RBASE*EXP
 108  0  COMPUTE LEXP = LOC*EXP
 109  0  COMPUTE LLOC = LG10(LOC)
 110  0  COMPUTE ELLOC = EXP*LLOC
 111  0  COMPUTE ELRAD =RADVISE*LLOC
 112  0  COMPUTE ELRAS = RASSIST*LLOC
 113  0  COMPUTE ELRTV = RTANG*LLOC
 114  0  COMPUTE ELRBS = RBASE*LLOC
 115  0  COMPUTE LOCTIN = LLOC*LMOSOP
 116  0  COMPUTE CEP = COLM*EXP
 117  0  VARIABLE LABELS
 118  0        RADVISE "GENERAL ADVISE & ASSISTANCE"
 119  0        RASSIST "SAFETY NET SUPPORT"
 120  0        RTANG "COACHING AND EXPOSURE"
 121  0        RBASE "KNOWLEDGE: PROCESSES & PEOPLE"
 122  0        LTROI "LOG RETURN ON INVESTMENT"
 123  0        RTROI "SQUARE ROOT RETURN ON INVESTMENT"
 124  0        LLOC "LOG LOCUS OF CONTROL"
 125  0        EXP "EXPERIENCE FACTOR"
 126  0        LMOSOP "LOG MONTHS IN OPERATION"
 127  0        ELLOC "EXPERIENCE X LOG LOC"
 128  0        CEP "COLLEGE MAJOR X EXP FACTOR"
 129  0              ELRAD "LOG LOC X GENL ADVICE FACTOR"
 130  0              ELRAS "LOG LOC X SAFETY NET FACTOR"
 131  0              ELRTV "LOG LOC X COACHING FACTOR"
 132  0              ELRBS "LOG LOC X KNOWLEDGE FACTOR"
 133  0        ADVISE "NONRESIDUAL FACTOR ONE"
 134  0        ASSIST "NONRESIDUAL FACTOR TWO"
 135  0        TANG "NONRESIDUAL FACTOR THREE"
 136  0        BASE "NONRESIDUAL FACTOR FOUR"
 137  0        LOCAG "LOC X AGE"
 138  0        LOCMO "LOC X MONTHS IN OPN"
 139  0        LOCRAD "LOC X RESID FACTOR ONE"
```

```
09 NOV 87    SPSS-X RELEASE 2.2  FOR IBM/MVS
11:43:46     NORTH TEXAS STATE UNIVERSITY   NAS/8083         MVS/SP

 0         LAGE "LOG OF AGE"
 0         ERBS "NA THIS SET"
 0         EADV "NA THIS SET"
 0         ETAN "NA THIS SET"
 0         EASS "NA THIS SET"
 0         LEXP "LOC X EXPERIENCE FACTOR"
 0         LOCTIN "LOG LOC X LOG MOS IN OPN"
 0    REGRESSION DESCRIPTIVES/
 0         VARIABLES = ADVISE ASSIST TANG BASE MOSOP AGE LOC LTROI MGT FLDEX
 0                           RADVISE RASSIST RBASE RTANG LOCAG LOCMO LOCRAD
 0                           BUSEX COLM
 0                              ROI RTROI LAGE LMOSOP ERBS EADV ETAN EASS
 0                                    LEXP EXP LLOC ELLOC ELRAD ELRAS ELRTV ELRBS
 0                                           LOCTIN ID CEP SATIS FINSAT/
 0          MISSING = MEANSUB/
 0          STATISTICS = R ANOVA COEFF ZPP CHA CI SES LABEL HISTORY/
 0          DEP = LTROI/
 0                ENTER COLM/
 0            ENTER EXP/
 0                ENTER LMOSOP/
 0            ENTER LLOC/
 0                ENTER RTANG/
 0                ENTER RBASE/
 0                ENTER RASSIST/
 0               ENTER RADVISE/
 0                  ENTER CEP/
 0                   ENTER ELRAD ELRAS ELRTV ELRBS/
 0           RESID = DEFAULT SIZE(SMALL)/
 0           SCATTERPLOT (*PRED *RESID)/
 0           SAVE PRED(BING) RESID(DING)/

THERE ARE   216920 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   215392 BYTES.

    47484 bytes of memory required for REGRESSION procedure.
     7376 more bytes may be needed for Residuals plots.
```

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11:44:04 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

* * * * M U L T I P L E R E G R E S S I O N * * * *

Mean Substituted for Missing Data

	Mean	Std Dev	Cases	Label
ADVISE	.075	3.176	99	NONRESIDUAL FACTOR ONE
ASSIST	.000	1.814	102	NONRESIDUAL FACTOR TWO
TANG	.000	2.256	102	NONRESIDUAL FACTOR THREE
BASE	.000	2.040	102	NONRESIDUAL FACTOR FOUR
MOSOP	50.951	47.037	102	MONTHS IN OPERATION
AGE	41.716	8.590	102	AGE OF RESPONDENT
LOC	5.891	3.213	92	LOCUS OF CONTROL
LTROI	1.472	.787	102	LOG RETURN ON INVESTMENT
MGT	.634	.482	101	MANAGEMENT EXPERIENCE
FLDEX	2.753	3.752	97	PRIOR EXPERIENCE IN VENTURE FIELD
RADVISE	.000	2.730	102	GENERAL ADVISE & ASSISTANCE
RASSIST	.000	1.661	102	SAFETY NET SUPPORT
RBASE	.000	1.828	102	KNOWLEDGE: PROCESSES & PEOPLE
RTANG	.000	1.970	102	COACHING AND EXPOSURE
LOCAG	241.315	138.588	92	LOC X AGE
LOCMO	283.413	351.686	92	LOC X MONTHS IN OPN
LOCRAD	.616	18.349	92	LOC X RESID FACTOR ONE
BUSEX	2.330	3.489	97	PRIOR EXPERIENCE IN BUSINESS
COLM	.260	.436	100	BUSINESS-RELATED COLLEGE MAJ
ROI	83.382	127.197	102	RETURN ON INVESTMENT
RTROI	7.312	5.497	102	SQUARE ROOT RETURN ON INVESTMENT
LAGE	1.611	.089	102	LOG OF AGE
LMOSOP	1.572	.333	102	LOG MONTHS IN OPERATION
ERBS	-.688	3.822	92	NA THIS SET
EADV	.321	4.686	92	NA THIS SET
ETAN	.340	4.109	92	NA THIS SET
EASS	-.380	2.935	92	NA THIS SET
LEXP	1.007	12.149	84	LOC X EXPERIENCE FACTOR
EXP	.065	1.972	92	EXPERIENCE FACTOR
LLOC	.696	.254	92	LOG LOCUS OF CONTROL
ELLOC	.070	1.363	85	EXPERIENCE X LOG LOC
ELRAD	.069	1.957	92	LOG LOC X GENL ADVICE FACTOR
ELRAS	.012	1.211	92	LOG LOC X SAFETY NET FACTOR
ELRTV	.073	1.373	92	LOG LOC X COACHING FACTOR
ELRBS	.060	1.127	92	LOG LOC X KNOWLEDGE FACTOR
LOCTIN	1.074	.457	92	LOG LOC X LOG MOS IN OPN
ID	61.088	33.104	102	ORDER OF RECEIPT
CEP	.142	1.082	98	COLLEGE MAJOR X EXP FACTOR
SATIS	4.480	.754	102	PERSONAL BUSINESS SATISFACTION
FINSAT	3.814	1.108	102	ATTAINMENT OF FINANCIAL GOALS

N of Cases encountered = 102

Minimum Pairwise N of Cases = 81

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11:44:08 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

*** * * * M U L T I P L E   R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG RETURN ON INVESTMENT

Descriptive Statistics are printed on Page 30

Beginning Block Number 1. Method: Enter COLM

Variable(s) Entered on Step Number 1.. COLM BUSINESS-RELATED COLLEGE MAJ

Multiple R	.01995		
R Square	.00040	R Square Change	.00040
Adjusted R Square	-.00960	F Change	.03981
Standard Error	.79099	Signif F Change	.8423

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	.02491	.02491
Residual	100	62.56577	.62566

F = .03981 Signif F = .8423

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.035980	.180329	-.393747	.321788	-.019948	.099980	-.019948	-.019948	-.019948	-.200	.8423
(Constant)	1.481642	.091281	1.300544	1.662740						16.232	.0000

End Block Number 1 All requested variables entered.

* *

Beginning Block Number 2. Method: Enter EXP

Variable(s) Entered on Step Number 2.. EXP EXPERIENCE FACTOR

Multiple R	.13695		
R Square	.01876	R Square Change	.01836
Adjusted R Square	-.00107	F Change	1.85213
Standard Error	.78764	Signif F Change	.1766

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	1.17391	.58696
Residual	99	61.41676	.62037

F = .94614 Signif F = .3917

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11:44:11 NORTH TEXAS STATE UNIVERSITY NAS/8083 MVS/SP

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG RETURN ON INVESTMENT

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.067520	.181055	-.426772	.291732	-.037435	.100383	-.019948	-.037127	-.037454	-.373	.7100
EXP	.054541	.040077	-.024979	.134062	.136614	.100383	.131822	.135490	.135517	1.361	.1766
(Constant)	1.486311	.090959	1.305829	1.666793						16.340	.0000

End Block Number 2 All requested variables entered.

* *

Beginning Block Number 3. Method: Enter LMOSOP

Variable(s) Entered on Step Number 3.. LMOSOP LOG MONTHS IN OPERATION

Multiple R	.26870		
R Square	.07220	R Square Change	.05345
Adjusted R Square	.04380	F Change	5.64527
Standard Error	.76978	Signif F Change	.0194

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	4.51912	1.50637
Residual	98	58.07156	.59257

F = 2.54211 Signif F = .0607

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-7.30617E-04	.179170	-.356287	.354826	-4.051E-04	.099337	-.019948	-.000397	-.000412	-.004	.9968
EXP	.050290	.039209	-.027519	.128099	.125964	.098210	.131822	.124798	.128489	1.283	.2027
LMOSOP	.553619	.233007	.091225	1.016014	.234157	.098552	.237397	.231183	.233382	2.376	.0194
(Constant)	.599056	.383863	-.162707	1.360819						1.561	.1218

End Block Number 3 All requested variables entered.

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                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

Beginning Block Number  4.  Method:  Enter       LLOC

Variable(s) Entered on Step Number  4..     LLOC       LOG LOCUS OF CONTROL

Multiple R           .32572                                       Analysis of Variance
R Square             .10609      R Square Change     .03389                        DF      Sum of Squares      Mean Square
Adjusted R Square    .06923      F Change           3.67739       Regression        4             6.64026          1.66007
Standard Error       .75948      Signif F Change     .0581        Residual         97            55.95041           .57681

                                                                  F =       2.87802        Signif F =  .0267

------------------------------------------------ Variables in the Equation ------------------------------------------------

Variable            B         SE B     95% Confdnce Intrvl B        Beta    SE Beta    Correl Part Cor  Partial        T   Sig T

COLM         -.036021      .177727     -.388760     .316717    -.019971    .098537  -.019948 -.019457 -.020575     -.203   .8398
EXP           .050333      .038684     -.026444     .127110     .126073    .096895   .131822  .124905  .130971     1.301   .1963
LMOSOP        .522937      .230444      .065570     .980304     .221179    .097468   .237397  .217844  .224526     2.269   .0255
LLOC         -.574086      .299369    -1.168250     .020079    -.185371    .096666  -.197255 -.184090 -.191118    -1.918   .0581
(Constant)   1.056242      .447517      .168046    1.944438                                                        2.360   .0203

End Block Number   4   All requested variables entered.

                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Beginning Block Number  5.  Method:  Enter       RTANG

Variable(s) Entered on Step Number  5..     RTANG      COACHING AND EXPOSURE

Multiple R           .35642                                       Analysis of Variance
R Square             .12703      R Square Change     .02094                        DF      Sum of Squares      Mean Square
Adjusted R Square    .08157      F Change           2.30302       Regression        5             7.95106          1.59021
Standard Error       .75443      Signif F Change     .1324        Residual         96            54.63962           .56916

                                                                  F =       2.79395        Signif F =  .0212
```

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*** * * *   M U L T I P L E   R E G R E S S I O N   * * * ***

Equation Number 1   Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

------------------------------ Variables in the Equation ------------------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.061980	.177372	-.414060	.290100	-.034364	.098341	-.019948	-.033322	-.035642	-.349	.7275
EXP	.046395	.038514	-.030055	.122846	.116209	.096470	.131822	.114871	.122027	1.205	.2313
LMDSOP	.511085	.229045	.056435	.965735	.216167	.096876	.237397	.212783	.222053	2.231	.0280
LLOC	-.599318	.297843	-1.190531	-.008105	-.193519	.096173	-.197255	-.191882	-.201170	-2.012	.0470
RTANG	.058345	.038446	-.017970	.134660	.146035	.096229	.147488	.144715	.153061	1.518	.1324
(Constant)	1.099446	.445452	.215232	1.983660						2.468	.0154

End Block Number   5   All requested variables entered.

* *

Beginning Block Number 6. Method: Enter   RBASE

Variable(s) Entered on Step Number 6..   RBASE   KNOWLEDGE: PROCESSES & PEOPLE

Multiple R	.36189			Analysis of Variance			
R Square	.13098	R Square Change	.00393		DF	Sum of Squares	Mean Square
Adjusted R Square	.07608	F Change	.42981	Regression	6	8.19715	1.36619
Standard Error	.75668	Signif F Change	.5137	Residual	95	54.39353	.57256

F =   2.38610   Signif F = .0343

------------------------------ Variables in the Equation ------------------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.092068	.183725	-.456808	.272673	-.051045	.101863	-.019948	-.047929	-.051346	-.501	.6174
EXP	.043200	.038936	-.034097	.120496	.108205	.097525	.131822	.106118	.113103	1.110	.2700
LMOSOP	.505647	.229878	.049282	.962011	.213866	.097228	.237397	.210382	.220141	2.200	.0303
LLOC	-.554122	.306583	-1.162765	.054521	-.178925	.098995	-.197255	-.172868	-.182329	-1.807	.0739
RTANG	.050089	.040565	-.030442	.130620	.125372	.101532	.147488	.118102	.125684	1.235	.2199
RBASE	-.030647	.046746	-.123449	.062156	-.071166	.108551	-.156343	-.062704	-.067111	-.656	.5137
(Constant)	1.084549	.447358	.196432	1.972666						2.424	.0172

End Block Number   6   All requested variables entered.

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*** * * *   M U L T I P L E   R E G R E S S I O N   * * * ***

Equation Number 1   Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

Beginning Block Number 7. Method: Enter   RASSIST

Variable(s) Entered on Step Number 7..   RASSIST   SAFETY NET SUPPORT

Multiple R	.36259		
R Square	.13147	R Square Change	.00051
Adjusted R Square	.06679	F Change	.05479
Standard Error	.76047	Signif F Change	.8154

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	7	8.22884	1.17555
Residual	94	54.36184	.57832

F =   2.03270   Signif F = .0589

------------------ Variables in the Equation ------------------

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.084255	.187639	-.456815	.288306	-.046714	.104033	-.019948	-.043162	-.046264	-.449	.6544
EXP	.042123	.039400	-.036106	.120353	.105509	.098688	.131822	.102767	.109607	1.069	.2878
LMOSOP	.512277	.232760	.050128	.974427	.216671	.098447	.237397	.211556	.221372	2.201	.0302
LLOC	-.543465	.311464	-1.161884	.074954	-.175484	.100571	-.197255	-.167723	-.177124	-1.745	.0843
RTANG	.048541	.041301	-.033464	.130546	.121495	.103376	.147488	.112971	.120339	1.175	.2429
RBASE	-.030443	.046988	-.123740	.062853	-.070694	.109113	-.156343	-.062277	-.066676	-.648	.5186
RASSIST	-.011164	.047693	-.105859	.083531	-.023548	.100600	-.068227	-.022501	-.024137	-.234	.8154
(Constant)	1.064745	.457491	.156387	1.973103						2.327	.0221

End Block Number   7   All requested variables entered.

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                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

Beginning Block Number  8.  Method:  Enter      RADVISE

Variable(s) Entered on Step Number  8..    RADVISE   GENERAL ADVISE & ASSISTANCE

Multiple R           .36364                                    Analysis of Variance
R Square             .13224      R Square Change   .00077                        DF     Sum of Squares     Mean Square
Adjusted R Square    .05759      F Change          .08199      Regression         8            8.27673         1.03459
Standard Error       .76421      Signif F Change   .7753       Residual          93           54.31395          .58402

                                                               F =      1.77150      Signif F =  .0926
```

-- Variables in the Equation --

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.080568	.189001	-.455886	.294750	-.044669	.104788	-.019948	-.041177	-.044160	-.426	.6709
EXP	.042196	.039595	-.036431	.120823	.105691	.099175	.131822	.102942	.109839	1.066	.2893
LMOSOP	.519296	.235186	.052265	.986328	.219640	.099473	.237397	.213287	.223186	2.208	.0297
LLOC	-.559699	.318089	-1.191360	.071963	-.180726	.102710	-.197255	-.169967	-.179495	-1.760	.0818
RTANG	.053588	.045092	-.035956	.143132	.134128	.112864	.147488	.114795	.122307	1.188	.2377
RBASE	-.025087	.050789	-.125944	.075769	-.058257	.117939	-.156343	-.047714	-.051154	-.494	.6225
RASSIST	-.005562	.051767	-.108360	.097237	-.011731	.109194	-.068227	-.010378	-.011140	-.107	.9147
RADVISE	.009513	.033220	-.056457	.075482	.032987	.115199	-.002100	.027660	.029680	.286	.7753
(Constant)	1.064054	.459748	.151086	1.977022						2.314	.0228

End Block Number   8   All requested variables entered.

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                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

Beginning Block Number  9.  Method:  Enter      CEP

Variable(s) Entered on Step Number  9..     CEP       COLLEGE MAJOR X EXP FACTOR

Multiple R           .36371                                    Analysis of Variance
R Square             .13228     R Square Change    .00005                   DF      Sum of Squares      Mean Square
Adjusted R Square    .04740     F Change           .00489      Regression    9             8.27962           .91996
Standard Error       .76833     Signif F Change    .9444       Residual     92            54.31106           .59034

                                                               F =      1.55836      Signif F =  .1397
```

-- Variables in the Equation --

Variable	B	SE B	95% Confdnce	Intrvl B	Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.078565	.192164	-.460220	.303089	-.043559	.106542	-.019948	-.039706	-.042586	-.409	.6836
EXP	.043950	.047043	-.049482	.137381	.110084	.117832	.131822	.090731	.096943	.934	.3526
LMOSOP	.519648	.236508	.049924	.989372	.219788	.100032	.237397	.213383	.223288	2.197	.0305
LLOC	-.564354	.326652	-1.213113	.084406	-.182229	.105475	-.197255	-.167788	-.177271	-1.728	.0874
RTANG	.053876	.045522	-.036535	.144287	.134849	.113940	.147488	.114939	.122461	1.184	.2397
RBASE	-.025219	.051098	-.126704	.076265	-.058563	.118656	-.156343	-.047932	-.051388	-.494	.6228
RASSIST	-.005747	.052114	-.109249	.097755	-.012122	.109925	-.068227	-.010710	-.011496	-.110	.9124
RADVISE	.009645	.033453	-.056796	.076086	.033446	.116007	-.002100	.028000	.030045	.288	.7738
CEP	-.006255	.089405	-.183820	.171310	-.008600	.122921	.118906	-.006795	-.007294	-.070	.9444
(Constant)	1.066995	.464135	.145183	1.988807						2.299	.0238

End Block Number   9   All requested variables entered.

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                    * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Equation Number 1    Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

Beginning Block Number 10.  Method:  Enter      ELRAD     ELRAS     ELRTV     ELRBS

Variable(s) Entered on Step Number 10..    ELRAS     LOG LOC X SAFETY NET FACTOR
                                   11..    ELRAD     LOG LOC X GENL ADVICE FACTOR
                                   12..    ELRBS     LOG LOC X KNOWLEDGE FACTOR
                                   13..    ELRTV     LOG LOC X COACHING FACTOR

                                                                   Analysis of Variance
Multiple R           .43259                                                      DF      Sum of Squares      Mean Square
R Square             .18714       R Square Change     .05486       Regression      13            11.71308           .90100
Adjusted R Square    .06706       F Change           1.48465       Residual        88            50.87762           .57815
Standard Error       .76038       Signif F Change     .2137
                                                                   F =        1.55841       Signif F =  .1130
```

--- Variables in the Equation --

Variable	B	SE B	95% Confdnce Intrvl B		Beta	SE Beta	Correl	Part Cor	Partial	T	Sig T
COLM	-.102545	.191941	-.483987	.278898	-.056854	.106418	-.019948	-.051347	-.056859	-.534	.5945
EXP	.040544	.046986	-.052830	.133918	.101553	.117688	.131822	.082933	.091599	.863	.3905
LMDSOP	.477577	.237855	.004890	.950264	.201994	.100602	.237397	.192974	.209297	2.008	.0477
LLOC	-.673919	.329958	-1.329641	-.018198	-.217607	.106543	-.197255	-.196298	-.212741	-2.042	.0441
RTANG	.342012	.137778	.068207	.615817	.856043	.344854	.147488	.238577	.255813	2.482	.0150
RBASE	.243110	.134839	-.024853	.511073	.564536	.313114	-.156343	.173283	.188743	1.803	.0748
RASSIST	.001586	.101933	-.200984	.204157	.003348	.215011	-.068227	.001496	.001659	.016	.9876
RADVISE	.063540	.068335	-.072262	.199342	.220340	.236969	-.002100	.089365	.098636	.930	.3550
CEP	.024413	.090417	-.155272	.204098	.033565	.124314	.118906	.025950	.028770	.270	.7878
ELRAS	.022184	.138405	-.252867	.297236	.034113	.212827	-.036130	.015405	.017084	.160	.8730
ELRAD	-.057436	.092311	-.240883	.126012	-.142810	.229524	.015710	-.059789	-.066181	-.622	.5354
ELRBS	-.368777	.188198	-.742780	.005226	-.527985	.269448	-.156630	-.188329	-.204472	-1.960	.0532
ELRTV	-.381274	.178481	-.735967	-.026582	-.664789	.311198	.058331	-.205312	-.222038	-2.136	.0354
(Constant)	1.265039	.474036	.322992	2.207086						2.669	.0091

End Block Number 10   All requested variables entered.

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. LTROI LOG RETURN ON INVESTMENT

Summary table

Step	MultR	Rsq	AdjRsq	F(Eqn)	SigF	RsqCh	FCh	SigCh		Variable	BetaIn	Correl	
1	.0199	.0004	-.0096	.040	.842	.0004	.040	.842	In:	COLM	-.0199	-.0199	BUSINESS-RELATED COLLEGE MAJ
2	.1370	.0188	-.0011	.946	.392	.0184	1.852	.177	In:	EXP	.1366	.1318	EXPERIENCE FACTOR
3	.2687	.0722	.0438	2.542	.061	.0534	5.645	.019	In:	LMOSOP	.2342	.2374	LOG MONTHS IN OPERATION
4	.3257	.1061	.0692	2.878	.027	.0339	3.677	.058	In:	LLOC	-.1854	-.1973	LOG LOCUS OF CONTROL
5	.3564	.1270	.0816	2.794	.021	.0209	2.303	.132	In:	RTANG	.1460	.1475	COACHING AND EXPOSURE
6	.3619	.1310	.0761	2.386	.034	.0039	.430	.514	In:	RBASE	-.0712	-.1563	KNOWLEDGE: PROCESSES & PEOPLE
7	.3626	.1315	.0668	2.033	.059	.0005	.055	.815	In:	RASSIST	-.0235	-.0682	SAFETY NET SUPPORT
8	.3636	.1322	.0576	1.771	.093	.0008	.082	.775	In:	RADVISE	.0330	-.0021	GENERAL ADVISE & ASSISTANCE
9	.3637	.1323	.0474	1.558	.140	.0000	.005	.944	In:	CEP	-.0086	.1189	COLLEGE MAJOR X EXP FACTOR
10									In:	ELRAS	.1372	-.0361	LOG LOC X SAFETY NET FACTOR
11									In:	ELRAD	.0505	.0157	LOG LOC X GENL ADVICE FACTOR
12									In:	ELRBS	-.2085	-.1566	LOG LOC X KNOWLEDGE FACTOR
13	.4326	.1871	.0671	1.558	.113	.0549	1.485	.214	In:	ELRTV	-.6648	.0583	LOG LOC X COACHING FACTOR

Equation Number 1   Dependent Variable..   LTROI   LOG RETURN ON INVESTMENT

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	.4248	2.3158	1.4723	.3405	102
*RESID	-1.8301	1.1651	.0000	.7097	102
*ZPRED	-3.0759	2.4770	.0000	1.0000	102
*ZRESID	-2.4069	1.5323	.0000	.9334	102

Total Cases = 102

Durbin-Watson Test = 1.55303

- - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S

	FRED	BING
FRED	1.0000 (0) P= .	-.1901 (102) P= .056
BING	-.1901 (102) P= .056	1.0000 (0) P= .

(COEFFICIENT / (CASES) / 2-TAILED SIG)

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